FORMER VOGT MANUFACTURING FACILITY
MONROE COUNTY, NEW YORK

Site Management Plan

NYSDEC Site Number: C828119

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Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

[DECEMBER 2009]

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

SITE MANAGEMENT PLAN

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

This document is required as an element of the remedial program at 100 Fernwood Avenue (hereinafter referred to as the "Site") under the New York State (NYS) Brownfield Cleanup Program (BCP), administered by New York State Department of Environmental Conservation (NYSDEC). The Site was remediated in accordance with Brownfield Cleanup Agreement (BCA) Index # B8-06660-04-05, Site # C828119, which was executed on October 14, 2004. However, contamination remains on the Site, which if managed according to the requirements in this SMP will allow the Site to be reused for industrial, commercial or restricted residential purposes.

1.1.1 General

Conifer Development Inc. entered into a BCA, with the NYSDEC to remediate an 8.095-acre property located in the City of Rochester, County of Monroe, New York. This BCA requires the Participant, Conifer Development Inc. to investigate and remediate contaminated media at the Site. A map showing the Site location and boundaries of this 8.095-acre Site is provided in Figure 1. The boundaries of the Site are more fully described in the metes and bounds Site description, attached as an appendix to this plan, and also accompanies the Environmental Easement, a draft version of which is included in Appendix H.

After completion of the remedial work described in the Remedial Work Plan, some contamination was left in the subsurface at this Site, which is hereafter referred to as 'remaining contamination." This Site Management Plan (SMP) was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. Reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by DAY Environmental Inc., on behalf of Conifer Development, Inc., in accordance with the requirements in NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation, dated December 2002, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement for the Site. The Participant and the Participant's successors or assigns, must manage the controls and monitoring in full compliance with the terms of this SMP and the remedial program.

The Participant and the Participant's successors or assigns remain responsible for the long term maintenance obligations associated with the remaining contamination on the Site described in this SMP. This obligation should end when the Participant and the Participant's successors or assigns can demonstrate Track 1 unrestricted SCOs have been achieved. At that point, the Participant and the Participant's successors or assigns, can petition to terminate the environmental easement on the Site since the engineering controls (ECs) and Institutional Controls (ICs) described in this SMP would no longer be required once the Track 1 cleanup objectives have been achieved.

This Site Management Plan (SMP) has been prepared for the Participant and the Participant's successors and assigns, to understand how to manage remaining contamination at the Site in perpetuity or until extinguishment of the Environmental Easement in accordance with Article 71 Title 36 of the Environmental Conservation Law and applicable regulations in 6 NYCRR Part 375. An Environmental Easement will be recorded and will run with the land requiring the Participant and the Participant's successors and assigns to comply with the terms in this SMP and the Environmental Easement.

1.1.2 Purpose

The Site contains remaining contamination left after completion of the remedial action performed under the BCP in accordance with the Track 4 remedy selected for the Site in the NYSDEC approved RWP. Requirements to evaluate the need for, and install/operate Engineering Controls (if warranted based on the redevelopment) have been incorporated into the site remedy to control exposure to remaining contamination during the use of the Site to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Monroe County Clerk, will require compliance with this SMP, and ECs and ICs placed on the Site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for ECs and ICs. This SMP specifies the methods necessary to ensure compliance with ECs and ICs required by the Environmental Easement for contamination that remains at the Site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

Long term Site management is triggered by the approval of the Final Engineering Report and issuance of the Certificate of Completion (COC) by NYSDEC at the end of the remedial process. The SMP continues in perpetuity or until extinguished in accordance with 6 NYCRR Part 375 when Track 1 unrestricted cleanup objectives are achieved. It is the responsibility of the Applicant and Applicant's successors and assigns, to ensure that Site Management responsibilities under this plan continue to be performed to ensure the continued safe use of the Site until Track 1 unrestricted cleanup objectives are achieved.

This SMP provides a detailed description of procedures required to manage remaining contamination at the Site after completion of the Remedial Action, including: (1) implementation and management of Engineering Controls (ECs) and Institutional Controls (ICs) identified in the Environmental Easement; (2) media monitoring; (3) operation and maintenance of treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations and all ECs and ICs due to achievement of the unrestricted Track 1 objectives.

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs, which includes a reporting plan for the submittal of data, information, recommendations, and certifications to NYSDEC; (2) a Monitoring Plan for implementation of Site Monitoring; and (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment or recovery systems, including vapor mitigation systems if needed in future buildings,

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the environmental easement, which is grounds for revocation of the Certificate of Completion (COC);
- Failure to comply with this SMP is also a violation of 6NYCRR Part 375 and the BCA (Index # B8-06660-04-05; Site # C828119) for the Site, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. In accordance with the Environmental Easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The Site is located in the City of Rochester, County of Monroe, New York and is identified as Block 1 and Lot 5 on the Monroe County Real Property Data Website. The Site is an approximately 8.095-acre area bounded by: commercial, industrial, and residential properties to the north; residential properties to the south; residential properties to the east; and commercial, industrial, and residential properties to the west. A project locus map is included as Figure 1. The boundaries of the Site are more fully described in Appendix B – Metes and Bounds.

1.2.2 Site History

There are two buildings on the Site. The main building was constructed between 1926 and 1930, and is an approximately 120,000-square foot, one-story concrete block building with a partial basement. The smaller building is an approximately 3,000-square foot, one-story brick building with a basement that was constructed between 1910 and 1922.

The main building is currently vacant and will be demolished. The main building was originally constructed as Vogt Manufacturing Corporation, which manufactured auto trimmings (e.g., textile trimmings spinning and weaving). Vogt Manufacturing Corporation later became known as Voplex Corporation. The main building was later converted for multi-tenant light industrial/commercial use. Former uses of the main building by tenants include: plastic products manufacturer, tool and die makers, machine shops, painters, printers, graphics companies, and sheet metal contractors.

The smaller building is currently vacant and will be demolished. This building was originally constructed as, and until recently was used as, a church. However, the smaller building has also been occupied in the past by light industrial/commercial tenants such as Empire Engraving Company (metal cutting allied services) and Phoenix Equipment Co.

The Site is zoned industrial, and is located in a mixed-use urban area. The Site and surrounding area are serviced by a public water system. A Site Plan showing relevant features of the Site is presented as Figure 2.

1.2.3 Geologic Conditions

A summary of test pits/borings, monitoring wells, and other explorations conducted at the Site is included on Table 1, and the locations of these test pits/borings and monitoring wells are shown on Figure 2. The geologic conditions identified at the Site based on these explorations and regional geologic conditions based on published documents are summarized below:

<u>Lithology</u>

Based on the work performed to date at the Site, heterogeneous fill material generally consisting of reworked soil (e.g., silt, sand, gravel, and clay) and/or cinders with lesser amounts of brick, concrete, asphalt, organics, and wood is present over many locations of the Site from the ground surface to depths ranging between approximately 0.5 feet and 6.6 feet. The average thickness of fill material in test borings advanced on the Site during the 2004/2005 Remedial Investigation/Remedial Alternatives Analysis (RI/RAA) was 2.3 feet. Thinner layers of fill encountered appear to have been used for sub-base material beneath buildings or paved parking lots. At most test locations, the indigenous soil predominantly consists of varying grades of silts and sands, with lesser amounts of gravel and clay. Geologic sections are included as Figures 3, 4, and 5.

Based on a review of a geologic map from the document titled “Subsurface Structure and Stratigraphy of Rochester, New York” dated 1983 by Jolie Lynn Scherzer, and on information obtained from the document titled “New York State Geological Highway Map” dated 1990, bedrock underlying the overburden deposits in proximity to the Site consists of Rochester Shale belonging to the Clinton Group, Upper Silurian Period, Paleozoic Era. Equipment refusal indicative of the inferred top of bedrock was encountered at test borings at an average depth of 12.9 feet below the ground surface.

<u>Hydrology</u>

Based on a preliminary review of a 1980 Generalized Groundwater Contour Map, Rochester East Quadrangle, groundwater in the area of the Site appears to flow to the east-northeast toward Irondequoit Bay, which is located approximately three miles from the Site. This flow direction may be modified locally due to buried utilities, seasonal conditions, or other factors.

A copy of a site-specific potentiometric groundwater contour map for November 14, 2005 is included as Figure 6, and depicts a radial groundwater flow pattern away from the existing unpaved in-situ bioremediation system area. Depths to groundwater recorded for June 2005, October 2005, and November 2005 sampling events ranged from approximately 5.5 feet below ground surface to 10.5 feet below ground surface.

1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

A Remedial Investigation (RI) was performed to characterize the nature and extent of contamination at the site. The results of the RI are described in detail in the following report:

- Remedial Investigation/Remedial Alternatives Analysis Report, Former Vogt Manufacturing Facility, Brownfield Cleanup Program (BCP), NYSDEC Site #C828119, 100 Fernwood Avenue, Rochester, New York, dated November 2006, as modified by an addendum dated March 8, 2007, Day Environmental, Inc.

This study has been used to prepare the following conceptual site model describing subsurface conditions, contaminant release mechanisms, and distribution patterns.

The type of contamination present at the Site generally consists of SVOCs with lesser amounts of VOCs, and is basically related to petroleum products and/or plasticizers previously stored in USTs located north of the northwest corner of the main building (Figure 2). Contaminants attributable to petroleum products and plasticizers were detected in soil and groundwater samples in proximity to the location where the five USTs were removed. Additionally, light non-aqueous phase liquid (LNAPL) was detected on the groundwater surface in various monitoring wells located in the vicinity of the former USTs.

Field findings and analytical laboratory testing of soil, groundwater, and LNAPL samples suggest a petroleum/plasticizer plume present at the Site. The petroleum/plasticizer plume is located in proximity to the former UST locations that were removed north of the main building, and the plume is estimated to be about 60 feet in length. The plume likely extended radially away from the former UST locations. A zone of more extensive contamination, including LNAPL, was documented to trend south/southwest of the former UST locations, which includes migration beneath the northeast portion of the main building. Based on a review of Site data and environmental reports for the adjoining former JML Optical, Inc. property to the west, petroleum and plasticizer contamination attributable to the former USTs at the Site appears to have also migrated via groundwater onto the adjoining former JML Optical, Inc. property (Refer to Figure 9).

Low concentrations of chlorinated VOC contaminants were detected in groundwater samples from various monitoring wells on the Site. A source of the chlorinated VOCs is unknown, but seems attributable to an area-wide groundwater condition.

Below is further information concerning site conditions identified in the RI. Table 2 summarizes the nature and extent of contaminants found in soil and groundwater. Tables 3 through 14 summarize the analytical laboratory test results of soil and groundwater samples collected during the RI.

Soil

Surface Soil: Two of four surface soil samples collected from the northern undeveloped portion of the Site contained some PAH SVOCs above December 14, 2006 NYSDEC Part 375 (Environmental Restoration Programs) soil cleanup objectives (SCOs) for Restricted Residential Use (refer to Figure 2 and Table 4). However, the concentrations of these SVOCs are comparable to other projects in the City of Rochester where surface soil data has been collected. As such, the NYSDEC concurs that the limited exceedances of the Restricted Residential Use SCOs in surface soil at the Site are attributable to the local geology or urban setting of the Site and are not significant.

Subsurface Soil: In general, contaminants attributable to petroleum products and plasticizers were detected in subsurface soil samples in proximity to the location where five USTs were removed (i.e., in proximity to the northwest corner of the main building) and also at other miscellaneous areas of the Site (refer to Figure 2 and Tables 3 to 6). The analytical laboratory test results of field samples are summarized below:

- Target VOCs were detected in 9 of 20 subsurface soil samples, but at concentrations below available NYSDEC SCOs for Restricted Residential Use. Most of the VOCs detected appear to be related to petroleum products.

- Total petroleum hydrocarbons (TPH) were detected in 2 of 11 subsurface soil samples.

- Target SVOCs were detected in 11 of the 19 subsurface soil samples, and most are related to petroleum products or plasticizers. Only the concentrations of benzo(a)anthracene, benzo(b)fluoranthene and benzo(a)pyrene detected in Sample 033 from TB-4(0-4') that was collected immediately beneath the floor of the main building (and which partly consisted of fill that contained cinders) exceeded their available NYSDEC SCOs for Restricted Residential Use. The concentrations of the SVOCs in Sample 033 are comparable to other projects in the City of Rochester where surface soil data has been collected. As such, the presence of these SVOCs appears attributable to the local geology or urban setting of the Site and is not significant. Concentrations of the SVOC bis(2-ethylhexyl)phthalate detected in 6 of the 19 subsurface soil samples were more than one or two orders of magnitude higher than other SVOCs detected in these samples. Concentrations of bis(2-ethylhexyl)phthalate in the six samples ranged from 0.059 ppm to 350 ppm. The higher concentrations of bis(2-ethylhexyl)phthalate were detected in samples from the proximity to the former UST area (i.e., up to 350 ppm at a test location outside the IRM in-situ bioremediation system, and up to 1,400 ppm on a November 2005 post-treatment soil sample collected from within the in-situ bioremediation system). This is the area of the Site where an 8,000-gallon UST containing high concentrations of bis(2-ethylhexyl)phthalate, as well as other USTs containing petroleum products, had been removed. NYSDEC SCOs are not available for the SVOC bis(2-ethylhexyl)phthalate.

- Target analyte list (TAL) metals and cyanide test results for subsurface soil samples did not exceed available NYSDEC SCOs for Restricted Residential Use. Naturally occurring concentrations of metals in soil at the Site may be contributing to the detected concentrations of metals in the subsurface soil samples (e.g., calcium, iron, magnesium, zinc).

- PCBs were not detected at concentrations above the reported analytical laboratory detection limit in the six subsurface soil samples that were tested.
- Pesticides were detected in 3 of 10 subsurface soil samples that were tested, but at concentrations below their respective NYSDEC SCOs for Restricted Residential Use.
- Formaldehyde was detected in 2 of 4 subsurface soil samples at concentrations of 0.27 ppm and 0.43 ppm. NYSDEC SCOs are not available for formaldehyde.

<u>Groundwater</u>

In general, contaminants attributable to solvents were detected in groundwater samples from wells on the southern portion of the Site. In addition, contaminants attributable to petroleum products and plasticizers were detected in groundwater samples in proximity to the location where five USTs were removed (i.e., in proximity to the northwest corner of the main building). Figure 8 shows the location of groundwater monitoring wells. The analytical laboratory test results of field samples are provided on Tables 7 to 11 and are summarized below:

- Target VOCs and tentatively identified compounds (TICs) were detected in one or more groundwater sample from wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-8 and MW-10. Target VOCs and TICs were also detected in one or more groundwater sample from monitoring wells MWIRM-1 through MWIRM-3. Types of VOCs detected in most wells are generally attributable to solvents, and the VOCs detected in a groundwater sample from well MW-10 are generally attributable to petroleum products. The measured concentrations of the VOCs 1,1,1-trichlroethane, trichloroethene, benzene, xylene, toluene, and tetrahydrofuran exceeded NYSDEC Technical and Operational Guidance Series (TOGS 1.1.1) groundwater standards and guidance values in one or more groundwater sample. Based on the concentrations detected [i.e., between 2 and 15 ug/l or parts per billion (ppb)], and since an on-site source was not documented at the Site for these types of VOCs, it is possible that the chlorinated VOCs detected in the groundwater samples at the Site may represent area-wide contamination in groundwater due to an off-site source(s). The petroleum-related VOCs generally appear attributable to the on-site USTs that were formerly located north of the northwest corner of the main building. The VOC tetrahydrofuran was detected in groundwater samples collected from wells within the footprint of the former tank excavation after construction of the in-situ bioremediation system. Tetrahydrofuran was not detected in groundwater samples from any of the other wells on the Site; thus, it does not appear that tetrahydrofuran has migrated away from the apparent source area.

- Target SVOCs and TICs were detected in one or more groundwater sample from wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-7, MW-8, MW-9, MW-10 and MW-11. Target SVOCs detected in one or more of these samples included: naphthalene; phenol; caprolactam; 2-methylnaphthalene; 1,1-biphenyl; acenaphthene; dibenzofuran; fluorene; phenanthrene; anthracene; carbazole; and bis(2-ethylhexyl)phthalate. Only the concentration of bis(2-ethylhexyl)phthalate detected in the groundwater samples from well MW-5, and the concentrations of naphthalene and bis(2-ethylhexyl)phthalate detected in the groundwater sample from well MW-10, exceeded their NYSDEC TOGS 1.1.1 groundwater standards or guidance values. [Note: Wells MW-5 and MW-10 are in proximity to the former UST locations where the in-situ bioremediation system was constructed.]

- TAL metals detected in one or more groundwater sample included: aluminum; antimony; arsenic; barium; beryllium; calcium; chromium; cobalt; copper; iron; lead; magnesium; manganese; nickel; potassium; selenium; sodium; and vanadium. NYSDEC TOGS 1.1.1 groundwater standards and guidance values were exceeded in one or more groundwater sample for: antimony; iron; magnesium; manganese; and, sodium. However, based on local geology, these metals are likely present due to naturally occurring background conditions.

- Cyanide concentrations detected in two groundwater samples did not exceed its NYSDEC TOGS 1.1.1 groundwater standard or guidance value.

- PCBs, pesticides and TPH were not detected in groundwater samples at concentrations above reported analytical laboratory detection limits.

- Formaldehyde was only detected in groundwater samples from wells MW-1, MW-4 and MW-8 at concentrations ranging between 5.2 ug/l (ppb) and 5.6 ug/l (ppb). There is no TOGS 1.1.1 groundwater standard or guidance value for formaldehyde.

During the remedial investigation, measurable LNAPL was detected at groundwater monitoring well locations MW-6 and MW-10 (refer to Figure 9). Between approximately 0.21 and 0.37 foot of LNAPL was observed on top of the groundwater in well MW-6, and approximately 0.1 foot of LNAPL was observed on top of the groundwater in well MW-10. The LNAPL detected in these wells appeared dark brown. A June 2005 LNAPL sample collected from monitoring well MW-6 primarily contained: VOCs related to petroleum products, and SVOCs related to petroleum products and plasticizers. The LNAPL sample also contained some TAL metals and pesticides. TPH test results best matched a chromatogram for #2 fuel oil. Table 2 highlights the constituents in the LNAPL sample.

Evidence of dense non-aqueous phase liquid (DNAPL) was not detected at test boring, test pit, or monitoring well locations during the RI.

<u>Soil Vapor Intrusion</u>

The results of a vapor intrusion evaluation at 142 Fernwood Avenue (i.e. the small church building) suggest that chlorinated VOCs detected in nearby groundwater monitoring well MW-1 are not impacting indoor air quality inside the building. However, the highest concentration of chlorinated VOCs (i.e., 51 ug/m^3 of trichloroethylene) was detected in an indoor air sample collected from the first floor of this building. Possible sources of the VOCs detected on the first floor during this sampling event may include historic spills to flooring, etc. on the first floor of the building, or VOC residues on former church patron clothing, shoes, etc.

Underground Storage Tanks

One 15,000-gallon UST, one 8,000-gallon UST, two 2,000-gallon USTs, and one 4,000-gallon UST were permanently closed (i.e., removed). These five USTs were located in the same general area north of the northwest corner of the main building and are depicted in Figure 2.

1.4 SUMMARY OF REMEDIAL ACTIONS

The Site was remediated in accordance with the Interim Remedial Measure Work Plan dated February 2005 as modified and approved by the NYSDEC, and the NYSDEC-approved Remedial Work Plan (RWP) dated January 2008.

The following is a summary of the Remedial Actions performed at the Site:

1. Removal of five UST's from the area located adjacent to the northwest portion of the main building;
2. Installation of an in-situ bioremediation system at the former UST area, and possible further treatment if occupied buildings are to be constructed over this area in the future;
3. LNAPL monitoring and recovery from onsite monitoring wells located in or around the northwest corner of the main building;
4. Execution and recording of an Environmental Easement to restrict land use and prevent future exposure to any contamination remaining at the Site;
5. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;
6. Confirmatory soil and groundwater sampling at the former UST area;
7. Monitored natural attenuation of contaminants in groundwater; and
8. Periodic certification of the institutional controls (ICs).

Some of the remedial actions mentioned above are ongoing at the Site as of the writing of this SMP, including LNAPL monitoring and recovery and monitored natural attenuation.

1.4.1 Removal of Contaminated Materials from the Site

In December 2003, one 15,000 gallon UST was removed from the Site. In December 2004, two 2,000-gallon USTs and the one 4,000-gallon UST were removed from the Site. These USTs were closed in accordance with applicable regulations (locations depicted on Figure 2). The tanks and their contents were removed from the Site and disposed/recycled.

During this tank closure work, approximately 1,856 cubic yards (or 2,800 tons) of impacted soil was removed and staged on-site. The staged contaminated soil was amended with materials that enhance bioremediation, backfilled into the excavation from which it was originally removed, and covered with a layer of clean soil. The amended soil was incorporated into an engineered in-situ bioremediation system that is described in Section 1.4.3 of this plan.

On April 29, 2005, dewatering of standing water from the aforementioned tank pit excavation commenced. Prior to dewatering, samples of excavation water were collected and tested. With approval from Monroe County Pure Waters, approximately 50,000 gallons of water was pumped from the excavation and discharged to a drain located inside the main building that is connected to the public sanitary sewer system.

At the time of writing of this Site Management Plan, a total of 3.6 gallons of LNAPL have been removed from monitoring/recovery wells located on the northwest portion of the Site. Monitoring/recovery wells from which LNAPL has been removed are depicted on Figure 9 and include MW-6, MW-8, MW-10 and MW-15.

1.4.2 Site-Related Treatment Systems

<u>In-Situ Bioremediation</u>

An interim remedial measure (IRM) was implemented as part of this project to address staged impacted soil associated with the UST area. This work was completed in general accordance with the In-Situ Bioremediation Interim Remedial Measure Work Plan dated February 2005 as modified and subsequently approved by the NYSDEC. The IRM involved construction and operation of an on-site in-situ bioremediation system to treat two piles of staged impacted soil excavated during the removal of the USTs. The system layout and construction details are depicted on Figure 10 and Figure 11.

<u>LNAPL Monitoring and Recovery</u>

Monitoring Wells MW-2 through MW-6, MW-8, MW-10, MW-12 through MW-16, and MWIRM-1 through MWIRM-3 are monitored for the presence of LNAPL using a Heron Model H01.l oil-water interface probe (refer to Figure 9 for locations). After establishing which wells contain LNAPL, the LNAPL is removed by bailing, pumping, passive absorbent socks, etc. The actual recovery methods used are based on the amount of LNAPL and associated recharge rate at each well location. Over time, the number of wells to be monitored may be decreased based on the previous LNAPL monitoring and recovery data that is generated. It is anticipated that LNAPL monitoring and recovery will be completed on a monthly basis; however, this schedule may be adjusted accordingly with input from the NYSDEC site representative. It is anticipated that LNAPL monitoring and recovery will be completed for a period of two years. The LNAPL monitoring and recovery started in November 2008, and is generally performed on a monthly basis. If Site conditions change (i.e., such as during the upcoming planned demolition of existing buildings), Conifer Development, Inc. may evaluate and implement other options for remediating the LNAPL.

Recovered LNAPL is placed in a 55-gallon drum that is stored in a secure location at the Site (currently inside the existing main building). Full drums will be shipped off-site for recycling or disposal in accordance with applicable regulations.

1.4.3 Remaining Contamination

Subsequent to completing the physical remedy described above, an area of contamination remains in proximity to the northwest corner of the existing building (i.e., former UST area). This area is generally shown on Figure 9. LNAPL is currently being monitored and recovered from this area. NYSDEC TOGS 1.1.1 groundwater standards or guidance values are exceeded in this area. However, confirmatory testing shows that available Track 2 Restricted Residential SCOs are not exceeded. The compound bis(2-ethylhexyl)phthalate (related to plasticizers) remains at concentrations up to 840 ppm in subsurface soils in the in-situ bioremediation area and SCOs have not been defined for this compound.

In addition, it is anticipated that chlorinated VOCs that appear to be an area-wide condition caused by an off-site source(s) remains on some portions of the site.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 INTRODUCTION

2.1.1 General

Since remaining contaminated soil and groundwater from an on-site source area of former tanks and area-wide soil vapor from an off-site source(s) exists beneath the Site, Engineering Controls and Institutional Controls (EC/ICs) are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management of EC/ICs at the Site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of EC/ICs on the site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the Excavation Work Plan for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Site; and
- Other provisions necessary to identify or establish methods for implementing the EC/ICs required by the site remedy, as determined by the NYSDEC.

2.2 ENGINEERING CONTROLS

2.2.1 Engineering Control Systems

Engineering controls are currently not required for the Site. However, ECs may be required in the future depending upon actual redevelopment as described below.

<u>2.2.1.1 Future Engineering Controls</u>

The potential for vapor intrusion must be evaluated prior to the redevelopment of the Site as outlined in Section 2.3.2. If mitigation of vapor intrusion is warranted, an engineering control will be designed and implemented and may include one or more of the following: sub-slab depressurization system, sub-membrane depressurization system, or other appropriate mechanism. Procedures for operating and maintaining future systems should be documented in an operation and maintenance plan to be submitted to the NYSDEC for inclusion into this SMP.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

2.2.2.1 In-Situ Bioremediation System

Further treatment at the in-situ bioremediation system is not currently required since a restriction prohibiting construction of occupied buildings over this area of the Site is in place. The aboveground portions of the in-situ bioremediation system will be adjusted to finished grade of the redevelopment, and the in-situ bioremediation system will not be dismantled or discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the in-situ bioremediation system is no longer required, a proposal to discontinue the system will be submitted by the property owner to the NYSDEC and NYSDOH.

2.2.2.2 Sub-Slab Depressurization System (SSDS)

If installation in a structure is deemed necessary, active SSDS will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the SSDS is no longer required, a proposal to discontinue the SSDS will be submitted by the property owner to the NYSDEC and NYSDOH.

2.2.2.3 Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic to a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

2.3 INSTITUTIONAL CONTROLS

A series of Institutional Controls is required by the RWP to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the site to restricted residential, commercial, and/or industrial uses only. Adherence to these Institutional Controls on the Site is required by the Environmental Easement and will be implemented under this SMP. These Institutional Controls are:

- Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;
- Engineering Controls must be operated and maintained as specified in this SMP;
- Engineering Controls, if and when required, on the Controlled Property must be inspected at a frequency and in a manner defined in the SMP.

- Groundwater or other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in this SMP;

Institutional Controls identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement.

The Site has a series of Institutional Controls in the form of site restrictions. Adherence to these Institutional Controls is required by the Environmental Easement. Site restrictions that apply to the Controlled Property are:

- The property may only be used for restricted residential, commercial, and/or industrial use provided that the long-term Engineering and Institutional Controls included in this SMP are employed;
- No occupied building can be constructed in the area containing the in-situ bioremediation system and LNAPL (i.e., designated as Area A as discussed in Section A-4 of the Excavation Work Plan in Appendix A, and shown on Figure 12)unless soil cleanup objectives and LNAPL recovery requirements are met to the satisfaction of the NYSDEC;
- The property may not be used for a higher level of use, such as unrestricted use without additional remediation and amendment of the Environmental Easement, as approved by the NYSDEC;
- Future activities on the property that will disturb remaining contaminated material greater than two feet must be conducted in accordance with this SMP;
- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use;
- The potential for vapor intrusion must be evaluated for any buildings developed on the Site, and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the property are prohibited;
- Groundwater monitoring wells required to be monitored as set forth in Sections 1.4.2 and 3.2.1 of this SMP will be monitored, maintained and replaced as necessary;
- The Site owner or Participant will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of the controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.3.1 Excavation Work Plan

The Site remedy allows for restricted residential, commercial, or industrial use. Future intrusive work that will penetrate, encounter or disturb the remaining contamination (i.e., including potentially impacted fill, soil and/or groundwater that contains concentrations of VOCs and/or SVOCs that exceed regulatory criteria) will be performed in compliance with the Excavation Work Plan (EWP) that is attached as Appendix A. Intrusive construction work must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the Site. A copy of the HASP that includes the CAMP is attached as Appendix C to this SMP. The HASP and CAMP are in current compliance with DER-10, and 29 CFR 1910, 29 CFR 1926, and other applicable Federal, State and local regulations. Based on future changes to State and Federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-submitted with the notification provided in Section 2.4.2 below. Intrusive construction work that will require excavation into potentially impacted fill, soil, and/or groundwater will be performed in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (See Section 5).

The site owner and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are responsible for the safe performance of intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as building foundations and bridge footings). The site owner will ensure that site development activities will not interfere with, or otherwise impair or compromise, the requirements of this SMP.

2.3.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures on the Site, a soil vapor intrusion (SVI) evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to tenants and occupants of the structure(s) corresponding to the test results within 15 days of receipt of validated data. SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

2.4 INSPECTIONS AND NOTIFICATIONS

2.4.1 Inspections

Inspections of remedial components installed at the Site will be conducted at the frequency specified in the SMP Monitoring Plan schedule. A comprehensive site-wide inspection will be conducted annually, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether Engineering Controls continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- If site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system;

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this plan (Section 5).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the site by a qualified environmental professional as determined by NYSDEC.

2.4.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the BCA# B8-06660-04-05, 6NYCRR Part 375, and/or Environmental Conservation Law.
- 15-day advance notice of any proposed ground-intrusive activities below two feet that may have the potential to encounter impacted materials (i.e., potentially contaminated fill, soil, and/or groundwater) pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other Engineering Controls and likewise any action to be taken to mitigate the damage or defect.

- Notice within 48-hours of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the site, including a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the BCA, and all approved work plans and reports, including this SMP.
- Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to Day Environmental, Inc., the Owner's current qualified environmental professional, or any other qualified environmental professional. These emergency contact lists must be maintained in an easily accessible location at the Site.

Table 2.5.1-A: Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Table 2.5.1-B: Contact Numbers

Day Environmental, Inc.	585-454-0210
Greg MacLean, P.E. NYSDEC Project Manager	585-226-5356
Eileen Broderick Conifer Development, Inc.	585-324-0503

* Note: Contact numbers subject to change and should be updated as necessary

2.5.2 Map and Directions to Nearest Health Facility

A map and directions to the nearest health facility are included in the HASP in Appendix C.

Nearest Hospital Name: Rochester General Hospital

Hospital Location: 1426 Portland Avenue, Rochester, New York

Hospital Telephone: (585 (922-4000 (Main), (585) 922-2000 (Emergency department)

2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Table 2.5.1-A). The list will also be posted prominently at the Site and made readily available to all personnel at all times.

3.0 SITE MONITORING PLAN

3.1 INTRODUCTION

3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site, and affected site media identified below. Monitoring of other Engineering Controls is described in Chapter 4, Operation, Monitoring and Maintenance Plan. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards and Part 375 SCOs for soil;
- Assessing achievement of the remedial performance criteria.
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification

Semi-annual (for the first two years) and annual (for the next three years) monitoring of the performance of the remedy and overall reduction in contamination on-site will be conducted for the first five years. The frequency thereafter will be determined by the NYSDEC. Trends in contaminant levels in air, soil, and/or groundwater in the affected areas, will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in Table 3.1.2-A and outlined in detail in Sections 3.2 and 3.3 below.

Table 3.1.2-A: Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Matrix	Analysis
MNA	Semi-Annually, years 1-2 Annually, years 3-5	Groundwater	TCL VOCs including TICs using NYSDEC ASP Method OLM04.3 TCL SVOCs including TICs using NYSDEC ASP Method OLM04.3 Natural attenuation parameters such as nitrate, iron (II), manganese, sulfate, methane, and chloride (Methods SM3500D, E300IC, ILM04.1, and RSK175).

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

3.2 MEDIA MONITORING PROGRAM

3.2.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy.

The network of monitoring wells has been installed to monitor both up-gradient and down-gradient groundwater conditions at the Site. The network of monitoring wells at the Site includes the following:

- MWIRM-1 through MWIRM-3 – monitoring wells installed within the IRM bio-remediation area (i.e., to evaluate contaminant concentrations within the source area).
- MW-5, MW-6, MW-8, MW-10, MW-12 through MW-16 – monitoring wells installed within an impacted area to evaluate migration of contaminants away from the source area.
- MW-2 through MW-4 – monitoring wells installed up-gradient of impacted and source areas.
- MW-8 and MW-10 – monitoring wells installed along the western property line of the Site intended to monitor groundwater conditions that may migrate on- and/or off-site to the west.

Test boring logs and well construction diagrams for the above monitoring wells are included in Appendix D. The location of the monitoring wells listed above and a groundwater contour map for data collected in 2005 is presented in Figure 6. Groundwater sampling will be conducted using a combination of the monitoring wells specified above as agreed upon by the

NYSDEC Project Manager. Refer to the table in Section 3.1.2 for anticipated analytes to be tested from the selected monitoring well.

The anticipated sampling frequency is listed in Section 3.1.2, and the sampling frequency and list of analytes may be modified with approval from the NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by the NYSDEC.

Deliverables for the groundwater monitoring program are specified below.

3.2.1.1 Sampling Protocol

Monitoring well sampling activities will be conducted in accordance with the Quality Assurance Project Plan (QAPP) included in Appendix E and recorded in a field book and a Low Flow Groundwater Purging and Sampling Log presented in Appendix F. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

Each of the groundwater samples collected as part of a routine sampling event will be submitted for testing by a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified analytical laboratory. Each sample will be analyzed for the analytes specified on Table 3.1.2A.

3.2.1.2 Monitoring Well Repairs, Replacement And Decommissioning

If biofouling or silt accumulation occurs in the on-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable.

The groundwater monitoring wells included in the long-term program should not require routine maintenance. Nonetheless, observation of the integrity and functionality of each well will be made during each groundwater-monitoring event. This will include observing the well covers, and evaluating the interior PVC well casing for readily apparent indications of damage. In the event a given well is found to be damaged, it will be repaired or replaced as soon as practical, weather permitting. If needed, the well PVC riser elevation will be re-surveyed. Similarly, if the Site is redeveloped and a given monitoring well needs to be replaced, it will be reinstalled as close as is reasonable to its prior location and re-surveyed.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with the NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.3 SITE-WIDE INSPECTION

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, an inspection form will be completed (Appendix G). The form will compile sufficient information to assess the following:

- Compliance with ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirm that site records are up to date.

3.4 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

Sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) that was prepared in January 2008 for the Site Remedial Work Plan. A copy of this QAPP is included in Appendix E.

3.5 MONITORING REPORTING REQUIREMENTS

Forms and any other information generated during regular monitoring events and inspections will be maintained by the Participant. Forms and other relevant reporting formats used during the monitoring/inspection events will be (1) subject to approval by NYSDEC and (2) submitted at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP.

Monitoring results will be reported to the NYSDEC on a periodic basis in the Periodic Review Report. The report will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of appropriate field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;

- Copies of all laboratory data sheets and the required laboratory data deliverables required for the points sampled (to be submitted electronically in the NYSDEC-identified format);
- Relevant observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by the NYSDEC. A summary of the monitoring program deliverables are summarized in Table 3.5-A below.

Table 3.5-A: Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*
Periodic Review Report	Annually

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC

4.0 OPERATION AND MAINTENANCE PLAN

4.1 INTRODUCTION

This Operation and Maintenance Plan describes the measures necessary to monitor and maintain the mechanical components of the remedy selected for the site. This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the site to maintain the in-situ bioremediation system;
- Includes a maintenance contingency plan; and,
- Will be updated periodically to reflect changes in site conditions or the manner in which the in-situ bioremediation system is maintained. [NOTE: While the in-situ bioremediation system is a passive mechanical system that relies on air flow, the above ground components may fail due to external forces and need to be inspected and maintained].

Information on non-mechanical Engineering Controls is provided in Section 3 - Engineering and Institutional Control Plan. A copy of this Operation and Maintenance Plan, along with the complete SMP, will be kept at the Site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of the SMP.

4.2 IN-SITU BIOREMEDIATION SYSTEM MAINTENANCE

The in-situ bioremediation system was constructed between April and May 2005, within the limits of the former UST pit excavation. Figure 10 and Figure 11 show the approximate location of the in-situ bioremediation system and provides as-built construction details. The in-situ bioremediation system was designed to accelerate the degradation of VOCs and SVOCs in soil and groundwater by 1) amending the impacted backfill soils below the water table with a chemical oxidizing agent and cultured natural bacteria; 2) amending backfill soils above the water table with fertilizer and a bulking agent; and 3) installing three perforated PVC pipe runs through backfill soils above the water table to increase airflow through the impacted soils.

4.2.1 Scope

The in-situ bioremediation system is a passive mechanical system that relies on air flow (i.e., wind) for operation. The system is designed to operate without routine maintenance. However, the above ground components of the in-situ bioremediation system may fail due to external forces (e.g., vandalism, severe weather, etc.) and should be observed as specified in Section 4.2.2.

4.2.2 System Operation: Non-Routine Equipment Maintenance

PVC risers, air influent goose-neck connectors, and air effluent wind turbines that appear cracked, broken, or missing will be repaired or replaced with similar materials.

If air influent or air effluent pipe ends appear to be blocked or filled, the obstruction(s) will be cleared to allow air to flow through the pipes.

4.3 IN-SITU BIOREMEDIATION SYSTEM PERFORMANCE MONITORING

The in-situ bioremediation system continues to be utilized at the time of this writing. Additional treatments may need to be completed in the future depending upon Site conditions. The need for such additional treatments will be determined by NYSDEC after evaluation of additional monitoring data. The scope and schedule will be outlined in a separate work plan to be submitted to NYSDEC within 30 days of NYSDEC's request for said work plan, for approval. Additional performance monitoring will also be completed in the form of soil and/or groundwater sampling at the Site, including within the in-situ bioremediation area (Figure10).

4.3.1 Performance Monitoring Schedule

Unscheduled inspections and/or sampling of the in-situ bioremediation system may take place when a suspected failure of the in-situ bioremediation system has been reported or an emergency occurs that is deemed likely to affect the operation of the system.

4.3.2 General Equipment Monitoring

A visual inspection of the aboveground portions of the system will be conducted during the annual monitoring event described in Section 3.4. In-situ bioremediation system components to be monitored include, but are not limited to, the following: PVC risers, air influent goose-neck connectors, and air effluent wind turbines.

If the system is damaged or is not performing, maintenance and repair as per Section 4.2.2 of the Operation and Maintenance Plan are required immediately.

4.4 MAINTENANCE AND PERFORMANCE MONITORING REPORTING REQUIREMENTS

Maintenance reports and other information generated during regular operations at the site will be kept on-file on-site and/or at the offices of the Participant. Reports, forms, and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the Periodic Review Report, as specified in the Section 5 of this SMP.

4.4.1 Routine Maintenance Reports

The site-wide inspection form (see Appendix G) will be completed during each annual inspection event. Information pertaining to the in-situ bioremediation system required for the site-wide inspection form will include, but not be limited to, the following:

- Date;
- Name, company, and position of person(s) conducting maintenance activities;
- Maintenance activities conducted (if any);

- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc. (attached to the checklist/form).

4.4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a form will be completed which will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Repairs or adjustments made to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and,
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

5. INSPECTIONS, REPORTING AND CERTIFICATIONS

5.1 SITE INSPECTIONS

5.1.1 Inspection Frequency

Inspections will be conducted at the frequency specified in the schedules provided in Section 3 Monitoring Plan and Section 4 Operation and Maintenance Plan of this SMP. At a minimum, a site-wide inspection will be conducted annually. Inspections of remedial components will also be conducted when a breakdown of any treatment system component has occurred or whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

A general, site-wide, inspection form will be completed during the site-wide inspection (see Appendix G). Observations of the conditions and performance of on-site monitoring wells and the in-situ remediation system will be included on the site-wide inspection form. These forms are subject to NYSDEC revision.

Applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format in the Periodic Review Report.

5.1.3 Evaluation of Records and Reporting

The results of the inspection and site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Maintenance activities are being conducted properly; and, based on the above items; and
- The site remedy continues to be protective of public health and the environment and is performing as designed in the RWP and FER.

5.2 CERTIFICATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

After the last inspection of the reporting period, a qualified environmental professional or Professional Engineer licensed to practice in New York State will prepare the following certification:

[If the remedy includes any engineering controls in the future, include the following:]

For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;
- The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the site is compliant with the environmental easement;
- The engineering control systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program [and generally accepted engineering practices]; and
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] (and if the site consists of multiple properties): [I have been authorized and designated by all site owners to sign this certification] for the site.
- No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and

Every five years the following certification will be added:

- The assumptions made in the qualitative exposure assessment remain valid.

The signed certification will be included in the Periodic Review Report described below.

[If the remedy requires only an institutional control, include the following:]

For each institutional control identified for the site, I certify that all of the following statements are true:

- The institutional control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the site is compliant with the environmental easement.
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] (and if the site consists of multiple properties): [and I have been authorized and designated by all site owners to sign this certification] for the site.
- No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and

Every five years the following certification will be added:

- The assumptions made in the qualitative exposure assessment remain valid.

The signed certification will be included in the Periodic Review Report described below.

5.3 PERIODIC REVIEW REPORT

A Periodic Review Report will be submitted to the Department every year, beginning eighteen months after the COC or equivalent document is issued. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in Appendix B (Metes and Bounds). The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of ECs/ICs required by the remedy for the site;
- Results of the required annual site inspections and severe condition inspections, if applicable;

- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of compounds analyzed, along with the applicable standards, with exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A site evaluation, which includes the following:
    - The compliance of the remedy with the requirements of the site-specific RWP;
    - The operation and the effectiveness of treatment units, etc., including identification of any needed repairs or modifications;
    - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
    - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
    - The overall performance and effectiveness of the remedy.
- A performance summary for treatment systems at the site during the calendar year, including information such as:
    - The contaminant mass removed;
    - A description of breakdowns and/or repairs along with an explanation for any significant downtime;
    - A description of the resolution of performance problems;
    - A summary of the performance, effluent and/or effectiveness monitoring; and
    - Comments, conclusions, and recommendations based on data evaluation.

The Periodic Review Report will be submitted in hard-copy format to the NYSDEC Regional Office in which the site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation.

5.4 CORRECTIVE MEASURES PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

APPENDIX A

EXCAVATION WORK PLAN

APPENDIX A – EXCAVATION WORK PLAN

A-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

Batholomew H. Putzig, P.E.
Regional Hazardous Waste Remediation Engineer
6274 East Avon-Lima Road Avon, NY 14414

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of intrusive work that will encounter potentially impacted fill, soil, and/or groundwater;
- A summary of the applicable components of this excavation work plan (EWP);
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in Appendix C of this document,
- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

A-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening (i.e., monitoring with a photoionization detector and a particulate meter, if warranted) will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

A-3 STOCKPILE METHODS

Depending on the quantity of material excavated, impacted materials may be loaded directly into trucks for transport off-site for disposal, placed within roll-off containers and/or placed in a soil stockpile. Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps or plastic sheeting. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

A-4 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under their supervision will oversee all invasive work conducted inside existing building footprints and below the top two feet of soil in Area A shown on Figure 12, and any excavation and load-out of materials in the areas specified above.

The owner of the property and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and other applicable transportation requirements).

If required based on the type and extent of invasive work proposed, a truck wash will be operated on-site. The qualified environmental professional will be responsible for ensuring that all outbound trucks are free of debris before leaving the Site until the activities performed under this section are complete.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

A-5 MATERIALS TRANSPORT OFF-SITE

Transport of contaminated materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used. [Note: To the extent possible, wet soil will be drained in an aboveground location on the Site prior to off-site transport.]

As necessary, trucks will be washed prior to leaving the Site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

A map and directions from the Site via approved truck transport routes will be obtained by the transporter prior to transporting contaminated materials off-site. Trucks loaded with Site materials will exit the vicinity of the Site using these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport; [(g) community input [where necessary]]

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

A-6 MATERIALS DISPOSAL OFF-SITE

As determined by characterization test results, fill, soil, and/or solid waste deemed to be contaminated that is excavated and removed from the Site will be treated as contaminated material and will be transported and disposed in accordance with applicable local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated off-site disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this Site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate (i.e., hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc.). Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at a minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

A-7 MATERIALS REUSE ON-SITE

In the event that excavation activities at the Site encounter potentially contaminated materials, the materials may be re-used on-site in accordance with guidelines as set forth below in this SMP. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below the impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

In order to qualify for re-use, the on-site material must:

- Comply with the remedial action objectives identified in the RWP.
- Be free of extraneous debris or solid waste
- Consist of soil or other unregulated material as set for in 6NYCRR Part 360
- Be tested at the rate outlined in table A-7(a)

Table A-7(a)
Required number of Soil Samples to determine re-use suitability of excavated on-site soils.

Contaminant	**Semi-Volatiles**		**Volatiles**		**Inorganics**		**PCBs/Pesticides**	
Soil Quantity (yd^{3})	Grab	Composite	Grab	Composite	Grab	Composite	Grab	Composite
0-50	1	1	1	NA	1	1	1	1
50-100	1	2	2	NA	1	2	1	2
100-200	1	3	3	NA	1	3	1	3
200-300	1	4	4	NA	1	4	1	4
300-400	2	4	4	NA	2	4	2	4
400-500	2	5	5	NA	2	5	2	5
500-800	2	6	6	NA	2	6	2	6
800-1000	2	7	7	NA	2	7	2	7
> 1000	Sample frequency may be reduced with approval from NYSDEC Project Manager							

Based on the testing outcome, soil may be used in the following manner:

- Soil originating on the Site that complies with unrestricted soil SCOs set forth in 6 NYCRR Part 375 Table 375-6.8(a) may be re-used without restriction on or off the Site. Table 375-6.8(a) is included in Appendix I.
- Soil originating on the Site that complies with the more stringent of the Restricted Residential SCOs or the Protection of Groundwater SCOs [set forth in 6 NYCRR Part 375 Table 375-6.8(b)] may be re-used on-site for backfill. Table 375-6.8(b) is included in Appendix I.
- Soil originating on the Site that complies with site-specific remedial action objectives for subsurface soil (referenced in the RWP) may be re-used on-site as backfill at a depth greater than two feet below finished grade, or as backfill for soils beneath future buildings, pavement, and other improvements.

In the event that building demolition material is proposed for reuse on-site, it will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site will not be reused on-site.

A-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will be managed off-site, or appropriately treated and discharged on-site in accordance with applicable regulations.

A-9 BACKFILL FROM OFF-SITE SOURCES

Materials proposed for import onto the Site that will be used as backfill materials will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the Site.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the Site.

Imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards for imported backfill and cover soil at this Site is the lesser of the SCOs for Restricted Residential Use and the Protection of Groundwater as referenced in 6NYCRR 375-6.8(b). Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

A-10 STORMWATER POLLUTION PREVENTION

During excavation activities barriers and hay bale checks will be installed and inspected once a week and after every storm event in accordance with applicable regulations. Results of inspections will be recorded in a logbook and will be available for inspection by NYSDEC. Necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

Undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Depending on the size of the excavation, silt fencing or hay bales will be installed around the entire perimeter of the construction area.

A-11 CONTINGENCY PLAN

In the event that underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to the NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

A-12 COMMUNITY AIR MONITORING PLAN

The CAMP is included in the HASP that has been developed for the Site (refer to Appendix C). The CAMP will be implemented during excavation at the Site (generally at depths greater than two feet). The locations of air sampling stations that will be used based on generally prevailing wind conditions, and also on where Site work is being performed, are shown in Figure 12. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations. In addition, fixed monitoring stations will be located at the Site perimeter next to residential areas in proximity to areas being worked at the Site, regardless of wind direction, since they are considered sensitive receptors. Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

A-13 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis may include limiting the extent of open excavations, the use of physical barriers or ventilation systems (i.e., in the event interior excavations are required) or other methods deemed appropriate at the time of excavation.. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated to the extent possible and acceptable to the impacted parties. NYSDEC and NYSDOH will be notified of odor events. Implementation of odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

Necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: limiting the area of open excavations and size of soil stockpiles; shrouding open excavations with tarps and other covers; using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: direct load-out of soils to trucks for off-site disposal; use of chemical odorants in spray or misting systems; and, use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

A-14 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved though the use of a dedicated on-site water truck, or other available water source of sufficient volume, for road wetting. The equipment will be capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

A-15 OTHER NUISANCES

As necessary, a plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

As necessary, a plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

TABLES

TABLE 1

NAD83 Horizontal Coordinates for Test Locations

100 Fernwood Avenue
Rochester, New York
NYSDEC Site No.C828119

Test Location	Type	Northing	Easting
TB-1	Test Boring	4783768.970	289673.390
TB-2	Test Boring	4783837.970	289667.390
TB-3	Test Boring	4783832.270	289768.440
TB-4	Test Boring	4783799.870	289770.240
TB-5	Test Boring	4783826.720	289787.040
TB-5A	Test Boring	4783829.420	289786.740
TB-6	Test Boring	4783806.620	289810.140
TB-7	Test Boring	4783799.270	289797.540
TB-8	Test Boring	4783926.020	289690.290
TB-9	Test Boring	4783911.620	289668.240
TB-10	Test Boring	4783892.120	289677.690
TB-11	Test Boring	4783887.170	289677.840
TB-12	Test Boring	4783903.820	289691.490
TB-13	Test Boring	4783894.970	289712.940
TB-14	Test Boring	4783905.320	289707.690
TB-15	Test Boring	4783895.720	289662.390
TB-16	Test Boring	4783889.570	289728.540
TB-17	Test Boring	4783831.820	289748.190
TB-18	Test Boring	4783831.820	289740.430
TB-19	Test Boring	4783881.770	289737.990
TB-20	Test Boring	4783877.060	289696.050
TB-21	Test Boring	4783860.920	289697.690
TB-22	Test Boring	4783878.190	289677.320
TB-23	Test Boring	4783833.170	289699.780
TB-24	Test Boring	4783798.220	289706.080
TB-25	Test Boring	4783797.770	289742.940
TB-26	Test Boring	4784004.460	289775.470
TB-27	Test Boring	4784059.390	289772.270
TB-28	Test Boring	4783881.170	289658.490
TB-29	Test Boring	4783866.640	289680.420
TB-30	Test Boring	4783872.020	289766.340
TB-31	Test Boring	4783800.020	289772.190
TB-32	Test Boring	4783871.780	289666.960
TB-33	Test Boring	4783857.770	289667.840
TB-34	Test Boring	4783894.970	289712.940
TB-35	Test Boring	4783905.320	289707.690
TB-36	Test Boring	4783926.020	289690.290
TB-37	Test Boring	4783903.820	289691.490
MW-1	Monitoring Well	4783799.400	289797.480
MW-2	Monitoring Well	4783892.600	289677.580
MW-3	Monitoring Well	4783903.580	289691.410
MW-4	Monitoring Well	4783894.970	289712.720
MW-5	Monitoring Well	4783877.240	289696.160
MW-6	Monitoring Well	4783878.140	289677.370
MW-7	Monitoring Well	4784004.450	289775.500
MW-8	Monitoring Well	4783881.080	289658.530
MW-9	Monitoring Well	4783799.550	289770.620
MW-10	Monitoring Well	4783871.740	289667.070
MW-11	Monitoring Well	4783799.400	289797.480
SG-1	Soil Gas	4783765.290	289672.960
SG-2	Soil Gas	4783799.250	289672.670
SG-3	Soil Gas	4783830.010	289670.450
SG-4	Soil Gas	4783859.810	289669.970

TABLE 1

NAD83 Horizontal Coordinates for Test Locations

100 Fernwood Avenue
Rochester, New York
NYSDEC Site No.C828119

Test Location	Type	Northing	Easting
SG-5	Soil Gas	4783894.340	289667.160
SG-6	Soil Gas	4783929.270	289668.510
SG-7	Soil Gas	4783766.260	289707.210
SG-8	Soil Gas	4783799.440	289705.860
SG-9	Soil Gas	4783829.140	289704.990
SG-10	Soil Gas	4783860.480	289704.410
SG-11	Soil Gas	4783895.120	289706.150
SG-12	Soil Gas	4783929.650	289702.280
SG-13	Soil Gas	4783768.380	289739.600
SG-14	Soil Gas	4783799.730	289736.410
SG-15	Soil Gas	4783828.950	289736.410
SG-16	Soil Gas	4783861.550	289735.440
SG-17	Soil Gas	4783895.990	289735.630
SG-18	Soil Gas	4783926.370	289736.500
SG-19	Soil Gas	4783771.380	289767.460
SG-20	Soil Gas	4783800.410	289766.200
SG-21	Soil Gas	4783829.910	289765.040
SG-22	Soil Gas	4783861.450	289765.820
SG-23	Soil Gas	4783896.380	289766.300
SG-24	Soil Gas	4783927.240	289765.530
SG-25	Soil Gas	4783776.460	289801.590
SG-26	Soil Gas	4783801.130	289802.070
SG-27	Soil Gas	4783830.980	289802.650
SG-28	Soil Gas	4783862.510	289801.680
SG-29	Soil Gas	4783896.670	289802.070
SG-30	Soil Gas	4783929.650	289801.200
SG-31	Soil Gas	4783967.010	289774.750
SG-32	Soil Gas	4784036.450	289773.940
IA-1	Indoor Air Sample	4783793.010	289806.590
IA-2	Indoor Air Sample	4783790.180	289809.480
SLB-1	Sub-Slab Air Sample	4783793.950	289806.260
BKG-1	Background Air Sample	4783777.520	289812.810
MWIRM-1	Monitoring Well	4783891.660	289703.520
MWIRM-2	Monitoring Well	4783899.270	289695.630
MWIRM-3	Monitoring Well	4783889.200	289685.170
TBIRM-1	Test Boring	4783892.660	289707.200
TBIRM-2	Test Boring	4783887.500	289698.800
TBIRM-3	Test Boring	4783887.280	289686.790
TBIRM-4	Test Boring	4783896.570	289690.990
TP-1	Test Pit	4783890.080	289680.680
TP-2	Test Pit	4783885.140	289680.540
TP-3	Test Pit	4783891.190	289742.010
TP-4	Test Pit	4783884.780	289685.620
SS-1	Soil Sample	4784043.030	289752.440
SS-2	Soil Sample	4784063.090	289797.100
SS-3	Soil Sample	4783954.660	289753.900
SS-4	Soil Sample	4783955.750	289799.060

NAD 83 UTM Zone 18 horizontal coordinates (in meters) obtained via instrument survey, GPS, or swing ties from located site features

TABLE 2

Nature and Extent of Contamination

100 Fernwood Avenue
Rochester, New York
NYSDEC Site #C828119

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[c] (ppb)[a]	Frequency of Exceeding SCG
Semi-Volatile Organic Compounds (SVOCs)	Benzo(a)anthracene	ND – 1.5	1.0	1 of 4
	Benzo(b)fluoranthene	ND – 2.6	1.0	2 of 4
	Benzo(a)pyrene	ND – 1.7	1.0	1 of 4

[a] ppb = parts per billion, which is equivalent to micrograms per kilogram (ug/Kg) in soil

[c] SCG = standards, criteria and guidance: NYSDEC Track 2 (Restricted Residential Use) BCP SCOs for soil; NYSDEC TOGS 1.1.1 standards and guidance values for groundwater and NAPL

ND = Not detected above reported analytical laboratory detection limit

TABLE 2 (Continued)

Nature and Extent of Contamination

100 Fernwood Avenue
Rochester, New York
NYSDEC Site #C828119

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[c] (ppb)[a]	Frequency of Exceeding SCG
SVOCs	Benzo(a)anthracene	ND – 1.5	1.0	1 of 19
	Benzo(b)fluoranthene	ND – 2.6	1.0	1 of 19
	Benzo(a)pyrene	ND – 1.3	1.0	1 of 19

[a] ppb = parts per billion, which is equivalent to micrograms per kilogram (ug/Kg) in soil

[c] SCG = standards, criteria and guidance: NYSDEC Track 2 (Restricted Residential Use) BCP SCOs for soil; NYSDEC TOGS 1.1.1 standards and guidance values for groundwater and NAPL

ND = Not detected above reported analytical laboratory detection limit

TABLE 2 (Continued)

Nature and Extent of Contamination

100 Fernwood Avenue
Rochester, New York
NYSDEC Site #C828119

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[b]	SCG[c] (ppb)[b]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	ND - 15	5	2 of 16
	Benzene	ND - 6	1	1 of 16
	Trichloroethene	ND - 11	5	3 of 16
	Xylenes (Total)	ND - 39	5	1 of 16
SVOCs	Naphthalene	ND - 130	10	1 of 16
	Bis(2-ethylhexyl)phthalate	ND - 300	5	2 of 16
Inorganics	Antimony	ND – 4.3	3	1 of 7
	Iron	ND – 10,200	300	2 of 7
	Magnesium	15,900 – 68,100	35,000	4 of 7
	Manganese	38.2- 1,030	300	3 of 7
	Sodium	7,910 – 319,000	20,000	6 of 7

[b] ppb = parts per billion, which is equivalent to micrograms per liter (ug/L) in water

[c] SCG = standards, criteria and guidance: NYSDEC Track 2 (Restricted Residential Use) BCP SCOs for soil; NYSDEC TOGS 1.1.1 standards and guidance values for groundwater and NAPL

ND = Not detected above reported analytical laboratory detection limit

TABLE 2 (Continued)

Nature and Extent of Contamination

100 Fernwood Avenue
Rochester, New York
NYSDEC Site #C828119

LNAPL Sample	Contaminants of Concern	Concentration Range Detected (ppb)[b]	SCG[c] (ppb)[b]	Frequency of Exceeding SCG
VOCs	Toluene	33,000	5	1 of 1
	Ethylbenzene	14,000	5	1 of 1
	Xylenes (Total)	190,000	5	1 of 1
SVOCs	Naphthalene	1,700,000	10	1 of 1
	1,1 -Biphenyl	190,000	5	1 of 1
	Acenaphthene	680,000	20	1 of 1
	Fluorene	570,000	50	1 of 1
	Phenanthrene	1,800,000	50	1 of 1
	Anthracene	450,000	50	1 of 1
	Fluoranthene	62,000	50	1 of 1
	Pyrene	370,000	50	1 of 1
	Benzo (a) anthracene	45,000	0.2	1 of 1
	Chrysene	66,000	0.002	1 of 1
	Bis(2-ethylhexyl)phthalate	51,000,000	5	1 of 1
	Di-n-octylphthalate	44,000	50	1 of 1
Pesticides	Gamma-Chlordane	290	0.05	1 of 1

[b] ppb = parts per billion, which is equivalent to micrograms per liter (ug/L) in water

[c] SCG = standards, criteria and guidance: NYSDEC Track 2 (Restricted Residential Use) BCP SCOs for soil; NYSDEC TOGS 1.1.1 standards and guidance values for groundwater and NAPL

NA = Not Available

Table 3 (Page 1 of 4)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of Detected Volatile Organic Compounds (VOCs)
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	001 TP-1 (8') 12/2/04	002 TP-4 (8') 12/2/04	032 TB-6 (0-4') 05/19/05	033 TB-4(0-4') 05/19/05	034 TB-8(11') 05/20/05	035 TB-9(7.9') 05/20/05
Acetone	0.2	100	0.074 J	0.18 J	U J	U J	U J	U J
Methyl Acetate	NA	NA	U	U J	U J	U J	U J	U J
Methylene Chloride	0.1	100	U	0.099 J	U J	U J	U J	U J
2-Butanone	0.3	100	0.039 J	0.013 J	U J	U J	U J	U J
Benzene	0.06	4.8	U	U J	U J	U J	U J	U J
Methylcyclohexane	NA	NA	12 DJ	0.004 J	U J	U J	U J	U J
Tetrachloroethene	1.4	19	U	U J	U J	U J	U J	U J
Toluene	1.5	100	0.19 J	U J	U J	U J	U J	U J
Ethylbenzene	5.5	41	2.3 DJ	0.023 J	U J	U J	U J	U J
Xylene (Total)	1.2	100	4.7 DJ	0.052 J	U J	U J	U J	U J
Isopropylbenzene	2.3	NA	2 DJ	0.12 J	U J	U J	U J	U J
TOTAL VOCS	NA	NA	21.303 DJ	0.491 J	U J	U J	U J	U J
TOTAL TICS	NA	NA	809 NJ	68.31 NJ	U	U	U	U
TOTAL VOCS AND TICS	10	NA	830.303 DNJ	68.801 NJ	U J	U J	U J	U J

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(2) = Brownfield Cleanup Program soil cleanup objective (BCP SCO) for Track 2 (restricted residential use) as referenced in Draft 6 NYCRR Part 375 Environmental Remediation Program dated June 14, 2006.

NA = Not available TIC = Tentatively identified compound J = Estimated value

D = Compound identified in an analysis at a secondary dilution factor

U = Not detected at concentration above reported analytical laboratory detection limit

N= Indicates presumptive evidence of tentatively identified compound

Table 3 (Page 2 of 4)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of Detected Volatile Organic Compounds (VOCs)
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	036 TB-10(9.9') 05/20/05	037 TB-12(8') 05/20/05	038 TB-13(11') 05/20/05	039 TB-14(12') 05/20/05	040 TB-15(8') 05/20/05	041 TB-18(0-4') 05/23/05
Acetone	0.2	100	0.008 J	U J	U J	U J	U J	U
Methyl Acetate	NA	NA	U J	U J	U J	U J	U J	U
Methylene Chloride	0.1	100	U J	U J	U J	U J	U J	U J
2-Butanone	0.3	100	U J	U J	U J	U J	U J	U
Benzene	0.06	4.8	U J	U J	U J	U J	U J	U
Methylcyclohexane	NA	NA	U J	U J	U J	U J	U J	U
Tetrachloroethene	1.4	19	U J	U J	U J	U J	0.006 J	U
Toluene	1.5	100	U J	U J	U J	U J	U J	U
Ethylbenzene	5.5	41	U J	U J	U J	U J	U J	U
Xylene (Total)	1.2	100	U J	U J	U J	U J	0.002 J	U
Isopropylbenzene	2.3	NA	U J	U J	U J	U J	U J	U
TOTAL VOCS	NA	NA	0.008 J	U J	U J	U J	0.008 J	U J
TOTAL TICS	NA	NA	1.734 NJ	0.006 NJ	U	U	U	U
TOTAL VOCS AND TICS	10	NA	1.742 NJ	0.006 NJ	U J	U J	0.008 J	U J

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D = Compound identified in an analysis at a secondary dilution factor

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Table 3 (Page 3 of 4)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of Detected Volatile Organic Compounds (VOCs)
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	042 TB-22(11-12') 05/23/05	043 TB-24(0-4') 05/23/05	048 SS-1(0-2") 05/26/05	049 SS-2(0-2") 05/26/05	050 SS-3(0-2") 05/26/05	051 SS-4(0-2") 05/26/05
Acetone	0.2	100	0.013	0.008 J	0.011 NJ	U	U	U
Methyl Acetate	NA	NA	U	U	0.004 J	U	U	U
Methylene Chloride	0.1	100	U J	U J	U	U	U	U
2-Butanone	0.3	100	U	U	U	U	U	U
Benzene	0.06	4.8	U	U	U	U	U	U
Methylcyclohexane	NA	NA	U	U	U	U	U	U
Tetrachloroethene	1.4	19	U	U	U J	U J	U	U J
Toluene	1.5	100	U	U	U J	U J	U	U J
Ethylbenzene	5.5	41	U	U	U J	U J	U	U J
Xylene (Total)	1.2	100	0.004 J	U	U J	U J	U	U J
Isopropylbenzene	2.3	NA	U	U	U J	U J	U	U J
TOTAL VOCS	NA	NA	0.017 J	0.008 J	0.015 NJ	U J	U	U J
TOTAL TICS	NA	NA	0.366 NJ	U	0.023 NJ	U	U	0.016 J
TOTAL VOCS AND TICS	10	NA	0.383 NJ	0.008 J	0.038 NJ	U J	U	0.016 J

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Table 3 (Page 4 of 4)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of Detected Volatile Organic Compounds (VOCs)
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	052 TB-27(0-2') 05/26/05	053 TB-29(8-12') 05/26/05	054 TB-30(11-12') 05/26/05	070 TB-32(9') 10/17/05	071 TB-33(9') 10/17/05	072 TB-37(10') 10/17/05
Acetone	0.2	100	U	U	0.015	U	U	U
Methyl Acetate	NA	NA	U	U	U	U	U	U
Methylene Chloride	0.1	100	U	0.003 J	0.003 J	U	U	U
2-Butanone	0.3	100	U	U	U	U	U	U
Benzene	0.06	4.8	U	U	U	0.007	U	U
Methylcyclohexane	NA	NA	U	U	U	0.059	U	U
Tetrachloroethene	1.4	19	U J	U	U	0.005 J	U	U
Toluene	1.5	100	U J	U	U	0.043	U	U
Ethylbenzene	5.5	41	U J	U	U	0.015 J	U	U
Xylene (Total)	1.2	100	U J	U	U	0.520	U	U
Isopropylbenzene	2.3	NA	U J	U	U	0.028	U	U
TOTAL VOCS	NA	NA	U J	0.003 J	0.018 J	0.677 J	U	U
TOTAL TICS	NA	NA	U	U	U	56.950 NJ	U	U
TOTAL VOCS AND TICS	10	NA	U J	0.003 J	0.018 J	57.627 NJ	U	U

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NA = Not available TIC = Tentatively identified compound J = Estimated value

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Table 4 (Page 1 of 5)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of Detected SVOCs and TPH
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	001 TP-1(8') 12/02/04	002 TP-4(8') 12/02/04	027 TB-1 (0-4') 05/19/05	028 TB-10 (2') 05/20/05	029 TB-16 (0-4') 05/23/05	032 TB-6 (0-4') 05/19/05
Naphthalene	13	100	12 DJ	1.1 J	NA	NA	NA	U J
Caprolactam	NA	NA	U	U	NA	NA	NA	U J
2-Methylnaphthalene	36.4	NA	76 DJ	1.9 J	NA	NA	NA	U J
1,1-Biphenyl	NA	NA	U J	U	NA	NA	NA	U J
Acenaphthene	50	100	6.1 J	0.11 J	NA	NA	NA	U J
Dibenzofuran	6.2	59	U	0.042 J	NA	NA	NA	U J
Fluorene	50	100	4.5 J	0.11 J	NA	NA	NA	U J
Phenanthrene	50	100	11 DJ	1 J	NA	NA	NA	0.11 J
Anthracene	50	100	3.4 J	0.22 J	NA	NA	NA	U J
Carbazole	NA	NA	1.3 J	0.078 J	NA	NA	NA	U J
Di-n-butylphthalate	8.1	NA	U	U	NA	NA	NA	U J
Fluoranthene	50	100	0.61 J	0.97 J	NA	NA	NA	0.23 J
Pyrene	50	100	3.6 J	1 J	NA	NA	NA	0.24 J
Butylbenzylphthalate	50	NA	U	U	NA	NA	NA	U J
Benzo(a)anthracene	0.224 or MDL	1	0.44 J	0.25 J	NA	NA	NA	0.18 J
Chrysene	0.4	3.9	0.65 J	0.1 J	NA	NA	NA	0.13 J
bis(2-Ethylhexyl)phthalate	50	NA	100 DJ	6.1 DJ	NA	NA	NA	0.059 J
Di-n-octylphthalate	50	NA	2.8 J	U	NA	NA	NA	U J
Benzo(b)fluoranthene	0.22 or MDL	1	0.17 J	0.14 J	NA	NA	NA	0.17 J
Benzo(k)fluoranthene	0.22 or MDL	3.9	0.056 J	0.069 J	NA	NA	NA	0.057 J
Benzo(a)pyrene	0.061 or MDL	1	0.24 J	0.095 J	NA	NA	NA	0.11 J
Indeno(1,2,3-cd)pyrene	3.2	0.5	U J	U	NA	NA	NA	0.061 J
Dibenzo(a,h)anthracene	0.0143 or MDL	0.33	U J	U	NA	NA	NA	U J
Benzo(g,h,i)perylene	50	100	U J	U	NA	NA	NA	0.048 J
TOTAL SVOCS	NA	NA	222.866 DJ	13.284 DJ	NA	NA	NA	1.395 J
TOTAL TICS	NA	NA	756 NJD	61.3 NJ	NA	NA	NA	0.1 J
TOTAL SVOCS AND TICS	500	NA	978.866 DJN	74.584 NDJ	NA	NA	NA	1.495 J
TOTAL cPAH SVOCS	NA	NA	1.556 DJN	0.654 DJ	NA	NA	NA	0.708 J
TOTAL cPAH SVOCS as BAP Toxicity Equivalent	NA	NA	0.30806 DJN	0.13569 DJ	NA	NA	NA	0.15297 J
TPH	NA	NA	NA	NA	U J	18	U	NA

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J = Estimated value

U = Not detected at concentration above reported analytical laboratory detection limit

NA = Not available

BAP = Benzo(a)pyrene

$\boxed{1.5}$ = Exceeds BCP SCO

N = Indicates presumptive evidence of tentatively identified compound

TIC = Tentatively identified compound

cPAH = Carcinogenic polyaromatic hydrocarbon

D = Compound identified in an analysis at a secondary dilution factor

Table 4 (Page 2 of 5)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of Detected SVOCs and TPH
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	033 TB-4(0-4') 05/19/05	034 TB-8(11') 05/20/05	035 TB-9(7.9') 05/20/05	036 TB-10(9.9') 05/20/05	037 TB-12(8') 05/20/05	038 TB-13(11') 05/20/05
Naphthalene	13	100	0.13 J	U	U	U	U	U
Caprolactam	NA	NA	U J	U	U	U	U	U
2-Methylnaphthalene	36.4	NA	0.11 J	U	U	U	U	U
1,1-Biphenyl	NA	NA	U J	U	U	U	U	U
Acenaphthene	50	100	0.099 J	U	U	U	U	U
Dibenzofuran	6.2	59	0.11 J	U	U	U	U	U
Fluorene	50	100	0.045 J	U	U	U	U	U
Phenanthrene	50	100	2.3 J	U	U	U	U	U
Anthracene	50	100	0.31 J	U	U	U	U	U
Carbazole	NA	NA	0.092 J	U	U	U	U	U
Di-n-butylphthalate	8.1	NA	U J	U	U	U	U	U
Fluoranthene	50	100	3.7 DJ	U	U	U	U	U
Pyrene	50	100	2.7 J	U	U	U	U	U
Butylbenzylphthalate	50	NA	U J	U	U	U	U	U
Benzo(a)anthracene	0.224 or MDL	1	1.5 J	U	U	U	U	U
Chrysene	0.4	3.9	1.4 J	U	U	U	U	U
bis(2-Ethylhexyl)phthalate	50	NA	U J	U J	U J	U J	U J	U J
Di-n-octylphthalate	50	NA	U J	U J	U	U	U	U
Benzo(b)fluoranthene	0.22 or MDL	1	2.6 J	U J	U J	U J	U J	U J
Benzo(k)fluoranthene	0.22 or MDL	3.9	0.68 J	U J	U	U	U	U
Benzo(a)pyrene	0.061 or MDL	1	1.3 J	U J	U	U	U	U
Indeno(1,2,3-cd)pyrene	3.2	0.5	0.34 J	U J	U J	U J	U J	U J
Dibenzo(a,h)anthracene	0.0143 or MDL	0.33	0.072 J	U J	U	U	U	U
Benzo(g,h,i)perylene	50	100	0.24 J	U J	U	U	U	U
TOTAL SVOCS	NA	NA	17.728 JD	U J	U J	U J	U J	U J
TOTAL TICS	NA	NA	3.698 NJ	1.537 J	0.27 NJ	0.319 NJ	0.23 NJ	0.35 J
TOTAL SVOCS AND TICS	500	NA	21.426 NJD	1.537 J	0.27 NJ	0.319 NJ	0.23 NJ	0.35 J
TOTAL cPAH SVOCS	NA	NA	7.892 J	NA	NA	NA	NA	NA
TOTAL cPAH SVOCS as BAP Toxicity Equivalent	NA	NA	1.8368 J	NA	NA	NA	NA	NA
TPH	NA	NA	190	NA	NA	U	U	NA

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J = Estimated value

U = Not detected at concentration above reported analytical laboratory detection limit

NA = Not available

BAP = Benzo(a)pyrene

$\boxed{1.5}$ = Exceeds BCP SCO

N = Indicates presumptive evidence of tentatively identified compound

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cPAH = Carcinogenic polyaromatic hydrocarbon

D = Compound identified in an analysis at a secondary dilution factor

Table 4 (Page 3 of 5)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of Detected SVOCs and TPH
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	039 TB-14(12') 05/20/05	040 TB-15(8') 05/20/05	041 TB-18(0-4') 05/23/05	042 TB-22(11-12') 05/23/05	043 TB-24(0-4') 05/23/05	048 SS-1(0-2") 05/26/05
Naphthalene	13	100	U	U	U	U	U	0.056 J
Caprolactam	NA	NA	U	U	U	U	U	U
2-Methylnaphthalene	36.4	NA	U	U	U	U	U	U
1,1-Biphenyl	NA	NA	U	U	U	U	U	U
Acenaphthene	50	100	U	U	U	U	U	0.12 J
Dibenzofuran	6.2	59	U	U	U	U	U	0.059 J
Fluorene	50	100	U	U	U	U	U	0.083 J
Phenanthrene	50	100	U	U	0.066 J	U	0.04 J	2.2
Anthracene	50	100	U	U	U	U	U	0.33 J
Carbazole	NA	NA	U	U	U	U	U	0.23 J
Di-n-butylphthalate	8.1	NA	U	U	U	U	U	0.36 J
Fluoranthene	50	100	U	U	U	U	0.038 J	3.8 D
Pyrene	50	100	U	U	U	U	U	3.3
Butylbenzylphthalate	50	NA	U	U	U	U	U	0.12 J
Benzo(a)anthracene	0.224 or MDL	1	U	U	U	U	U	**1.5**
Chrysene	0.4	3.9	U	U	U	U	U	1.3
bis(2-Ethylhexyl)phthalate	50	NA	U J	U J	U J	U J	U J	U J
Di-n-octylphthalate	50	NA	U	U	U	U	U	U
Benzo(b)fluoranthene	0.22 or MDL	1	U J	U J	U J	U	U J	**2.6** D
Benzo(k)fluoranthene	0.22 or MDL	3.9	U	U	U	U	U	0.91 D
Benzo(a)pyrene	0.061 or MDL	1	U	U	U	U	U	**1.7**
Indeno(1,2,3-cd)pyrene	3.2	0.5	U J	U J	U J	U	U J	0.33 J
Dibenzo(a,h)anthracene	0.0143 or MDL	0.33	U	U	U	U	U	0.1 J
Benzo(g,h,i)perylene	50	100	U	U	U	U	U	0.37 J
TOTAL SVOCS	NA	NA	U J	U J	0.066 J	U J	0.078 J	19.468 DJ
TOTAL TICS	NA	NA	0.3 NJ	0.27 J	0.25 J	U	U	35.68 NJ
TOTAL SVOCS AND TICS	500	NA	0.3 NJ	0.27 J	0.316 J	U J	0.078 J	55.148 DNJ
TOTAL cPAH SVOCS	NA	NA	NA	NA	NA	NA	NA	8.44 J
TOTAL cPAH SVOCS as BAP Toxicity Equivalent	NA	NA	NA	NA	NA	NA	NA	2.3821 J
TPH	NA	NA	NA	NA	U	U	U	NA

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$\boxed{1.5}$ = Exceeds BCP SCO

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Table 4 (Page 4 of 5)
100 Fernwood Avenue, Rochester, New York
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Summary of Detected SVOCs and TPH
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	049 SS-2(0-2") 05/26/05	050 SS-3(0-2") 05/26/05	051 SS-4(0-2") 05/26/05	052 TB-27(0-2') 05/26/05	053 TB-29(8-12') 05/26/05	054 TB-30(11-12') 05/26/05
Naphthalene	13	100	U	U	U	U	U	U
Caprolactam	NA	NA	U	U	U	U	U	0.11 J
2-Methylnaphthalene	36.4	NA	U	U	U	U	U	U
1,1-Biphenyl	NA	NA	U	U	U	U	U	U
Acenaphthene	50	100	U	U	U	U	U	U
Dibenzofuran	6.2	59	U	U	U	U	U	U
Fluorene	50	100	U	U	U	U	U	U
Phenanthrene	50	100	0.18 J	0.49	0.17 J	U	U	U
Anthracene	50	100	U	0.077 J	U	U	U	U
Carbazole	NA	NA	U	0.085 J	U	U	U	U
Di-n-butylphthalate	8.1	NA	U	0.044 J	0.043 J	0.043 J	U	0.05 J
Fluoranthene	50	100	0.24 J	1.7	0.38 J	0.081 J	U	U
Pyrene	50	100	U	1.3	0.32 J	0.092 J	U	U
Butylbenzylphthalate	50	NA	0.086 J	0.066 J	U	U	U	U
Benzo(a)anthracene	0.224 or MDL	1	0.15 J	0.71	0.22 J	0.07 J	U	U
Chrysene	0.4	3.9	0.14 J	0.59	0.15 J	0.044 J	U	U
bis(2-Ethylhexyl)phthalate	50	NA	U J	6.9 DJ	U J	U J	7.2 DJ	U J
Di-n-octylphthalate	50	NA	U	U	U	U	U	U
Benzo(b)fluoranthene	0.22 or MDL	1	0.16 J	1.1	0.25 J	0.063 J	U	U
Benzo(k)fluoranthene	0.22 or MDL	3.9	0.053 J	0.35 J	0.066 J	U	U	U
Benzo(a)pyrene	0.061 or MDL	1	0.12 J	0.65	0.15 J	0.045 J	U	U
Indeno(1,2,3-cd)pyrene	3.2	0.5	0.054 J	0.2 J	0.074 J	U	U	U
Dibenzo(a,h)anthracene	0.0143 or MDL	0.33	U	0.067 J	U	U	U	U
Benzo(g,h,i)perylene	50	100	0.06 J	0.2 J	0.094 J	U	U	U
TOTAL SVOCS	NA	NA	1.243 J	14.529 DJ	1.917 J	0.438 J	7.2 DJ	0.16 J
TOTAL TICS	NA	NA	25.26 NJ	17.18 NJ	22.172 NJ	7.141 NJ	3.811 J	4.61 NJ
TOTAL SVOCS AND TICS	500	NA	26.503 NJ	31.709 DNJ	24.089 NJ	7.579 NJ	11.011 DJ	4.77 NJ
TOTAL cPAH SVOCS	NA	NA	0.677 J	3.667 J	0.91 J	0.222 J	NA	NA
TOTAL cPAH SVOCS as BAP Toxicity Equivalent	NA	NA	0.15833 J	0.9274 J	0.20656 J	0.05874 J	NA	NA
TPH	NA	NA	NA	NA	NA	NA	U	U

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J = Estimated value — U = Not detected at concentration above reported analytical laboratory detection limit

NA = Not available — BAP = Benzo(a)pyrene

$\boxed{1.5}$ = Exceeds BCP SCO — N = Indicates presumptive evidence of tentatively identified compound

TIC = Tentatively identified compound — cPAH = Carcinogenic polyaromatic hydrocarbon

D = Compound identified in an analysis at a secondary dilution factor

Table 4 (Page 5 of 5)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of Detected SVOCs and TPH
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	070 TB-32(9') 10/17/05	071 TB-33(9') 10/17/05				
Naphthalene	13	100	2.1	U				
Caprolactam	NA	NA	U	U				
2-Methylnaphthalene	36.4	NA	17 DJ	U				
1,1-Biphenyl	NA	NA	0.29 J	U				
Acenaphthene	50	100	1.2	U				
Dibenzofuran	6.2	59	U	U				
Fluorene	50	100	1.1	U				
Phenanthrene	50	100	2.9 J	U				
Anthracene	50	100	0.7	U				
Carbazole	NA	NA	0.24 J	U				
Di-n-butylphthalate	8.1	NA	U	U				
Fluoranthene	50	100	0.1 J	U				
Pyrene	50	100	1.2 J	U J				
Butylbenzylphthalate	50	NA	U J	U J				
Benzo(a)anthracene	0.224 or MDL	1	0.1 J	U J				
Chrysene	0.4	3.9	0.052 J	U J				
bis(2-Ethylhexyl)phthalate	50	NA	350 DJ	0.13 J				
Di-n-octylphthalate	50	NA	0.32 J	U J				
Benzo(b)fluoranthene	0.22 or MDL	1	U J	U J				
Benzo(k)fluoranthene	0.22 or MDL	3.9	U J	U J				
Benzo(a)pyrene	0.061 or MDL	1	U J	U J				
Indeno(1,2,3-cd)pyrene	3.2	0.5	U J	U J				
Dibenzo(a,h)anthracene	0.0143 or MDL	0.33	U J	U J				
Benzo(g,h,i)perylene	50	100	U J	U J				
TOTAL SVOCS	NA	NA	377.302 DJ	0.13 J				
TOTAL TICS	NA	NA	108 NJ	0.88 J				
TOTAL SVOCS AND TICS	500	NA	485.302 DNJ	1.01 J				
TOTAL cPAH SVOCS	NA	NA	0.152 J	U				
TOTAL cPAH SVOCS as BAP Toxicity Equivalent	NA	NA	0.01052 J	U				
TPH	NA	NA	NA	NA				

(1) = Recommended soil cleanup objective (RSCO) as referenced in NYSDEC TAGM 4046 dated January 24, 1994 as amended by the NYSDEC's supplemental Tables dated August 22, 2001

(2) = Brownfield Cleanup Program soil cleanup objective (BCP SCO) for Track 2 (restricted residential use) as referenced in Draft 6 NYCRR Part 375 Environmental Remediation Program dated June 14, 2006.

J = Estimated value
U = Not detected at concentration above reported analytical laboratory detection limit
NA = Not available
BAP = Benzo(a)pyrene
$\boxed{1.5}$ = Exceeds BCP SCO
N = Indicates presumptive evidence of tentatively identified compound
TIC = Tentatively identified compound
cPAH = Carcinogenic polyaromatic hydrocarbon
D = Compound identified in an analysis at a secondary dilution factor

Table 5 (Page 1 of 2)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of Target Analyte List Metals and Cyanide
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Analyte	RSCO (1)	Typical Background Range (2)	Track 2 BCP SCO (3)	032 TB-6 (0-4') 05/19/05	033 TB-4(0-4') 05/19/05	041 TB-18(0-4') 05/23/05	042 TB-22(11-12') 05/23/05	048 SS-1(0-2") 05/26/05	049 SS-2(0-2") 05/26/05
Aluminum	SB	33000	NA	6150	5200	7260	3110	4730	6490
Antimony	SB	NA	NA	0.67 BNJ	1.6 BNJ	0.63 BNJ	0.47 BNJ	1.2 BNJ	0.91 BNJ
Arsenic	7.5 or SB	3-12	16	5.5	8.5	8.2	2.9	6.6	10.6
Barium	300 or SB	15-600	400	35.8	96.1	40.3	18.6 B	140	62.7
Beryllium	0.16 or SB	0-1.75	72	0.27 B	0.24 B	0.5 B	0.22 B	0.28 B	0.33 B
Cadmium	1 or SB (10)	0.1-1	4.3	0.29 B	0.71 B	0.15 B	0.23 B	2.1	0.85 B
Calcium	SB	130-35000	NA	5850 *	10500 *	1930 *	46800 *	34400	3250
Chromium	10 or SB (50)	1.5-40	180	6.4	7.2	11.4	5.7	86.7	10.3
Cobalt	30 or SB	2.5-60	NA	3.3 BEJ	4 BEJ	3.9 BEJ	3.7 BEJ	5.5 BE	4.1 BE
Copper	25 or SB	1-50	270	12.6	98.5	25.6	8.9	120	38.2
Iron	2,000 or SB	2000-550000	NA	10700	10600	18000	8790	10700	17700
Lead	SB	200-500**	400	50.8 *	271 *	10.5 *	2.5 *	284	245
Magnesium	SB	100-5000	NA	3450 *	2750 *	1930 *	3050 *	15400	1450
Manganese	SB	50-5000	2000	126 NJ	170 NJ	137 NJ	477 NJ	359 NJ	214 NJ
Mercury	0.1	0.001-0.2	0.81	0.11	0.33	U	U	0.18	0.17
Nickel	13 or SB	0.5-25	310	7.2 EJ	8.4 EJ	9.1 EJ	9.2 EJ	15.9 EJ	9.2 EJ
Potassium	SB	8500-43000	NA	353 B	489 B	965	826	972	705 B
Selenium	2 or SB	0.1-3.9	180	U NJ	U NJ	U NJ	U NJ	U	U
Silver	SB	NA	180	0.16 B	U	0.56 B	U	16.9 N*J	1.5 BN*J
Sodium	SB	6000-8000	NA	99.6 B	139 B	60.6 B	87.4 B	104 B	65.3 B
Thallium	SB	NA	NA	U	U	U	U	U	U
Vanadium	150 or SB	1-300	NA	10.5	9.9	18.2	6.4 B	13.7	13.6
Zinc	20 or SB	9-50	10000	80.7	405	37.4	19.3	364	227
Cyanide	NA	NA	27	U	0.21 B	U	U	0.48 B	0.15 B

(1) = Recommended soil cleanup objective (RSCO) as referenced in NYSDEC TAGM 4046 dated January 24, 1994.
Cadmium results also compared to RSCO of 10 ppm listed in the 1995 "proposed" TAGM 4046.
Chromium results also compared to RSCO of 50 ppm listed in the 1995 "proposed" TAGM 4046.

(2) = Typical background range as referenced in NYSDEC TAGM 4046 dated January 24, 1994.

(3) = Brownfield Cleanup Program soil cleanup objective (BCP SCO) for Track 2 (restricted residential use) as referenced in Draft 6 NYCRR Part 375 Environmental Remediation Program dated June 14, 2006.

* = Duplicate analysis not within control limits — J = Estimated value — SB = Site background. — NA = Not available

N = Spiked sample recovery not within control limits — U = Not detected at concentration above reported analytical laboratory detection limit

E = Reported value estimated due to interference — B = Reported Value less than contract required detection limit, but greater than instrument detection limit

Table 5 (Page 2 of 2)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of Target Analyte List Metals and Cyanide
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Analyte	RSCO (1)	Typical Background Range (2)	Track 2 BCP SCO (3)	050 SS-3(0-2") 05/26/05	051 SS-4(0-2") 05/26/05	052 TB-27(0-2') 05/26/05			
Aluminum	SB	33000	NA	6170	5910	8700			
Antimony	SB	NA	NA	0.97 BNJ	0.69 BNJ	0.49 BNJ			
Arsenic	7.5 or SB	3-12	16	7.4	6	4.1			
Barium	300 or SB	15-600	400	67.2	55.5	38.3			
Beryllium	0.16 or SB	0-1.75	72	0.42 B	0.33 B	0.37 B			
Cadmium	1 or SB (10)	0.1-1	4.3	0.77 B	0.44 B	0.22 B			
Calcium	SB	130-35000	NA	10000	2740	2000			
Chromium	10 or SB (50)	1.5-40	180	9.2	8.4	8.8			
Cobalt	30 or SB	2.5-60	NA	5.0 BE	4.3 BE	4.9 BE			
Copper	25 or SB	1-50	270	33.4	21.6	12.4			
Iron	2,000 or SB	2000-550000	NA	14200	11600	12400			
Lead	SB	200-500**	400	67.4	61.4	20.3			
Magnesium	SB	100-5000	NA	4600	1800	1770			
Manganese	SB	50-5000	2000	472 NJ	330 NJ	239 NJ			
Mercury	0.1	0.001-0.2	0.81	0.063 B	0.13	0.066 B			
Nickel	13 or SB	0.5-25	310	11.8 EJ	9.3 EJ	10.6 EJ			
Potassium	SB	8500-43000	NA	1550	996	448 B			
Selenium	2 or SB	0.1-3.9	180	U	U	U			
Silver	SB	NA	180	0.55 BN*J	1.2 BN*J	0.88 BN*J			
Sodium	SB	6000-8000	NA	58 B	47.8 B	40.4 B			
Thallium	SB	NA	NA	U	0.53 B	U			
Vanadium	150 or SB	1-300	NA	13.9	12.7	14.2			
Zinc	20 or SB	9-50	10000	142	80.6	44.1			
Cyanide	NA	NA	27	0.16 B	1.2	U			

(1) = Recommended soil cleanup objective (RSCO) as referenced in NYSDEC TAGM 4046 dated January 24, 1994.
Cadmium results also compared to RSCO of 10 ppm listed in the 1995 "proposed" TAGM 4046.
Chromium results also compared to RSCO of 50 ppm listed in the 1995 "proposed" TAGM 4046.

(2) = Typical background range as referenced in NYSDEC TAGM 4046 dated January 24, 1994.

(3) = Brownfield Cleanup Program soil cleanup objective (BCP SCO) for Track 2 (restricted residential use) as referenced in Draft 6 NYCRR Part 375 Environmental Remediation Program dated June 14, 2006.

* = Duplicate analysis not within control limits J = Estimated value SB = Site background. NA = Not available

N = Spiked sample recovery not within control limits U = Not detected at concentration above reported analytical laboratory detection limit

E = Reported value estimated due to interference B = Reported Value less than contract required detection limit, but greater than instrument detection limit

Table 6 (Page 1 of 3)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of PCBs, Pesticides and Formaldehyde
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	030 TB-5A (0-4') 05/19/05	031 TB-3 (0-4') 05/19/05	032 TB-6 (0-4') 05/19/05	041 TB-18(0-4') 05/23/05	042 TB-22(11-12') 05/23/05	044 TB-23(0-4') 05/23/05
4,4-DDE	2.1	8.9	U J	U J	U J	U	U	NA
4,4-DDT	2.1	7.9	U J	U J	U J	U	U	NA
Endrin ketone	NA	NA	U J	0.0039 JP	0.0023 J	U	U	NA
alpha-Chlordane	0.54	4.2	U J	U J	0.00088 J	U	U	NA
gamma-Chlordane	0.54	NA	U J	U J	U J	U	U	NA
PCB (Aroclor-1260)	1/10*	1	U J	U J	U J	U	U	NA
Formaldehyde	NA	NA	NA	NA	NA	NA	NA	U

(1) = Recommended soil cleanup objective (RSCO) as referenced in NYSDEC TAGM 4046 dated January 24, 1994 as amended by the NYSDEC's supplemental Tables dated August 22, 2001

(2) = Brownfield Cleanup Program soil cleanup objective (BCP SCO) for Track 2 (restricted residential use) as referenced in Draft 6 NYCRR Part 375 Environmental Remediation Program dated June 14, 2006.

J= Estimated Value U = Not detected at concentration above reported analytical laboratory detection limit

NA = Not available * = RSCO for surface soil is 1000 ppb / RSCO for subsurface soil is 10000 ppb

P = Greater than 25% difference in detection between two GC columns used for primary and confirmation analyses. The lower of the two values is reported.

N= Indicates presumptive evidence of tentatively identified compound

Table 6 (Page 2 of 3)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of PCBs, Pesticides and Formaldehyde
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	045 TB-11(6.6') 05/20/05	046 TB-25(0-4') 05/23/05	047 TB-19(0-4') 05/23/05	048 SS-1(0-2") 05/26/05	049 SS-2(0-2") 05/26/05	050 SS-3(0-2") 05/26/05
4,4-DDE	2.1	8.9	NA	NA	NA	U	0.0095	0.0038 PNJ
4,4-DDT	2.1	7.9	NA	NA	NA	0.0061 PNJ	0.016	0.0021 J
Endrin ketone	NA	NA	NA	NA	NA	U	U	U
alpha-Chlordane	0.54	4.2	NA	NA	NA	U	U	U
gamma-Chlordane	0.54	NA	NA	NA	NA	0.001 PNJ	U	U
PCB (Aroclor-1260)	1/10*	1	NA	NA	NA	U	U	U
Formaldehyde	NA	NA	0.43	U	0.27	NA	NA	NA

(1) = Recommended soil cleanup objective (RSCO) as referenced in NYSDEC TAGM 4046 dated January 24, 1994 as amended by the NYSDEC's supplemental Tables dated August 22, 2001

(2) = Brownfield Cleanup Program soil cleanup objective (BCP SCO) for Track 2 (restricted residential use) as referenced in Draft 6 NYCRR Part 375 Environmental Remediation Program dated June 14, 2006.

J= Estimated Value

U = Not detected at concentration above reported analytical laboratory detection limit

NA = Not available

* = RSCO for surface soil is 1000 ppb / RSCO for subsurface soil is 10000 ppb

P = Greater than 25% difference in detection between two GC columns used for primary and confirmation analyses. The lower of the two values is reported.

N= Indicates presumptive evidence of tentatively identified compound

Table 6 (Page 3 of 3)
100 Fernwood Avenue, Rochester, New York
NYSDEC Site #C828119

Summary of PCBs, Pesticides and Formaldehyde
in mg/Kg or Parts Per Million (ppm)

Soil Samples

Detected Compound	RSCO (1)	Track 2 BCP SCO (2)	051 SS-4(0-2") 05/26/05	052 TB-27(0-2') 05/26/05				
4,4-DDE	2.1	8.9	U	U				
4,4-DDT	2.1	7.9	0.002 J	U				
Endrin ketone	NA	NA	U	U				
alpha-Chlordane	0.54	4.2	U	U				
gamma-Chlordane	0.54	NA	U	U				
PCB (Aroclor-1260)	1/10*	1	U	U				
Formaldehyde	NA	NA	NA	NA				

(1) = Recommended soil cleanup objective (RSCO) as referenced in NYSDEC TAGM 4046 dated January 24, 1994 as amended by the NYSDEC's supplemental Tables dated August 22, 2001

(2) = Brownfield Cleanup Program soil cleanup objective (BCP SCO) for Track 2 (restricted residential use) as referenced in Draft 6 NYCRR Part 375 Environmental Remediation Program dated June 14, 2006.

J= Estimated Value — U = Not detected at concentration above reported analytical laboratory detection limit

NA = Not available — * = RSCO for surface soil is 1000 ppb / RSCO for subsurface soil is 10000 ppb

P = Greater than 25% difference in detection between two GC columns used for primary and confirmation analyses. The lower of the two values is reported.

N= Indicates presumptive evidence of tentatively identified compound

Table 7 (Page 1 of 3)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of Detected Volatile Organic Compounds (VOCs)
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Compound	Groundwater Standard or Guidance Value (1)	057 MW-1 (6/15/05)	058 MW-7 (6/15/05)	059 MW-4 (6/16/05)	060 MW-3 (6/16/05)	061 MW-2 (6/17/05)
Benzene	1	U	U	U	U	U
1,1,1-Trichloroethane	5	15	U	U	2 J	U
Trichloroethene	5	2 J	U	U	U	7 J
Toluene	5	U	U	U	U	U
Tetrachloroethene	5	U	U	U	2 J	4 J
Xylene (Total)	5	U	U	U	U	U
Isopropylbenzene	5	U	U	U	U	U
TOTAL VOCS*	NA	17 J	U	U	4 J	11 J
TOTAL TICS*	NA	U	U	U	U	25 NJ
TOTAL VOCS AND TICS*	NA	17 J	U	U	4 J	36 NJ

NA = Not available

(1) = Groundwater standard or guidance value as referenced in NYSDEC TOGS 1.1.1dated June 1998 as amended by the NYSDEC's supplemental table dated April 2000

$\boxed{15}$ Exceeds groundwater standard or guidance value

D = Compound identified in an analysis at a secondary dilution factor

U = Not detected at concentrations above reported analytical laboratory detection limits

* = Does not include constituents that were detected in associated blank as well as in the sample

J = Estimated value N = Spiked sample recovery not within control limits

TIC = Tentatively Identified Compound

Table 7 (Page 2 of 3)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of Detected Volatile Organic Compounds (VOCs)
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Compound	Groundwater Standard or Guidance Value (1)	062 MW-8 (6/17/05)	064 MW-5 (6/20/05)	078 MW-3 (11/14/05)	079 MW-4 (11/14/05)	080 MW-9 (11/15/05)
Benzene	1	U	U	U	U	U
1,1,1-Trichloroethane	5	U	U	U	U	U
Trichloroethene	5	5 J	1 J	U	U	U
Toluene	5	U	U	U	U	U
Tetrachloroethene	5	3 J	U	U	2 J	U
Xylene (Total)	5	U	U	U	U	U
Isopropylbenzene	5	U	U	U	U	U
TOTAL VOCS*	NA	8 J	1 J	U	2 J	U
TOTAL TICS*	NA	18 NJ	U	U	U	U
TOTAL VOCS AND TICS*	NA	26 NJ	1 J	U	2 J	U

NA = Not available

(1) = Groundwater standard or guidance value as referenced in NYSDEC TOGS 1.1.1dated June 1998 as amended by the NYSDEC's supplemental table dated April 2000

$\boxed{15}$ Exceeds groundwater standard or guidance value

D = Compound identified in an analysis at a secondary dilution factor

U = Not detected at concentrations above reported analytical laboratory detection limits

* = Does not include constituents that were detected in associated blank as well as in the sample

J = Estimated value N = Spiked sample recovery not within control limits

TIC = Tentatively Identified Compound

Table 7 (Page 3 of 3)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of Detected Volatile Organic Compounds (VOCs)
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Compound	Groundwater Standard or Guidance Value (1)	081 MW-5 (11/15/05)	082 MW-1 (11/15/05)	085 MW-11 (11/16/05)	086 MW-2 (11/16/05)	087 MW-8 (11/17/05)	088 MW-10 (11/17/05)
Benzene	1	U	U	U	U	U	**6 J**
1,1,1-Trichloroethane	5	U	**14**	U	U	U	U
Trichloroethene	5	U	U	U	**9 J**	**11**	U
Toluene	5	U	U	U	U	U	5 J
Tetrachloroethene	5	U	U	U	4 J	3 J	U
Xylene (Total)	5	U	U	U	U	U	**39**
Isopropylbenzene	5	U	U	U	U	U	1 J
TOTAL VOCS*	NA	U	14	U	13 J	14 J	51 J
TOTAL TICS*	NA	U	U	U	U	U	841 NJ
TOTAL VOCS AND TICS*	NA	U	14	U	13 J	14 J	892 NJ

NA = Not available

(1) = Groundwater standard or guidance value as referenced in NYSDEC TOGS 1.1.1dated June 1998 as amended by the NYSDEC's supplemental table dated April 2000

15 Exceeds groundwater standard or guidance value

D = Compound identified in an analysis at a secondary dilution factor

U = Not detected at concentrations above reported analytical laboratory detection limits

* = Does not include constituents that were detected in associated blank as well as in the sample

J = Estimated value N = Spiked sample recovery not within control limits

TIC = Tentatively Identified Compound

Table 8 (Page 1 of 3)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of Detected Semi-Volatile Organic Compounds (SVOCs)
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Compound	Groundwater Standard or Guidance Value (1)	057 MW-1 (6/15/05)	058 MW-7 (6/15/05)	059 MW-4 (6/16/05)	060 MW-3 (6/16/05)	061 MW-2 (6/17/05)
Phenol	2	1 J	U	U	U	U
Naphthalene	10	U	U	U	U	U
Caprolactam	NA	29	16	160 D	43	47
2-Methylnaphthalene	NA	U	U	U	U	U
1,1-Biphenyl	5	U	U	U	U	U
Acenaphthene	20	U	U	U	U	U
Dibenzofuran	NA	U	U	U	U	U
Fluorene	50	U	U	U	U	U
Phenanthrene	50	U	U	U	U	U
Anthracene	50	U	U	U	U	U
Carbazole	NA	U	U	U	U	U
bis (2-Ethylhexyl) phthalate	5	U	U	U	U	U
TOTAL SVOCS	NA	30 J	16	160 D	43	47
TOTAL TICS	NA	2 J	U	45 NJ	23 J	12 J
TOTAL SVOCS AND TICS	NA	32 J	16	205 DNJ	66 J	59 J

NA = Not available

(1) = Groundwater standard or guidance value as referenced in NYSDEC TOGS 1.1.1dated June 1998 as amended by the NYSDEC's supplemental table dated April 2000

$\boxed{300}$ Exceeds groundwater standard or guidance value

U = Not detected at concentrations above reported analytical laboratory detection limits

J = Estimated value

D = Compound identified in an analysis at a secondary dilution factor

TIC = Tentatively Identified Compound

N = Spiked sample recovery not within control limits

Table 8 (Page 2 of 3)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of Detected Semi-Volatile Organic Compounds (SVOCs)
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Compound	Groundwater Standard or Guidance Value (1)	062 MW-8 (6/17/05)	064 MW-5 (6/20/05)	078 MW-3 (11/14/05)	079 MW-4 (11/14/05)	080 MW-9 (11/15/05)
Phenol	2	U	U	U	U	U
Naphthalene	10	U	U	U	U	U
Caprolactam	NA	U	1 J	200 D	6 J	140 D
2-Methylnaphthalene	NA	U	U	U	U	U
1,1-Biphenyl	5	U	U	U	U	U
Acenaphthene	20	U	U	U	U	U
Dibenzofuran	NA	U	U	U	U	U
Fluorene	50	U	U	U	U	U
Phenanthrene	50	U	U	U	U	U
Anthracene	50	U	U	U	U	U
Carbazole	NA	U	U	U	U	U
bis (2-Ethylhexyl) phthalate	5	U	**300** D	2 J	2 J	2 J
TOTAL SVOCS	NA	U	301 DJ	202 JD	8 J	142 JD
TOTAL TICS	NA	3 J	3 J	6 NJ	8 J	11 NJD
TOTAL SVOCS AND TICS	NA	3 J	304 DJ	208 NJD	16 J	153 NJD

NA = Not available

(1) = Groundwater standard or guidance value as referenced in NYSDEC TOGS 1.1.1dated June 1998 as amended by the NYSDEC's supplemental table dated April 2000

$\boxed{300}$ Exceeds groundwater standard or guidance value

U = Not detected at concentrations above reported analytical laboratory detection limits

J = Estimated value

D = Compound identified in an analysis at a secondary dilution factor

TIC = Tentatively Identified Compound

N = Spiked sample recovery not within control limits

Table 8 (Page 3 of 3)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of Detected Semi-Volatile Organic Compounds (SVOCs)
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Compound	Groundwater Standard or Guidance Value (1)	081 MW-5 (11/15/05)	082 MW-1 (11/15/05)	085 MW-11 (11/16/05)	086 MW-2 (11/16/05)	087 MW-8 (11/17/05)	088 MW-10 (11/17/05)
Phenol	2	U	U	U	U	U	U
Naphthalene	10	U	U	U	U	U	**130** D
Caprolactam	NA	70	360 D	380 D	490 D	110 D	210 D
2-Methylnaphthalene	NA	U	U	U	U	U	230 D
1,1-Biphenyl	5	U	U	U	U	U	3 J
Acenaphthene	20	U	U	U	U	U	8 J
Dibenzofuran	NA	U	U	U	U	U	2 J
Fluorene	50	U	U	U	U	U	5 J
Phenanthrene	50	U	U	U	U	U	7 J
Anthracene	50	U	U	U	U	U	1 J
Carbazole	NA	U	U	U	U	U	12
bis (2-Ethylhexyl) phthalate	5	**39**	**7** J	2 J	3 J	U	**160** D
TOTAL SVOCS	NA	109	367 JD	382 JD	493 JD	110 D	768 JD
TOTAL TICS	NA	11 NJB	56 NJB	21 J	117 NJ	95 NJ	735 NJ
TOTAL SVOCS AND TICS	NA	120 NJ	423 NJDB	403 JD	610 NJD	205 NJD	1503 NJD

NA = Not available

(1) = Groundwater standard or guidance value as referenced in NYSDEC TOGS 1.1.1dated June 1998 as amended by the NYSDEC's supplemental table dated April 2000

300 Exceeds groundwater standard or guidance value

U = Not detected at concentrations above reported analytical laboratory detection limits

J = Estimated value D = Compound identified in an analysis at a secondary dilution factor

TIC = Tentatively Identified Compound

N = Spiked sample recovery not within control limits

Table 9 (Page 1 of 2)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of Target Analyte List Metals and Cyanide
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Analyte	Groundwater Standard or Guidance Value (1)	057 MW-1 (6/15/05)		058 MW-7 (6/15/05)		059 MW-4 (6/16/05)		060 MW-3 (6/16/05)		061 MW-2 (6/17/05)	
Aluminum	NA	104	B	210		59.7	B	108	B	52	B
Antimony	3	U		U		U		3	BJ	2.9	BJ
Arsenic	25	U		U		U		U		U	
Barium	1000	74.7	BEJ	94.3	BEJ	89.1	BEJ	48.8	BEJ	68.6	BEJ
Beryllium	3	U		U		U		U		U	
Cadmium	5	U		U		U		U		U	
Calcium	NA	102000		140000		116000		244000		104000	
Chromium	50	1.1	BJ	0.58	BJ	0.63	BJ	0.8	BJ	0.55	BJ
Cobalt	NA	1.2	B	0.86	B	0.85	B	1.6	B	0.73	B
Copper	200	2.4	B	2.7	B	1.8	B	U		2	B
Iron	300	U	NJ	U	NJ	U	BNJ	U	NJ	U	BNJ
Lead	25	U		U		U		U		U	
Magnesium	35000	29700		32400		**37200**		**68100**		15900	
Manganese	300	44.7		38.2		110		**489**		120	
Mercury	0.7	U		U		U		U		U	
Nickel	100	3.5	BJ	2.1	BJ	3.2	BJ	5.3	BJ	2	BJ
Potassium	NA	5950		1580	B	4330	B	3370	B	5840	
Selenium	10	U		5.4		U		U		5.6	
Silver	50	U	NJ	U	NJ	U	NJ	U	NJ	U	NJ
Sodium	20000	**227000**		7910		**319000**		**311000**		**201000**	
Thallium	0.5	U		U		U		U		U	
Vanadium	NA	U		0.48	B	U		U		0.6	B
Zinc	2000	U	B*J	U	B*J	U	B*J	U	B*J	U	B*J
Cyanide	200	U		U		U		3.4	B	U	

SB = Site background.

(1) = Groundwater standard or guidance value as referenced in NYSDEC TOGS 1.1.1dated June 1998 as amended by the NYSDEC's supplemental table dated April 2000

489 Exceeds groundwater standard or guidance value

E = Reported value estimated due to interference

B = Reported value less than contract required detection limit, but greater than instrument detection limit

N = Spiked sample recovery not within control limits

* = Duplicate analysis not within control limits

U = Not detected at concentrations above reported analytical laboratory detection limits

J = Estimated Value

NA = Not available

Table 9 (Page 2 of 2)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of Target Analyte List Metals and Cyanide
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Analyte	Groundwater Standard or Guidance Value (1)	062 MW-8 (6/17/05)		064 MW-5 (6/20/05)							
Aluminum	NA	4210		896							
Antimony	3	**4.3**	BJ	2.1	BJ						
Arsenic	25	4.9	B	U							
Barium	1000	180	BEJ	170	BEJ						
Beryllium	3	0.31	B	U							
Cadmium	5	U		U							
Calcium	NA	174000		196000							
Chromium	50	9	BJ	1.5	BJ						
Cobalt	NA	4.8	B	3.4	B						
Copper	200	27.1		1.5	B						
Iron	300	**10200**	NJ	**1770**	NJ						
Lead	25	12.2		U							
Magnesium	35000	**46400**		**68100**							
Manganese	300	**796**		**1030**							
Mercury	0.7	U		U							
Nickel	100	22.3	BJ	4.9	BJ						
Potassium	NA	6160		2820	B						
Selenium	10	U		U							
Silver	50	U	NJ	U	NJ						
Sodium	20000	**131000**		**308000**							
Thallium	0.5	U		U							
Vanadium	NA	8.2	B	1.5	B						
Zinc	2000	U	*J	U	B*J						
Cyanide	200	U		3.6	B						

SB = Site background.

(1) = Groundwater standard or guidance value as referenced in NYSDEC TOGS 1.1.1dated June 1998 as amended by the NYSDEC's supplemental table dated April 2000

$\boxed{1030}$ Exceeds groundwater standard or guidance value

E = Reported value estimated due to interference

B = Reported value less than contract required detection limit, but greater than instrument detection limit

N = Spiked sample recovery not within control limits

* = Duplicate analysis not within control limits

U = Not detected at concentrations above reported analytical laboratory detection limits

J = Estimated Value

NA = Not available

Table 10 (Page 1 of 2)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of PCBs and Pesticides
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Compound	Groundwater Standard or Guidance Value (1)	057 MW-1 (6/15/05)	058 MW-7 (6/15/05)	059 MW-4 (6/16/05)	060 MW-3 (6/16/05)	061 MW-2 (6/17/05)
Pesticides	N/A	U	U J	U	U	U
Total Aroclors (PCBs)	0.09	U	U J	U	U	U

NA = Not available

(1) = Groundwater standard or guidance value as referenced in NYSDEC TOGS 1.1.1dated June 1998 as amended by the NYSDEC's supplemental table dated April 2000

U = Not detected at concentrations above reported analytical laboratory detection limits

J = Estimated Value

Table 10 (Page 2 of 2)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of PCBs and Pesticides
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Compound	Groundwater Standard or Guidance Value (1)	062 MW-8 (6/17/05)	064 MW-5 (6/20/05)			
Pesticides	NA	U	U			
Total Aroclors (PCBs)	0.09	U	U			

NA = Not available

(1) = Groundwater standard or guidance value as referenced in NYSDEC TOGS 1.1.1dated June 1998 as amended by the NYSDEC's supplemental table dated April 2000

U = Not detected at concentrations above reported analytical laboratory detection limits

J = Estimated Value

Table 11 (Page 1 of 3)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of TPH, Nitrogen and Formaldehyde
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Compound	Groundwater Standard or Guidance Value (1)	057 MW-1 (6/15/05)	058 MW-7 (6/15/05)	059 MW-4 (6/16/05)	060 MW-3 (6/16/05)	061 MW-2 (6/17/05)
Nitrogen, Nitrate-Nitrite	10000	410	4600	2100	3500	5500
TPH	NA	U	U	U	U	U
Formaldehyde	NA	5.2 J	U	5.6 J	U	U

U = Not detected at concentrations above reported analytical laboratory detection limits

NA = Not available

J = Estimated Value

Table 11 (Page 2 of 3)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of TPH, Nitrogen and Formaldehyde
in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Compound	Groundwater Standard or Guidance Value (1)	062 MW-8 (6/17/05)	064 MW-5 (6/20/05)	078 MW-3 (11/14/05)	079 MW-4 (11/14/05)	080 MW-9 (11/15/05)
Nitrogen, Nitrate-Nitrite	10000	600	3900	2700	1600	3100
TPH	NA	U	U	NT	NT	NT
Formaldehyde	NA	5.4 J	U	NT	NT	NT

U = Not detected at concentrations above reported analytical laboratory detection limits

NA = Not available

NT = Not Tested

J = Estimated Value

Table 11 (Page 3 of 3)
100 Fernwood Ave, Rochester, New York
NYSDEC Site # C828119

Summary of TPH, Nitrogen and Formaldehyde in ug/L or Parts per Billion (ppb)

Groundwater Samples

Detected Compound	Groundwater Standard or Guidance Value (1)	081 MW-5 (11/15/05)	082 MW-1 (11/15/05)	085 MW-11 (11/16/05)	086 MW-2 (11/16/05)	087 MW-8 (11/17/05)	088 MW-10 (11/17/05)
Nitrogen, Nitrate-Nitrite	10000	5900	520	2600	5200	U	5900
TPH	NA	NT	NT	NT	NT	NT	NT
Formaldehyde	NA	NT	NT	NT	NT	NT	NT

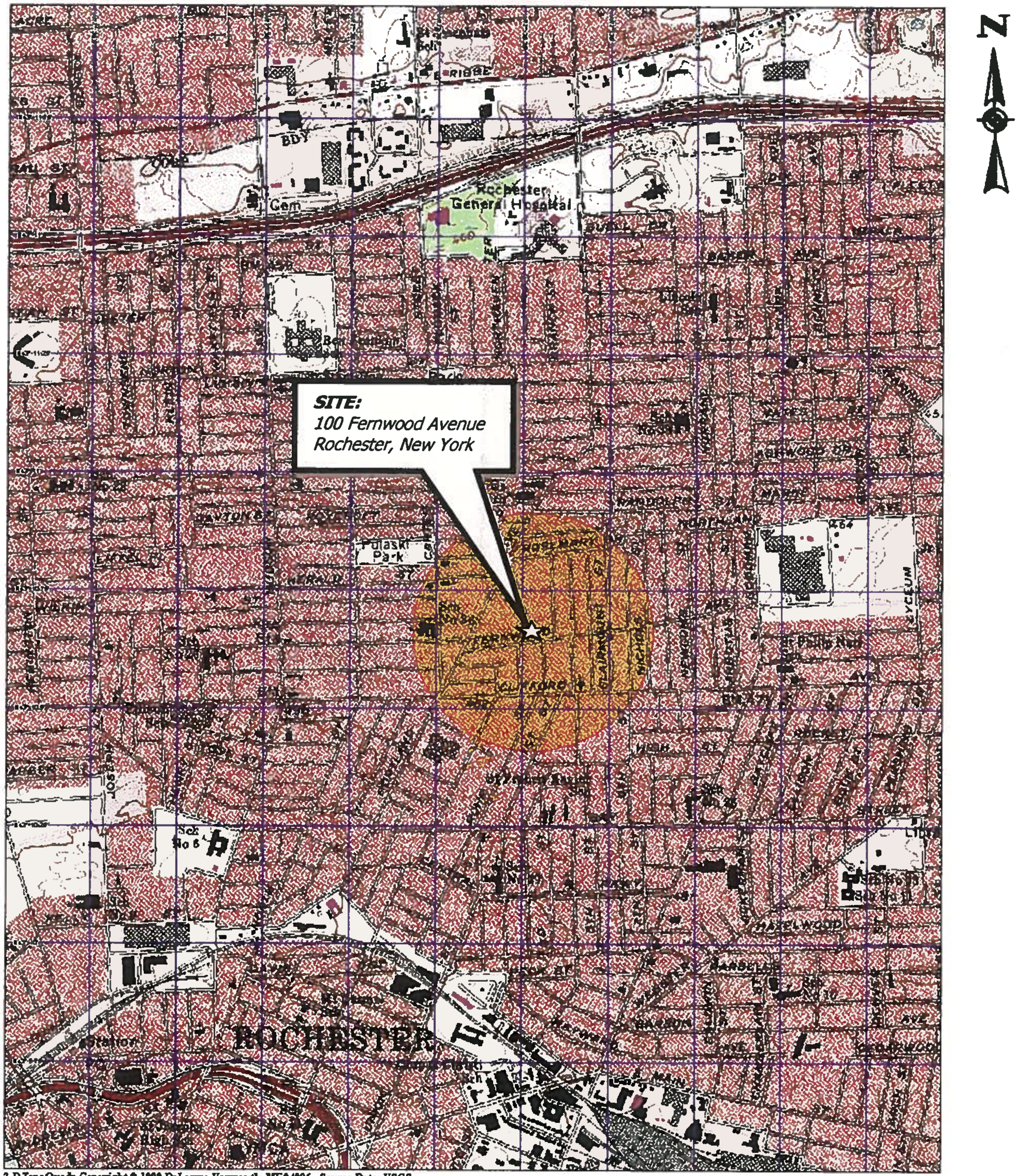
U = Not detected at concentrations above reported analytical laboratory detection limits

NA = Not available

NT = Not Tested

J = Estimated Value

FIGURES

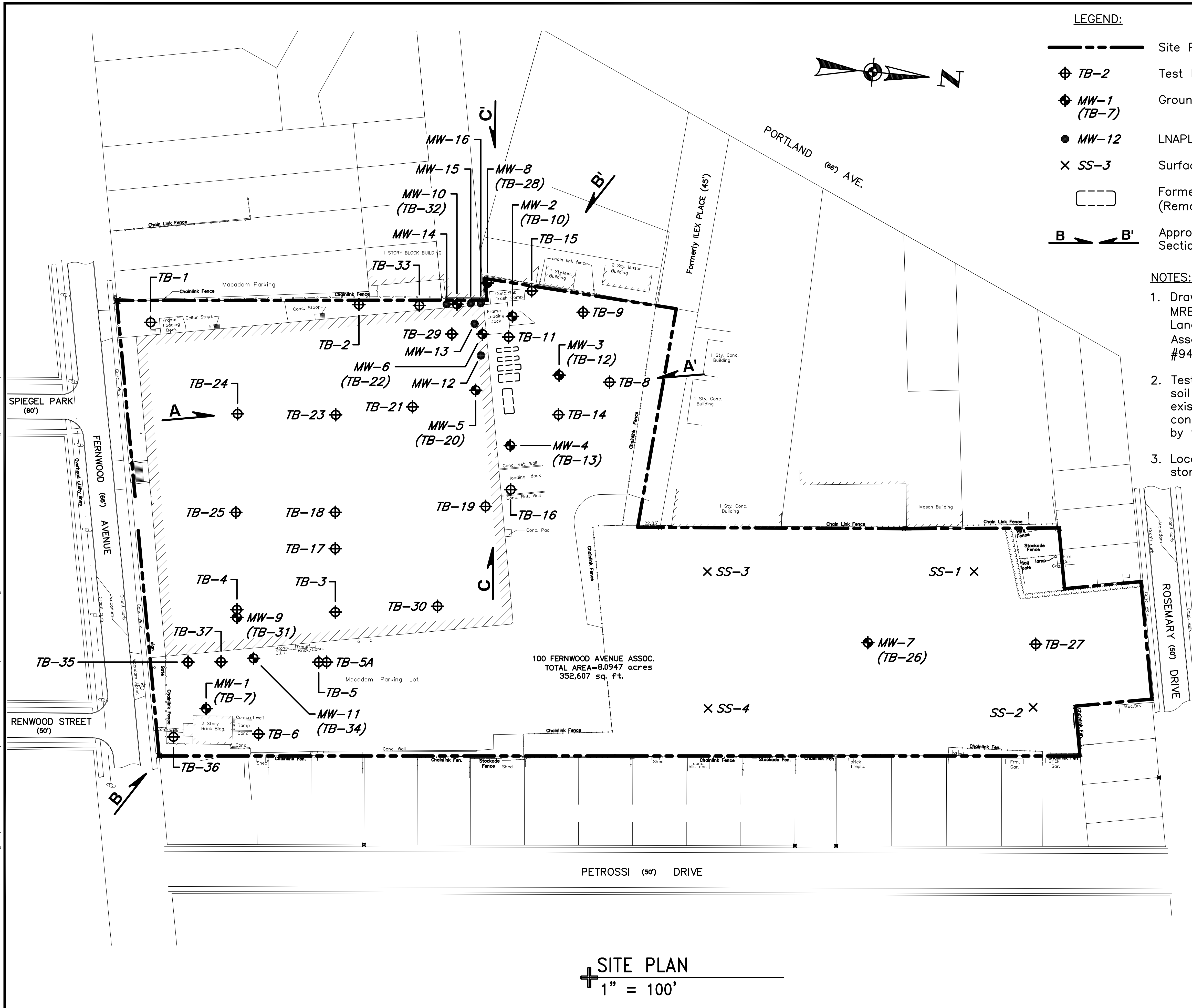


3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS

544 ft Scale: 1 : 19,200 Detail: 14-0 Datum: NAD27

Drawing Produced From: 3-D TopoQuads, DeLorme Map Co., referencing USGS quad map Rochester East (NY) 1995. Site Lat/Long: N43d-10.66' – W77d-35.22'

DATE 8-28-2009	day DAY ENVIRONMENTAL, INC. ENVIRONMENTAL CONSULTANTS ROCHESTER, NEW YORK 14623-2700	PROJECT TITLE 100 FERNWOOD AVENUE ROCHESTER, NEW YORK BROWNFIELD CLEANUP PROGRAM	PROJECT NO. 4014R-07
DRAWN BY RJM		DRAWING TITLE PROJECT LOCUS MAP	FIGURE 1
SCALE 1" = 2000'			



LEGEND:

- Site Property Line
- TB-2 — Test Boring Location
- MW-1 (TB-7) — Groundwater Monitoring Well Location
- MW-12 — LNAPL Monitoring And Recovery Well Location
- SS-3 — Surface Soil Sample Location
- Former Underground Storage Tank Location (Removed)
- B — B' — Approximate Location Of Geologic Cross Section

NOTES:

1. Drawing produced from a CAD file from MRB Group, P.C. titled "Map of Survey of Lands of 100 Fernwood Avenue Associates" dated 12-15-00, MRB project #942-343.
2. Test Boring, monitoring well and surface soil sample locations tape measured from existing site structures, and should be considered accurate to the degree implied by the method used.
3. Locations of the former underground storage tanks shown are approximate.

DATE	8-2009
DATE DRAWN	8-28-2009
DATE ISSUED	8-31-2009
FIELD VERIFIED BY	JAD
DRAWN BY	RJM
SCALE	As Noted

day
DAY ENVIRONMENTAL, INC.
ENVIRONMENTAL CONSULTANTS
ROCHESTER, NEW YORK 14614-1008
NEW YORK, NEW YORK 10016-0710

PROJECT TITLE
100 FERNWOOD AVENUE
ROCHESTER, NEW YORK

BROWNFIELD CLEANUP PROGRAM

DRAWING TITLE
Site Plan With Cumulative Surface & Subsurface Test Locations

PROJECT NO.
4014R-07

FIGURE 2

Ref1:
Ref2:
Ref3:

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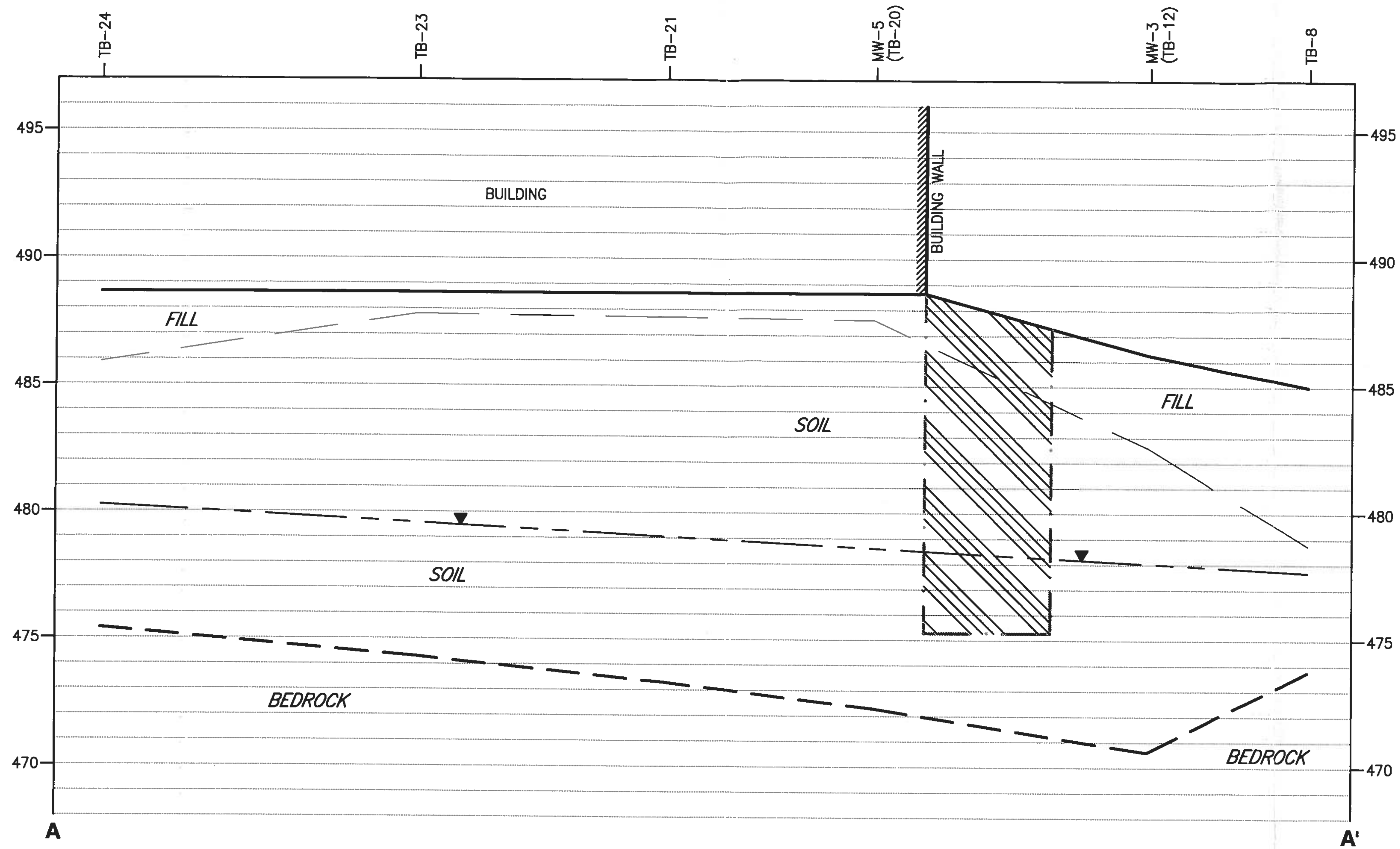

GEOLOGIC CROSS-SECTION A-A'

1" = 40' Horizontal
1" = 5' Vertical

LEGEND

Inferred Ground Surface

Inferred Boundary Between Overburden Soil and Bedrock

Inferred Boundary Between Fill Material and Overburden Soil

Inferred Groundwater Elevations Based On Static Water Level Measurements Collected From Monitoring Wells On June 15, 2005

Approximate Limits of In-Situ Bioremediation System That Is Installed Within The Former Tank Excavation

NOTE

Surveyed ground elevation data from monitoring wells used on this figure. Ground elevations inferred for test boring locations due to lack of elevation data.

Ref1: Section A_A.dwg
Ref2:
Ref3:

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FIELD VERIFIED BY	CAH
DATE	8-2009
DRAWN BY	RJM
DATE DRAWN	8-31-2009
SCALE	As Noted
DATE ISSUED	8-31-2009

day

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NEW YORK, NEW YORK 10016-0710

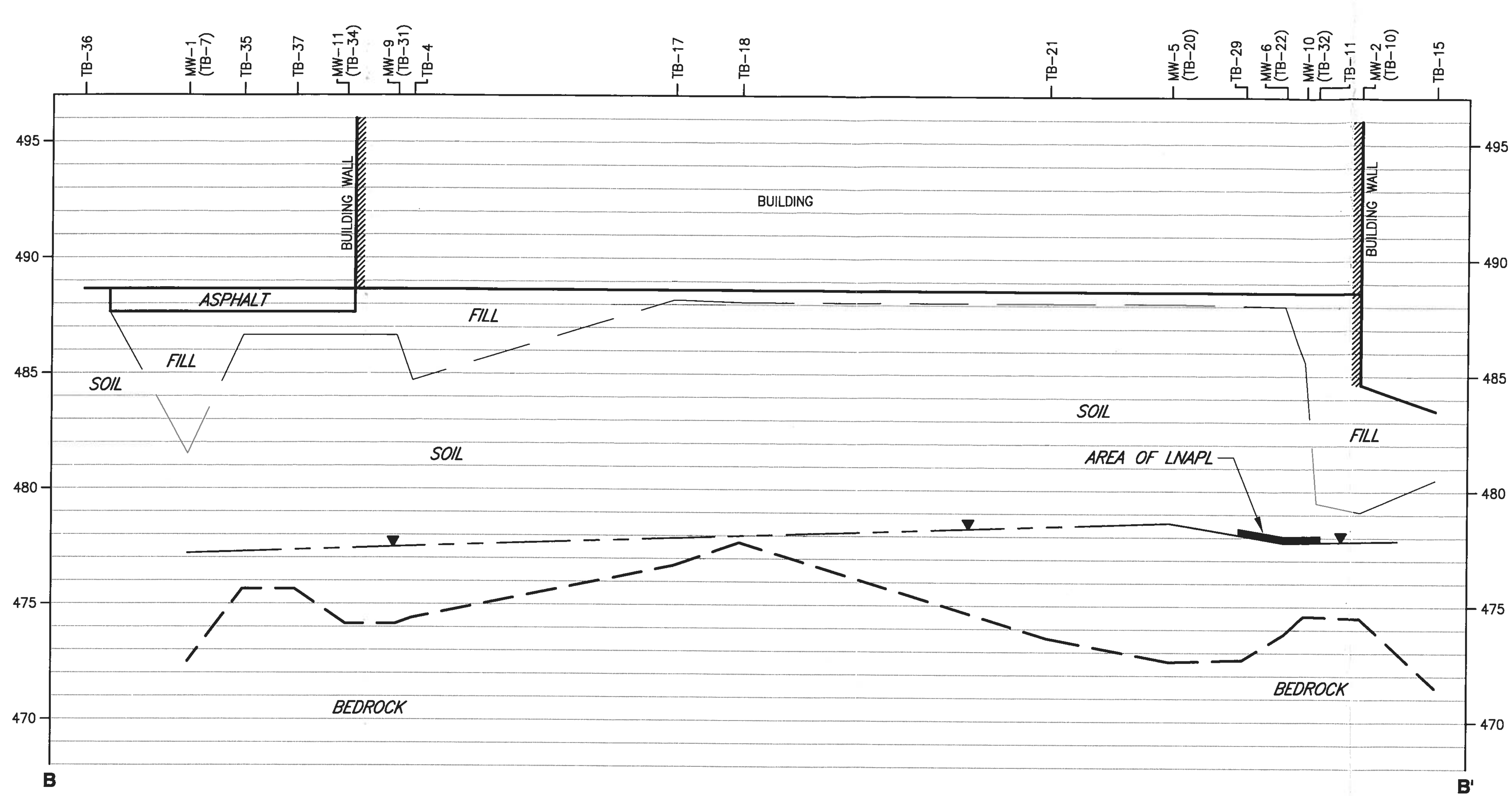
PROJECT TITLE
100 FERNWOOD AVENUE
ROCHESTER, NEW YORK

BROWNFIELD CLEANUP PROGRAM

DRAWING TITLE
Geologic Cross-Section A-A'

PROJECT NO.
4014R-07

FIGURE 3



GEOLOGIC CROSS-SECTION B-B'

1" = 50' Horizontal
1" = 5' Vertical

LEGEND

- Inferred Ground Surface
- Inferred Boundary Between Overburden Soil and Bedrock
- Inferred Boundary Between Fill Material and Overburden Soil
- Inferred Groundwater Elevations Based On Static Water Level Measurements Collected From Monitoring Wells On June 15, 2005
- Area of LNAPL on top of groundwater

NOTE

Surveyed ground elevation data from monitoring wells used on this figure. Ground elevations inferred for test boring locations due to lack of elevation data.

Ref1: Section B_B.dwg
Ref2:
Ref3:

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DATE	8-2009
DATE DRAWN	8-31-2009
DATE ISSUED	8-31-2009
FIELD VERIFIED BY	CAH
DRAWN BY	RJM
SCALE	As Noted

day
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NEW YORK, NEW YORK 10016-0710

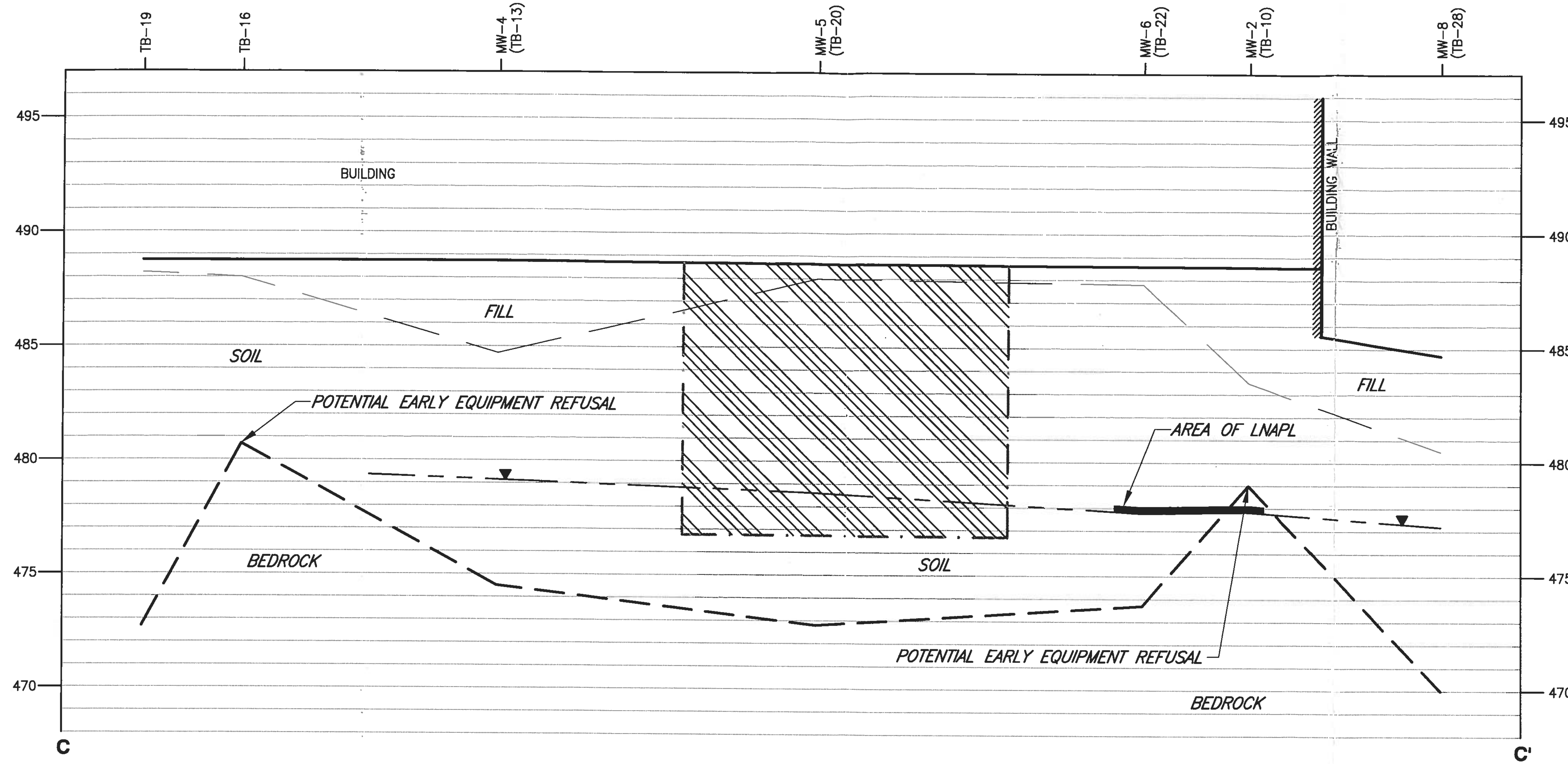
PROJECT TITLE
100 FERNWOOD AVENUE
ROCHESTER, NEW YORK

BROWNFIELD CLEANUP PROGRAM

DRAWING TITLE
Geologic Cross-Section B-B'

PROJECT NO.
4014R-07

FIGURE 4



GEOLOGIC CROSS-SECTION C-C'

1" = 20' Horizontal
1" = 5' Vertical

LEGEND

- Inferred Ground Surface
- Inferred Boundary Between Overburden Soil and Bedrock
- Inferred Boundary Between Fill Material and Overburden Soil
- Inferred Groundwater Elevations Based On Static Water Level Measurements Collected From Monitoring Wells On June 15, 2005
- Area of LNAPL on top of groundwater
- Approximate Limits of In-Situ Bioremediation System That Is Installed Within The Former Tank Excavation

NOTE

Surveyed ground elevation data from monitoring wells used on this figure. Ground elevations inferred for test boring locations due to lack of elevation data.

Ref1: Section C_C.dwg
Ref2:
Ref3:

Xerox432AnsiB-2; 11 x 17
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FIELD VERIFIED BY: CAH	DATE: 8-2009
DRAWN BY: RJM	DATE DRAWN: 8-31-2009
SCALE: As Noted	DATE ISSUED: 8-31-2009

day
DAY ENVIRONMENTAL, INC.
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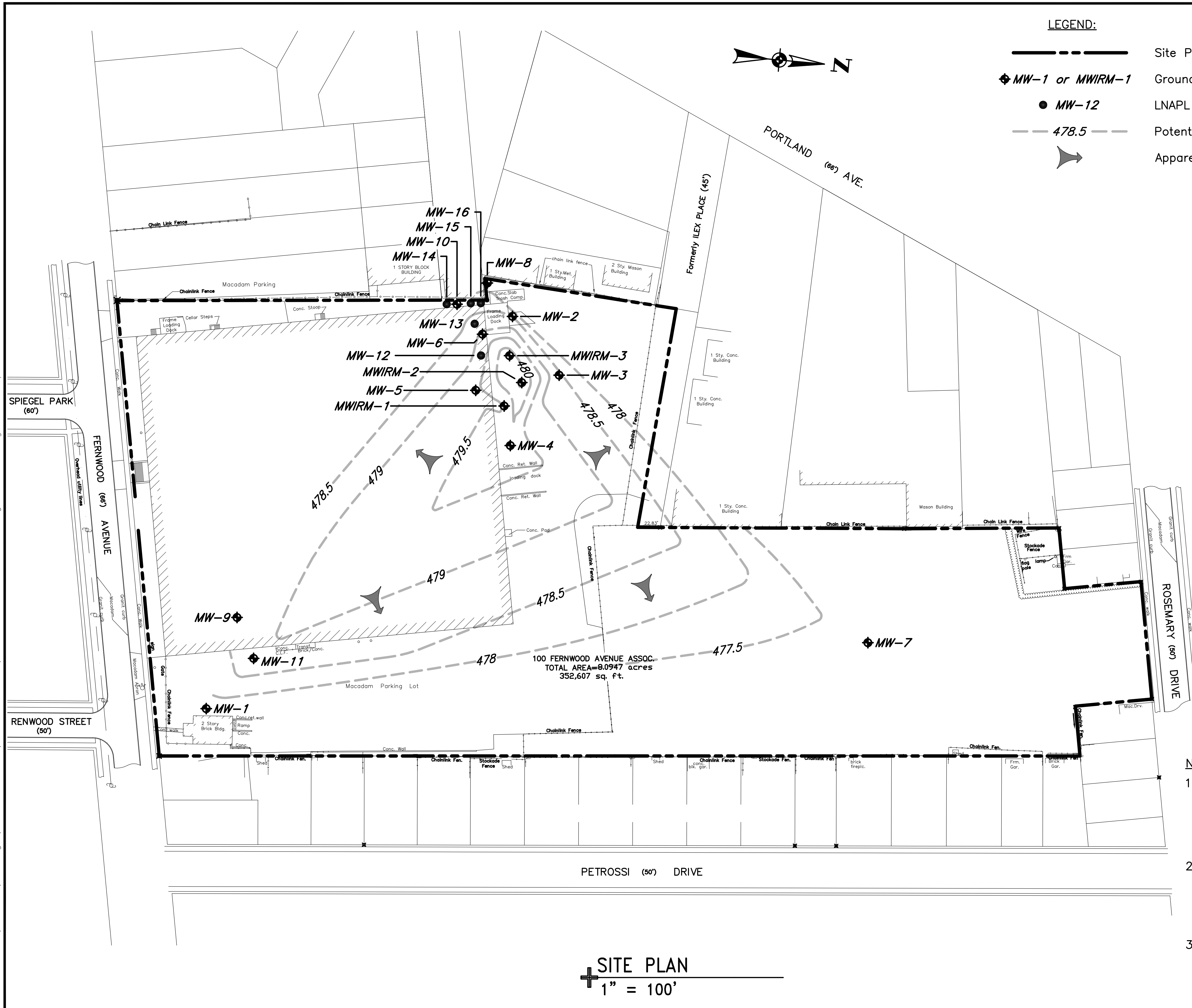
PROJECT TITLE
100 FERNWOOD AVENUE
ROCHESTER, NEW YORK
BROWNFIELD CLEANUP PROGRAM

DRAWING TITLE
Geologic Cross-Section C-C'

PROJECT NO.
4014R-07

FIGURE 5



LEGEND:

- Site Property Line
- MW-1 or MWIRM-1 — Groundwater Monitoring Well Location
- MW-12 — LNAPL Monitoring And Recovery Well Location
- 478.5 — Potentiometric Contour Line
- Apparent Groundwater Flow Direction

GROUNDWATER MONITORING WELL	GROUNDWATER ELEVATION ON NOV. 14, 2005
MW-1	477.81
MW-2	478.55
MW-3	478.54
MW-4	479.76
MW-5	479.38
MW-6	479.12*
MW-7	477.20
MW-8	477.85
MW-9	478.77
MW-10	478.09*
MW-11	478.94
MWIRM-1	479.43
MWIRM-2	480.60
MWIRM-3	480.45

* Adjusted groundwater elevation due to presence of light non-aqueous phase liquid.

NOTES:

1. Drawing produced from a CAD file from MRB Group, P.C. titled "Map of Survey of Lands of 100 Fernwood Avenue Associates" dated 12-15-00, MRB project #942-343.
2. Monitoring well locations tape measured from existing site structures, and should be considered accurate to the degree implied by the method used.
3. Groundwater contours based on measured elevations prior to the installation of wells MW-12 through MW-16.

DATE 11-14-2005
DATE DRAWN 8-31-2009
DATE ISSUED 8-31-2009
FIELD VERIFIED BY JAD
DRAWN BY RJM
SCALE As Noted

day
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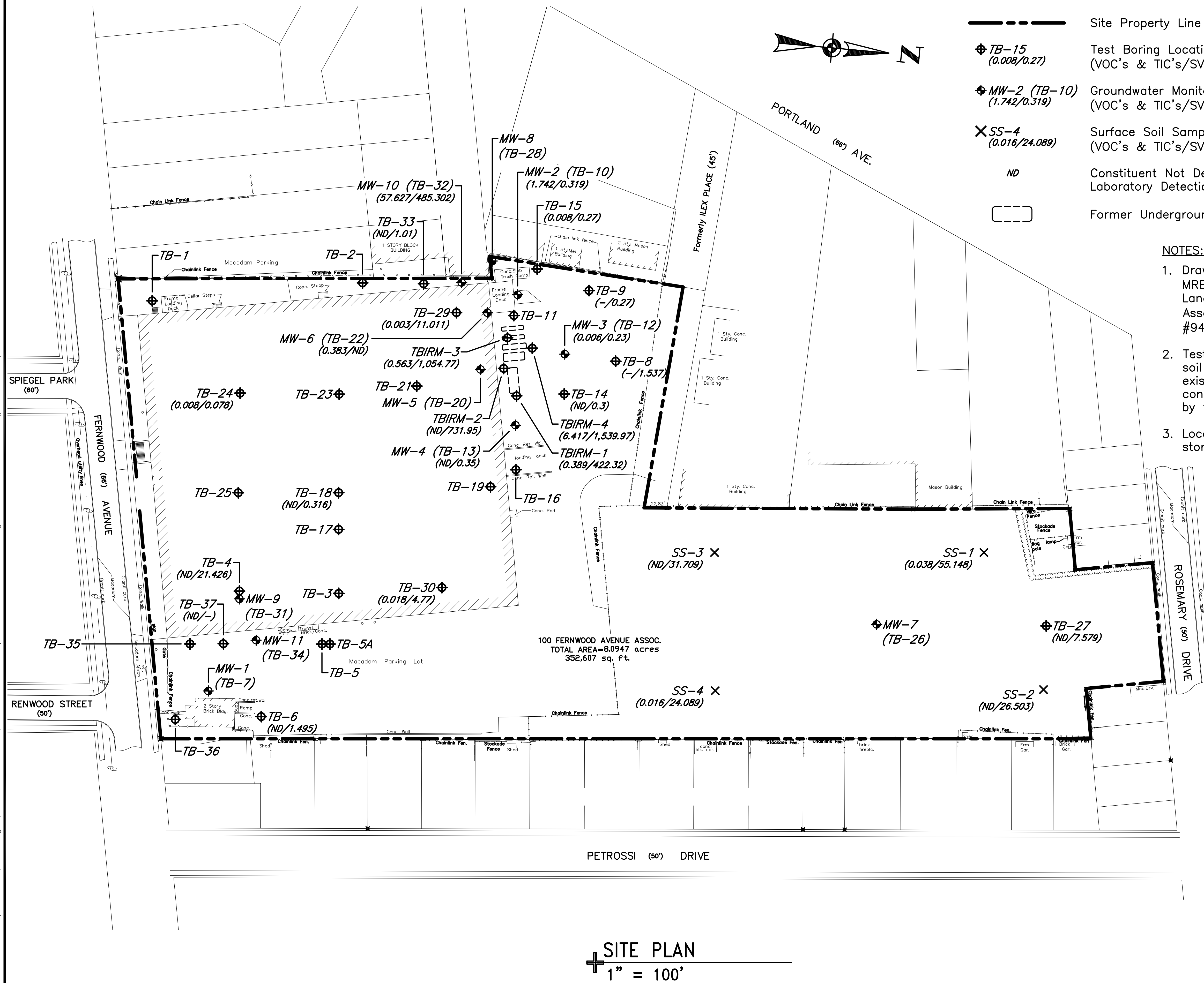
NEW YORK, NEW YORK 10016-0710

PROJECT TITLE
100 FERNWOOD AVENUE
ROCHESTER, NEW YORK
BROWNFIELD CLEANUP PROGRAM

DRAWING TITLE
Potentiometric Groundwater Contour Map For November 14, 2005

PROJECT NO.
4014R-07

FIGURE 6



LEGEND:

(line symbol)	Site Property Line
TB-15 (0.008/0.27)	Test Boring Location With Total (VOC's & TIC's/SVOC's & TIC's) Concentrations in mg/kg
MW-2 (TB-10) (1.742/0.319)	Groundwater Monitoring Well Location With Total (VOC's & TIC's/SVOC's & TIC's) Concentrations in mg/kg
SS-4 (0.016/24.089)	Surface Soil Sample Location With Total (VOC's & TIC's/SVOC's & TIC's) Concentrations in mg/kg
ND	Constituent Not Detected At Concentrations Above Laboratory Detection Method Limits
(dashed box)	Former Underground Storage Tank Location (Removed)

NOTES:

1. Drawing produced from a CAD file from MRB Group, P.C. titled "Map of Survey of Lands of 100 Fernwood Avenue Associates" dated 12-15-00, MRB project #942-343.
2. Test Boring, monitoring well and surface soil sample locations tape measured from existing site structures, and should be considered accurate to the degree implied by the method used.
3. Locations of the former underground storage tanks shown are approximate.

DATE	8-2009
FIELD VERIFIED BY	JAD
DATE DRAWN	8-31-2009
DRAWN BY	RJM
DATE ISSUED	8-31-2009
SCALE	As Noted

day
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NEW YORK, NEW YORK 10016-0710

PROJECT TITLE
100 FERNWOOD AVENUE
ROCHESTER, NEW YORK
BROWNFIELD CLEANUP PROGRAM

DRAWING TITLE
Remedial Investigation Soil Contamination Summary

PROJECT NO.
4014R-07

FIGURE 7

Ref1:
Ref2:
Ref3:
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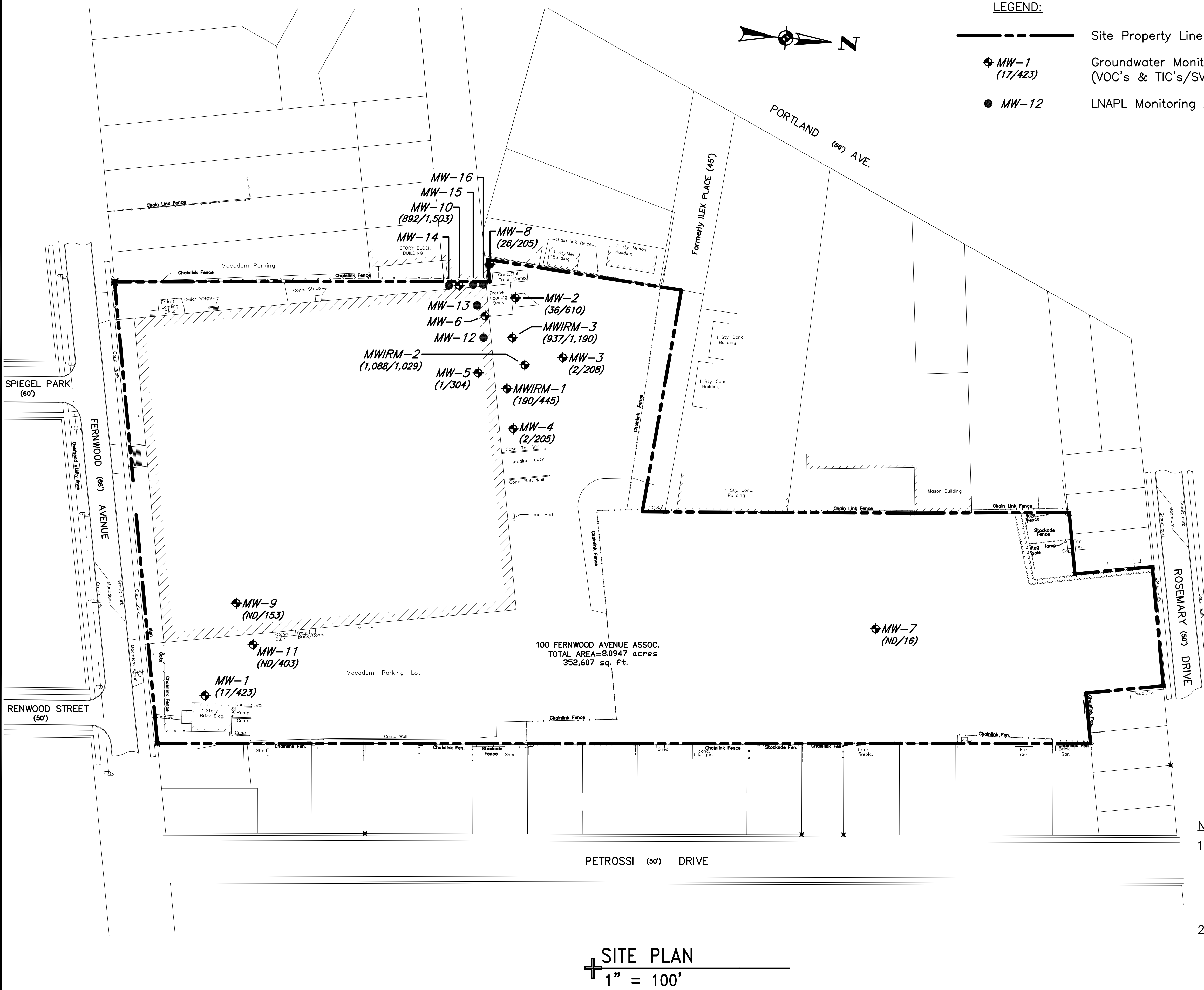

LEGEND:

(line)	Site Property Line
MW-1 (17/423)	Groundwater Monitoring Well Location With Total (VOC's & TIC's/SVOC's & TIC's) Concentrations in ug/kg
MW-12	LNAPL Monitoring And Recovery Well Location

NOTES:

1. Drawing produced from a CAD file from MRB Group, P.C. titled "Map of Survey of Lands of 100 Fernwood Avenue Associates" dated 12-15-00, MRB project #942-343.
2. Monitoring well locations tape measured from existing site structures, and should be considered accurate to the degree implied by the method used.

Ref1:
Ref2:
Ref3:

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FIELD VERIFIED BY: JAD	DATE: 8-2009
DRAWN BY: RJM	DATE DRAWN: 8-31-2009
SCALE: As Noted	DATE ISSUED: 8-31-2009

DAY ENVIRONMENTAL, INC.
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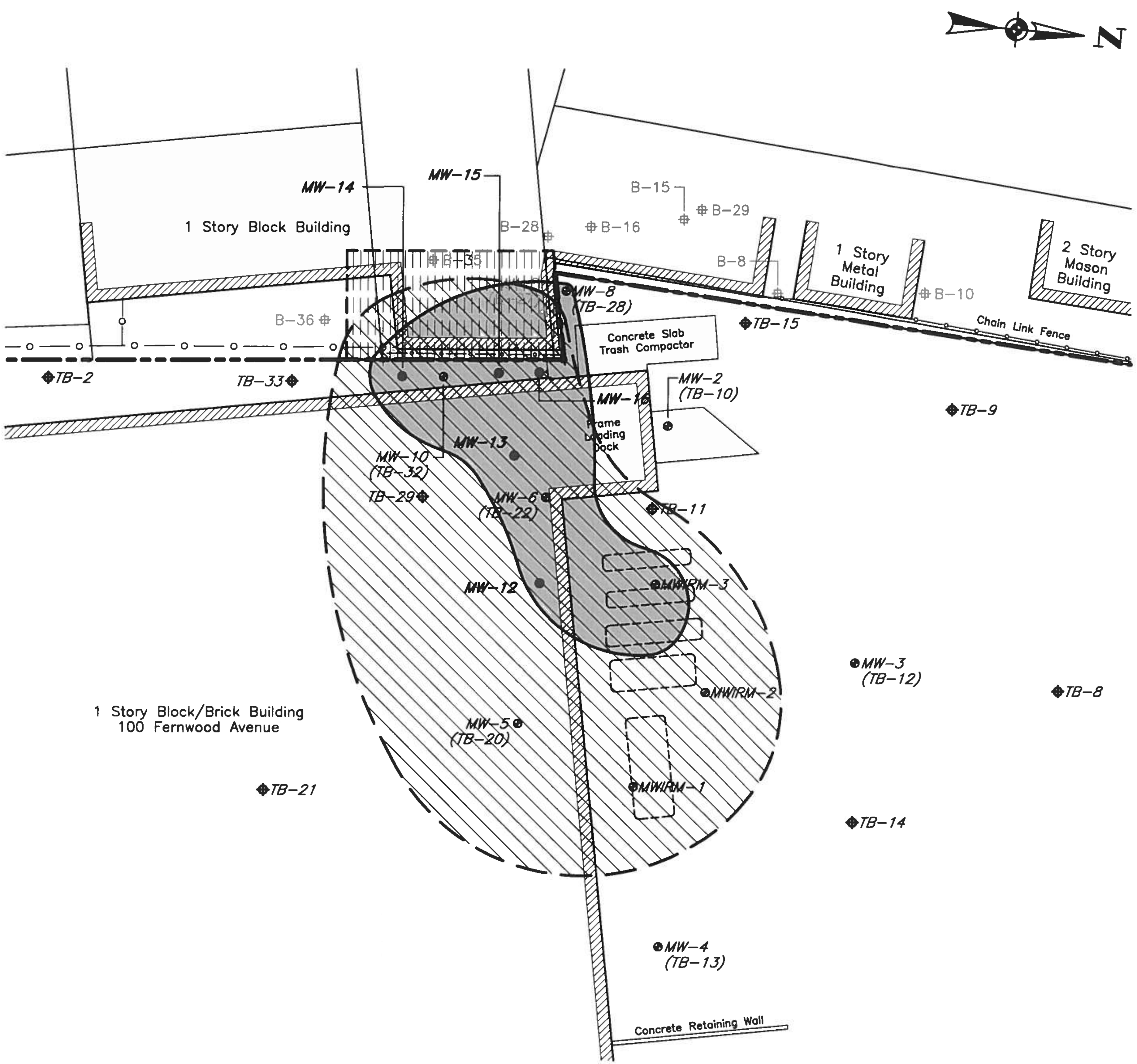
ROCHESTER, NEW YORK 14614-1008
NEW YORK, NEW YORK 10016-0710

PROJECT TITLE
100 FERNWOOD AVENUE
ROCHESTER, NEW YORK
BROWNFIELD CLEANUP PROGRAM

DRAWING TITLE
Remedial Investigation Groundwater Contamination Summary

PROJECT NO.
4014R-07

FIGURE 8



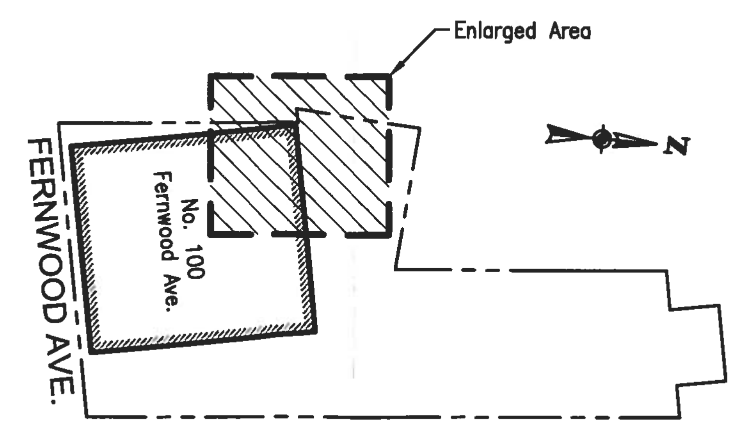
PARTIAL PLAN
1" = 30'

LEGEND:

- Site Property Line
- TB-2 LNAPL Monitoring And Recovery Well Location
- TB-2 Existing Test Boring Location
- MW-10 (TB-32) Existing Groundwater Monitoring Well Location
- B-35 Existing Offsite Test Location By Others
- Former Underground Storage Tank Location (Removed)
- Approximate Extent Of LNAPL As Of November 21, 2008 That May Be Associated With The Former Underground Storage Tanks
- Approximate Extent Of Dissolved Constituents Exceeding TOGS 1.1.1 Groundwater Standards Or Guidance Values That May Be Associated With The Former Underground Storage Tanks
- Approximate 55' x 25' Area (1,375 Square Feet) Of Offsite Impact That Appears Attributable To The Former Underground Storage Tank Area

NOTES:

1. Drawing produced from a CAD file from MRB Group, P.C. titled "Map of Survey of Lands of 100 Fernwood Avenue Associates" dated 12-15-00, MRB project #942-343.
2. Test Boring and monitoring well locations tape measured from existing site structures, and should be considered accurate to the degree implied by the method used.
3. Locations of the former underground storage tanks shown are approximate.



LOCATION PLAN
1" = 300'

FIELD VERIFIED BY: JAD	DATE: 11-21-2008	
DRAWN BY: RJM	DATE DRAWN: 8-31-2009	
SCALE: As Noted	DATE ISSUED: 8-31-2009	

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ENVIRONMENTAL CONSULTANTS
ROCHESTER, NEW YORK 14614-1008
NEW YORK, NEW YORK 10016-0710

PROJECT TITLE: 100 FERNWOOD AVENUE ROCHESTER, NEW YORK
BROWNFIELD CLEANUP PROGRAM
DRAWING TITLE: Extent Of LNAPL Detection In Onsite Wells

PROJECT NO. 4014R-07

FIGURE 9

Ref1:
Ref2:
Ref3:
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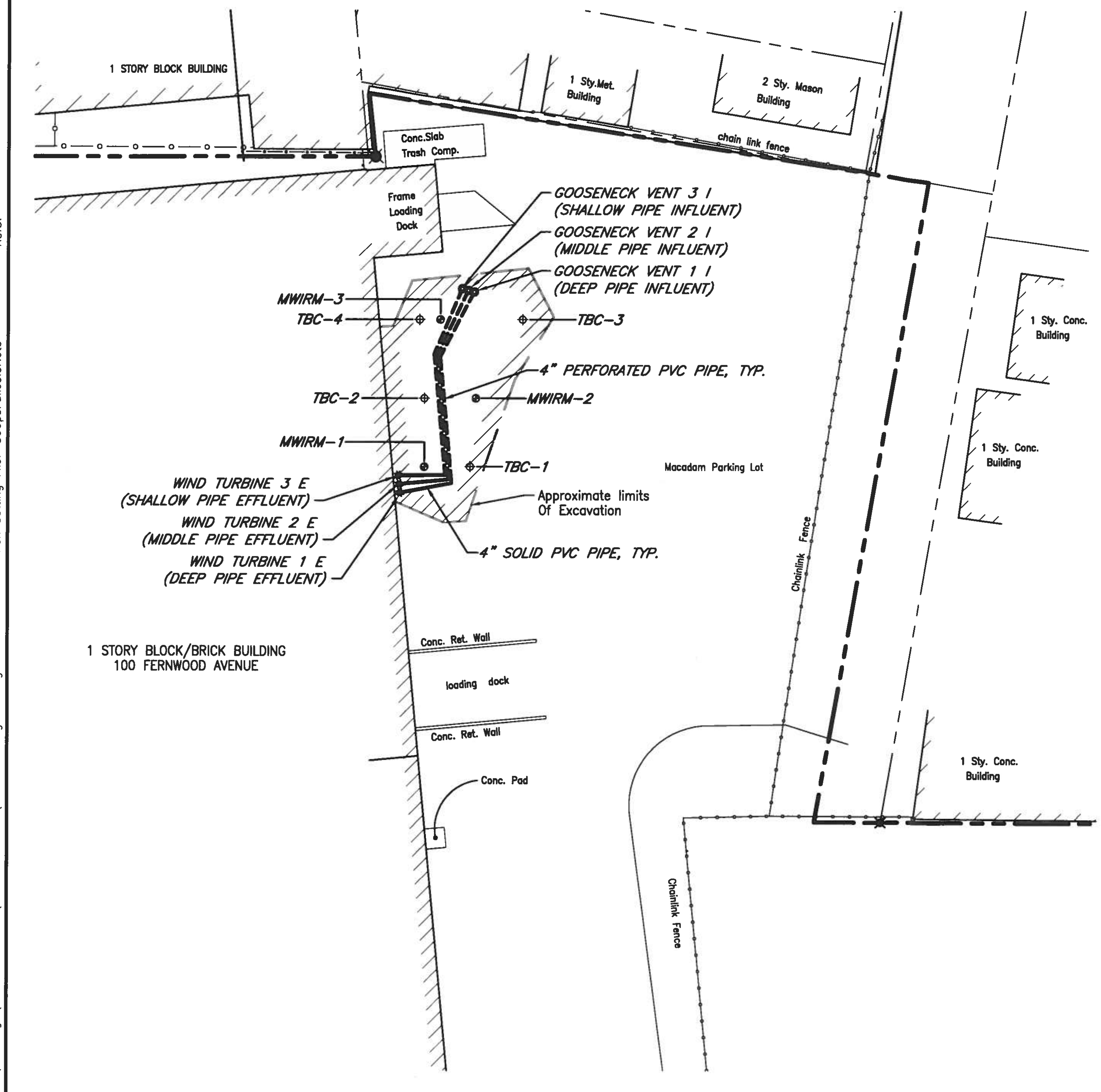


PARTIAL PLAN
1" = 40'

LEGEND:

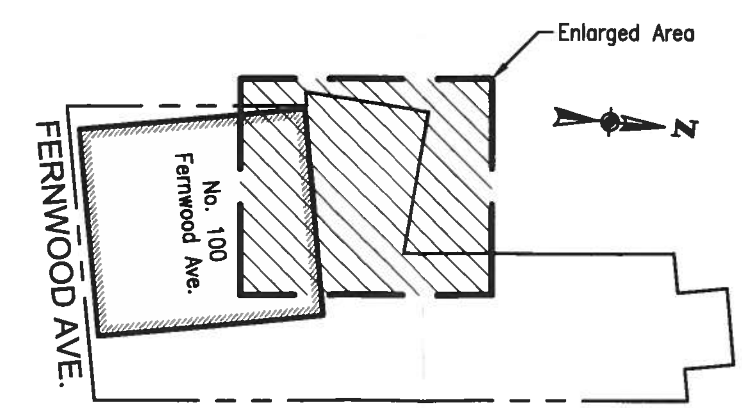
Site Property line

⊛MWIRM-2 Existing 4" PVC monitoring well location with designation

⊕TBC-1 Proposed Confirmatory Test boring location with designation

NOTES:

1. Drawing produced from a CAD file from MRB Group, P.C. titled "Map of Survey of Lands of 100 Fernwood Avenue Associates" dated 12-15-00, MRB project #942-343.
2. Interim remedial measure components and approximate limits of excavation were tape-measured from existing site structures and should be considered accurate to the degree implied by the method used.



LOCATION PLAN
1" = 300'

FIELD VERIFIED BY JAD	DATE 8-2009	
DRAWN BY RJM	DATE DRAWN 9-1-2009	
SCALE As Noted	DATE ISSUED 9-1-2009	

day
DAY ENVIRONMENTAL, INC.
ENVIRONMENTAL CONSULTANTS
ROCHESTER, NEW YORK 14614-1008
NEW YORK, NEW YORK 10016-0710

PROJECT TITLE
100 FERNWOOD AVENUE
ROCHESTER, NEW YORK

BROWNFIELD CLEANUP PROGRAM

DRAWING TITLE
Extent Of Remedial Excavation And Location Of Existing In-situ Bioremediation System

PROJECT NO.
4014R-07

FIGURE 10

Ref1: Location-1.dwg
Ref2:
Ref3:

Xerox432AnsiB-2; 11 x 17
Layout Name: Layout1
Pen Setting File: 800psFullcolor.ctb

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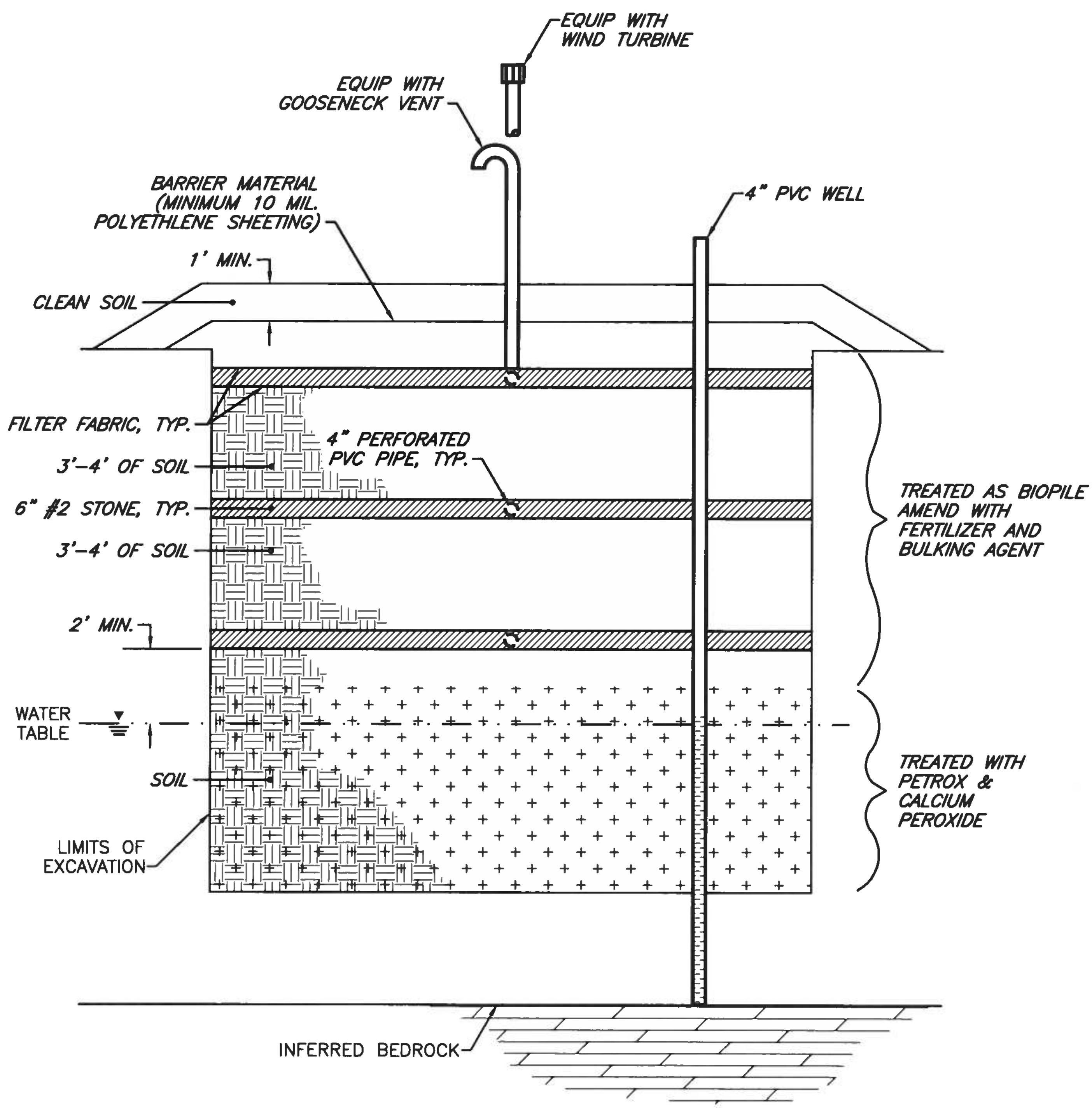
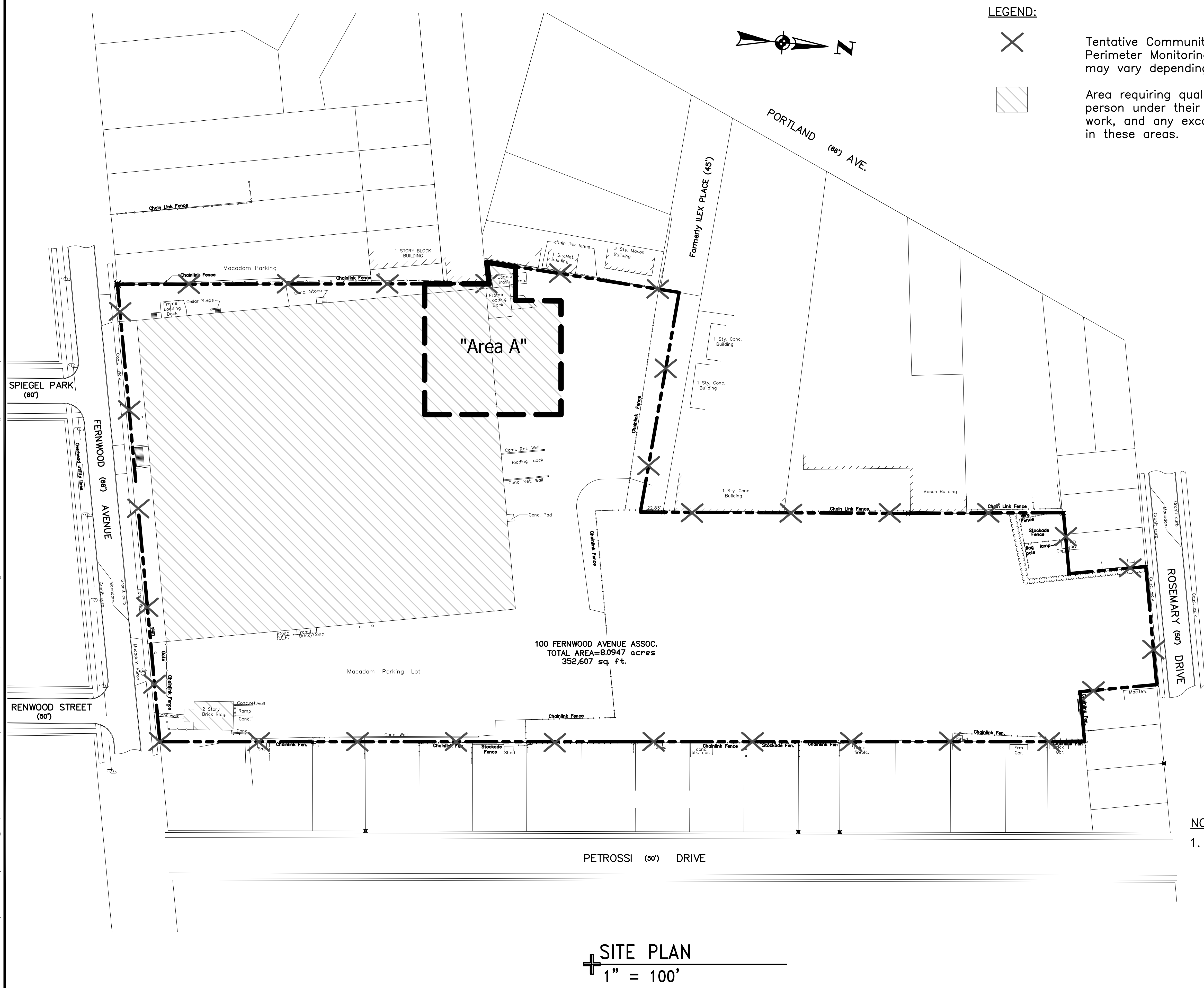


DATE 9-1-2009 DRAWN BY RJM SCALE No Scale	day DAY ENVIRONMENTAL, INC. ENVIRONMENTAL CONSULTANTS ROCHESTER, NEW YORK 14614-1008 NEW YORK, NEW YORK 10016-0710	PROJECT TITLE 100 FERNWOOD AVENUE ROCHESTER, NEW YORK BROWNFIELD CLEANUP PROGRAM DRAWING TITLE Remedial Measure Cross-Section (Existing In-Situ Bioremediation System)	PROJECT NO. 4014R-07 FIGURE 11



LEGEND:

✕ Tentative Community Air Monitoring Plan (CAMP) Perimeter Monitoring Station. Actual locations may vary depending on field conditions encountered.

(hatched) Area requiring qualified environmental professional or person under their supervision to oversee all invasive work, and any excavation and load–out of the materials in these areas.

NOTES:

1. Drawing produced from a CAD file from MRB Group, P.C. titled "Map of Survey of Lands of 100 Fernwood Avenue Associates" dated 12–15–00, MRB project #942–343.

SITE PLAN
1" = 100'

Ref1:
Ref2:
Ref3:

Xerox432AnsiB-2: 11 x 17
Layout Name: Layout1
Pen Setting File: 800psFullcolor.ctb

Time Plotted: Friday, December 18, 2009 10:30:38 AM
File Name: U:\McPhee\Drawings\Phase 2-2007\Conifer-4014R\4014R-3.dwg

FIELD VERIFIED BY: JAD	DATE: 12-2009
DRAWN BY: RJM/CPS	DATE DRAWN: 12-2009
SCALE: As Noted	DATE ISSUED: 12-14-2009

day
DAY ENVIRONMENTAL, INC.
ENVIRONMENTAL CONSULTANTS
ROCHESTER, NEW YORK 14614-1008
NEW YORK, NEW YORK 10016-0710

PROJECT TITLE
100 FERNWOOD AVENUE
ROCHESTER, NEW YORK
BROWNFIELD CLEANUP PROGRAM

DRAWING TITLE
Areas requiring oversight, and Tentative CAMP Perimeter Monitoring Stations

PROJECT NO.
4014R-07

FIGURE 12

APPENDIX A

EXCAVATION WORK PLAN

APPENDIX A – EXCAVATION WORK PLAN

A-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

Batholomew H. Putzig, P.E.
Regional Hazardous Waste Remediation Engineer
6274 East Avon-Lima Road Avon, NY 14414

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of intrusive work that will encounter potentially impacted fill, soil, and/or groundwater;
- A summary of the applicable components of this excavation work plan (EWP);
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in Appendix C of this document,
- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

A-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening (i.e., monitoring with a photoionization detector and a particulate meter, if warranted) will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

A-3 STOCKPILE METHODS

Depending on the quantity of material excavated, impacted materials may be loaded directly into trucks for transport off-site for disposal, placed within roll-off containers and/or placed in a soil stockpile. Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps or plastic sheeting. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

A-4 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under their supervision will oversee all invasive work conducted inside existing building footprints and below the top two feet of soil in Area A shown on Figure 12, and any excavation and load-out of materials in the areas specified above.

The owner of the property and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and other applicable transportation requirements).

If required based on the type and extent of invasive work proposed, a truck wash will be operated on-site. The qualified environmental professional will be responsible for ensuring that all outbound trucks are free of debris before leaving the Site until the activities performed under this section are complete.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

A-5 MATERIALS TRANSPORT OFF-SITE

Transport of contaminated materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used. [Note: To the extent possible, wet soil will be drained in an aboveground location on the Site prior to off-site transport.]

As necessary, trucks will be washed prior to leaving the Site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

A map and directions from the Site via approved truck transport routes will be obtained by the transporter prior to transporting contaminated materials off-site. Trucks loaded with Site materials will exit the vicinity of the Site using these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport; [(g) community input [where necessary]]

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

A-6 MATERIALS DISPOSAL OFF-SITE

As determined by characterization test results, fill, soil, and/or solid waste deemed to be contaminated that is excavated and removed from the Site will be treated as contaminated material and will be transported and disposed in accordance with applicable local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated off-site disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this Site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate (i.e., hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc.). Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at a minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

A-7 MATERIALS REUSE ON-SITE

In the event that excavation activities at the Site encounter potentially contaminated materials, the materials may be re-used on-site in accordance with guidelines as set forth below in this SMP. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below the impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

In order to qualify for re-use, the on-site material must:

- Comply with the remedial action objectives identified in the RWP.
- Be free of extraneous debris or solid waste
- Consist of soil or other unregulated material as set for in 6NYCRR Part 360
- Be tested at the rate outlined in table A-7(a)

Table A-7(a)
Required number of Soil Samples to determine re-use suitability of excavated on-site soils.

Contaminant	**Semi-Volatiles**		**Volatiles**		**Inorganics**		**PCBs/Pesticides**	
Soil Quantity (yd^{3})	Grab	Composite	Grab	Composite	Grab	Composite	Grab	Composite
0-50	1	1	1	NA	1	1	1	1
50-100	1	2	2	NA	1	2	1	2
100-200	1	3	3	NA	1	3	1	3
200-300	1	4	4	NA	1	4	1	4
300-400	2	4	4	NA	2	4	2	4
400-500	2	5	5	NA	2	5	2	5
500-800	2	6	6	NA	2	6	2	6
800-1000	2	7	7	NA	2	7	2	7
> 1000	Sample frequency may be reduced with approval from NYSDEC Project Manager							

Based on the testing outcome, soil may be used in the following manner:

- Soil originating on the Site that complies with unrestricted soil SCOs set forth in 6 NYCRR Part 375 Table 375-6.8(a) may be re-used without restriction on or off the Site. Table 375-6.8(a) is included in Appendix I.
- Soil originating on the Site that complies with the more stringent of the Restricted Residential SCOs or the Protection of Groundwater SCOs [set forth in 6 NYCRR Part 375 Table 375-6.8(b)] may be re-used on-site for backfill. Table 375-6.8(b) is included in Appendix I.
- Soil originating on the Site that complies with site-specific remedial action objectives for subsurface soil (referenced in the RWP) may be re-used on-site as backfill at a depth greater than two feet below finished grade, or as backfill for soils beneath future buildings, pavement, and other improvements.

In the event that building demolition material is proposed for reuse on-site, it will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site will not be reused on-site.

A-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will be managed off-site, or appropriately treated and discharged on-site in accordance with applicable regulations.

A-9 BACKFILL FROM OFF-SITE SOURCES

Materials proposed for import onto the Site that will be used as backfill materials will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the Site.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the Site.

Imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards for imported backfill and cover soil at this Site is the lesser of the SCOs for Restricted Residential Use and the Protection of Groundwater as referenced in 6NYCRR 375-6.8(b). Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

A-10 STORMWATER POLLUTION PREVENTION

During excavation activities barriers and hay bale checks will be installed and inspected once a week and after every storm event in accordance with applicable regulations. Results of inspections will be recorded in a logbook and will be available for inspection by NYSDEC. Necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

Undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Depending on the size of the excavation, silt fencing or hay bales will be installed around the entire perimeter of the construction area.

A-11 CONTINGENCY PLAN

In the event that underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to the NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

A-12 COMMUNITY AIR MONITORING PLAN

The CAMP is included in the HASP that has been developed for the Site (refer to Appendix C). The CAMP will be implemented during excavation at the Site (generally at depths greater than two feet). The locations of air sampling stations that will be used based on generally prevailing wind conditions, and also on where Site work is being performed, are shown in Figure 12. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations. In addition, fixed monitoring stations will be located at the Site perimeter next to residential areas in proximity to areas being worked at the Site, regardless of wind direction, since they are considered sensitive receptors. Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

A-13 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis may include limiting the extent of open excavations, the use of physical barriers or ventilation systems (i.e., in the event interior excavations are required) or other methods deemed appropriate at the time of excavation.. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated to the extent possible and acceptable to the impacted parties. NYSDEC and NYSDOH will be notified of odor events. Implementation of odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

Necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: limiting the area of open excavations and size of soil stockpiles; shrouding open excavations with tarps and other covers; using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: direct load-out of soils to trucks for off-site disposal; use of chemical odorants in spray or misting systems; and, use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

A-14 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved though the use of a dedicated on-site water truck, or other available water source of sufficient volume, for road wetting. The equipment will be capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

A-15 OTHER NUISANCES

As necessary, a plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

As necessary, a plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

APPENDIX B

METES AND BOUNDS

N09-104 September 25, 2009

Survey description of land owned by 100 Fernwood Avenue Associates.

ALL THAT TRACT OR PARCEL OF LAND, situate in part of Town Lot 46, Township 14, South Range of the Phelps and Gorham Purchase, City of Rochester, County of Monroe, State of New York, bounded and described as follows:

BEGINNING at a point in the north line of Fernwood Avenue (a 66-foot wide right-of-way), said point being S 84° 34’ 10” W, 90.24 feet from the west line of Petrossi Drive; running thence:

(1) S 84° 34’ 10” W, along the north line of Fernwood Avenue, 465.16 feet to a railroad spike marking the southeast corner of land now or formerly owned by 690 Portland Avenue Co., as recorded in Liber 5954 of Deeds at Page 8; thence:

(2) N 00° 03’ 00” W, along the east line of land now or formerly owned by said 690 Portland Avenue Co. and the east line of land now or formerly owned by Comida-JML Optical Ind., as recorded in Liber 5898 of Deeds at Page 301, for a total distance of 376.23 feet to an iron pin; thence:

(3) S 85° 55’ 16” W, along land now or formerly owned by said Comida-JML Optical Ind., 22.06 feet to a point; thence:

(4) N 9° 00’ 16” E, along the east line of land now or formerly owned by said Comida-JML Optical Ind. and the east line of land owned by the City of Rochester, for a total distance of 197.21 feet to a point marking the southwest corner of land reputedly owned by Stephen, Mark, and Charles Battle, said point marking the former centerline of Ilex Place; thence:

(5) S 80° 08’ 34” E, along the south line of land reputedly owned by said Battle being the former centerline of Ilex Place, 225.77 feet to a point; thence:

(6) N 00° 08’ 06” W, along the east line of land reputedly owned by said Battle and the east line of land reputedly owned by David C. Hildreth, for a total distance of 271.01 feet to a point; thence:

(7) N 00° 23’ 41” W, along the east line of land reputedly owned by said Hildreth, 157.34 feet to an iron pin in the south line of land reputedly owned by Marcelino and Rosa Cintra; thence:

(8) N 84° 35’ 50” E, along the south line of land reputedly owned by said Cintra and the south line of land reputedly owned by Oliemae C. Bennett, for a total distance of 61.98 feet to a point; thence:

(9) N 05° 18’ 06” W, along the east line of land reputedly owned by said Bennett, 78.00 feet to a point in the south line of Rosemary Drive; thence:

(10) N 84° 35’ 50” E, along the south line of Rosemary Drive, 120.00 feet to a point marking the northwest corner of land reputedly owned by Marie E. Macko; thence:

(11) S 05° 18’ 06” E, along the west line of land reputedly owned by said Macko, 78.00 feet to a point; thence:

(12) N 84° 35’ 50” E, along the south line of land reputedly owned by said Macko and the south line of land reputedly owned by Scott Grove, 50.93 feet to a point marking the northwest corner of land reputedly owned by Michele L. and Nancy B. Viola; thence:

(13) S 00° 08’ 00” E, along the west line of Lots fronting on Petrossi Drive known as the John Petrossi Tract, for a total distance of 936.23 feet to the point and place of beginning, comprising an area of 8.095 acres or 352,607 square feet according to a survey prepared by Kocher Surveying, P.C., dated August 12, 2009, Project No. N09-104.

BEING AND INTENDING to describe the same premises conveyed in the Deed:

Tamarack III Associates and Tamarack Associates to 100 Fernwood Avenue Associates, dated March 30, 1995 and recorded in the Office of the Monroe County Clerk in Liber 8873 of Deeds at Page 504.

APPENDIX C

HEALTH AND SAFETY PLAN
AND
COMMUNITY AIR MONITORING PLAN

HEALTH AND SAFETY PLAN

BROWNFIELD CLEANUP PROGRAM
100 FERNWOOD AVENUE
ROCHESTER, NEW YORK
NYSDEC SITE ID C828119

Prepared for:	Conifer Development, Inc. 183 East Main Street, 6th Floor Rochester, New York 14604
Prepared by:	Day Environmental, Inc. 40 Commercial Street Rochester, New York 14614
Project No.:	4014R-07
Date:	January 2008

TABLE OF CONTENTS

ATTACHMENTS

1.0 INTRODUCTION

This Health and Safety Plan (HASP) outlines the policies and procedures necessary to protect workers and the public from potential environmental hazards posed during remediation activities under the New York State Department of Environmental Protection (NYSDEC) Brownfield Cleanup Program (BCP). The subject property (Site) consists of eleven contiguous parcels totaling approximately 8.14 acres. The parcels are addressed as: 100 and 142 Fernwood Avenue; 31, 35 and 41 Rosemary Drive; and 25, 29, 33, 39, 43, 49, and 55 Ilex Place, City of Rochester, County of Monroe, New York (Tax account #s 106.27-1-5; 91.83-3-19; 91.83-3-20; 91.83-3-21; 106.27-1-87; 106.27-1-88; 106.27-1-89; 106.27-1-90; 106.27-1-91; 106.27-1-92; and 106.27-1-93). Figure 1 included in Attachment 1 depicts the general location of the Site. As outlined in this HASP, the remedial activities shall be conducted in a manner to minimize the probability of injury, accident, or incident occurrence.

Although the HASP focuses on the specific work activities planned for this Site, it must remain flexible due to the nature of this work. Conditions may change and unforeseen situations can arise that require deviations from the original HASP.

1.1 Site History/Overview

There are two buildings on the Site. The main building was constructed between 1926 and 1930 and is an approximately 120,000-square foot, one-story concrete block building that has a partial basement. The smaller building is an approximately 3,000-square foot, one-story brick building with a basement that was constructed between 1910 and 1922.

Elmer W. Davis, Inc currently uses the main building at the Site for the storage of insulation panels; however, it has no full time employees stationed on-site. The main building was originally constructed as Vogt Manufacturing Corporation, which manufactured auto trimmings (e.g., textile trimmings spinning and weaving). The main building was later converted for multi-tenant light industrial/commercial use. Former uses of the main building by tenants include: plastic products manufacturer, tool and die makers, machine shops, painters, printers, graphics companies, and sheet metal contractors. The building was vacant between approximately 2002 and 2004.

The smaller building was originally constructed as, and until recently was used as, a church. However, the smaller building has also been occupied in the past by light industrial/commercial tenants such as Empire Engraving Company (metal cutting allied services) and Phoenix Equipment Co.

The Site is located in an urban area that is serviced by a public water system. The Site and surrounding area are generally level. There are no surface water bodies at, or within a 0.5-mile radius of the Site. Surface water appears to flow off the Site via sheet flow toward adjoining streets to the north and to the south (i.e. Rosemary Drive and Fernwood Avenue), into the City of Rochester combined sewer system. Groundwater at the Site generally flows radially outward from an unpaved location north of the main building where five underground storage tanks (USTs) were removed and an in-situ bioremediation system was installed (see below for further information). This flow direction may be modified locally due to buried utilities, seasonal conditions, or other factors.

The Site is zoned industrial, and is located in a mixed-use urban area. The Site is bounded to the north and west by commercial, industrial and residential properties, and bounded to the south and east by residential properties.

A November 2000 Phase I Environmental Site Assessment (Phase I ESA) report identified the following recognized environmental conditions (RECs) at the Site:

1. Abandoned Underground Storage Tanks (USTs)
2. Confirmed Local Waste Site/Active New York State Department of Environmental Conservation (NYSDEC) Spill Site on Nearby Property
3. Active NYSDEC Spill on Adjoining Property
4. Suspect Asbestos-Containing Material (ACM) [Note: ACM is not addressed as part of this project.]
5. Closed NYSDEC Spill on Site
6. Transformers/Polychlorinated Biphenyl (PCB) Suspect Equipment
7. Historic Use of the Site

In addition to the RECs identified above, the NYSDEC requested that investigative work be included to evaluate whether environmental conditions have been impacted at loading docks equipped with hydraulic lifts. The NYSDEC also requested that a pipe chase in the floor of the main building be further evaluated, and that some limited surface and subsurface evaluation be included on the northern undeveloped portion of the Site.

A Remedial Investigation/Remedial Alternatives Analysis (RI/RAA) Report dated November 2006 as modified by a March 8, 2007 Addendum was prepared by Day Environmental, Inc. (DAY). Tasks performed as part of the remedial investigation to evaluate or address the RECs identified above included:

- Performing a passive soil gas survey as a screening tool to evaluate the presence of volatile organic compounds (VOCs) at the Site;
- Performing sampling and analysis of various media to evaluate whether PCBs were present at three pad-mounted transformers located east of the main building;
- Performing an evaluation of hydraulic lifts at three loading docks on the main building;
- Performing test pits and magnetic locator work to evaluate the potential presence of abandoned USTs;
- Permanently closing (i.e., removing) four USTs in accordance with applicable regulations;
- Designing and constructing an on-site in-situ bioremediation system within the former tank pit to treat contaminated soils that were displaced/disturbed during the UST closure work;
- Performing post-treatment monitoring to evaluate the effectiveness of the in-situ bioremediation system;

- Evaluating surface soil conditions;
- Evaluating subsurface soil conditions;
- Evaluating groundwater quality conditions and groundwater movement characteristics;
- Performing a vapor intrusion study to evaluate whether VOCs in soil or groundwater were volatilizing and impacting indoor air inside the smaller church building on the Site that is addressed as 142 Fernwood Avenue; and
- Evaluating environmental data for the adjoining former JML Optical, Inc. property located west of the Site.

The findings of the remedial investigation are summarized below:

- The hydraulic loading docks and pad-mounted transformers at the Site do not appear to have adversely impacted environmental conditions at the Site. In addition, evidence of environmental impact was not detected at test boring locations that were completed in proximity to a pipe chase located inside the main building. Therefore, it does not appear that this pipe chase has adversely impacted environmental conditions at the Site.

- Prior to the remedial investigation, a 15,000-gallon UST was removed from the Site. As part of the remedial investigation, one 8,000-gallon UST, two 2,000-gallon USTs and one 4,000-gallon UST were removed from the Site. These five USTs were located in the same general area north of the northwest corner of the main building.

- A primary area of soil and groundwater contamination, including the presence of a relatively thin layer (i.e., 0.37 foot or less) of LNAPL that is more limited in extent, was detected in proximity to the former UST locations near the northwest corner of the main building. This contamination generally consists of petroleum products and plasticizers that historically leaked from the former USTs. Based on field screening, analytical laboratory test results, and groundwater monitoring, it appears that this impact has migrated radially outward from the former UST area, including beneath the northwest corner of the main building. In addition, the length of the petroleum/plasticizer plume is estimated to be about 60 feet away from the former UST locations. Based on a review of Site data and environmental reports for the adjoining former JML Optical, Inc. property to the west, petroleum and plasticizer contamination attributable to the former UST locations at the Site appears to have also migrated from the Site via groundwater onto an estimated 1,375-square foot area of the adjoining former JML Optical, Inc. property.

- As an interim remedial measure (IRM), petroleum and plasticizer contaminated soils that were displaced during the UST removal work were amended with bioremediation products and placed back into the tank pit excavation as part of an in-situ bioremediation system. The analysis of post-treatment soil and groundwater samples indicate the in-situ bioremediation system is working, and contaminants have been reduced by approximately 40% (on average). The results of the post-treatment sampling and analytical laboratory testing indicated that contaminants were still present in soil and groundwater at concentrations exceeding SCG values.

- Two of four surface soil samples collected from the northern undeveloped portion of the Site contained some polyaromatic hydrocarbon (PAH) semi-volatile organic compounds (SVOCs) above December 14, 2006 NYSDEC Part 375 (Environmental Restoration Programs) Track 2 Soil Cleanup Objectives (SCOs) for Restricted Residential Use. However, the concentrations of these SVOCs are comparable to other projects in the City of Rochester where surface soil data has been collected. As such, the NYSDEC concurs that the limited exceedances of the Restricted Residential Use SCOs in surface soil at the Site are attributable to the local geology or urban setting of the Site and are not significant.

- Chlorinated VOCs were detected in groundwater samples at some of the monitoring well locations. An on-site source of chlorinated VOCs that could result in contamination of the groundwater was not found during the soil and groundwater studies performed as part of this investigation. It is possible that the chlorinated VOCs are attributable to an off-site source(s) that has resulted in an area-wide groundwater condition. A review of environmental reports indicates a sump and a former degreaser area at the adjoining former JML Optical, Inc. property to the west, and also a nearby NYSDEC Inactive Hazardous Waste Disposal Site located southwest of the Site, could potentially be sources of the chlorinated VOCs that are present at the Site.

- A subsurface soil sample collected from a depth interval of 0-4' at test boring TB-4 contained three PAH SVOCs that exceeded Track 2 BCP SCOs for restricted residential use. This sample was collected beneath the floor of the main building and contained fill material that consisted of reworked soil with some cinders. The PAH SVOCs would presumably be limited in extent to the fill material, and can be a common component of cinders.

1.2 Planned Activities Covered by HASP

This HASP is intended to be used during this NYSDEC BCP project for remedial activities. Currently, identified activities include:

- Site preparation activities (e.g., put up NYSDEC Remediation Project sign);
- Installation of four wells for monitoring and recovery of light non-aqueous phase liquid (LNAPL);
- Groundwater sampling associated with monitored natural attenuation; and
- Miscellaneous on-site tasks that may arise during this project.

This HASP can be modified to cover other site activities as deemed appropriate. The owner of the property, its contractors, and other site workers will be responsible for the development and/or implementation of health and safety provisions associated with normal construction activities or site activities.

2.0 KEY PERSONNEL AND MANAGEMENT

The Project Manager (PM) and Site Safety Officer (SSO) are responsible for formulating and enforcing health and safety requirements, and implementing the HASP.

2.1 Project Manager

The PM has the overall responsibility for the project and will coordinate with the SSO to ensure that the goals of the remedial program are attained in a manner consistent with the HASP requirements.

2.2 Site Safety Officer

The SSO has responsibility for administering the HASP relative to site activities conducted by DAY personnel, and will be in the field full-time while site activities are in progress. The SSO's operational responsibilities will be monitoring, including personal and environmental monitoring, ensuring personal protective equipment maintenance, and assignment of protection levels. The SSO will be the main contact in any on-site emergency situation. The SSO will direct the safety aspects of field activities conducted by DAY personnel and will be responsible for stopping work when unacceptable health or safety risks exist. The SSO is responsible for ensuring that on-site personnel understand the safety requirements in this HASP.

2.3 Employee Safety Responsibility

Each employee is responsible for personal safety as well as the safety of others in the area. The employee will use the equipment provided in a safe and responsible manner as directed by the SSO.

2.4 Key Safety Personnel

The following individuals are anticipated to share responsibility for health and safety at the site.

Project Manager	Jeffrey A. Danzinger
Site Safety Officer	Mathew K. Dickinson, Glenn R. Miller, Kelly A. Crandall, or Samuel C. Price

3.0 SAFETY RESPONSIBILITY

Contractors, consultants, state or local agencies, or other parties, and their employees, involved with this project will be responsible for their own safety while on-site. Their employees will be required to understand the information contained in this HASP, and must follow the recommendations that are made in this document. As an alternative, contractors, consultants, state or local agencies, or other parties, and their employees, involved with this project can utilize their own health and safety plan for this project as long as it is found acceptable to the New York State Department of Health (NYSDOH) and/or the MCDPH.

4.0 JOB HAZARD ANALYSIS

There are many hazards associated with remedial work on a site, and this HASP discusses some of the anticipated hazards for this Site. The hazards listed below deal specifically with those hazards associated with the management of potentially contaminated media (e.g., soil, groundwater, fill, etc.).

4.1 Chemical Hazards

Chemical substances can enter the unprotected body by inhalation, skin absorption, ingestion, or injection (i.e., a puncture wound, etc.). A contaminant can cause damage to the point of contact or can act systemically, causing a toxic effect at a part of the body distant from the point of initial contact.

A list of selected VOCs, SVOCs, and metals that have been detected at the Site and which exceed soil or groundwater standards, criteria and guidance (SCG) values or were detected in one or more media at high concentrations in relation to other constituents are presented below. This list also presents the Occupational Safety and Health Administration (OSHA) 8-hour Time-Weighted Average (TWA) Permissible Exposure Limits (PELs), the National Institute for Occupational Safety and Health (NIOSH) 8-hour TWA Recommended Exposure Limits (RELs), and the NIOSH Immediately Dangerous to Life or Health (IDLH) levels.

CONSTITUENT	OSHA PEL	NIOSH REL	IDLH
Benzene (Ca)	1 ppm	0.1 ppm	500 ppm
Toluene	200 ppm	100 ppm	500 ppm
Ethylbenzene	100 ppm	100 ppm	800 ppm
Xylenes	100 ppm	100 ppm	900 ppm
Trichloroethene (Ca)	100 ppm	25 ppm	1000 ppm
1,1,1-Trichloroethane	350 ppm	350 ppm	700 ppm
Naphthalene	10 ppm	10 ppm	250 ppm
1,1-Biphenyl (Ca)	0.2 ppm	0.2 ppm	15.8 ppm
Phenanthrene (Ca)	0.2 mg/m^3	0.1 mg/m^3	80 mg/m^3
Anthracene (Ca)	0.2 mg/m^3	0.1 mg/m^3	80 mg/m^3
Pyrene (Ca)	0.2 mg/m^3	0.1 mg/m^3	80 mg/m^3
Bis(2-ethylhexyl)phthalate	5 mg/m^3	5 mg/m^3	4000 mg/m^3
Chrysene (Ca)	0.2 mg/m^3	0.1 mg/m^3	80 mg/m^3
Benzo(b)fluoranthene (Ca)	0.2 mg/m^3	0.1 mg/m^3	80 mg/m^3
Benzo(a)pyrene (Ca)	0.2 mg/m^3	0.1 mg/m^3	80 mg/m^3
Gamma-Chlordane (Ca)	0.5 mg/m^3	0.5 mg/m^3	100 mg/m^3
Antimony	0.5 mg/m^3	0.5 mg/m^3	50 mg/m^3
Iron (dust-fume)	10 mg/m^3	5 mg/m^3	2,500 mg/m^3
Magnesium (fume)	15 mg/m^3	10 mg/m^3	750 mg/m^3
Manganese (fume)	5 mg/m^3 (ceiling)	1 mg/m^3 (15-min)	500 mg/m^3

Ca = Potential carcinogen

The potential routes of exposure for these analytes and chemicals include inhalation, ingestion, skin absorption and/or skin/eye contact. The potential for exposure through any one of these routes will depend on the activity conducted. The most likely routes of exposure for the activities that are performed during remedial activities at the Site include inhalation and skin/eye contact.

4.2 Physical Hazards

There are physical hazards associated with this project, which might compound the chemical hazards. Hazard identification, training, adherence to the planned remedial measures, and careful housekeeping can prevent many problems or accidents arising from physical hazards. Potential physical hazards associated with this project and suggested preventative measures include:

- Slip/Trip/Fall Hazards - Some areas may have wet surfaces that will greatly increase the possibility of inadvertent slips. Caution must be exercised when using steps and stairs due to slippery surfaces in conjunction with the fall hazard. Good housekeeping practices are essential to minimize the trip hazards.

- Small Quantity Flammable Liquids - Small quantities of flammable liquids will be stored in "safety" cans and labeled according to contents.

- Electrical Hazards - Electrical devices and equipment shall be de-energized prior to working near them. All extension cords will be kept out of water, protected from crushing, and inspected regularly to ensure structural integrity. Temporary electrical circuits will be protected with ground fault circuit interrupters. Only qualified electricians are authorized to work on electrical circuits. Heavy equipment (e.g., excavator, backhoe, drill rig) shall not be operated within 10 feet of high voltage lines, unless proper protection from the high voltage lines is provided by the appropriate utility company.

- Noise - Work around large equipment often creates excessive noise. The effects of noise can include:

  - Workers being startled, annoyed, or distracted.
  - Physical damage to the ear resulting in pain, or temporary and/or permanent hearing loss.
  - Communication interference that may increase potential hazards due to the inability to warn of danger and proper safety precautions to be taken.

  Proper hearing protection will be worn as deemed necessary. In general, feasible administrative or engineering controls shall be utilized when on-site personnel are subjected to noise exceeding an 8-hour TWA sound level of 90 dBA (decibels on the A-weighted scale). In addition, whenever employee noise exposures equal or exceed an 8-hour TWA sound level of 85 dBA, employers shall administer a continuing, effective hearing conservation program as described in the OSHA Regulation 29 CFR Part 1910.95.

- Heavy Equipment - Each morning before start-up, heavy equipment will be inspected to ensure safety equipment and devices are operational and ready for immediate use.

- Subsurface and Overhead Hazards - Before any excavation activity, efforts will be made to determine whether underground utilities and potential overhead hazards will be encountered. Underground utility clearance must be obtained prior to subsurface work.

4.3 Environmental Hazards

Environmental factors such as weather, wild animals, insects, and irritant plants can pose a hazard when performing outdoor tasks. The SSO shall make every reasonable effort to alleviate these hazards should they arise.

4.3.1 Heat Stress

The combination of warm ambient temperature and protective clothing increases the potential for heat stress. In particular:

- Heat rash
- Heat cramps
- Heat exhaustion
- Heat stroke

Site workers will be encouraged to increase consumption of water or electrolyte-containing beverages such as Gatorade® when the potential for heat stress exists. In addition, workers are encouraged to take rests whenever they feel any adverse effects that may be heat-related. The frequency of breaks may need to be increased upon worker recommendation to the SSO.

4.3.2 Exposure to Cold

With outdoor work in the winter months, the potential exists for hypothermia and frostbite. Protective clothing greatly reduces the possibility of hypothermia in workers. However, personnel will be instructed to wear warm clothing and to stop work to obtain more clothing if they become too cold. Employees will also be advised to change into dry clothes if their clothing becomes wet from perspiration or from exposure to precipitation.

5.0 SITE CONTROLS

To prevent migration of contamination caused through tracking by personnel or equipment, work areas and personal protective equipment staging/decontamination areas will be specified prior to beginning operations.

5.1 Site Zones

In the area where contaminated materials present the potential for worker exposure (work zone), personnel entering the area must wear the mandated level of protection for the area. A "transition zone" shall be established where personnel can begin and complete personal and equipment decontamination procedures. This can reduce potential off-site migration of contaminated media. Contaminated equipment or clothing will not be allowed outside the transition zone (e.g., on clean portions of the Site) unless properly containerized for disposal. Operational support facilities will be located outside the transition zone (i.e., in a "support zone"), and normal work clothing and support equipment are appropriate in this area. If possible, the support zone should be located upwind of the work zone and transition zone.

5.2 General

The following items will be requirements to protect the health and safety of workers during implementation of activities that disturb contaminated material.

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand to mouth transfer and ingestion of contamination shall not occur in the work zone and/or transition zone during disturbance of contaminated material.

- Personnel admitted in the work zone shall be properly trained in health and safety techniques and equipment usage.

- No personnel shall be admitted in the work zone without the proper safety equipment.

- Proper decontamination procedures shall be followed before leaving the Site.

6.0 PROTECTIVE EQUIPMENT

This section addresses the various levels of personal protective equipment (PPE), which are or may be required at this job site. Personnel entering the work zone and transition zone shall be trained in the use of the anticipated PPE to be utilized.

6.1 Anticipated Protection Levels

TASK	PROTECTION LEVEL	COMMENTS/MODIFICATIONS
Site mobilization	D	
Site preparation	D	
Extrusive work (e.g., surveying, etc.)	D	
Intrusive work (e.g., well installation, collecting samples, etc.)	C/Modified D/D	Based on air monitoring, and SSO discretion
Support zone	D	
Site breakdown and demobilization	D	

It is anticipated that work conducted as part of this project will be performed in Level D or modified Level D PPE. If conditions are encountered that require Level A or Level B PPE, the work will immediately be stopped. The appropriate government agencies (e.g., NYSDEC, NYSDOH, MCDPH, etc.) will be notified and the proper health and safety measures will be implemented (e.g., develop and implement engineering controls, upgrade in PPE, etc.).

6.2 Protection Level Descriptions

This section lists the minimum requirements for each protection level. Modifications to these requirements can be made upon approval of the SSO. If Level A, Level B, and/or Level C PPE is required, Site personnel that enter the work zone and/or transition zone must be properly trained and certified in the use of those levels of PPE.

6.2.1 Level D

Level D consists of the following:

- Safety glasses
- Hard hat when working with heavy equipment
- Steel-toed or composite-toed work boots
- Protective gloves during sampling or handling of potentially contaminated media
- Work clothing as prescribed by weather

6.2.2 Modified Level D

Modified Level D consists of the following:

- Safety glasses with side shields
- Hard hat when working with heavy equipment
- Steel-toed or composite-toed work boots
- Work gloves
- Outer protective wear, such as Tyvek coverall [Tyveks (Sarans) and polyvinyl chloride (PVC) acid gear will be required when workers have a potential to be exposed to contaminated liquids and/or particulates].

6.2.3 Level C

Level C consists of the following:

- Air-purifying respirator with appropriate cartridges
- Outer protective wear, such as Tyvek coverall [Tyveks (Sarans) and PVC acid gear will be required when workers have a potential to be exposed to contaminated liquids and/or particulates].
- Hard hat when working with heavy equipment
- Steel-toed or composite-toed work boots
- Nitrile, neoprene, or PVC overboots, if appropriate
- Nitrile, neoprene, or PVC gloves, if appropriate
- Face shield (when projectiles or splashes pose a hazard)

6.2.4 Level B

Level B protection consists of the items required for Level C protection with the exception that an air-supplied respirator is used in place of the air-purifying respirator. Level B PPE is not anticipated to be required during this project. If the need for level B PPE becomes evident, site remediation activities will be stopped until site conditions are further evaluated, and any necessary modifications to the HASP have been approved by the PM and SSO. Subsequently, the appropriate safety measures (including Level B PPE) must be implemented prior to commencing site activities.

6.2.5 Level A

Level A protection consists of the items required for Level B protection with the addition of a fully-encapsulating, vapor-proof suit capable of maintaining positive pressure. Level A PPE is not anticipated to be required during this project. If the need for level A PPE becomes evident, site remediation activities will be stopped until site conditions are further evaluated, and any necessary modifications to the HASP have been approved by the PM and SSO. Subsequently, the appropriate safety measures (including Level A PPE) must be implemented prior to commencing site activities.

6.3 Respiratory Protection

Any respirator used will meet the requirements of the OSHA 29 CFR 1910.134. Both the respirator and cartridges specified shall be fit-tested prior to use in accordance with OSHA regulations (29 CFR 1910). Air purifying respirators shall not be worn if contaminant levels exceed designated use concentrations. The workers will wear respirators with approval for: organic vapors <1,000 ppm; and dusts, fumes and mists with a TWA < 0.05 mg/m^3.

No personnel who have facial hair, which interferes with respirator sealing surface, will be permitted to wear a respirator and will not be permitted to work in areas requiring respirator use.

Only workers who have been certified by a physician as being physically capable of respirator usage shall be issued a respirator. Personnel unable to pass a respiratory fit test or without medical clearance for respirator use will not be permitted to enter or work in areas that require respirator protection.

7.0 DECONTAMINATION PROCEDURES

This section describes the procedures necessary to ensure that both personnel and equipment are free from contamination when they leave the work site.

7.1 Personnel Decontamination

Personnel involved with activities that involve disturbing contaminated media will follow the decontamination procedures described herein to ensure that material which workers may have contacted in the work zone and/or transition zone does not result in personal exposure and is not spread to clean areas of the Site. This sequence describes the general decontamination procedure. The specific stages can vary depending on the Site, the task, and the protection level, etc.

1. Leave work zone and go to transition zone
2. Remove soil/debris from boots and gloves
3. Remove boots
4. Remove gloves
5. Remove Tyvek suit and discard, if applicable
6. Remove and wash respirator, if applicable
7. Go to support zone

7.2 Equipment Decontamination

Contaminated equipment shall be decontaminated in the transition zone before leaving the Site. Decontamination procedures can vary depending upon the contaminant involved, but may include sweeping, wiping, scraping, hosing, or steam cleaning the exterior of the equipment. Personnel performing this task will wear the proper PPE.

7.3 Disposal

Disposable clothing will be disposed in accordance with applicable regulations. Liquids (e.g., decontamination water, etc.) or solids (e.g., soil) generated by remedial activities will be disposed in accordance with applicable regulations.

8.0 AIR MONITORING

Air monitoring will be conducted in order to determine airborne particulate and contamination levels. This ensures that respiratory protection is adequate to protect personnel against the chemicals that are encountered and that chemical contaminants are not migrating off-site. Additional air monitoring may be conducted at the discretion of the SSO. Readings will be recorded and be available for review.

The following chart describes the direct reading instrumentation that will be utilized and appropriate action levels.

Monitoring Device	Action level	Response/Level of PPE
PID Volatile Organic Compound Meter	< 1 ppm in breathing zone, sustained 5 minutes	Level D
	1-25 ppm in breathing zone, sustained 5 minutes	Level C
	26-250 ppm in breathing zone, sustained 5 minutes	Level B, Stop work, evaluate the use of engineering controls
	>250 ppm in breathing zone	Level A, Stop work, evaluate the use of engineering controls
RTAM Particulate Meter	$\leq$ 150 $\mu g/m^3$ over an integrated period not to exceed 15 minutes.	Continue working
	> 150 $\mu g/m^3$	Cease work, implement dust suppression, change in way work performed, etc. If levels can not be brought below 150 $\mu g/m^3$, then upgrade PPE to Level C.

8.1 Particulate Monitoring

During activities where contaminated materials (e.g., fill) may be disturbed, air monitoring will include real-time monitoring for particulates using a real-time aerosol monitor (RTAM) particulate meter at the perimeter of the work zone in accordance with the 1989 NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4031 entitled, "Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites." The TAGM uses an action level of 150 $\mu g/m^3$ (0.15 mg/m^3) over an integrated period not to exceed 15 minutes. If the action level is exceeded, or if visible dust is encountered, then work shall be discontinued until corrective actions are implemented. Corrective actions may include dust suppression, change in the way work is performed, and/or upgrade of personal protective equipment.

8.2 Volatile Organic Compound Monitoring

During activities where contaminated materials may be disturbed, a photoionization detector (PID) will be used to monitor total VOCs in the ambient air. The PID will prove useful as a direct reading instrument to aid in determining if current respiratory protection is adequate or needs to be upgraded. The SSO will take measurements before operations begin in an area to determine the amount of VOCs naturally occurring in the air. This is referred to as a background level. Levels of VOCs will periodically be measured in the air at active work sites, and at the transition zone when levels are detected above background in the work zone.

8.3 Community Air Monitoring Plan

This Community Air Monitoring Plan (CAMP) includes real-time monitoring for VOCs and particulates (i.e., dust) at the downwind perimeter of each designated work area when activities with the potential to release VOCs or dust are in progress at the Site. This CAMP is based on the NYSDOH Generic CAMP included as Appendix 1A of the NYSDEC document titled *"Draft DER-10, Technical Guidance for Site Investigation and Remediation"* dated December 2002. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of project activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air. Reliance on the CAMP should not preclude simple, common sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Continuous monitoring will be conducted during ground intrusive activities. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, advancement/installation of test borings or monitoring wells, etc.

Periodic monitoring for VOCs will be conducted during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

8.3.1 VOC Monitoring, Response Levels, and Actions

VOCs must be monitored at the downwind perimeter of the immediate work area (i.e., the work zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 ppm above background for the 15-minute average, work activities must be temporarily halted and monitoring must be continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source or vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less (but in no case less than 20 feet), is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

The 15-minute readings must be recorded and made available for NYSDEC and NYSDOH personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

8.3.2 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the work zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter ($\mu g/m^3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 $\mu g/m^3$ above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 $\mu g/m^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

Readings will be recorded and made available for NYSDEC and NYSDOH personnel to review.

9.0 EMERGENCY RESPONSE

To provide first-line assistance to field personnel in the case of illness or injury, the following items will be made immediately available on the Site:

- First-aid kit;
- Portable emergency eye wash; and
- Supply of clean water.

9.1 Emergency Telephone Numbers

The following telephone numbers are listed in case there is an emergency at the Site:

Fire/Police Department:	911
Poison Control Center:	(800) 222-1222
NYSDEC	
Greg MacLean	(585) 226-5356
Spills	(585) 226-2466
NYSDOH	
Debra McNaughton	(585) 423-8069
MCDPH	
Joe Albert	(585) 753-5904
CONIFER DEVELOPMENT, INC.	
Eileen Broderick	(585) 324-0503
DAY ENVIRONMENTAL, INC.	
Jeff Danzinger	(585) 454-0210 x114
Ray Kampff	(585) 454-0210 x108
Nearest Hospital	Rochester General Hospital 1425 Portland Avenue Rochester, NY 14621 (585) 922-4000 (Main) (585) 922-2000 (Emergency Department)
Directions to the Hospital (refer Figure 1):	Turn right (west) onto Fernwood Avenue and travel approximately 0.18 miles. Turn right (north) onto Portland Avenue and travel approximately 1.17 miles. Turn left (west) into Rochester General Hospital and follow signs to the Emergency Department.

9.2 Evacuation

A log of each individual entering and leaving the Site will be kept for emergency accounting practices. Although unlikely, it is possible that a site emergency could require evacuating personnel from the site. If required, the SSO will give the appropriate signal for site evacuation (i.e., hand signals, alarms, etc.).

All personnel shall exit the site and shall congregate in an area designated by the SSO. The SSO shall ensure that all personnel are accounted for. If someone is missing, the SSO will alert emergency personnel. The appropriate government agencies will be notified as soon as possible regarding the evacuation, and any necessary measures that may be required to mitigate the reason for the evacuation.

9.3 Medical Emergency

In the event of a medical emergency involving illness or injury to one of the on-site personnel, the Site should be shut down and immediately secured. The appropriate government agencies should be notified immediately. The area in which the injury or illness occurred shall not be entered until the cause of the illness or injury is known. The nature of injury or illness shall be assessed. If the victim appears to be critically injured, administer first aid and/or cardio-pulmonary resuscitation (CPR) as needed. Instantaneous real-time air monitoring shall be done in accordance with air monitoring outlined in Section 8.0 of this HASP.

9.4 Contamination Emergency

It is unlikely that a contamination emergency will occur; however, if such an emergency does occur, the Site shall be shut down and immediately secured. If an emergency rescue is needed, notify Police, Fire Department and Emergency Medical Service (EMS) Units immediately. Advise them of the situation and request an expedient response. The appropriate government agencies shall be notified immediately. The area in which the contamination occurred shall not be entered until the arrival of trained personnel who are properly equipped with the appropriate PPE and monitoring instrumentation as outlined in Section 8.0 of this HASP.

9.5 Fire Emergency

In the event of a fire on-site, the Site shall be shut down and immediately secured. The area in which the fire occurred shall not be entered until the cause can be determined. All non-essential site personnel shall be evacuated from the site to a safe, secure area. Notify the Fire Department immediately. Advise the Fire Department of the situation and the identification of any hazardous materials involved. The appropriate government agencies shall be notified as soon as possible.

The four classes of fire along with their constituents are as follows:

Class A:	Wood, cloth, paper, rubber, many plastics, and ordinary combustible materials.
Class B:	Flammable liquids, gases and greases.

Class C: Energized electrical equipment.

Class D: Combustible metals such as magnesium, titanium, sodium, potassium.

Small fires on-site may be actively extinguished; however, extreme care shall be taken while in this operation. Approaches to the fire shall be done from the upwind side if possible. Distance from on-site personnel to the fire shall be close enough to ensure proper application of the extinguishing material, but far enough away to ensure that the personnel are safe. The proper extinguisher shall be utilized for the Class(s) of fire present on the site. If possible, the fuel source shall be cut off or separated from the fire. Care must be taken when performing operations involving the shut-off values and manifolds, if present.

Examples of proper extinguishing agent as follows:

Class A: Water
Water with 1% AFFF Foam (Wet Water)
Water with 6% AFFF or Fluorprotein Foam
ABC Dry Chemical

Class B: ABC Dry Chemical
Purple K
Carbon Dioxide
Water with 6% AFFF Foam

Class C: ABC Dry Chemical
Carbon Dioxide

Class D: Metal-X Dry Powder

No attempt shall be made against large fires. These shall be handled by the Fire Department.

9.6 Spill or Air Release

In the event of spills or air releases of hazardous materials on-site, the Site shall be shut down and immediately secured. The area in which the spills or releases occurred shall not be entered until the cause can be determined and site safety can be evaluated. Non-essential site personnel shall be evacuated from the Site to a safe and secure area. The appropriate government agencies shall be notified as soon as possible. The spilled or released materials shall be immediately identified and appropriate containment measures shall be implemented, if possible. Real-time air monitoring shall be implemented as outlined in Section 8.0 of this HASP. If the materials are unknown, Level B protection is mandatory. Samples of the materials shall be acquired to facilitate identification.

9.7 Locating Containerized Waste and/or Underground Storage Tanks

In the event that unanticipated containerized waste (e.g., drums) and/or USTs are encountered/discovered during remedial activities, the Site shall be shut down and immediately secured. The area where unanticipated containerized wastes and/or tanks are discovered shall not be entered until site safety can be evaluated. Non-essential Site personnel shall be evacuated from the Site to a safe and secure area. The appropriate government agencies shall be notified as soon as possible. The SSO shall monitor the area as outlined in Section 8.0 of this HASP.

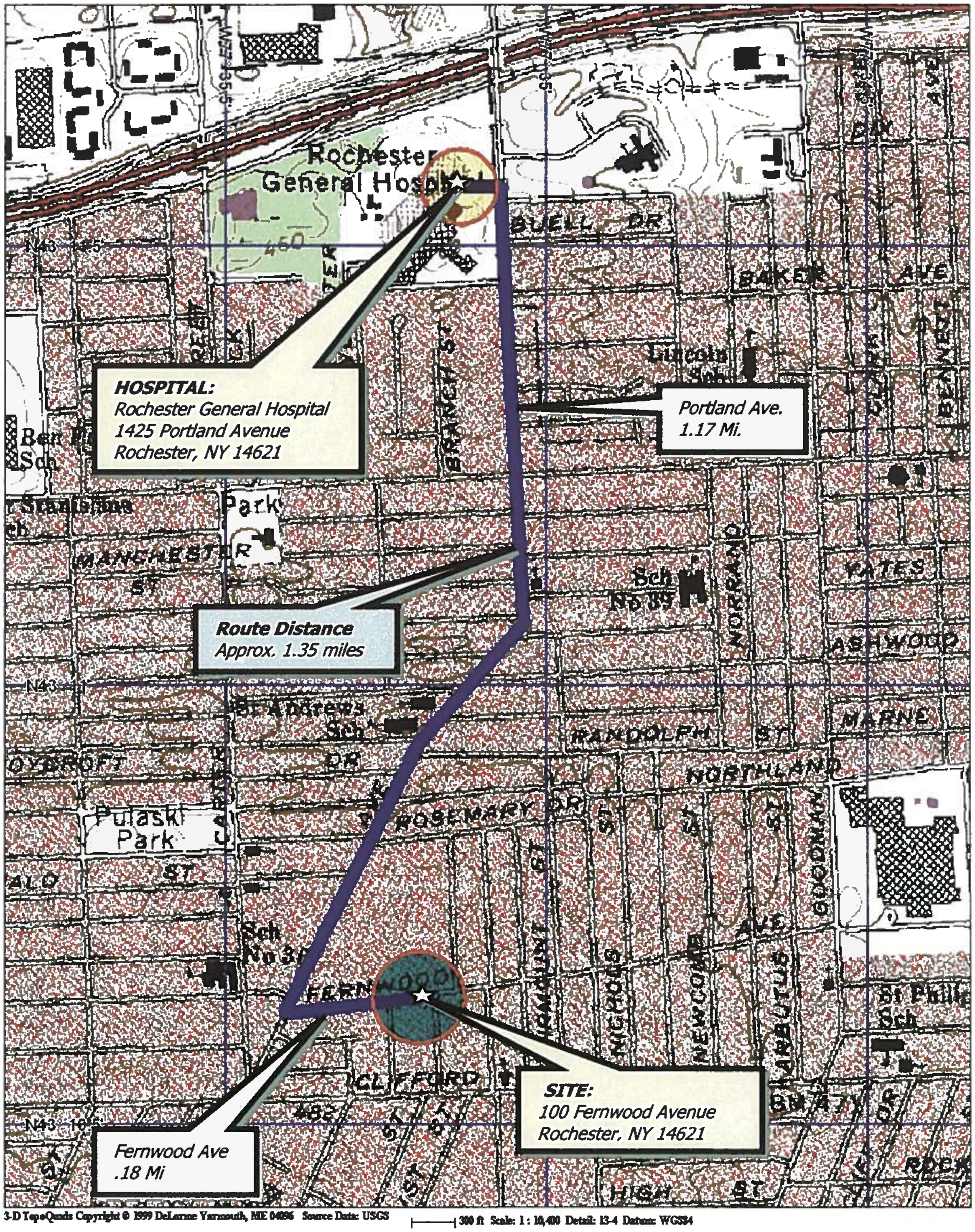
Prior to any handling, containers that are encountered will be visually assessed by the SSO to gain as much information as possible about their contents. As a precautionary measure, personnel shall assume that unlabelled containers and/or tanks contain hazardous materials until their contents are characterized. To the extent possible based upon the nature of the containers encountered, actions may be taken to stabilize the area and prevent migration (e.g., placement of berms, etc.). Subsequent to initial visual assessment and any required stabilization, properly trained personnel will sample, test, remove, and dispose of any containers and/or tanks, and their contents. After visual assessment and air monitoring, if the material remains unknown, Level B protection is mandatory.

10.0 ABBREVIATIONS

BCP	Brownfield Cleanup Program
CAMP	Community Air Monitoring Program
CPR	Cardio-Pulmonary Resuscitation
DAY	Day Environmental, Inc.
dBA	Decibels on the A-Weighted Scale
DNAPL	Dense Non-Aqueous Phase Liquid
EMS	Emergency Medical Service
HASP	Health and Safety Plan
IDLH	Immediately Dangerous to Life or Heath
LNAPL	Light Non Aqueous Phase Liquid
MCDPH	Monroe County Department of Public Health
mg/m^3	Milligram Per Meter Cubed
NIOSH	National Institute for Occupational Safety and Health
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PAH	Polyaromatic Hydrocarbon
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PM	Project Manager
PM-10	Particulate Matter Less Than 10 Micrometers In Diameter
PPE	Personal Protection Equipment
ppm	Parts Per Million
PVC	Polyvinyl Chloride
REC	Recognized Environmental Condition
REL	Recommended Exposure Limit
RI/RAA	Remedial Investigation/Remedial Alternatives Analysis
RTAM	Real-Time Aerosol Monitor
SCG	Standards, Criteria and Guidance
SCO	Soil Cleanup Objective
SSO	Site Safety Officer
SVOC	Semi-Volatile Organic Compound
TAGM	Technical and Administrative Guidance Memorandum
TOGS	Technical and Operational Guidance Series
TWA	Time-Weighted Average
$\mu g/m^3$	Micrograms Per Meter Cubed
UST	Underground Storage Tank
VOC	Volatile Organic Compound

ATTACHMENT 1

Figure 1- Route for Emergency Services



Drawing Produced From: 3-D TopoQuads, DeLorme Map Co., referencing USGS quad maps Rochester East (NY) 1995.

DATE 12-04-2007 DRAWN BY RJM SCALE As Shown	day DAY ENVIRONMENTAL, INC. ENVIRONMENTAL CONSULTANTS ROCHESTER, NEW YORK 14614-1008	PROJECT TITLE 100 FERNWOOD AVENUE ROCHESTER, NEW YORK HEALTH AND SAFETY PLAN DRAWING TITLE ROUTE FOR EMERGENCY SERVICE	PROJECT NO. 4014R-07 FIGURE 1

APPENDIX D

MONITORING WELL BORING AND CONSTRUCTION LOGS

day

DAY ENVIRONMENTAL, INC.

ENVIRONMENTAL CONSULTANTS

AN AFFILIATE OF DAY ENGINEERING, P.C

TEST BORING NO. TB-10 (MW-2)

Project #:	3458S-04
Project Address:	100 & 142 Fernwood Ave Rochester, New York
DAY Representative:	C. Davidson
Drilling Contractor:	TREC Env.
Sampling Method:	Direct Push

Ground Elevation:	489.98'	Datum:	MCGS Monument
Date Started:	5/20/2005	Date Ended:	5/20/2005
Borehole Depth:	9.9'	Borehole Diameter:	2.25"

Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings

Water Level (Date/Time): 5.2' (05/20/05 @ 1410)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	PID Reading (ppm)	Sample Description	Notes
							CONCRETE	
1							Brown fine Sand and Gravel, trace Silt, Brick, Cinders (FILL), moist	1
2	N/A	S-1	0-4	25	N/A	0.0		2
3								3
4								4
5							Brown fine Sandy SILT, trace fine and coarse Gravel	5
6	N/A	S-2	4-8	25	N/A	0.0		6
7							...wet	7
8								8
9	N/A	S-3	8-9.9	100	N/A	107		9 petroluem-type odor
10							Refusal @ 9.9'	10

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable

TEST BORING NO. TB-10 (MW-2)

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AN AFFILIATE OF DAY ENGINEERING, P.C

TEST BORING NO. TB-13 (MW-4)

Page 1 of 1

Project #:	3458S-04	Ground Elevation:	488.75'
Project Address:	100 & 142 Fernwood Ave, Rochester, New York	Datum:	MCGS Monument
DAY Representative:	C. Davidson	Date Started:	5/20/2005
Drilling Contractor:	TREC Env.	Date Ended:	5/20/2005
Sampling Method:	Direct Push	Borehole Depth:	14.0'
		Borehole Diameter:	2.25"

Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings

Water Level (Date/Time): 12.0' (observed in sample sleeve)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	PID Reading (ppm)	Sample Description	Notes
0–4	N/A	S-1	0-4	25	N/A	0.0	Black Sand and Gravel (FILL), moist	
4–8	N/A	S-2	4-8	50	N/A	0.0	Red to brown fine Sandy SILT, trace fine Gravel, moist	
8–12	N/A	S-3	8-12	100	N/A	0.0	...gray red mottled seam ...little coarse Gravel	
12–14	N/A	S-4	12-14	0	N/A	N/A	...water in sample sleeve	12 ...no sample recovery
14							Refusal @14.0'	

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable

TEST BORING NO. TB-13 (MW-4)

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AN AFFILIATE OF DAY ENGINEERING, P.C

Project #: 3458S-04
Project Address: 100 & 142 Fernwood Ave
Rochester, New York
DAY Representative: J. Scherer
Drilling Contractor: TREC Env.
Sampling Method: Direct Push

TEST BORING NO. TB-20 (MW-5)

Ground Elevation: 488.65'   Datum: MCGS Monument
Date Started: 5/23/2005   Date Ended: 5/23/2005
Borehole Depth: 16.0'   Borehole Diameter: 2.25"
Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings
Water Level (Date/Time): 9.17' (05/23/05 @1529)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	PID Reading (ppm)	Sample Description	Notes
0							Cinders (FILL)	cored through concrete floor
0-3	N/A	S-1	0-4	70	N/A	0.0	Brown SILT, some Sand, little Gravel and Clay, damp	
3-7							Tan fine to medium SAND, little Silt, trace Gravel	
4-8	N/A	S-2	4-8	80	N/A	0.0		
7-9.5							Red brown fine to coarse SAND and GRAVEL, little Silt, moist ...seam of gray Silt	
8-12	N/A	S-3	8-12	100	N/A	0.0		
9.5-16							Brown fine to medium SAND and SILT, some Gravel, moist ...wet	
12-16	N/A	S-4	12-16	90	N/A	0.0		
16							Terminated @ 16.0'	

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable

TEST BORING NO. TB-20 (MW-5)

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ENVIRONMENTAL CONSULTANTS

AN AFFILIATE OF DAY ENGINEERING, P.C

TEST BORING NO. TB-22 (MW-6)

Project #: 3458S-04
Project Address: 100 & 142 Fernwood Ave, Rochester, New York
DAY Representative: J. Scherer
Drilling Contractor: TREC Env.
Sampling Method: Direct Push

Ground Elevation: 488.59'
Datum: MCGS Monument
Date Started: 5/23/2005
Date Ended: 5/23/2005
Borehole Depth: 15.0'
Borehole Diameter: 2.25"
Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings
Water Level (Date/Time): 10.27' (05/23/05 @ 1533)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	PID Reading (ppm)	Sample Description	Depth (ft)	Notes
							Cinders (FILL)		cored through wood and concrete floor
1							Brown fine SAND, little Silt, damp	1	
2	N/A	S-1	0-4	N/A	75	1.4		2	
3								3	
4								4	
5							Red brown SILT, some fine Sand, little Gravel, trace Clay, moist	5	
6	N/A	S-2	4-8	N/A	55	0.2		6	
7								7	
8							...some fine Sand and Gravel	8	stained soil
9								9	
10	N/A	S-3	8-12	N/A	75	12	...wet	10	chemical-type odor
11								11	
12								12	
13								13	
14	N/A	S-4	12-15	N/A	90	3.1	Tan SILT, some fine Sand, little Gravel, wet	14	LNAPL noted on static water level indicator probe tip on 05/23/05 @ 1533.
15							Refusal @ 15.0'	15	

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable

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AN AFFILIATE OF DAY ENGINEERING, P.C

TEST BORING NO. TB-28 (MW-8)

Project #:	3458S-04
Project Address:	100 & 142 Fernwood Ave, Rochester, New York
DAY Representative:	J. Danzinger
Drilling Contractor:	TREC Env.
Sampling Method:	Direct Push

Ground Elevation:	484.71'	Datum:	MCGS Monument
Date Started:	5/26/2005	Date Ended:	5/27/2005
Borehole Depth:	14.5'	Borehole Diameter:	2.25"

Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings

Water Level (Date/Time): 7.3' (05/26/05 @ 1240)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	PID Reading (ppm)	Sample Description	Notes
1–4	N/A	S-1	0-4	25	N/A	0.0	Black brown Silt, Brick, Gravel, Sand (FILL), moist ...Rock in bottom of sample shoe	
4–8	N/A	S-2	4-8	75	N/A	0.0	Red brown SILT, some Clay, trace Gravel, moist (7) Tan brown CLAY, little Silt, moist	
8–12	N/A	S-3	8-12	75	N/A	0.0	Tan brown Sandy SILT, some Gravel and Clay, wet ...gray green, some Gravel, moist	
12–14.5	N/A	S-4	12-14.5	N/A	N/A	0.0	Gray brown Silty fine to coarse SAND, some Gravel	
15							Refusal @ 14.5'	

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable

TEST BORING NO. TB-28 (MW-8)

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AN AFFILIATE OF DAY ENGINEERING, P.C

TEST BORING TB-32 (MW-10)

Page 1 of 1

Project #: 3458S-04
Project Address: 100 & 142 Fernwood Avenue
Rochester, NY
DAY Representative: C. Davidson
Drilling Contractor: TREC Env.
Sampling Method: Direct Push

Ground Elevation: 483.88'
Datum: MCGS Monument
Date Started: 10/17/2005
Date Ended: 10/17/2005
Borehole Depth: 14.0'
Borehole Diameter: 2.25"
Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings
Water Level (Date/Time): 9' (observed on sample)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N. Value or RQD%	PID Reading (ppm)	Sample Description	Notes
0							Brown fine Sand, trace Silt, Gravel, Cinders (FILL) damp	
1–2	NA	S-1	0-4	80	NA	0.4		
3							Brown fine to medium SAND, trace Silt, Gravel, moist	
4–6	NA	S-2	4-8	75	NA			
7						141	...Gravel lens ...petroleum-type odor (staining)	
9							...globules of product, wet	
10	NA	S-3	8-12	75	NA	66.4	...globules of product	
12–13	NA	S-4	12-14	100	NA	75	...globules of product	
14							Refusal @ 14.0'	

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable
5) Headspace PID readings may be influenced by moisture

TEST BORING TB-32 (MW-10)

Project #: 4014R-07
Project Address: 100 Fernwood Avenue, Rochester, New York
DAY Representative: G. Miller
Drilling Contractor: TREC Environmental, Inc.
Sampling Method: Geoprobe, Macro Core

TEST BORING MW-12

Ground Elevation: 488.70' Datum: MCGS Monument
Date Started: 9/29/2008 Date Ended: 9/29/2008
Borehole Depth: 18.4' Borehole Diameter: 8"
Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings
Water Level (Date): 11.82' (10-7-2008)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	Headspace PID (ppm)	PID Reading (ppm)	Sample Description	Notes
								CONCRETE	
1								Light Brown, coarse Sand, little Fill, Gravel, Concrete, damp (FILL)	-
2	NA	S-1	0-4	60	NA	1.9	0.7		-
3								Brown, fine Sand, some Silt, Cinders, Slag (FILL)	-
4									-
5								Asphalt lens @ 5.0' (FILL)	-
6	NA	S-2	4-8	80	NA	2.6	0.1		-
7								Red Sandy SILT, moist	-
8									-
9								Red, fine Sandy SILT, moist	-
10	NA	S-3	8-12	75	NA				-
11						104	77.7		-
12								Brown, fine SAND, some Silt, wet	-
13									-
14	NA	S-4	12-16	80	NA	28.2	47.7		-
15									-
16									-

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable
5) Headspace PID readings may be influenced by moisture

TEST BORING MW-12

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AN AFFILIATE OF DAY ENGINEERING, P.C.

TEST BORING MW-12

Project #: 4014R-07
Project Address: 100 Fernwood Avenue
Rochester, New York
DAY Representative: G. Miller
Drilling Contractor: TREC Environmental, Inc.
Sampling Method: Geoprobe, Macro Core

Ground Elevation: 488.70'
Datum: MCGS Monument
Date Started: 9/29/2008
Date Ended: 9/29/2008
Borehole Depth: 18.4'
Borehole Diameter: 8"
Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings
Water Level (Date): 11.82' (10-7-2008)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	Headspace PID (ppm)	PID Reading (ppm)	Sample Description	Notes
									Sheen on wet soil
17	NA	S-5	16-18.4	NA	NA	9.8	2.1		-
18									-
19								Refusal @ 18.4'	-
20									-
21									-
22									-
23									-
24									-
25									-
26									-
27									-
28									-
29									-
30									-
31									-
32									-

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable
5) Headspace PID readings may be influenced by moisture

TEST BORING MW-12

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TEST BORING MW-13

Project #: 4014R-07
Project Address: 100 Fernwood Avenue, Rochester, New York
DAY Representative: G. Miller
Drilling Contractor: TREC Environmental, Inc.
Sampling Method: Geoprobe, Macro Core

Ground Elevation: 488.56' Datum: MCGS Monument
Date Started: 9/29/2008 Date Ended: 9/29/2008
Borehole Depth: 18.3' Borehole Diameter: 8"
Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings
Water Level (Date): 11.40' (10-7-2008)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	Headspace PID (ppm)	PID Reading (ppm)	Sample Description	Notes
								CONCRETE	
1								Asphalt (FILL)	-
2	NA	S-1	0-4	60	NA	1.4	1.2	Brown, fine SAND, trace Silt, damp	-
3									-
4									-
5									-
6	NA	S-2	4-8	50	NA	1.4	0.7		-
7									-
8								Dark Brown, medium SAND, some Silt, moist	-
9									-
10	NA	S-3	8-12	60	NA	1.3	0.4		-
11									-
12								Red, fine Sandy SILT, moist	-
13									-
14	NA	S-4	12-16	80	NA	14.1	20.0	...gw @ 14.5'	-
15									-
									Dark Staining @ 15.5', Petroleum-type Odor
16								Brown/Gray, Silty SAND, wet	-

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable
5) Headspace PID readings may be influenced by moisture

TEST BORING MW-13

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TEST BORING MW-13

Project #:	4014R-07
Project Address:	100 Fernwood Avenue, Rochester, New York
DAY Representative:	G. Miller
Drilling Contractor:	TREC Environmental, Inc.
Sampling Method:	Geoprobe, Macro Core
Ground Elevation:	488.56'
Datum:	MCGS Monument
Date Started:	9/29/2008
Date Ended:	9/29/2008
Borehole Depth:	18.3'
Borehole Diameter:	8"
Completion Method:	■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings
Water Level (Date):	11.40' (10-7-2008)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	Headspace PID (ppm)	PID Reading (ppm)	Sample Description	Notes
									Petroleum-type odor
17	NA	S-5	16-18/3	10	NA	24.9	70.1	Brown, Sandy SILT, wet	-
18									-
19								Refusal @ 18.3'	-
20									-
21									-
22									-
23									-
24									-
25									-
26									-
27									-
28									-
29									-
30									-
31									-
32									-

Notes:
1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable
5) Headspace PID readings may be influenced by moisture

TEST BORING MW-13

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TEST BORING MW-14

Page 1 of 1

Project #: 4014R-07
Project Address: 100 Fernwood Avenue, Rochester, New York
DAY Representative: G. Miller
Drilling Contractor: TREC Environmental, Inc.
Sampling Method: Geoprobe, Macro Core

Ground Elevation: 484.27'
Datum: MCGS Monument
Date Started: 9/30/2008
Date Ended: 9/30/2008
Borehole Depth: 14.3'
Borehole Diameter: 8"
Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings
Water Level (Date): 7.72' (10-7-2008)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	Headspace PID (ppm)	PID Reading (ppm)	Sample Description	Notes
								TOPSOIL	
1								Brown, medium SAND, trace Silt, damp	
2	NA	S-1	0-4	20	NA	0.2	0.2		
3									
4									
5									
6	NA	S-2	4-8	80	NA	1.5	0.2	...some Gravel	
7								7.0	
								Red Rock 7.5	
8								Brown/Red, Silty SAND, damp	
9									
10	NA	S-3	8-12	50	NA	1.5	0.4	10.5	
11								Brown, medium SAND, little Gravel, moist	
12								...wet	
13									
14	NA	S-4	12-14.3	NA	NA	2.2	2.0		Shean on water, gray staining on soil
								Gray, Silty SAND	
15								Refusal @ 14.3'	
16									

Notes:
1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable
5) Headspace PID readings may be influenced by moisture

TEST BORING MW-14

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TEST BORING MW-15

Project #: 4014R-07
Project Address: 100 Fernwood Avenue, Rochester, New York
DAY Representative: G. Miller
Drilling Contractor: TREC Environmental, Inc.
Sampling Method: Geoprobe, Macro Core

Ground Elevation: 483.50' | Datum: MCGS Monument
Date Started: 9/30/2008 | Date Ended: 9/30/2008
Borehole Depth: 13.4' | Borehole Diameter: 8"
Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings
Water Level (Date): 7.20' (10-7-2008)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	Headspace PID (ppm)	PID Reading (ppm)	Sample Description	Notes
								TOPSOIL	
1								Fill, Asphalt, Cinder, Slag, Brick (fill)	-
2	NA	S-1	0-4	60	NA	3.7	0.4		-
3								Brown, fine SAND, trace Silt, damp	-
4									- Petroleum-type odor
5								Brown/Red, fine SAND, trace Silt, moist	-
6	NA	S-2	4-8	90	NA	33.1	12.3	...wet	-
7									-
8									-
9									-
10	NA	S-3	8-12	NA	NA	31.2	50.2		stained soil starting @ 10.0'
11								Gray, fine SAND, trace Silt	petroleum-type product (LNAPL) @ 11.0'
12									-
13	NA	S-4	12-13.4	NA	NA	NA	NA		-
14								Refusal @ 13.4'	-
15									-
16									-

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable
5) Headspace PID readings may be influenced by moisture

TEST BORING MW-15

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TEST BORING MW-16

Project #: 4014R-07
Project Address: 100 Fernwood Avenue
Rochester, New York
DAY Representative: G. Miller
Drilling Contractor: TREC Environmental, Inc.
Sampling Method: Geoprobe, Macro Core

Ground Elevation: 488.47'
Datum: MCGS Monument
Date Started: 9/30/2008
Date Ended: 9/30/2008
Borehole Depth: 14.6'
Borehole Diameter: 8"
Completion Method: ■ Well Installed ☐ Backfilled with Grout ☐ Backfilled with Cuttings
Water Level (Date): 7.06' (10-7-2008)

Depth (ft)	Blows per 0.5 ft.	Sample Number	Sample Depth (ft)	% Recovery	N-Value or RQD%	Headspace PID (ppm)	PID Reading (ppm)	Sample Description	Notes
0–4 (1, 2, 3, 4)	NA	S-1	0-4	25	NA	0.7	0.4	TOPSOIL Brown, medium SAND, little Silt, damp	
4–8 (5, 6, 7, 8)	NA	S-2	4-8	40	NA	0.5	1.3	...Gravel lens Red, Rock Brown & Gray SILT, moist	
8–12 (9, 10, 11, 12)	NA	S-3	8-12	50	NA	36.7	10.1	Medium Gray SAND, trace Silt, moist Staining and Strong Odor @ 11.0'	stained soil and petroleum-type odor @ 11.0'
12–14.6 (13, 14)	NA	S-4	12-14.6	90	NA	9.4	9.2		
15, 16								Refusal @ 14.6'	

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) Stratification lines represent approximate boundaries. Transitions may be gradual.
3) PID readings are referenced to a benzene standard measured in the headspace above the sample using a MiniRae 2000 equipped with a 10.6 eV lamp.
4) NA = Not Available or Not Applicable
5) Headspace PID readings may be influenced by moisture

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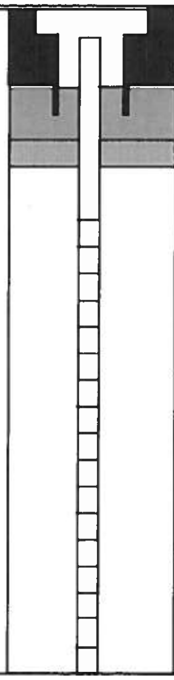
MONITORING WELL INSTALLATION LOG

MONITORING WELL MW-2

Project #:	3458S-04		
Project Address:	100 & 142 Fernwood Ave. Rochester, New York		
DAY Representative:	C. Davidson	Ground Elevation: 489.98'	Datum: MCGS Monument
Drilling Contractor:	TREC Env.	Date Started: 5/20/2005	Date Ended: 5/20/2005
		Water Level (Date): 5.87' (11/14/05)	

Refer to Test Boring Log TB- -- for Soil Description



Flush Mounted Roadbox
0.2' Depth to Top of Riser Pipe (ft)
1.0' Depth to Bottom of Cement Surface Patch (ft)
Backfill Type portland cement

1.0' Depth to Top of Bentonite Seal (ft)
3.0' Depth to Bottom of Bentonite Seal (ft)

4.9' Depth to Top of Well Screen (ft)

2.25" Diameter of Borehole (in)

Backfill Type Sand

1" Inside Diameter of Well (in)

Type of Pipe Schedule 40 PVC
Screen slot size 10-slot

9.9' Depth to Bottom of Well Screen (ft)

9.9' Depth of Borehole (ft)

Notes:

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MW-2

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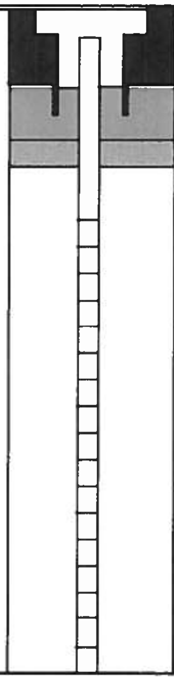
MONITORING WELL INSTALLATION LOG

MONITORING WELL MW-4

Project #: 3458S-04
Project Address: 100 & 142 Fernwood Ave.
Rochester, New York
DAY Representative: C. Davidson
Drilling Contractor: TREC Env.

Ground Elevation: 488.75'
Datum: MCGS Monument
Date Started: 5/20/2005
Date Ended: 5/20/2005
Water Level (Date): 8.73' (11/14/05)

Refer to Test Boring Log TB- -- for Soil Description



Flush Mounted Roadbox
0.26' Depth to Top of Riser Pipe (ft)
0.5' Depth to Bottom of Cement Surface Patch (ft)
Backfill Type portland cement

0.5' Depth to Top of Bentonite Seal (ft)
2.0' Depth to Bottom of Bentonite Seal (ft)

4.0' Depth to Top of Well Screen (ft)

2.25" Diameter of Borehole (in)

Backfill Type Sand

1" Inside Diameter of Well (in)

Type of Pipe Schedule 40 PVC
Screen slot size 10-slot

14.0' Depth to Bottom of Well Screen (ft)

14.0' Depth of Borehole (ft)

Notes:

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MW-4

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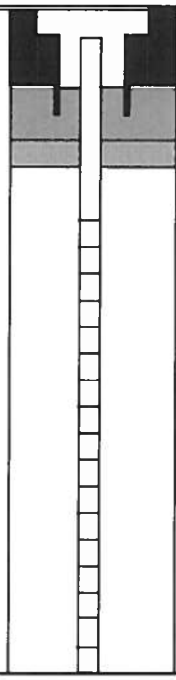
MONITORING WELL INSTALLATION LOG

MONITORING WELL MW-5

Project #:	3458S-04				
Project Address:	100 & 142 Fernwood Ave.				
	Rochester, New York	Ground Elevation:	488.65'	Datum:	MCGS Monument
DAY Representative:	J. Scherer	Date Started:	5/23/2005	Date Ended:	5/23/2005
Drilling Contractor:	TREC Env.				
		Water Level (Date):	9.10' (11/14/05)		

Refer to Test Boring Log TB- -- for Soil Description



Flush Mounted Roadbox

0.17' Depth to Top of Riser Pipe (ft)

1.5' Depth to Bottom of Cement Surface Patch (ft)

Backfill Type portland cement

1.5' Depth to Top of Bentonite Seal (ft)

3.5' Depth to Bottom of Bentonite Seal (ft)

6.0' Depth to Top of Well Screen (ft)

2.25" Diameter of Borehole (in)

Backfill Type Sand

1" Inside Diameter of Well (in)

Type of Pipe Schedule 40 PVC

Screen slot size 10-slot

16.0' Depth to Bottom of Well Screen (ft)

16.0' Depth of Borehole (ft)

Notes:

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MW-5

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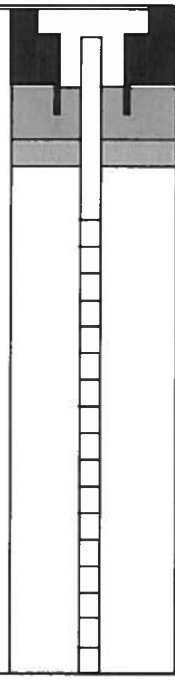
MONITORING WELL INSTALLATION LOG

MONITORING WELL MW-6

Project #:	3458S-04		
Project Address:	100 & 142 Fernwood Ave. Rochester, New York	Ground Elevation: 488.59'	Datum: MCGS Monument
DAY Representative:	J. Scherer	Date Started: 5/23/2005	Date Ended: 5/23/2005
Drilling Contractor:	TREC Env.		
		Water Level (Date): 9.43' (11/14/05)	

Refer to Test Boring Log TB-- for Soil Description



Flush Mounted Roadbox
0.24' Depth to Top of Riser Pipe (ft)
0.5' Depth to Bottom of Cement Surface Patch (ft)
Backfill Type portland cement

0.5' Depth to Top of Bentonite Seal (ft)
3.0' Depth to Bottom of Bentonite Seal (ft)

5.0' Depth to Top of Well Screen (ft)

2.25" Diameter of Borehole (in)

Backfill Type Sand

1" Inside Diameter of Well (in)

Type of Pipe Schedule 40 PVC
Screen slot size 10-slot

15.0' Depth to Bottom of Well Screen (ft)

15.0' Depth of Borehole (ft)

Notes:

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MW-6

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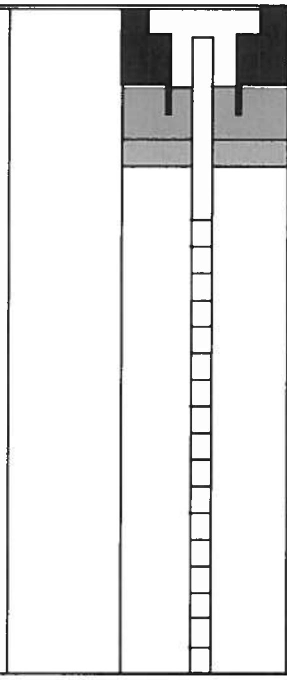
MONITORING WELL INSTALLATION LOG

MONITORING WELL MW-8

Project #:	3458S-04
Project Address:	100 & 142 Fernwood Ave.
	Rochester, New York
DAY Representative:	J. Danzinger
Drilling Contractor:	TREC Env.

Ground Elevation:	484.71'	Datum:	MCGS Monument
Date Started:	5/26/2005	Date Ended:	5/27/2005
Water Level (Date):	6.76' (11/14/05)		

Refer to Test Boring Log TB- -- for Soil Description



Flush Mounted Roadbox
0.1' Depth to Top of Riser Pipe (ft)
0.5' Depth to Bottom of Cement Surface Patch (ft)
Backfill Type portland cement

0.5' Depth to Top of Bentonite Seal (ft)
3.5' Depth to Bottom of Bentonite Seal (ft)

4.5' Depth to Top of Well Screen (ft)

2.25" Diameter of Borehole (in)

Backfill Type Sand

1" Inside Diameter of Well (in)

Type of Pipe Schedule 40 PVC
Screen slot size 10-slot

14.5' Depth to Bottom of Well Screen (ft)

14.5' Depth of Borehole (ft)

Notes:

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MW-8

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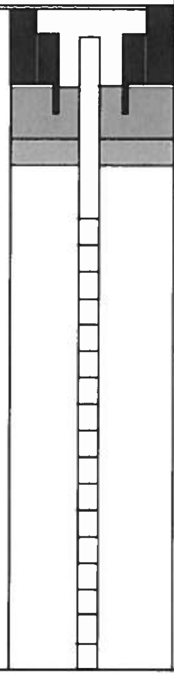
MONITORING WELL INSTALLATION LOG

MONITORING WELL MW-10

Project #:	3458S-04				
Project Address:	100 & 142 Fernwood Ave.				
	Rochester, NY	Ground Elevation:	483.88'	Datum:	MCGS Monument
DAY Representative:	C. Davidson	Date Started:	10/17/2005	Date Ended:	10/17/2005
Drilling Contractor:	TREC Env.				
		Water Level (Date):	5.61' (11/14/05)		

Refer to Test Boring Log TB-32 for Soil Description



Flush Mounted Roadbox
~3.0" Depth to Top of Riser Pipe (in)
1.0' Depth to Bottom of Cement Surface Patch (ft)
Backfill Type Bentonite Grout

1.0' Depth to Top of Bentonite Seal (ft)
3.0' Depth to Bottom of Bentonite Seal (ft)

4.0' Depth to Top of Well Screen (ft)

2.25" Diameter of Borehole (in)

Backfill Type Sand

1.0" Inside Diameter of Well (in)

Type of Pipe PVC
Screen slot size 10

14.0' Depth to Bottom of Well Screen (ft)

14.0' Depth of Borehole (ft)

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MW-10

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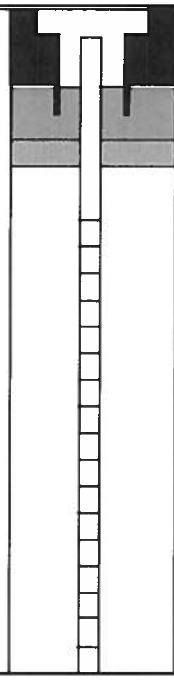
MONITORING WELL CONSTRUCTION DIAGRAM

MONITORING WELL MW-12

Project #:	4014R-07
Project Address:	100 Fernwood Avenue, Rochester, New York
DAY Representative:	G. Miller
Drilling Contractor:	TREC Env.
Ground Elevation:	488.70'
Datum:	MCGS Monument
Date Started:	9/29/08
Date Ended:	9/29/08
Water Level (Date):	11.82' (10-7-2008)

Refer to Test Boring Log MW-12 for Soil Description



Flush Mounted Roadbox
0.15 Depth to Top of Riser Pipe (ft)
0.5 Depth to Bottom of Cement Surface Patch (ft)
Backfill Type Concrete

0.5 Depth to Top of Bentonite Seal (ft)
5.0 Depth to Bottom of Bentonite Seal (ft)

8.2 Depth to Top of Well Screen (ft)

8 Diameter of Borehole (in)

Backfill Type Sand

2 Inside Diameter of Well (in)

Type of Pipe 2" Schedule 40 PVC
Screen slot size 10

18.2 Depth to Bottom of Well Screen (ft)

18.5 Depth of Borehole (ft)

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MW-12

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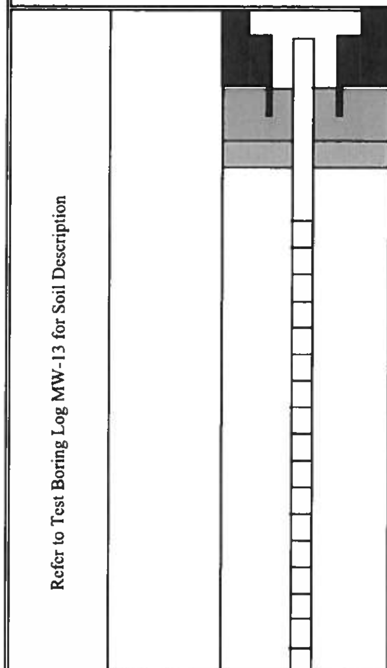
MONITORING WELL CONSTRUCTION DIAGRAM

MONITORING WELL MW-13

Project #:	4014R-07				
Project Address:	100 Fernwood Avenue				
	Rochester, New York	Ground Elevation:	488.56'	Datum:	MCGS Monument
DAY Representative:	G. Miller	Date Started:	9/29/08	Date Ended:	9/29/08
Drilling Contractor:	TREC Env.	Water Level (Date):	11.40' (10-7-2008)		



Flush Mounted Roadbox
____ Depth to Top of Riser Pipe (ft)
1.0 Depth to Bottom of Cement Surface Patch (ft)
Backfill Type Concrete

1.0 Depth to Top of Bentonite Seal (ft)
6.0 Depth to Bottom of Bentonite Seal (ft)

8.4 Depth to Top of Well Screen (ft)

8 Diameter of Borehole (in)

Backfill Type Sand

2 Inside Diameter of Well (in)

Type of Pipe 2" Schedule 40 PVC
Screen slot size 10

18.4 Depth to Bottom of Well Screen (ft)

18.7 Depth of Borehole (ft)

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MW-13

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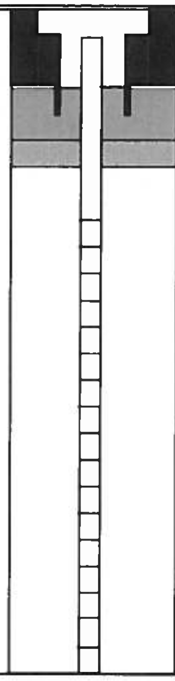
MONITORING WELL CONSTRUCTION DIAGRAM

MONITORING WELL MW-14

Project #:	4014R-07				
Project Address:	100 Fernwood Avenue				
	Rochester, New York	Ground Elevation:	484.27'	Datum:	MCGS Monument
DAY Representative:	G. Miller	Date Started:	9/30/08	Date Ended:	9/30/08
Drilling Contractor:	TREC Env.	Water Level (Date):	7.72' (10-7-2008)		

Refer to Test Boring Log MW-14 for Soil Description



Flush Mounted Roadbox

0.2 Depth to Top of Riser Pipe (ft)

0.5 Depth to Bottom of Cement Surface Patch (ft)

Backfill Type Concrete

0.5 Depth to Top of Bentonite Seal (ft)

3.0 Depth to Bottom of Bentonite Seal (ft)

4.2 Depth to Top of Well Screen (ft)

8 Diameter of Borehole (in)

Backfill Type Sand

2 Inside Diameter of Well (in)

Type of Pipe 2" Schedule 40 PVC

Screen slot size 10

14.2 Depth to Bottom of Well Screen (ft)

14.4 Depth of Borehole (ft)

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MW-14

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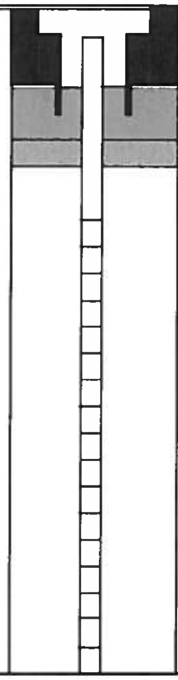
MONITORING WELL CONSTRUCTION DIAGRAM

MONITORING WELL MW-15

Page 1 of 1

Project #:	4014R-07				
Project Address:	100 Fernwood Avenue				
	Rochester, New York	Ground Elevation:	483.50'	Datum:	MCGS Monument
DAY Representative:	G. Miller	Date Started:	9/30/08	Date Ended:	9/30/08
Drilling Contractor:	TREC Env.				
		Water Level (Date):	7.20' (10-7-2008)		

Refer to Test Boring Log MW-15 for Soil Description



Flush Mounted Roadbox
0.2 Depth to Top of Riser Pipe (ft)
0.5 Depth to Bottom of Cement Surface Patch (ft)
Backfill Type Concrete

0.5 Depth to Top of Bentonite Seal (ft)
3.0 Depth to Bottom of Bentonite Seal (ft)

4.4 Depth to Top of Well Screen (ft)

8 Diameter of Borehole (in)

Backfill Type Sand

2 Inside Diameter of Well (in)

Type of Pipe 2" Schedule 40 PVC
Screen slot size 10

14.4 Depth to Bottom of Well Screen (ft)

14.6 Depth of Borehole (ft)

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MW-15

S:\Fieldforms\Monitoring Well Installation Log (revised October 2006)

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ENVIRONMENTAL CONSULTANTS
AN AFFILIATE OF DAY ENGINEERING, P.C.

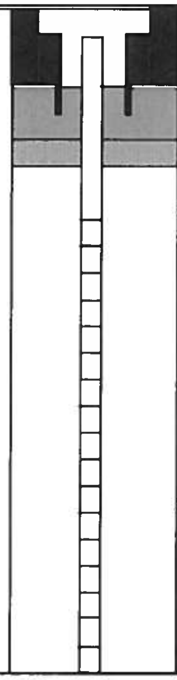
MONITORING WELL CONSTRUCTION DIAGRAM

MONITORING WELL MW-16

Project #:	4014R-07				
Project Address:	100 Fernwood Avenue				
	Rochester, New York	Ground Elevation:	483.47'	Datum:	MCGS Monument
DAY Representative:	G. Miller	Date Started:	9/30/08	Date Ended:	9/30/08
Drilling Contractor:	TREC Env.				
		Water Level (Date):	7.06' (10-7-2008)		

Page 1 of 1

Refer to Test Boring Log MW-16 for Soil Description



Flush Mounted Roadbox
0.3 Depth to Top of Riser Pipe (ft)
0.5 Depth to Bottom of Cement Surface Patch (ft)
Backfill Type Concrete

0.5 Depth to Top of Bentonite Seal (ft)
2.0 Depth to Bottom of Bentonite Seal (ft)

3.7 Depth to Top of Well Screen (ft)

8 Diameter of Borehole (in)

Backfill Type Sand

2 Inside Diameter of Well (in)

Type of Pipe 2" Schedule 40 PVC
Screen slot size 10

13.7 Depth to Bottom of Well Screen (ft)

13.7 Depth of Borehole (ft)

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MW-16

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MONITORING WELL INSTALLATION LOG

MONITORING WELL MWIRM-1

Project #: 3458S-04
Project Address: 100 Fernwood Ave.
Rochester, New York
DAY Representative: J. Danzinger
Drilling Contractor: TREC Env.

Ground Elevation: 484.71'
Datum: MCGS Monument
Date Started: 5/2/2005
Date Ended: 5/6/2005
Water Level (Date): 13.36' (11/14/05)

Refer to Test Boring Log TB- -- for Soil Description

2.22' Top of Riser Pipe Above Ground Surface (ft)

0.5' Depth to Bottom of Cement Surface Patch (ft)
Backfill Type portland cement

0.5' Depth to Top of Bentonite Seal (ft)
3.5' Depth to Bottom of Bentonite Seal (ft)

9.03 Depth to Top of Well Screen (ft)

8" Diameter of Borehole (in)

Backfill Type Sand

4" Inside Diameter of Well (in)

Type of Pipe Schedule 40 PVC
Screen slot size 10-slot

19.03' Depth to Bottom of Well Screen (ft)

19.03' Depth of Borehole (ft)

Notes:

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MWIRM-1

S:\Fieldforms\2005 Monitoring Well Installation Log

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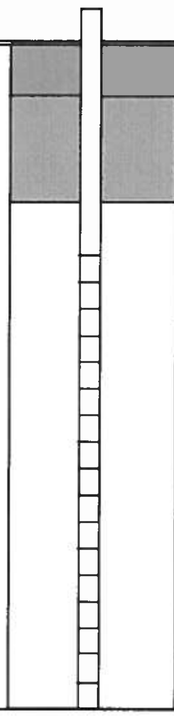
MONITORING WELL INSTALLATION LOG

MONITORING WELL MWIRM-2

Project #:	3458S-04				
Project Address:	100 Fernwood Ave.				
	Rochester, New York	Ground Elevation:	484.71'	Datum:	MCGS Monument
DAY Representative:	J. Danzinger	Date Started:	5/2/2005	Date Ended:	5/6/2005
Drilling Contractor:	TREC Env.				
		Water Level (Date):	10.47' (11/14/05)		

Refer to Test Boring Log TB- -- for Soil Description



1.09' Top of Riser Pipe Above Ground Surface (ft)

0.5' Depth to Bottom of Cement Surface Patch (ft)
Backfill Type portland cement

0.5' Depth to Top of Bentonite Seal (ft)
3.5' Depth to Bottom of Bentonite Seal (ft)

9.18' Depth to Top of Well Screen (ft)

8" Diameter of Borehole (in)

Backfill Type Sand

4" Inside Diameter of Well (in)

Type of Pipe Schedule 40 PVC
Screen slot size 10-slot

19.18' Depth to Bottom of Well Screen (ft)

19.2' Depth of Borehole (ft)

Notes:

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MWIRM-2

S:\Fieldforms\2005 Monitoring Well Installation Log

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MONITORING WELL INSTALLATION LOG

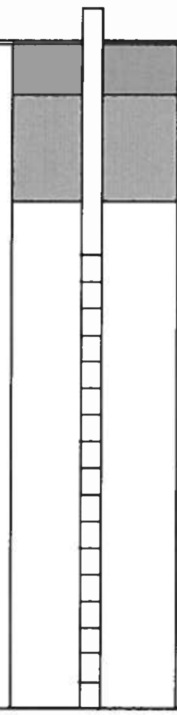
MONITORING WELL MWIRM-3

Project #: 3458S-04
Project Address: 100 Fernwood Ave.
Rochester, New York
DAY Representative: J. Danzinger
Drilling Contractor: TREC Env.

Ground Elevation: 484.71'   Datum: MCGS Monument
Date Started: 5/2/2005   Date Ended: 5/6/2005

Water Level (Date): 10.69' (11/14/05)

Refer to Test Boring Log TB- -- for Soil Description



1.82' Top of Riser Pipe Above Ground Surface (ft)

0.5' Depth to Bottom of Cement Surface Patch (ft)
Backfill Type portland cement

0.5' Depth to Top of Bentonite Seal (ft)
3.5' Depth to Bottom of Bentonite Seal (ft)

10.42' Depth to Top of Well Screen (ft)

8" Diameter of Borehole (in)

Backfill Type Sand

4" Inside Diameter of Well (in)

Type of Pipe Schedule 40 PVC
Screen slot size 10-slot

20.42' Depth to Bottom of Well Screen (ft)

21.1' Depth of Borehole (ft)

Notes:

Notes: 1) Water levels were made at the times and under conditions stated. Fluctuations of groundwater levels may occur due to seasonal factors and other conditions.
2) NA = Not Available or Not Applicable

MONITORING WELL MWIRM-3

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APPENDIX E

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN

This project-specific Quality Assurance Project Plan (QAPP) was prepared in accordance with Section 2.2 of the New York State Department of Environmental Conservation (NYSDEC) draft DER-10 document for NYSDEC Site ID C828119 (Site). The QAPP provides quality assurance/quality control (QA/QC) protocols and guidance that are to be followed when implementing the remedy for the Site to ensure that data of a known and acceptable precision and accuracy are generated. The QAPP also provides a summary of the remedial project, identifies personnel responsibilities, and provides procedures to be used during sampling of environmental media, other field activities, and the analytical laboratory testing of samples. The components of the QAPP are provided herein.

1.0 Project Scope and Project Goals

The QAPP applies to the aspects of the project associated with implementing a physical remedy and the collection of field data, the collection and analytical laboratory testing of field samples and QA/QC samples, and the evaluation of the quality of the data that is generated. Specifically, the physical remediation will include: light non-aqueous phase liquid (LNAPL) monitoring, recovery and off-site disposal or recycling; confirmatory soil and groundwater sampling and analysis at the existing in-situ bioremediation system; and monitored natural attenuation that involves analytical laboratory testing of groundwater samples and the collection of groundwater quality measurements. After review of the data, the site management plan (SMP) that is developed for the Site may include a contingency that involves additional application of remediation products at the existing in-situ bioremediation system including subsequent additional confirmatory soil or groundwater sampling and analysis.

2.0 Project/Task Organization

Project organization and tentative personnel to implement the work are outlined in this section of the QAPP.

<u>Principal in Charge</u>

The Principal in Charge is responsible for review of project documents and ensuring the project is completed in accordance with applicable work plans. Mr. David D. Day, P.E., a Day Environmental, Inc. (DAY) representative, will serve as the Principle-in-Charge on this project.

<u>Project Manager</u>

The Project Manager has the overall responsibility for implementing the project and ensuring that the project meets the objectives and quality standards as presented in this QAPP. Mr. Jeffrey A. Danzinger, a DAY representative, will serve as the Project Manager on this project, and will serve as the primary point of contact and control for the project.

<u>Quality Assurance Officer</u>

The Quality Assurance Officer is responsible for QA/QC on this project. The Quality Assurance Officer's responsibilities on this project are not as a project manager or task manager involved with project productivity or profitability as job performance criteria. Ms. Hope Kilmer, a DAY representative, will serve as the Quality Assurance Officer on this project. The Quality Assurance Officer may conduct audits of the operations at the site to ensure that work is being performed in accordance with the QAPP.

Technical Staff, Subconsultants and Subcontractors

DAY's technical staff for this project consists of experienced professionals (e.g., professional engineers, engineers-in-training, scientists, technicians, etc.) that possess the qualifications necessary to effectively and efficiently complete the project tasks. The technical staff will be used to gather and analyze data, prepare various project documentation, etc. Subconsultants and subcontractors used on this project will consist of firms and companies with experience in the services to be provided.

Analytical Laboratory

It is anticipated that Mitkem Laboratories, a Division of Spectrum Analytical, Inc., with facilities at 175 Metro Center Boulevard, Warwick, Rhode Island will be retained to complete the required analytical laboratory testing of samples as part of this project. Mitkem is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified analytical laboratory (ELAP ID11522).

Dr. Kin S. Chiu is the Laboratory Director for Mitkem. The laboratory director is responsible for analytical work, and works in conjunction with the Laboratory Manager and QA unit regarding QA and chain-of-custody requirements.

Ms. Agnes Ng of Mitkem will act as the Laboratory Manager on this remediation project. The Laboratory Manager will report to the laboratory director and work in conjunction with the laboratory QA unit regarding QA elements of specific sample analyses tasks.

3.0 Sampling Procedures

This section of the QAPP provides the protocols for collection of confirmatory soil samples from test borings, installation of groundwater wells for monitoring and recovery of LNAPL, well development, and collection of groundwater samples from monitoring wells as part of the remediation project.

Collection of Confirmatory Soil Samples from Test Borings

A subcontractor will be retained to provide vehicle-mounted direct-push soil sampling equipment to advance the test borings. However, if it is determined in the field that such equipment cannot adequately be advanced through the existing overburden soils, then the NYSDEC will be consulted to approve any modifications to the drilling program (i.e., use of rotary drill-rig, etc.).

Based on the results of the previous remedial investigation, it is anticipated that the test borings will be advanced to depths up to approximately 20 feet below the ground surface. Sampling equipment will be used to collect soil samples in two-foot or four-foot intervals throughout the entire depth of the test borings. The soil samples will be collected in new disposable plastic liners.

The recovered soil samples will be visually examined by a DAY representative for evidence of suspect contamination (e.g., staining, unusual odors) and screened with a photoionization detector (PID). Portions of the samples will be placed in containers for possible analytical laboratory testing. Different portions of the soil samples will be placed in sealable Ziploc®-type plastic baggies, and will be field screened the same day the samples are collected. These samples will be agitated and homogenized for at least 30 seconds and allowed to equilibrate for at least three minutes. The ambient headspace air inside the baggies above each soil sample will be screened for total volatile organic compound (VOC) vapors with a RAE Systems MiniRAE 2000 PID equipped with a 10.6 eV lamp (or equivalent). The sampling port for the PID will be placed in the ambient air headspace inside each baggie by opening a corner of the "locked" portion of the baggie. The PID will monitor air inside each baggie for a period of at least 15 seconds, and the peak readings measured will be recorded on a log sheet or log book.

Pertinent information for each boring will be recorded on a test boring log. The recorded information will include:

- Date, boring identification, and project identification.
- Name of individual developing the log.
- Name of drilling company.
- Drill make and model.
- Identification of any alternative drilling methods used.
- Depths recorded in feet and fractions thereof (tenths of inches) referenced to ground surface.
- The length of the sample interval and the percentage of the sample recovered.
- The depth of the first encountered water table, along with the method of determination, referenced to ground surface.
- Drilling and borehole characteristics.
- Sequential stratigraphic boundaries.
- Initial PID screening results of soil samples, and/or PID screening results of ambient headspace air above selected samples.

Each test boring will be backfilled with grout upon completion. Soil cuttings, disposable materials and decontamination water will be placed in New York State Department of Transportation (NYSDOT)-approved drums that will be characterized and disposed off-site in accordance with applicable regulations.

Installation of Groundwater Wells for Monitoring and Recovery of LNAPL

A subcontractor will be retained to provide vehicle-mounted Geoprobe Systems Model 6000 series or equivalent direct-push soil sampling equipment to advance test borings for the subsequent installation of groundwater wells. However, if it is determined in the field that such equipment cannot adequately be advanced through the existing overburden soils, then the NYSDEC will be consulted to approve any modifications to the drilling program and installation of associated wells.

Based on the results of the previous remedial investigation, it is anticipated that the test borings will be advanced to depths up to approximately 20 feet below the ground surface. Sampling equipment will be used to collect soil samples in two-foot or four-foot intervals throughout the entire depth of the test borings. The soil samples will be collected in new disposable plastic liners. The soil samples will be collected ahead of 4.25-inch inner diameter hollow stem augers. The soil sampling equipment and hollow stem auger equipment will be advanced to equipment refusal (i.e., inferred top of bedrock).

The recovered soil samples will be visually examined and screened with a PID in accordance with the protocol specified above for "Collection of Confirmatory Soil Samples from Test Borings". This information will be recorded on test boring logs.

Following the completion of drilling, a Schedule 40 polyvinyl chloride (PVC) monitoring well will be constructed within each completed test boring. Each monitoring well will consist of a pre-cleaned two-inch inner diameter, threaded, flush-jointed, five-foot to ten-foot long No. 10 slot screen that is attached to solid riser casing that will extend from the top of the screened section to the ground surface. Each well screen will be installed to intercept the top of the uppermost water-bearing unit. A washed and graded sand pack surrounding the screen and extending up to one foot below it and about one to two feet above it will be placed in the annulus. A minimum two-foot bentonite seal will be placed above the sand pack and the remaining annulus will be filled with cement/bentonite grout. A steel protective casing with locking cap, or flush-mounted curb box with bolted cover will be placed over each well and cemented in place, and a concrete seal will be installed at the ground surface.

Pertinent information will be recorded on test boring logs and well construction diagrams, which will include:

- Date, boring/well identification, and project identification;
- Name of individual developing the log;
- Name of drilling contractor;
- Drill make and model, auger size, and sampling method;
- Identification of alternative drilling methods used;
- Depths recorded in feet and fractions thereof (tenths of inches) referenced to ground surface.
- The length of the sample interval and the percentage of the sample recovered.
- The depth of the first encountered water table, along with the method of determination, referenced to ground surface.
- Drilling and borehole characteristics;
- Sequential stratigraphic boundaries;
- Well specifications (materials; screened interval; amount of Portland cement, bentonite and water used to mix grout; etc.); and
- Initial PID screening results of soil samples, and/or PID screening results of ambient headspace air above selected samples.

Soil cuttings, disposable materials, and decontamination water will be placed in NYSDOT-approved drums that will be characterized and disposed off-site in accordance with applicable regulations.

Well Development

At least one week following installation, new groundwater wells will be developed by utilizing either a new dedicated disposable bailer with dedicated cord and/or a pump and new dedicated disposable tubing. No fluids will be added to the wells during development, and non-dedicated well development equipment will be decontaminated prior to development of each well. The development procedure will be as follows:

- Obtain pre-development static water level readings with a static water level indicator or oil/water interface meter;
- Calculate water/sediment volume in the well;
- Obtain initial field water quality measurements (e.g., pH, conductance, turbidity, temperature) using a Horiba U-22 water quality meter (or similar);
- Select development method and set up equipment depending on method used;
- Alternate water agitation methods (e.g., moving a bailer or pump tubing up and down inside the screened interval) and water removal methods (e.g., pumping or bailing) in order to suspend and remove solids from the well;

- Obtain field water quality measurements using a Horiba U-22 water quality meter (or similar) for every one to five gallons of water removed. Record water quantities and rates removed;
- Stop development when water quality criteria listed below have been met;
- Obtain post-development water level readings using a Horiba U-22 water quality meter (or similar); and
- Document development procedures, measurements, quantities, etc.

To the extent feasible, development will continue until the following criteria are achieved:

- Water is clear and free of sediment and turbidity is less than 50 nephelometric turbidity units (NTUs);
- Monitoring parameters have stabilized (i.e., parameters are $\pm 10\%$); and/or
- A minimum of five well volumes has been removed.

The field measurement data will be presented on Monitoring Well Development Logs.

Collection of Groundwater Samples from Monitoring Wells

Static water level measurements will be obtained from each well using an oil/water interface meter. The presence of LNAPL will be monitored by using visual observations and the oil/water interface meter at each well location. The results of this work will be documented.

Subsequent to obtaining static water level measurements and monitoring the wells for LNAPL, the following low-flow purge and sample techniques will be used to collect a groundwater sample from each well:

- A portable bladder pump connected to new disposable polyethylene tubing will be lowered and positioned at or slightly above the mid-point of the water column within the well screen when the screened interval is set in relatively homogeneous material. When the screened interval is set in heterogeneous materials, the pump will be positioned adjacent to the zone of highest hydraulic conductivity (as defined by geologic samples). Care will be taken to install and lower the bladder pump slowly in order to minimize disturbance of the water column.

- The pump will be connected to a control box that is operated on compressed gas (nitrogen, air, etc.) and is capable of varying pumping rates. An in-line flow-through cell attached to a Horiba U-22 water quality meter (or similar equipment) will be connected to the bladder pump effluent tubing to measure water quality data.

- The pump will be started at a pumping rate of 100 ml/min or less (for pumps that can not achieve a flow rate this low, the pump will be started at the lowest pump rate possible). The water level in the well will be measured and the pump rate will be adjusted (i.e., increased or decreased) until the drawdown is stabilized. In order to establish the optimum flow-rate for purging and sampling, the water level in the well will be measured on a periodic basis (i.e., every one or two minutes) using an electronic water level meter or an oil/water interface meter. When the water level in the well has stabilized (i.e., use goal of <0.33 ft of constant drawdown), the water level measurements will be collected less frequently.

- While purging the well at the stabilized water level, water quality indicator parameters will be monitored on a three to five minute basis with the Horiba U-22 water quality meter (or similar equipment). Water quality indicator parameters will be considered stabilized when the parameter readings listed below are generally achieved after three consecutive readings:
  - pH ($\pm$ 0.1);
  - specific conductance ($\pm$ 3%);
  - dissolved oxygen ($\pm$ 10 %);
  - oxidation-reduction potential ($\pm$ 10 mV);
  - temperature ($\pm$ 10%); and
  - turbidity ($\pm$ 10%, when turbidity is greater than 10 NTUs)

- Following stabilization of the water quality parameters, the flow-through cell will be disconnected and a groundwater sample will be collected from the bladder pump effluent tubing. The pumping rate during sampling will remain at the established purging rate or it may be adjusted downward to minimize aeration, bubble formation, or turbulent filling of sample containers. A pumping rate below 100 ml/min. will be used when collecting VOC samples.

- The procedures and equipment used during the purging and groundwater sampling, and the field measurement data obtained, will be documented in the field and recorded on Monitoring Well Sampling Logs.

During sampling, the following parameters will be measured using a water quality meter(s) and will later be presented on Monitoring Well Sampling Logs:

- Dissolved Oxygen
- Conductivity
- Oxidation/Reduction Potential (redox)
- pH
- Temperature
- Turbidity

4.0 Decontamination Procedures

In order to reduce the potential for cross-contamination of samples collected during this project, the following procedures will be implemented to ensure that the data collected (primarily the laboratory data and groundwater quality measurement data) is acceptable.

It is anticipated that most of the materials used to assist in obtaining samples will be disposable one-use materials (e.g., sampling containers, bailers, rope, pump tubing, latex gloves, etc.). When equipment must be re-used (e.g., static water level indicator, oil/water interface meter, drilling equipment, etc.), it will be decontaminated by at least one of the following methods:

- Steam clean the equipment; or
- Rough wash in tap water; wash in mixture of tap water and alconox-type soap; double rinse with deionized or distilled water; and air dry and/or dry with clean paper towel.

Split-spoon samplers used during rotary drilling, Macrocore cutting shoes used during direct-push drilling, and other re-usable equipment, will be decontaminated between each use.

When deemed necessary, a temporary decontamination pad will be constructed for decontamination of equipment. Any decontamination pad will be removed following completion of associated activities. Decontamination pad materials, liquids, disposable equipment, and personal protective equipment will be containerized in NYSDOT-approved 55-gallon drums and left on-site until the disposal method is determined.

5.0 Operation and Calibration of On-Site Monitoring Equipment

The field personnel will be familiar with the equipment being used. Volatile vapor monitoring will be conducted using a PID. It is anticipated that a RAE Systems MiniRAE 2000 PID equipped with a 10.6 eV lamp, or equivalent, will be used during this project. The PID will be calibrated in accordance with the manufacturer's specifications using an isobutylene gas standard prior to use and as necessary during fieldwork. Measurements will be collected in accordance with the protocols outlined in the Health and Safety Plan (HASP).

Other miscellaneous field instruments that may be used during this project include:

- An electronic static water level indicator;
- An oil/water interface meter;
- LNAPL recovery equipment;
- A low-flow bladder pump system;
- A global positioning system (GPS);
- Survey equipment; and
- A Horiba U-22 water quality meter, or similar.

These meters will be calibrated, operated, and maintained in accordance with the manufacturer's recommendations.

Mitkem's preventative maintenance procedures and calibration procedures for laboratory equipment are provided in its Quality Assurance Plan (QAP) included in Attachment 1.

6.0 Sample Handling and Custody Requirements

During sampling activities, personnel will wear disposable latex or nitrile gloves. Between collection of samples, personnel performing the sampling will discard used latex gloves and put on new gloves to preclude cross-contamination between samples. As few personnel as possible will handle samples or be in charge of their custody prior to shipment to the analytical laboratory.

New laboratory-grade sample containers will be used to collect soil and groundwater samples. Sufficient volume (i.e., as specified by the analytical laboratory and on Table 7.2 of Mitkem's QAP included in Attachment 1) will be collected to ensure that the laboratory has adequate sample to perform the specified analyses.

Samples will be preserved as specified by the analytical laboratory for the type of parameters and matrices being tested. Table 7.2 of Mitkem's QAP included in Attachment 1 provides sample preservation requirements. Sample holding times and preservation protocols will be adhered to during this project in accordance with the requirements that are also presented on Mitkem's Table 7.2.

Chain-Of-Custody

Samples that are collected for subsequent testing as part of this project will be handled using chain-of-custody control. Chain-of-custody documentation will accompany samples from their inception to their analysis, and copies of chain-of-custody documentation will be included with the laboratory's report. The chain-of-custody will include the date and time the sample was collected, the sample identity and sampling location, the requested analysis, and any request for accelerated turnaround time.

Sample Labels

Sample labels for field samples and QC samples with adhesive backing will be placed on sample containers in order to identify the sample. Sample information will be clearly written on the sample labels using waterproof ink. Sufficient sample information will be provided on the label to allow for cross-reference with the field sampling records or sample logbook.

The following information will be provided on each sample label:

Name of company;

Initials of sampler;

Date and time of collection;

Sample identification;

Intended analyses; and

Preservation required.

Custody Seals

Custody seals are preprinted adhesive-backed seals that are designed to break if disturbed. Seals will be signed and dated before being placed on the shipping cooler. Seals will be placed on one or more location on each shipping cooler as necessary to ensure security. Shipping tape will be placed over the seals on the coolers to ensure that the seals are not accidentally broken during shipment. Sample receipt personnel at the laboratory will check and document whether the seals on the shipping coolers are intact when received.

Sample Identification

The following format will be used on the labels affixed to sample containers to identify samples:

Each sample will be numbered starting at 001, and continue in succession (i.e., 001, 002, 003, etc.). The sample test location will also be provided after the sample number using the following test location designations:

TBC-(x')	Confirmatory soil sample from test boring location with depth or depth interval in parentheses.
MW-	Existing or new monitoring well location
MWIRM-	Existing monitoring well location
TBxx/xx/xx-	Trip Blank with day/month/year
FBxx/xx/xx-	Field Blank (equipment rinsate) with day/month/year

As an example, assuming the first project sample is a confirmatory soil sample collected from test boring TBC-1 at a depth of 10 feet, the sample will be designated as 001/TBC-1(10').

Transportation of Samples

Samples will be handled, packaged and shipped in accordance with applicable regulations, and in a manner that does not diminish their quality or integrity. Samples will be delivered to the laboratory no later than 48 hours from the day of collection.

7.0 Analytical Quality Assurance/Quality Control

Analytical laboratory testing will be completed by Mitkem (NYSDOH ELAP ID #11522). The analytical laboratory test results for confirmatory soil and groundwater samples and monitoring natural attenuation groundwater samples will be reported in NYSDEC ASP Category B deliverable reports. Analytical laboratory test results for soil samples will be reported on a dry-weight basis. Mitkem will analyze the samples using the lowest practical quantitation limits (PQLs) possible.

Mitkem will provide internal QA/QC checks that are required by NYSDEC ASP and/or United States Environmental Protection Agency (USEPA) CLP protocol, such as analyses performed, spike blanks, internal standards, surrogate samples, calibration standards, and reference standards. Laboratory reports will be reviewed by Mitkem as outlined in its 2007 QAP that is included in Attachment 1, and also by the Quality Assurance Officer.

Mitkem's laboratory results will be compared to data quality indicators in accordance with Mitkem's QAP included in Attachment 1 and NYSDEC ASP. Data quality indicators include: precision, accuracy, representation, completeness, and comparability.

The analytical methods to be used by Mitkem for each type of sample and sample matrix are identified on Table 1 included in Attachment 2. These exclude analytical methods required by regulated landfill facilities or Monroe County Pure Waters (MCPW) for the purposes of waste disposal. As shown, sample methods include the following:

- Target compound list (TCL) VOCs including tentatively identified compounds (TICs) using NYSDEC ASP Method OLM04.3;
- TCL semi-volatile organic compounds (SVOCs) including TICs using NYSDEC ASP Method OLM04.3;
- Total petroleum hydrocarbons (TPH) using NYSDOH Method 310.13; and
- Natural attenuation parameters such as nitrate, iron (II), manganese, sulfate, methane, and chloride (Methods SM3500D, E300IC, ILM04.1, and RSK175).

In order to provide control over the collection, analysis, review, and interpretation of analytical laboratory data, the following QA/QC samples will be included as part of this project (refer to Table 1 in Attachment 2):

- During the confirmatory groundwater sampling and one round of monitored natural attenuation groundwater sampling, one trip blank will be included per 20 liquid samples, or per shipment if less than 20 samples, when the shipment contains liquid field samples (i.e., groundwater samples) that are to be analyzed by Mitkem for VOCs. These trip blanks will be analyzed for VOCs.

- One matrix spike/matrix spike duplicate (MS/MSD) will be analyzed during confirmatory soil sampling, during confirmatory groundwater sampling, and also during one round of monitored natural attenuation groundwater sampling event for each 20 samples of each matrix that are shipped within a seven-day period. Specific parameters that MS/MSD samples will be tested for by Mitkem will be dependent upon the test parameters of the samples that are being analyzed.

- One field blank (i.e., rinsate sample) will be collected from reusable groundwater sampling equipment and reusable soil sampling equipment for each sampling event of 20 samples, or per shipment if less than 20 samples. It is anticipated that a field blank will be collected during confirmatory soil sampling, confirmatory groundwater sampling, and one round of monitored natural attenuation groundwater sampling. It is anticipated that equipment rinsate samples will be tested for the test parameters of the samples that are being analyzed by Mitkem.

As an exception, Osprey will perform plate count analyses on select confirmatory soil and groundwater samples, and will provide the test results on its standard data report format. As shown on Table 1 included in Attachment 2, Osprey will analyze the samples for total plate count and pseudomonas plate count using USEPA Method 9215C.

Data Usability Summary Report

Ms. Hope Kilmer of DAY will complete a data usability summary report (DUSR) on some of the analytical laboratory data that is generated as part of the scope of work in the remedial work plan, to the extent required by the NYSDEC (i.e., analytical laboratory results for confirmatory soil and groundwater samples, and up to two rounds of monitored natural attenuation groundwater sampling). The DUSR will be conducted in accordance with the provisions set forth in Appendix 2B of the Draft DER-10 Technical Guidance for Site Investigation and Remediation dated December 25, 2002. The findings of the DUSR conducted on available data at the time will be incorporated in the Final Engineering Report (FER) and/or subsequent annual MNA reports. A copy of Ms. Kilmer's resume is included in Attachment 3.

<u>Reporting</u>

Analytical and QC data will be included in the FER. The FER will summarize the remedial work and provide evaluation of the data that is generated, including the validity of the results in the context of QA/QC procedures.

8.0 Record Keeping and Data Management

DAY will document project activities in a bound field book on a daily basis. Information that will be recorded in the field book will include:

- Dates and time work is performed;
- Details on work being performed;
- Details on field equipment being used;
- Visual and olfactory observations during field activities;
- Field meter measurements collected during monitoring activities;
- Sampling locations and depths;
- Measurements of sample locations, and test locations, excavations, etc.;
- Personnel and equipment on-site;
- Weather conditions; and
- Other pertinent information as warranted.

Alternatively, DAY may record such information from test locations on designated logs (e.g., sample logs, boring logs, well construction diagrams, etc.). Well development data and well sampling data will also be presented on designated logs.

The analytical data will be reported as electronic data deliverables (EDDs) and as hard copies. Differential GPS, swing ties from existing surveyed site structures, and/or a licensed surveyor will be used to collect spatial data. The spatial data will be plotted using integrated geographic information system (GIS) and/or computer-aided design (CAD) mapping. Electronic and hard copy files will be maintained by DAY.

ATTACHMENT 1

Mitkem Quality Assurance Plan (QAP)

Mitkem Corporation

QUALITY ASSURANCE PLAN
2007

Approved By:

Sharyn B. Lawler — 1/30/07
Sharyn B. Lawler
QA/QC Director

Date

Yihai Ding — 1/30/07
Yihai Ding
Laboratory Manager

Date

MITKEM Corporation 175 Metro Center Boulevard, Warwick, RI 02886
Phone Number: (401) 732-3400, Fax Number: (401) 732-3499

2.0 Table of Contents

2.0 Table of Contents (Cont.)

2.0 Table of Contents (Cont.)

2.0 Table of Contents (Cont.)

Table of Contents (Cont.)

3.0 INTRODUCTION

MITKEM Corporation is a minority-owned small business environmental services company, incorporated in the State of Rhode Island.

Offices and laboratories are located in Warwick, Rhode Island. The laboratory occupies approximately 11,000 square feet of laboratory space.

This Quality Assurance Plan (QAP) describes the policies, organization, objectives, quality control activities. It also specifies quality assurance functions employed at MITKEM and demonstrates MITKEM's dedication to the production of accurate, consistent data of known quality. This QAP is developed by following the guidelines discussed in the EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, EPA QA/R-5, Interim Final, Jan., 1994 and the National Environmental Laboratory Accreditation Conference (NELAC) standards, July 12, 2002.

4.0 QUALITY ASSURANCE POLICY STATEMENT

MITKEM is firmly committed to the production of valid data of known quality through the use of analytical measurements that are accurate, reproducible and complete. To ensure the production of such data, MITKEM has developed a comprehensive Quality Assurance/Quality Control Program that operates throughout the entire organization.

MITKEM Management considers Quality Assurance/Quality Control to be of the highest importance in the success of its Analytical Testing Laboratory and therefore fully supports the staff in the implementation and maintenance of a sound and thorough Quality Assurance Program.

MITKEM's corporate success is based on its participation in the most rigorous and quality-focused environmental testing programs, such as the EPA Contract Laboratory Program, US Department of Defense programs, NELAC, and other nationwide and state-specific certification and approval programs. These programs require consistent application of the QA/QC procedures described in this document. MITKEM's ability to demonstrate and document that analyses were performed in this manner is one of the foundations of its business. The other foundation of its business is to provide superior levels of customer service, above and beyond the norm for laboratories performing at this level of quality.

MITKEM's approach to customer service is to aggressively meet or exceed customer expectations, particularly in terms of turnaround time for results. While the production of rapid turnaround time data may require MITKEM employees to "go the extra mile" for the customer, without quality, the data are useless. MITKEM constantly strives to manage its business to rapidly provide data to meet all the requirements of its quality program.

- MITKEM management works to insure: that employees understand the primary importance of quality in its day to day operations,
- that employees will not be subjected to pressure to sacrifice quality for turnaround, financial or other considerations,
- that employees understand the importance of their ethical responsibilities in terms of data manipulation, falsification or other illegal or improper actions,
- that the company avoids involvement in activities that diminish its competence, impartiality, judgment or operational integrity.
- that employees maintain all client information in a confidential manner, and
- that employees understand that any short-term gain realized by disregarding the QA/QC program will be more than wasted by the serious penalties for these actions.
- That the laboratory has the technical personnel to identify occurrences of departure from the quality system and to initiate actions to prevent or minimize such departures.

All employees receive training in these issues as part of the initial orientation process, and are required to acknowledge that they understand their responsibilities in these areas.

These issues are also discussed among all laboratory staff at company meetings and re-training sessions. The QA Officer, Technical Director and other senior company management are readily available to all staff through their daily presence, "open door" policy and approachable manner. This allows any employee to readily discuss any questions, concerns or issues that may occur.

Quality Control is defined as an organized system of activities whose purpose is to demonstrate that quality data are being produced through documentation. Quality Assurance is more broadly defined as a system of activities designed to ensure that the quality control program is actually effective in producing data of the desired quality.

Quality Control is included as part of Quality Assurance. In supporting government regulatory and enforcement proceedings, a high degree of attention to quality is essential. Thorough application of quality control principles and routine quality assurance audits is required.

The basic components of the MITKEM QA/QC Program are control, evaluation and correction.

<u>Control</u> ensures the proper functioning of analytical systems through the implementation of an orderly and well-planned series of positive measures taken prior to and during the course of analysis including quality control practices, routine maintenance and calibration of instruments, and frequent validation of standards.

<u>Evaluation</u> involves the assessment of data generated during the control process. For example, precision and accuracy are determined from the results of duplicates and spikes, and other check samples. Long-term evaluation measures include performance and systems audit conducted by regulatory agencies, as well as the MITKEM quality assurance group.

<u>Correction</u> includes the investigation, diagnosis and resolution of any problems detected in an analytical system. Proper functioning of the system may be restored through method re-evaluation, analysis of additional check samples, trouble-shooting and repair of instrumentation or examination and comparison with historical data. Corrective actions are documented and reviewed to make sure they are implemented.

Certain situations may occur when there are occasional departures or exceptions from documented policies and procedures or standard specifications due to client or project specific protocols, unusual sample matrix, or special non-target analyte or non-routine analyses. MITKEM's policy is to fully document all such procedures and their associated QC, and notify the client or regulatory agency. If the situation is to continue, a Standard Operating Procedure will be written and implemented.

5.0 QUALITY ASSURANCE MANAGEMENT, ORGANIZATION AND RESPONSIBILITY

Quality Assurance at MITKEM is a company-wide function that depend on:

(1) cooperative working relationships at all levels within the laboratory and

(2) multi-level review through all working levels of responsibility.

Responsibilities for QA/QC functions begin with the bench scientist and extend to the chief executive officer.

The primary level of quality assurance resides with the bench scientist. After completion of the documented training program, his/her responsibilities include:

- complying with all aspects of formally approved analytical methods and SOPs,
- carefully documenting each step of the analytical process,
- conscientiously obtaining peer review as required,
- promptly alerting laboratory supervisors and/or QA staff members to problems or anomalies that may adversely impact data quality, and
- participation in corrective actions as directed by the laboratory supervisor or QA Director.

The supervisor of each laboratory is responsible for ensuring thorough oversight of the quality of the data generated by the bench scientists. The laboratory supervisor implements and monitors the specific QC protocols and QA programs with the laboratory to ensure a continuous flow of data meeting all control protocols and Mitkem QA requirements. The laboratory supervisor's responsibilities include providing the bench chemist with adequate resources to achieve the desired quality of performance.

The MITKEM organizational structure is shown in the Organization Chart. Resumes of the CEO/Technical Director, Quality Assurance Director, Operations Manager, Laboratory Manager, MIS Director, Project Manager, Laboratory Supervisors, and other key personnel are included.

Mitkem's lines of communication flow upward on the Organizational Chart. Mitkem's open door policy allows all employees access to anyone on the organization chart. If an employee has an issue with his/her immediate supervisor, he or she may, at any time, speak with someone in management higher up in the Organizational Chart.

Implementation of the entire Quality Assurance Program is the responsibility of the QA Director. While interacting on a daily basis with laboratory staff members, the QA Director remains independent of the laboratories and reports directly to the Chief Executive Officer/Technical Director. The QA Director evaluates laboratory compliance with respect to the QA program through informal and formal systems and performance audits as described in Section 13.0. Remedial action, to alleviate any detected problems, is suggested and/or discussed with the appropriate parties and implemented when necessary.

With input from the appropriate staff members, the QA Director writes, edits and archives QA Plans, QC protocols, safety procedures, and Standard Operating Procedures (SOPs) in accordance with US EPA approved methodologies, and GLP procedures. If sites-specific or project-specific QA Plans and/or QC protocols are required, these will be generated as needed.

An essential element of the QA program is record keeping and archiving all information pertaining to quality assurance including QA/QC data, pre-award check sample results, performance test sample results, scores, and follow-up; state certifications of the laboratory; external and internal audits with resolution of EPA and other audit team comments, recommendations and reports. The QA Director also plays an important role in the corrective action mechanism described in Section 16.

In addition, the QA Director works with scientists and management to continuously upgrade procedures and systems to improve the laboratory's efficiency and data quality.

Ultimately, the success of the QA program depends on the cooperation and support of the entire organization. MITKEM's most valuable resource is its staff of dedicated professionals who take personal pride in the quality of their performance.

Laboratory management works to ensure the competence of all who operate equipment, perform tests and calibrations, evaluate data and sign reports. When employees are in training, appropriate supervision will be provided until the employee has demonstrated the appropriate level of understanding, training, and skill.

<u>Mitkem Corporation's personnel job descriptions:</u>

Responsibilities of each staff area in the laboratory include:

Bench Scientist / Preparation Laboratory Areas:

- Analysis of samples through compliance with all aspects of formally approved analytical methods and laboratory SOPs.
- Carefully documenting each step of the analytical process.
- Noting in the appropriate logbook area any unusual occurrences or sample matrix problems.
- Conscientiously obtaining peer review as required.
- Promptly alerting laboratory supervisors and/or QA staff members to problems or anomalies. that may adversely impact data quality.
- Routine housekeeping duties for their laboratory area.

Bench Scientist / Instrument Laboratory Areas:

- Analysis of samples through compliance with all aspects of formally approved analytical methods and laboratory SOPs.
- Routine maintenance of instrumentation.
- Preparation of analytical standards and spiking solutions which are documented and traceable to their original source.
- Carefully documenting each step of the analytical process.
- Noting in the appropriate logbook area any unusual occurrences or sample matrix problems.
- Conscientiously obtaining peer and supervisor review as required.
- Promptly alerting laboratory supervisors and/or QA staff members to problems or anomalies that may adversely impact data quality.
- Documenting the initial review of analysis data to determine compliance with established company QA/QC protocols and any project-specific QA criteria, and noting any unusual occurrences or discrepancies on the data review checklist.
- Routine housekeeping duties for their laboratory area.

Data Reporting Staff:

- Assemble CLP-format data reports by organizing data report forms and raw data in proper order to allow for technical data review.
- Enter data into LIMS or other data reporting computer programs.
- Provide non-technical typographical review of data entered into computer systems by other individuals.
- Deliver data reports to customers by FAX or electronic mail.
- Paginate, photocopy, scan, archive Mitkem's copies of customer reports or other documentation to be retained by the laboratory.
- Ship, or organize for courier delivery, final data reports to customers.
- Assist the QA Director in management of the document control system.

Supervisor:

- Oversight of bench scientists in their laboratory areas.
- Monitors the status of all work in their laboratory area to insure compliance with holding time and turnaround time requirements.
- Training new scientists in the appropriate procedures and methods in the laboratory.
- Works with laboratory managers and the QA staff to review, revise and implement SOPs.
- Insures adequate resources to perform the needed tasks by working with administrative personnel to order needed supplies.

- Insures all supplies and reagents meet the QC requirements of their intended task prior to their use in the laboratory.
- Insures all staff are using proper safety protocols.
- Works with laboratory managers on the annual review of personnel performance.
- Interviews prospective new employees to insure they have the minimal level of qualifications, experience, education and skills necessary to perform their tasks, as well as the appropriate work ethic and social skills necessary for proper teamwork and productivity.
- Review of analytical data to insure compliance with method/SOP requirements prior to release to the client.
- Documents any non-compliance or other unusual occurrences noted during sample analysis and data review such that these can be included in the report narrative and explained to the client.

Senior Scientists:

- Review of analytical data to insure compliance with method/SOP requirements prior to release to the client.
- Documents any non-compliance or other unusual occurrences noted during sample analysis and data review such that these can be included in the report narrative and explained to the client.
- Assist laboratory Managers and Supervisors in other tasks as required.

Laboratory Manager:

- Works with laboratory Supervisors to coordinate laboratory areas in the completion of analytical projects.
- Review of analytical data to insure compliance with method/SOP requirements prior to release to the client.
- Works with QA Director to implement new SOPs and to annually review and revise existing SOPs.
- Works with the QA Director and laboratory Supervisors to develop and implement corrective action when needed.
- Works with management and supervisory staff to continuously improve the quality and efficiency of all company procedures.
- Assists laboratory Supervisors in the annual review of personnel performance.
- Supervises laboratory Supervisors to insure compliance with company QA policies and other company procedures.

Operations Manager:

- Prioritizes work in the laboratory areas to insure projects are completed on a timely basis.

- Works with laboratory Managers and Supervisors to coordinate laboratory areas in the completion of analytical projects.
- Review of analytical data to insure compliance with method/SOP requirements prior to release to the client.
- Writes project report narratives to document any unusual occurrences noted during sample analysis.
- Works with management and supervisory staff to continuously improve the quality and efficiency of all company procedures.
- Works with clients to insure all questions and concerns are addressed and answered.
- Assists laboratory Managers and Supervisors in the annual review of personnel performance.
- Supervises laboratory Managers and Supervisors to insure compliance with company QA policies and other company procedures.

Project Manager:

- Works with the client to completely understand the requirements of all incoming work.
- To evaluate the client's requirements as compared to the abilities of the laboratory as stated in Mitkem's Standard Operating Procedure (SOP); Project Management, SOP 110.0023.
- To communicate the customer's requirements to all laboratory staff working on the project.
- Works with the customer to determine the number and type of sample containers required for the project.
- Works with the Sample Custodian to resolve and communicate to the client any problem or discrepancies with incoming samples.
- Maintains open, responsive and continuous communication with the customer.
- Follows up with the client to assess level of satisfaction, and insure all project goals have been accomplished.

QA Director:

- Implements the entire QA program.
- Interact on a daily basis with laboratory staff.
- Evaluates compliance with the QA program through formal and informal reviews of data and processes.
- Implements the corrective action system.
- Works with laboratory Managers and Supervisors to implement new SOPs and to annually review and revise existing SOPs.
- Interfaces with certification authorities and agencies to maintain existing certifications and obtain new certifications.
- Maintains records of employee training and certification.

- Instructs laboratory personnel on ethics in the workplace.
- Oversees analytical trends that need to be evaluated and corrected.
- Oversees the implementation of MDLs and control limit studies.
- Directs both the internal and external audit programs.

CEO/Technical Director:

- Review of analytical data to insure compliance with method/SOP requirements prior to release to the client.
- Supervises all Management, QA and Supervisory staff to insure compliance with company QA policies and other company procedures.
- Provides technical assistance to all areas of the laboratory staff.
- Works with clients to insure their understanding of complex technical issues.
- Performs final review of select analytical data to ensure compliance with method/SOP requirements prior to release to the client.
- Acts as technical consultant for chemistry related issues that arise in the lab.
- Provides assistance with instrument optimization or performance issues as needed.
- Offers input on the purchase and operation of new instrumentation.
- Trains other analysts in procedures and methodologies.

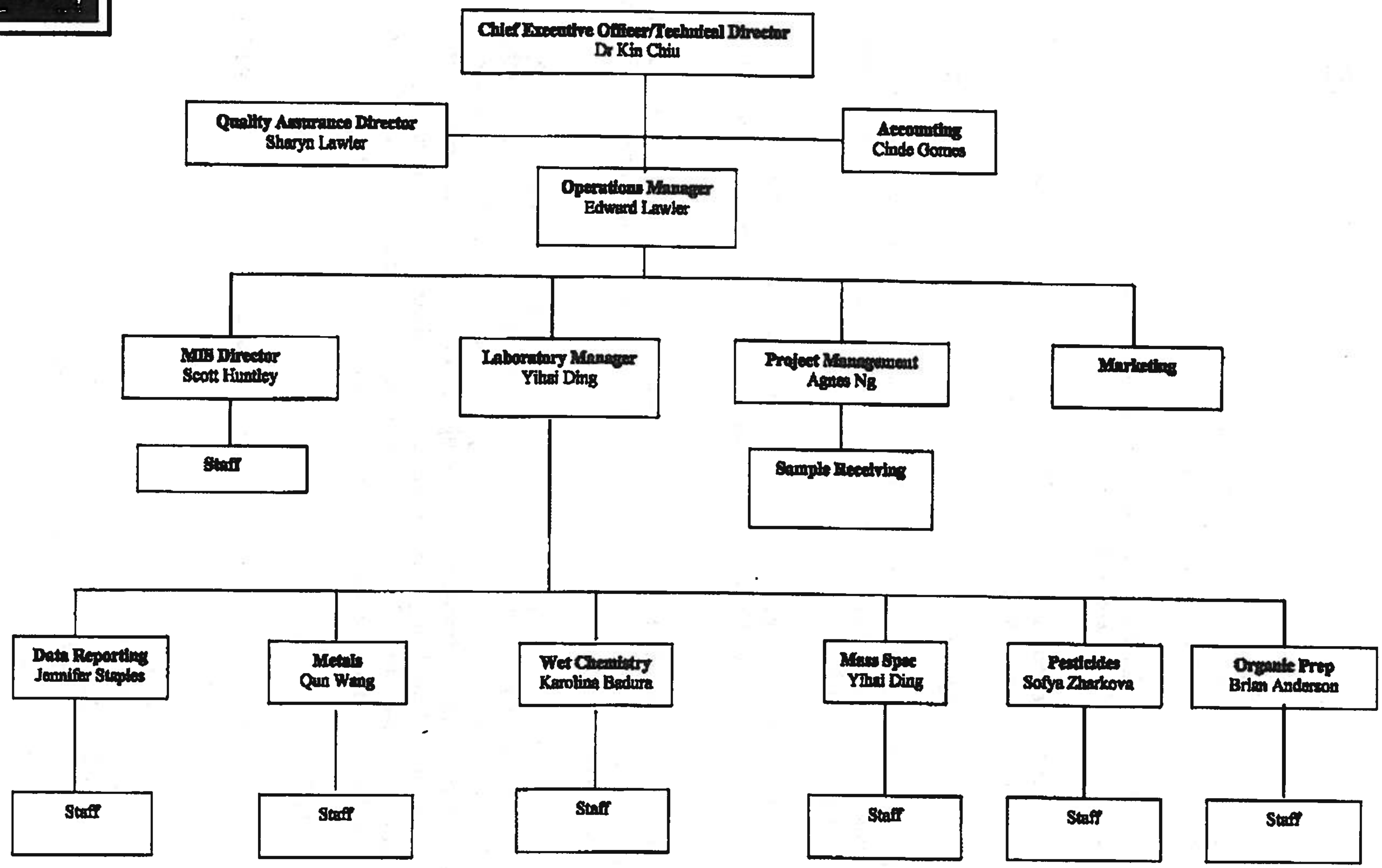
In Mitkem's organizational structure, the CEO/Technical Director is one of the principal owners of the company. He is the ultimate authority for all chemistry-related aspects of the company. The QA Director reports directly to the CEO/Technical Director. She has the authority within the management system to bring any issue to the highest levels of the company management and ownership, as well as to halt the release of data she believes to be questionable or suspend the performance of an analysis she believes to be unreliable. The Operations Manager is a Vice President of the company, and works with the project management and marketing staff and with the laboratory Supervisors to prioritize and coordinate work within the laboratories.

The personnel training records are located in the QA department. All individual training is documented including new employee training, individual training, annual retraining procedures, and Health and Safety training.

Figure 5-1
MITKEM Corporation's Organizational Chart

MITKEM CORPORATION

Organizational Chart



6.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA IN TERMS OF PRECISION, ACCURACY, REPRESENTATION, COMPLETENESS AND COMPARABILITY AND QA REPORTING

As part of the evaluation component of the overall QA Program, laboratory results are compared with the data quality indicators defined as follows:

- Precision: the agreement of reproducibility among individual measurements of the same property usually made under identical conditions.

- Accuracy: the degree of agreement of a measurement with the true or accepted value.

- Representation: the degree to which data accurately and precisely represent a characteristic of a population, parameter variations of a sample of a finite process condition, or of a finite environmental condition.

- Completeness: a measure of the amount of valid data obtained from a measurement system compared with the amount that was expected to be obtained under normal conditions.

- Comparability: an expression of the confidence with which one laboratory data set can be compared with another laboratory data set in regard to the same property and laboratory sample population.

Quality Assurance objectives may vary by project and requested parameters. The accuracy, precision, and representation of data will be functions of the origins of the sample material, the procedures used to analyze sample and generate data, and the specific sample matrices involved in each project. Quality control practices utilized in the evaluation of these data quality indicators include blanks, replicates, spikes, standards, check samples, calibrations and surrogates. The process for quantifying or assessing the above indicators for data quality is addressed in Section 15.

6.1 Precision and Accuracy:

For each parameter analyzed, the QA objectives for precision and accuracy will be determined from:

- Published historical data;
- Method validation studies;
- MITKEM experience with similar samples and/or;
- Project-specific requirements, such as those stipulated by the USEPA in the CLP protocols and control documents.

6.2 Representation:

Analytical data should represent the sample analyzed regardless of the heterogeneity of the original sample matrix. In most cases, representation is achieved by mixing the laboratory sample well before removing a portion for analysis. On occasion, multi-phase laboratory samples may require that each phase be analyzed individually and reported in relation to its proportion in the whole sample.

6.3 Completeness:

The completeness goal is 100% in all cases and includes:

- Analysis of all samples;
- Generation and analysis of all required QC samples;
- Sufficient documentation of associated calibration, tuning and standardization;
- Records of data reduction processes, including manual calculations.

While the laboratory staff is responsible for achieving the completeness objective stated above, assigning each project a specific project manager whose functions include sample management and tracking ensures completeness.

6.4 Comparability:

To assure comparability, MITKEM employs established and approved analytical methods (e.g. USEPA protocols), consistent analytical bases (dry weight, volume, etc.) and consistent reporting units (mg/Kg, µg/L, etc.). Where data from different samples must be comparable, the same sample preparation and analysis protocols are used for all of the samples of interest.

6.5 QA Reporting

General QA procedures require that an MS/MSD or DUPLICATE/MS be reported with each sample batch up to 20 samples. In addition, each batch requires a method blank (MB) and laboratory control sample (LCS).

An acceptance criterion for the MB depends upon the method criteria. In-house control limits dictate the acceptability of the LCS. A high bias LCS is considered acceptable if the analyte is not present in the samples above the reporting limit. A low bias LCS will require re-extraction (if sample volume allows) and re-analysis.

DUP, MS, and MSD recoveries and calculated RSD's are specified in the methods of analyses. Recoveries outside the limits require some form of corrective action, whether that includes a post-digestion/distillation/extraction spike, re-extraction, re-analysis and/or notification to the client in the project narrative.

Omega LIMS will flag any QA samples outside method criteria on the reporting forms. Formal written corrective action reports are required for any incident that does not meet method criteria and cannot be remedied at the laboratory. The QA Officer signs off on any corrective actions and can also track QA trends in this manner.

7.0 SAMPLING PROCEDURES

For most projects, outside sampling teams deliver or send samples to the MITKEM laboratory. When sampling by MITKEM personnel is required, the sampling team follows the sampling procedures outlined in the EPA *Test Methods for Evaluating Solid Wastes*, SW-846, 3rd Edition, or procedures found in the EPA "Handbook for Sampling and Sample Preservation of Water and Wastewater".

Appropriately prepared sample containers are supplied by MITKEM at clients' request. When required, preservatives are added to the sample containers. Tables 7-1 through 7-3 provide the MITKEM Recommended Container, Preservation Techniques and Holding Times. Additional sample volumes may be required if additional QC functions are to be performed.

Holding times for SW846, CLP Methods, Standard Methods and certain USEPA methods are different and are presented in Tables 7-1 to 7-3. Holding times for most methods are calculated from the date of sample collection. Holding times for CLP methods are calculated from the Validated Time of Sample Receipt (VTSR). It should be noted that the CLP analysis program combines chemical analyses and contract compliance procedures in one document. For laboratory analysis and contract compliance purposes, holding times are calculated from VTSR, while post-analysis data usability and validation (generally performed by the client or a third party) compares holding times to the SW-846 method holding times calculated from date of sample collection.

Representative portions of samples are taken for analysis by following Mitkem SOP 110.0039, Standard Operating Procedure for Sub-Sampling.

Table 7-1
Recommended Container, Preservation Techniques and Holding Times for SW-846 Analyses

Analytes	Method	Containers	Required* Volume	Preservation	Holding Times
Volatile Organics					
Solid	8260C, 5030B	Amber glass jar with Teflon lining	Minimal head-space in jar	4°C	14 days
Solid [a]	8260C, 5035	40mL vial or Encore with Teflon lining	5.0gram ± 0.5	4°C, unpreserved	48 hours
				DI Water -10 to -20°C	14 days
				Sodium bisulfate -10 to -20°C, 4°C	14 days
				Methanol 4°C	14 days
Aqueous	8260C, 5030B	40mL VOA Vials with Teflon septum	40mL	4°C HCl, pH<2	14 days
Semivolatile Organics					
Solid	3540C, 3550B 8270D	Amber glass jar with Teflon lining	30gram	4°C	Extraction within 14 days Analysis within 40 days
Aqueous	3510C, 3520C 8270D	Amber glass bottles with Teflon lining	1L	4°C	Extraction within 7 days Analysis within 40 days
Polychlorinated Biphenyls					
Solid	3540C, 3550B 8082	Amber glass jar with Teflon lining	30gram	4°C	Extraction within 14 days Analysis within 40 days
Aqueous	3510C, 3520C 8082	Amber glass bottle with Teflon lining	1L	4°C	Extraction within 7 days Analysis within 40 days
Organochlorine Pesticides					
Solid	3540C, 3550B 8081A	Amber glass jar with Teflon lining	30gram	4°C	Extraction within 14 days Analysis within 40 days
Aqueous	3510C, 3520C 8081A	Amber glass bottle with Teflon lining	1L	4°C	Extraction within 7 days Analysis within 40 days
Chlorinated Herbicides					
Solid	8151A	Amber glass jar with Teflon lining	30gram	4°C	Extraction within 14 days Analysis within 40 days
Aqueous	8151A	Amber glass bottle with Teflon lining	1L	4°C	Extraction within 7 days Analysis within 40 days

Table 7-1 (cont'd)

Recommended Containers, Preservation Techniques and Holding Times for SW846 Analyses

Analytes	Method	Containers	Required* Volume	Preservation	Holding Times
Total Petroleum Hydrocarbons					
Gasoline Range Organics, including Maine-GRO**					
Solid	8015M, 5030B ME 4.1.17	Amber glass jar With Teflon lining	Minimal head-space in jar	4°C	14 days
Solid [a]	8015M, 5035	40mL vial or Encore with Teflon lining	5.0gram ± 0.5	4°C, unpreserved	48 hours
				4°C, Methanol	14days
Aqueous	8015M, 5030B ME 4.1.17	40mL VOA vials With Teflon septum	40mL	4°C HCl, pH<2	14 days
Diesel Range Organics, including Maine-DRO					
Solid	3540C, 3550B 8015M ME 4.1.25	Amber glass jar with Teflon lining	30gram	4°C	Extraction within 14 days Analysis within 40 days
Aqueous	3510C, 3520C 8015M ME 4.1.25	Amber glass bottle with Teflon lining	1L	4°C H_2SO_4, pH<2	Extraction within 7 days Analysis within 40 days
Total Metals except Mercury and Chromium (VI)					
Solid	3050B 6010C	Amber glass jar with Teflon lining	10g	4°C	180 days
Aqueous	3005A, 3010A	Polyethylene bottle	100mL	HNO_3, pH<2	180 days
Chromium (VI)					
Solid	7196A	Amber glass jar with Teflon lining	10g	4°C	Digestion within 30 days Analysis within 96 hours
Aqueous	7196A	Polyethylene bottle	25mL	4°C	24 hours
Mercury					
Solid	7471A	Amber glass jar	10g	4°C	28 days
Aqueous	7470A	Polyethylene bottle	100mL	4°C HNO_3, pH<2	28 days
Cyanide					
Solid	9012	Amber glass jar with Teflon lining	10g	4°C	14 days
Aqueous	9012	Polyethylene bottle	50mL	4°C NaOH, pH≥12	14 days
Flashpoint					
Aqueous	1010	Amber glass bottle	30mL	4°C	28 days

Table 7-2

Recommended Container, Preservation Techniques and Holding Times For CLP/ASP Analyses

Analytes	Method	Containers	Required* Volume	Preservation	Holding Times
Volatile Organics					
Solid	CLP/ASP	Amber glass jar with Teflon lining	Minimal head-space in jar	4°C	10 days from VTSR
Aqueous	CLP/ASP	40mL VOA vials with Teflon septum	40mL	4°C HCl, pH<2	10 days from VTSR
	CLP Low	40mL VOA vials with Teflon septum	40mL	4°C HCl, pH<2	10 days from VTSR
Semivolatile Organics					
Solid	CLP/ASP	Amber glass jar with Teflon lining	30gram	4°C	10 days from VTSR Analysis within 40 days
Aqueous	CLP/ASP	Amber glass bottle with Teflon lining	1L	4°C	5 days from VTSR Analysis within 40 days
	CLP Low	Amber glass bottle with Teflon lining	1L	4°C	5 days from VTSR Analysis within 40 days
Organochlorine Pesticide/PCB					
Solid	CLP/ASP	Amber glass jar with Teflon lining	30gram	4°C	10 days from VTSR Analysis with 40 days
Aqueous	CLP/ASP	Amber glass bottle with Teflon lining	1L	4°C	5 days from VTSR Analysis within 40 days
	CLP Low	Amber glass bottle with Teflon lining	1L	4°C	5 days from VTSR Analysis within 40 days
Cyanide					
Solid	CLP/ASP	Amber glass jar	10gram	4°C	12 days from VTSR
Aqueous	CLP/ASP	Polyethylene bottle	50mL	4°C NaOH, pH>12	12 days from VTSR
Total Metals except Mercury					
Solid	CLP/ASP	Amber glass jar	10gram	4°C	180 days from VTSR
Aqueous	CLP/ASP	Polyethylene bottle	100mL	HNO_3, pH<2	180 days from VTSR

Table 7-2 (con't)

Recommended Container, Preservation Techniques and Holding Times For CLP/ASP Analyses

Analytes	Method	Containers	Required* Volume	Preservation	Holding Times
Mercury					
Solid	CLP/ASP	Amber glass jar	10gram	4°C	26 days from VTSR
Aqueous	CLP/ASP	Polyethylene bottle	100mL	4°C HNO_3, pH<2	26 days from VTSR

Table 7-3

Recommended Containers, Preservation Techniques and Holding Times for Other Analyses

Analytes	Method	Containers	Required* Volume	Preservation	Holding Times
Volatile Organics					
Aqueous	624	40mL VOA vials with Teflon septum	40mL	4°C HCl, pH<2	14 days
Semivolatile Organics					
Aqueous	3510C, 3520C 625	Amber glass bottle with Teflon lining	1L	4°C	Extraction within 7 days Analysis within 40 days
Organochlorine Pesticide/PCB					
Aqueous	3510C, 3520C 608	Amber glass bottle with Teflon lining	1L	4°C	Extraction within 7 days Analysis within 40 days
EDB/DBCP					
Aqueous	504.1	40mL VOA vials with Teflon septum	35mL	4°C HCl, pH<2	28 days
MA Extractable Petroleum Hydrocarbons (EPH)					
Solid	3540C, 3550B MADEP	Amber glass jar with Teflon lining	10gram	4°C	Extraction within 7 days Analysis within 40 days
Aqueous	3510C, 3520C MADEP	Amber glass bottle with Teflon lining	1L	4°C HCl, pH<2	Extraction within 14 days Analysis withinn 40 days
MA Volatile Petroleum Hydrocarbons (VPH)					
Solid	MADEP	Amber glass jar with Teflon lining	10gram	4°C 10mL Methanol	14 days
Aqueous	MADEP	40mL VOA vial with Teflon lining	40mL	4°C HCl, pH<2	14 days
Oil & Grease					
Aqueous	1664	Amber glass bottle with Teflon lining	1L	4°C HCl, pH<2	28 days
Alkalinity					
Aqueous	SM2320	Polyethylene bottle	100mL	4°C	14 days
Ammonia					
Aqueous	SM4500NH3B	Polyethylene bottle	100mL	4°C H_2SO_4, pH<2	28 days
Chloride					
Aqueous	EPA 325.2	Polyethylene bottle	100mL	4°C	28 days

Table 7-3 (cont'd)

Recommended Containers, Preservation Techniques and Holding Times for Other Analyses

Analytes		Method	Containers	Required Volume	Preservation	Holding Times
Chloride		E300.0	Polyethylene bottle	50mL	4°C	28 days
COD						
	Aqueous	SM5220D	Amber VOA vial	40mL	4°C H2SO4, pH<2	28 days
Color						
	Aqueous	E110.2Modified	Polyethylene bottle	50mL	4°C	Immediate
Nitrate/Nitrite						
	Aqueous	E353.2	Polyethylene bottle	50mL	4°C H_2SO_4, pH<2	28 days
Nitrate/Nitrite						
	Aqueous	E300.0	Polyethylene bottle	50mL	4°C	48 hours
Nitrite						
	Aqueous	SM4500NO2B E300.0	Polyethylene bottle	50mL	4C	48 hours
Orthophosphate						
	Aqueous	SM4500-P, E E300.0	Polyethylene bottle	50mL	4°C	48 hours
Total phosphate						
	Aqueous	SM4500-P B,E	Polyethylene bottle	50mL 50mL	4°C H_2SO_4, pH<2	28 days
Phenols						
	Aqueous	SM5530B	Polyethylene bottle	250mL	4°C H_2SO_4, pH<2	28 days
Sulfates						
	Aqueous	SM4500SO4 E E300.0	Polyethylene bottle	50mL	4°C	28 days
Sulfide Total						
	Aqueous	SM4500-S D	Polyethylene bottle	50mL	4°C NaOH, pH>12 ZnAc	28 days
Reactivity						
	Solid	Chapter 7 SW846	Amber glass jar	10gram	4°C	28 days
	Aqueous	Chapter 7	Polyethylene bottle	250mL	4°C	28 days
Total Organic Carbon (TOC)						
	Solid	Lloyd Kahn	Amber glass jar	10g	4°C	14 days

Table 7-3 (cont'd)

Recommended Containers, Preservation Techniques and Holding Times For Other Analyses

Analytes	Method	Containers	Required* Volume	Preservation	Holding Times
Total Organic Carbon					
Aqueous	E415.1	40mL VOA vials	40mL	4°C HCl, pH<2	28 days
TKN					
Aqueous	SM4500Norg C	Polyethylene bottle or Amber glass bottle	50mL	4°C H_2SO_4, pH<2	28 days
Total Solids (TS)					
Aqueous	SM2540B	Polyethylene bottle	200mL	4°C	7 days
Total Dissolved Solids (TDS)					
Aqueous	SM2540C	Polyethylene bottle	200mL	4°C	7 days
Total Suspended Solids (TSS)					
Aqueous	SM2540D	Polyethylene bottle	200mL	4°C	7 days
Settleable Solids					
Aqueous	SM2540F	Polyethylene bottle	200mL	4°C	48 hours

* These represent minimum required volume. Additional sample volumes should be collected to minimize headspace loss for volatile analysis. Additional sample aliquot are also required to perform QA/QC functions (e.g. spikes, duplicates), % moisture for solid samples and sample re-analysis (if needed).

[a] For Massachusetts analyses, the Volatile Organics soil samples are preserved in Methanol in the field.

EPA SW-846 Method 5035 provides several options for preservation of soil samples for volatile organics. Certain state jurisdictions (NY for example) have not adopted these options to-date, and continue to recommend the collection of unpreserved soil sample aliquots for volatiles analysis. Mitkem's preference for low-level analysis is to collect approximately 5 grams of soil into 5mL of organic-free DI water and to preserve by freezing within 48hours of collection. A separate container with approximately 5 grams of soil into 5mL of methanol is also collected for potential medium-level analysis. A separate container of unpreserved soil also must be collected to perform percent moisture analysis.

** Maine GRO soil analysis requires a medium level methanol extraction. A 10 gram sample and 10mL methanol volume is used.

8.0 SAMPLE CUSTODY

8.1 Chain of Custody:

Samples are physical evidence collected from a facility or the environment. In hazardous waste investigations, sample data may be used as evidence in (EPA) enforcement proceedings. In support of potential litigation, laboratory chain-of-custody procedures have been established to ensure sample traceability from time of receipt through the disposal of the sample.

A sample is considered to be in the custody under the following conditions:

- It is in an authorized person's actual possession, or
- It is in an authorized person's view, after being in that person's physical possession, or
- It was in an authorized person's possession and then was locked or sealed to prevent tampering, or
- It is in a secure area.

Chain-of-custody originates as samples are collected. Chain-of-custody documentation accompanies the samples as they are moved from the field to the laboratory with shipping information and appropriate signatures indicating custody changes along the way.

Laboratory chain-of-custody is initiated as samples are received and signed for by the Sample Custodian or his/her designated representative at MITKEM. Documentation of sample location continues as samples are signed in and out of the central storage facility for analysis in the several MITKEM departments, using the Sample Tracking Forms (Fig 8.4-1). After analysis, any remaining sample is held in the central storage area to await disposal. Mitkem's policy is to hold spent samples for a period of at least thirty days from submittal of final report, unless other arrangements are agreed upon with the client.

8.2 Laboratory Security:

Samples and all data generated from the analyses of samples at MITKEM are kept within secure areas during all stages of residence, including the periods of time spent in preparation for analysis, while undergoing analysis, and while in storage.

The entire laboratory is designated as a secure area. The doors to the laboratory are under continuous surveillance, are kept locked after regular business hours and may only be accessed by key or keypad entry. Only authorized personnel are allowed to enter the secure areas. The central laboratory facility and IT office are only accessed through keypad entry. A MITKEM staff member must accompany visitors to the laboratory.

8.3 Duties and Responsibilities of Sample Custodian:

Duties and responsibilities of the Sample Custodian include:

8.3.1 Receiving samples.

8.3.2 Inspecting and documenting sample shipping containers for presence/absence and condition of:

8.3.2.1 Custody seals, locks, "evidence tape", etc.;

8.3.2.2 Container breakage and/or container integrity, including air space in aqueous samples, or proper preservation for soil samples for Volatiles analysis.

8.3.3 Recording condition of both shipping containers and sample containers (cooler temperature, bottles, jars, cans, etc.).

8.3.4 Signing documents shipped with samples (i.e. air bills, chain-of-custody record(s), Sample Management Office (SMO) Traffic Reports, etc.)

8.3.5 Verifying and recording agreement or non-agreement of information on sample documents (i.e. sample tags, chain-of-custody records, traffic reports, air bills, etc.). If there is non-agreement, recording the problems, contacting the project manager for direction, and notifying appropriate laboratory personnel. (Client's corrective action directions shall be documented in the case file.)

8.3.6 Initiating the paper work for sample analyses on laboratory documents (including establishing sample workorder files) as required for analysis or according to laboratory standard operating procedures.

8.3.7 Label samples with laboratory sample identification numbers and cross-referencing laboratory numbers to client numbers and sample tag numbers.

8.3.8 Placing samples and spent samples into appropriate storage and/or secure areas.

8.3.9 Where applicable, making sure that sample tags are removed from the sample containers and included in the workorder file.

8.3.10 Where applicable, accounting for missing tags in a memo to the file or documenting that the sample tags are actually labels attached to sample containers or were disposed of, due to suspected contamination.

8.3.11 Monitoring storage conditions for proper sample preservation such as refrigeration temperature and prevention of cross-contamination.

8.3.12 Sending shipping containers with prepared sample bottles and sample instructions to clients who request them.

8.3.13 Recording temperatures of freezers and refrigerators in the laboratories.

8.3.14 Calibrating the non-contact infrared temperature gun quarterly.

8.3.15 Disposal of samples after a specified time period determined by contract or client request.

8.4 Sample Receipt:

The Sample Custodian or his/her designated representative receives sample shipments at MITKEM. Unless the shipment is a continuation of a previous workorder, a new workorder file is started for the sample. The information is logged into the Sample Receipt Logbook (Figure 8.4-1).

The cooler is inspected for the following (if applicable) and findings are documented on the Sample Login Form (Figure 8.4-2) for USEPA CLP samples, and on the Sample Condition Form (Figure 8.4-3) for all other samples:

- Custody seal (conditions and custody number)
- Air bill (courier and air bill #)

The cooler is then opened and the following items are checked (in order). Make sure the hood is turned on when the cooler is opened.

- Chain of custody (COC) records (or traffic report). These are usually taped to the inside of the cooler cover.
- Radioactivity using the Geiger counter, which continuously monitors the receiving area for radiation
- Cooler temperature using the non-contact infrared temperature gun. Record the temperature of a temperature blank if available, using a calibrated thermometer. Record each temperature on the COC.

The Sample Custodian will perform the following:

- Remove the sample containers and arrange them in the same order as documented in the chain of custody report.
- Inspect condition of the sample containers.
- Assign laboratory sample ID and cross-reference the laboratory ID to the client ID.
- Remove tags and place in the workorder file.
- Check preservative and document in the Sample Condition Form (Figure 8.4-3) if needed. If additional preservative is needed, it is added at this time.
- Check for air bubbles in aqueous samples and for proper preservation and immersion of soil samples designated for volatile organic analysis.
- Ensure peer review occurs for proper cross-referencing and labeling of sample containers.

Any discrepancies or problems are noted in the Sample Condition Notification Form (Figure 8.4-4).

The sample custodian conveys the information to the project manager who will in turn inform the client, or may directly inform the client of the discrepancies.

Samples can be rejected at Mitkem for any of the following reasons:

1. Complete and proper documentation was not sent with the samples.
2. Sample labels cannot be identified because indelible ink was not used during the sampling procedure.
3. Hold times had already been exceeded when samples arrived at the laboratory.
4. Inadequate sample volume.
5. Potential cross-contamination has occurred among samples.
6. Samples are inadequately preserved.
7. The samples or shipping container is badly destroyed during shipping.
8. The samples are potentially radioactive.
9. The samples represent untreated fecal waste for which Mitkem employees are currently not inoculated against.

In all instances, the client is contacted initially before any action is taken at Mitkem.

The Sample Custodian signs the Sample Receipt Form and originates a file folder for the set of samples. The following forms are included in the file: the Sample Receipt Form, chain of custody records, shipping information, and an orange Sample Condition Notification Form if any problems or discrepancies need to be addressed.

When the Sample Custodian is not available to receive samples, another MITKEM staff member signs for the sample container. The time, date and name of the person receiving the container are recorded on the custody records. In addition, the cooler temperature is measured and recorded on the Sample Condition Form. The samples are then stored in the centralized walk-in refrigerator in the sample receipt area. The sample receipt area is located in the secure central storage facility of the laboratory. VOA samples are stored in the VOA analysis laboratory. The samples are officially received and documented by the Sample Custodian or designee before the next business day.

At times, samples will be sent to another lab for analysis not performed at MITKEM. These subcontracted analyses are performed by laboratories certified to perform the analyses. The use of a subcontractor laboratory is discussed with the client prior to sending samples, per Mitkem's Project Management Standard Operating Procedure.

These samples are packed to prevent breakage and stored in a cooler in the walk-in or stored in the small refrigerator in the central storage facility. The samples are either hand delivered to a local sub-contract lab, or shipped with sufficient coolant to maintain a 4 degree temperature by air courier under MITKEM's chain-of-custody (Figure 8.4-5).

8.5 Sample Log-in Identification:

8.5.1 Sample Identification:

To maintain sample identity, each sample received at MITKEM is assigned a unique sample identification (Sample ID) number. Samples are logged into MITKEM via the Omega Laboratory Information Management System (LIMS).

After inspecting the samples, the Sample Custodian logs each sample into the Omega LIMS, which assigns a MITKEM Sample ID Number. These Numbers are assigned sequentially in chronological order. MITKEM Sample Identification Numbers appear in the following format:
YXXXX-NNF

In which: Y – represents the current year with A for 2002, B for 2003, C for 2004, etc.
XXXX – represents a four-digit work order number that is assigned sequentially to each submittal of samples
NN – represents the sample number within the group or workorder.
F – represents the fraction. All sample portions that are received in identical bottles with identical preservatives are grouped into one fraction.

For example, the first fraction of the fifth sample of the 20th workorder of 2003 would have the number: B0020-05A

The MITKEM Sample ID Numbers are recorded on the Sample Login Form (Figure 8.4-2) for USEPA CLP samples, and on the Sample Condition Form (Figure 8.4-3) for all other samples. Information on these forms cross-reference the Sample ID Numbers with SDG numbers, sample tag numbers and/or other client identifiers. Each sample is clearly labeled with its MITKEM Sample ID Number by the Sample Custodian. The same sample ID Number appears on the LIMS status report, on each sample preparation container and extract vial associated with the sample.

8.5.1.1 Sample Extract Identification:

As described in Section 8.5.1, a sample extract is identified with the same unique sample identification number as the sample from which it derives

8.5.2 Sample Login:

Sample login system at MITKEM consists of computerized entry using Omega LIMS (Figure 8.5-1). The information recorded onto the Workorder Report includes:

- Workorder number
- Client name
- Project name and location
- Final data report format
- Date of receipt
- Date sample collected
- Due date, fax and/or hardcopy
- EDD requirements
- Comments or notes on the workorder
- MITKEM Sample Identification numbers
- Client Sample Identification numbers
- Sample matrix
- Analyses required
- Case number, where used by the client
- SDG number, where used by the client

8.5.3 Sample Information:

After sample information is properly recorded (Sample Receipt Logbook, Sample Receipt Forms) and the samples have been properly logged into the LIMS, bottle labels are generated and applied to the sample containers. The Sample Custodian notifies the Project Manager or peer or supervisor to review the sample bottle labeling. This person reviews all the information associated with the samples. He/she verifies (by initialing) the correctness of the information on the Sample Condition Form or Sample Log-In Form. Sample login information is available through the Omega LIMS to all appropriate laboratory staff.

The Sample Custodian initiates a red workorder file. This file contains the original Sample Log-In Form or Sample Condition Form, air bills, SMO traffic reports, sample tags, workorder reports and all correspondence with the Client or SMO or others. The red workorder file is forwarded to the Project Manager for review of the login paperwork, and for updating status of the workorder in the LIMS. Once the login information is thoroughly reviewed for correctness, the red workorder file is stored in the data reporting area. Analytical data are placed in this as analyses are completed and data are reviewed.

8.6 Sample Storage and Disposal:

Samples at MITKEM are stored in a central storage facility. After sample receipt and login procedures are completed, the Sample Custodian places the samples in the centralized walk-in refrigerator. Volatile Organic sample aliquots are released to the volatile organic lab with documentation (Figure 8.6-1).

The central storage facility is for samples only; no standards or reagents are to be stored there. Access to the centralized sample storage facility is limited by keypad entry at all times.

All sample/extract refrigerators are maintained at 4°C ± 2°C. Standards are kept in freezers maintained at -10 to -20°C. They are monitored twice every working day and once daily on the weekends. Temperatures are recorded in the Temperature Log (Figure 8.6-2).

When analysis is complete, any remaining sample is retained in the central storage facility until it may be removed for disposal (see SOP 30.0024 for Sample Disposal). Broken and damaged samples are promptly disposed in a safe manner. Unless there is a specific request by the client, excess, unused sample aliquots are stored for at least 30 days after the submission of compliant data. The samples are then disposed after such period. USEPA and NYS ASP extracts are stored under refrigeration for at least one year. Other extracts are stored under refrigeration for up to three months, unless there is a specific agreement with the client. After such time, the extracts are disposed. All disposals are performed in a manner compliant with federal and state regulations.

8.6.1 Extract Transfer:

The extracts generated during the preparation for the organic analyses are transferred from the Organic Prep Lab to the Analysis Labs. The extracts, for Semivolatiles, TPH, Pesticides and PCBs, are checked in the Analysis Lab by entries in the appropriate Extract Transfer Logbook (Figures 8.6-3 and 8.6-4).

Metals analysis samples that are transferred from the prep area to the analysis room are signed for by the metals analyst. This entry occurs in the Metals Preparation Logbooks at the time of the transfer (Figures 8.6-5).

There is no extract transfer that occurs with either Wet Chemistry or VOA samples.

8.6.2 Extract Storage:

Semivolatile, Pesticide/PCB, and TPH extracts, which are contained in crimp top vials or screw cap vials with Teflon lined septa, are stored at 4°C ± 2°C. Semivolatile and Pesticide/PCB extracts are stored in refrigerators in the Organic Analysis room. They are catalogued numerically by workorder number that approximates chronological order, according to date of receipt. USEPA CLP extracts are stored separately within the refrigerator from sample extracts of other clients.

Excess Pesticide extracts, not analyzed, are stored in screw cap vials with Teflon lined septa in the Organic Prep Lab. In most instances, they consist of the remaining 8 mL portions of aqueous and soil sample extracts and are stored chronologically by workorder.

8.7 Sample Tracking:

When a sample is removed from storage, the analyst who has custody signs the Sample Receipt Log. The Sample Receipt Log records the initials of the sample custodian or other authorized lab personnel who relinquishes custody of the sample(s) to the analyst, as well as the initials of the analyst who receives the sample. When the sample(s) are returned to the central storage facility, the analyst relinquishes the sample to the sample custodian or other authorized lab personnel. In addition to the individual's initials, the date is recorded. This information indicates the location of the sample at any point in time.

Chain-of-custody of a sample ensures that the sample is traceable from the field, where it was taken, through laboratory receipt, preparation, analysis and finally disposal. The primary chain-of-custody documents are used to locate a sample at any point in time.

1. The chain-of-custody form from the field describes the origin and transportation of a sample;

2. The MITKEM Sample Receipt Logbook and supporting login records document acceptance of a sample by the Mitkem laboratory; and

3. The MITKEM Sample Receipt Logbook documents which analyst has custody of the sample after removal from storage.

4. The sample preparation logs and/or extract transfer logs document when the extracts or digestates were received by the analytical labs and where they are stored..

Figure 8.4-1
Sample Receipt Tracking Logbook Form

MITKEM CORPORATION

Sample Receiving Logbook

Workorder No. ________________

Client Name: ______________________________

Date Recv'd__________ **Sample #s**__________________ **Storage Locations:**__________________

Date Recv'd__________ **Sample #s**__________________ **Storage Locations:**__________________

Date Recv'd__________ **Sample #s**__________________ **Storage Locations:**__________________

Date Recv'd__________ **Sample #s**__________________ **Storage Locations:**__________________

Date Recv'd__________ **Sample #s**__________________ **Storage Locations:**__________________

OUT				IN			
Relinquished By		**Received By**		**Relinquished By**		**Received By**	
Date:	Init:	Date:	Init:	Date:	Init:	Date:	Init:
Samp. #s							
Date:	Init:	Date:	Init:	Date:	Init:	Date:	Init:
Samp. #s							
Date:	Init:	Date:	Init:	Date:	Init:	Date:	Init:
Samp. #s							
Date:	Init:	Date:	Init:	Date:	Init:	Date:	Init:
Samp. #s							
Date:	Init:	Date:	Init:	Date:	Init:	Date:	Init:
Samp. #s							
Date:	Init:	Date:	Init:	Date:	Init:	Date:	Init:
Samp. #s							
Date:	Init:	Date:	Init:	Date:	Init:	Date:	Init:
Samp. #s							
Date:	Init:	Date:	Init:	Date:	Init:	Date:	Init:
Samp. #s							

Comments: ____

____

Please record analyst's initials, date, and sample #s removed. Add any comments if necessary (broken bottles, empty jars, etc.)
Include the abbreviated name of the test to be performed., ie: SVOA, PCB...near the "samp. #s".
Include bottle or jar number when more than one.

Reviewed:____________

Logbook ID: 30.0287-11/06

Figure 8.4-2
USEPA CLP Sample Login Form

SAMPLE LOG-IN SHEET

Lab Name Mitkem Corporation	Page __ of __
Received By (Print Name)	Log-in Date
Received By (Signature)	

Case Number	Sample Delivery Group No.	SAS Number

Remarks: (1) Please see associated Sample/extract transfer logbook pages submitted with this data package.

			Corresponding		
		EPA Sample #	Sample Tag #	Assigned Lab #	Remarks: Condition of Sample Shipment, etc.
1. Custody Seal(s)	Present/Absent* Intact/Broken				
2. Custody Seal Nos.	______ ______				
3. Chain of Custody Records	Present/Absent*				
4. Traffic Reports or Packing Lists	Present/Absent*				
5. Airbill	Airbill/Sticker Present/Absent*				
6. Airbill No.	______ ______				
7. Sample Tags	Present/Absent*				
Sample Tag Numbers	Listed/Not Listed on Chain-of-Custody				
8. Sample Condition	Intact/Broken*/ Leaking				
9. Cooler Temperature	______				
10. Does information on custody records, traffic reports, and sample tags agree?	Yes/No*				
11. Date Received at Lab	______				
12. Time Received	______				

Sample Transfer	
Fraction BNA & Pest/PCB (1)	Fraction VOA (1)
Area # R1	Area # VOA Lab
By	By
On	On

* Contact SMO and attach record of resolution

Reviewed By	Logbook No.
Date	Logbook Page No.

SAMPLE LOG-IN SHEET
FORM DC-1

Lab Name Mitkem Corporation	Page ___ of ___
Received By (Print Name)	Log-in Date
Received By (Signature)	

Case Number	Sample Delivery Group No.	Mod. Ref. No.

Remarks:
(1) Please see associated sample/extract transfer logbook pages submitted with this data package.

		EPA Sample #	Corresponding Sample Tag #	Corresponding Assigned Lab #	Remarks: Condition of Sample Shipment, etc.
1. Custody Seal(s)	Present/Absent* Intact/Broken				
2. Custody Seal Nos.	___________ ___________				
3. Traffic Reports/ Chain of Custody Records (TR/COCs) or Packing Lists	Present/Absent*				
4. Airbill	Airbill/Sticker Present/Absent*				
5. Airbill No.	___________ ___________				
6. Sample Tags	Present/Absent*				
Sample Tag Numbers	Listed/Not Listed on Chain-of-Custody				
7. Sample Condition	Intact/Broken*/ Leaking				
8. Cooler Temperature Indicator Bottle	Present/Absent				
9. Cooler Temperature	___________				
10. Does information on TR/COCs and sample tags agree?	Yes/No*				
11. Date Received at Laboratory	___________				
12. Time Received	___________				
Sample Transfer					
Fraction VOA (1)	Fraction BNA/Pest/Aro (1)				
Area #	Area #				
By	By				
On	On				

* Contact SMO and attach record of resolution.

Reviewed By	Logbook No.
Date	Logbook Page No.

Figure 8.4-3
Sample Condition Form

MITKEM CORPORATION

Sample Condition Form

Received By:	Reviewed By:	Date:	MITKEM Workorder #:
Client Project:		Client:	

1) Cooler Sealed Yes / No

2) Custody Seal(s) Present / Absent
Coolers / Bottles
Intact / Broken

3) Custody Seal Number(s) ________

4) Chain-of-Custody Present / Absent

5) Cooler Temperature ________
Coolant Condition ________

6) Airbill(s) Present / Absent
Airbill Number(s) ________

7) Sample Bottles Intact/Broken/Leaking

8) Date Received ________

9) Time Received ________

Preservative Name/Lot No:

Lab Sample ID		Preservation (pH) HNO$_3$	H$_2$SO$_4$	HCl	NaOH	VOA Matrix	Soil Headspace or Air Bubbles $\geq$ 1/4"

VOA Matrix Key:

US = Unpreserved Soil A = Air
UA = Unpreserved Aqu. H = HCl
M= MeOH E = Encore
N = NaHSO$_4$ F = Freeze

See Sample Condition Notification/Corrective Action Form yes / no

Rad OK yes/ no

Figure 8.4-4
Sample Condition Notification Form

Sample Condition Notification

Mitkem Project#:______________ **Date of Receipt:**______________
Client:________________________ **Received By:**________________
Client project #/name:________________________

Unusual Occurance Description:

____

____

____

____

____

____

Client Contacted:

Contacted via: Phone/Fax/E-mail
Date:__________ **Time:**___________
Contacted By:_________________________
Name of person contacted:________________________

Client Response:

Responded via: Phone/Fax/E-mail
Date:____________
Name of person responding:__________________________
Responding to:_________________________

____

____

____

____

____

Mitkem Action Taken: ____

____

____

____

____

Figure 8.4-5
MITKEM Chain-of-custody Form

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

Page ____ of ____

REPORT TO		INVOICE TO		
COMPANY	PHONE	COMPANY	PHONE	LAB PROJECT #:
NAME	FAX	NAME	FAX	
ADDRESS		ADDRESS		TURNAROUND TIME
CITY/ST/ZIP		CITY/ST/ZIP		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	REQUESTED ANALYSES												COMMENTS
	/																				
	/																				
	/																				
	/																				
	/																				
	/																				
	/																				
	/																				
	/																				
	/																				
	/																				
	/																				

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME	ADDITIONAL REMARKS:	COOLER TEMP
1		/		/		
2		/		/		
3		/		/		

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

Figure 8.5-1
Workorder Information Form

Mitkem Corporation *20/Dec/06 11:35* **WorkOrder: E1468**

Client ID: MITKEM_WARWICK
Project: WW 9/25
Location:
Comments: N/A

Case:
SDG:
PO: --

Report Level: LEVEL 2
EDD:
HC Due: 10/10/06
Fax Due:

Sample ID	Client Sample ID	Collection Date	Date Recv'd	Matrix	Test Code	Lab Test Comments	Hold	MS	SEL	Storage
E1468-01A	WW-9/25-C	09/25/2006 0:00	09/26/2006	Aqueous	SM5220		☐	☐	☐	Disposed
E1468-01B	WW-9/25-C	09/25/2006 0:00	09/26/2006	Aqueous	E200.7	Cd, Cr, Cu, Pb, Ni, Ag, Zn	☐	☐	☑	Disposed
E1468-02A	WW-9/25-G	09/25/2006 0:00	09/26/2006	Aqueous	E624		☐	☐	☐	Disposed
E1468-02B	WW-9/25-G	09/25/2006 0:00	09/26/2006	Aqueous	E335.4		☐	☐	☐	Disposed

Client Rep:

Figure 8.6-1
Volatiles Receiving Logbook Form

MITKEM CORPORATION: VOLATILES RECEIVING LOGBOOK

VOA Log-In Date	Workorder	Client	Sample Numbers	Relinquished By	Comments

Logbook ID 90.0191-04/05 Reviewed By:

Figure 8.6-2
Temperature Logbook Form

MITKEM CORPORATION: Refrigerator/Freezer Temperature Logbook

Date: ____________ **Analyst** ______________

		Time1 :		Time 2 :		Time 3 :		Comments
Refrigerator ID	Freezer ID	R-Temp	F-Temp	R-Temp	F-Temp	R-Temp	F-Temp	
R-1-Front	N/A							
R-1- Back	N/A							
R2	F2							
R3	F3							
R4	F4							
R5	F5							
R7	F7							
R8	F8							
R9	F9							
R10	F10							
R11	N/A							
R12	F12							
R13	F13							
R14	N/A							
N/A	F15							
N/A	F16							
R17	F17							
N/A	F18							
R19	N/A							
R20	N/A							

Temperature Requirements

Freezers between-10 and -20 degree C
Refrigerators between 2 and 6 degree C

Logbook ID: 30.0108-12/08 **Reviewed by:** ____________________

Figure 8.6-3
Extracts Transfer Logbook Form – Semivolatile Analysis

MITKEM CORPORATION EXTRACT TRANSFER LOGBOOK: SEMIVOLATILE ANALYSIS						
Date Transferred from Prep Lab	Lab ID		Transferred By	Received By	Storage Location	Comments

Logbook ID 70.0141-12/06 Reviewed By: ____________________

Figure 8.6-4
Extracts Transfer Logbook Form – Pesticide/PCB Analysis

MITKEM CORPORATION EXTRACTS TRANSFER LOGBOOK: PESTICIDES/PCB ANALYSIS						
Date Transferred from Prep Lab	Lab ID		Transferred by	Received by	Storage Location	Comments

Logbook ID: 60.0132 - 07/08 **Reviewed by**________________

Figure 8.6-5
Preparation Logbook Form – Metals Analysis

MITKEM CORPORATION: Aqueous Metals Preparation Logbook

Date	Sample ID		Client ID	Sample Vol (ml)	pH	Sample Color Before	Clarity Before	Conc. HNO_3 (ml)	Conc. HCl (ml)	1:1 HCl (ml)	Sample Color After	Sample Clarity After	Final Volume (ml)	Comments	Analyst

HCl Lot# ____________________

HNO3 Lot# ____________________

Method: ____________

Digestion Temp: ____________ oC

LCSS/Spike ID: ____________________

____

____

SOP#: ____________

Digestate Relinquished to: ____________________

Logbook ID 100.0125 -11/06

REVIEWED BY: ____________________

9.0 CALIBRATION PROCEDURES AND FREQUENCIES

9.1 Instruments:

Specific calibration and check procedures are given in the analytical methods referenced in Section 10. The frequencies of calibration and the concentrations of calibration standards are determined by the cited methods and any special project or contract-specific requirements. Standard calibration curves of signal response versus concentration are generated on each analytical instrument used for a project, prior to analysis of samples. A calibration curve of the appropriate linear range is established for each parameter that is included in the analytical procedure employed and is verified on a regular basis with check standards as specified in the appropriate CLP Protocols. For non-CLP work, MITKEM adheres to the calibration criteria specified by SW-846 and/or Standard Methods for both organic and inorganic analyses. Where requested, other method specific calibration criteria are used.

For organic analyses whenever possible, unless otherwise specified in the individual methods, the initial calibration standards (ICAL), continuing calibration verification standards (CCV), laboratory control sample spike (LCS) and matrix spike (MS) will all be from the same source. The initial calibration verification (ICV) standards are prepared from a separate source. The following are examples of calibration procedures for various instrumental systems. Refer to the Standard Operating Procedures for the specific calibration requirements.

GC/ECD and GC/FID – An initial calibration is performed using five different concentration levels for each parameter of interest for SW-846 analyses. The initial calibration is done on each column and each instrument, and is repeated each time a new column is installed or whenever a major change is made to the chromatographic system.

An initial calibration verification (ICV), near mid level concentration for all analytes, is performed immediately after the calibration. If the ICV does not meet method specific criteria, a new calibration curve is generated and an ICV is analyzed. If repeated ICV failures are encountered, the system is checked to find the cause of these failures, and the problem is corrected. For certain GC/FID analyses (i.e. GRO or DRO), the instrument is calibrated using individual compounds while the laboratory control sample or ICV uses a petroleum product (diesel or gasoline).

A continuing calibration verification (CCV), near a mid-level concentration for all analytes, is run at ten (10) sample intervals. If CCV values are determined outside the upper limit of the method specified range and if no analytes were detected in the samples, the run will be accepted as valid and 'No Detects' reported for the sample. If an analyte is detected and the CCV is out at the high end, the problem will be identified and corrected and the affected samples will be re-analyzed with a compliant CCV.

If a CCV value is out of the method specified limits at the lower limit, the cause of the problem will be identified and corrected, and all samples affected by the out of control CCV will be rerun with a compliant CCV.

For CLP-type analyses, the continuing calibration takes place at the beginning of the analytical sequence and once every twelve (12) hours throughout the analytical sequence. The percent difference in calibration factors for each standard must not exceed the criteria specified by the method.

If a CCV fails to meet criteria limits, a new calibration curve will be generated and all samples affected will be re-analyzed.

GC/MS – For CLP methods, a minimum of five-level calibration (four-level for selected semivolatile compounds) is carried out for each analyte per system before analysis of samples take place.

Continuing calibrations, near midpoint levels, are analyzed every twelve hours of instrument analysis time for CLP analyses.

Re-calibration takes place whenever a major change occurs in the system, such as a column change in the GC or a source cleaning of the mass spectrometer or when the continuing calibration fails to meet method specific requirements.

Tunes are performed once every twelve (12) hours. The GC/MS system is tuned to USEPA specifications for bromofluorobenzene (BFB) or decafluorotriphenylphosphine (DFTPP) for volatile and semivolatile analyses, respectively. Verification of tuning criteria occurs every twelve hours of instrument run time for all CLP-type and SW846 analyses.

More detailed instrument and method-specific calibration procedures and criteria are described in the individual analysis SOPs.

ICAP – Instrument calibration, for each wavelength used, occurs at the start of each analysis. The calibration curve is constructed per method specification.

An initial calibration verification and initial calibration blank (ICB) are analyzed before analysis of samples. If the ICV and ICB do not meet method specific criteria for an analyte, the analyte is re-analyzed with a new calibration.

During the analysis, a continuing calibration verification (CCV) and continuing calibration blank (CCB) is analyzed at least every ten (10) samples. If either the CCV or CCB fails to meet method specific criteria for an analyte, the source of the problem is investigated. If it can be determined that the failed CCV and/or

CCB is not representative (such as for instrument carryover from previous sample or from an empty autosampler tube), the CCV and/or CCB are re-analyzed and the reason for the failure documented. If a failure still occurs, further corrective action is performed, and the analyte is re-analyzed with a new calibration.

The CCV is obtained from a source independent from that of the standards. The CCV concentration for the different analytes are at method specified levels.

The Flow Injection Mercury System (FIMS) - Instrument calibration occurs at the start of each analysis. The calibration curve is constructed per method specification.

An initial calibration verification (ICV) and initial calibration blank (ICB) are analyzed before analysis of samples. If the ICV and ICB do not meet method specific criteria for Mercury, re-calibration and reanalysis are required.

During the analysis, a continuing calibration verification (CCV) and continuing calibration blank (CCB) is analyzed at least every ten (10) samples. If either the CCV or CCB fails to meet method specific criteria for Mercury, the source of the problem is investigated. If it can be determined that the failed CCV and/or CCB is not representative (such as for instrument carryover from previous sample or from an empty autosampler tube), the CCV and/or CCB are re-analyzed and the reason for the failure documented. If a failure still occurs, further corrective action is performed, and the analyte is re-analyzed with a new calibration.

The CCV is obtained from a source independent from that of the standards. The CCV concentration for Mercury is at method specified levels.

Other instrumentation:

pH- the meter is calibrated at two pH levels (4.0 and 10.0) before analyses of samples. The pH 7.0 buffer is analyzed as an LCS and recovery is calculated.

Lachat 8000- automated flow-through spectrophotometer is calibrated per method specification before the analyses of samples.

An initial calibration verification and initial calibration blank (if required) are analyzed before analysis of samples. If the ICV and/or ICB do not meet method specific criteria for an analyte, re-calibration must occur.

During the analyses, a continuing calibration verification and continuing calibration blank is analyzed at least every ten (10) samples. If either the CCV or CCB fails to meet specified criteria for an analyte, the source of the problem is investigated. If it can be determined that the failed CCV and/or CCB is not representative (such as for instrument carryover from previous sample or from an empty autosampler tube), the CCV and/or CCB are re-analyzed and the reason for the failure documented. If a failure still occurs, further corrective action is performed, and the analyte is re-analyzed with a new calibration.

The CCV is obtained from a source independent from that of the standards. The CCV concentration for the different analytes are at method specified levels.

SpecGenesys- manual spectrophotometer is calibrated per method specification.

A calibration curve calibration verification is analyzed at the beginning, end, and at least every 10 samples. The verification standard is from an independent source. If the calibration verification does not meet method specific criteria for an analyte, it is re-analyzed once. If failure still occurs, a new calibration curve is established and any affected samples are reanalyzed. Calibration curves are established at least quarterly.

Balances: are calibrated by an outside source on an annual basis. The balances are calibrated with Class "S" weights each day of use. A calibration check is performed with NIST Class "1" traceable weights monthly. The Class "1" weights are NIST certified by an outside certified service on a regular basis.

Thermometers are calibrated once a year against a NIST-verified thermometer or as they are replaced. The NIST-verified thermometers are certified by an outside certified service annually.

Gel Permeation Chromatography is used to clean samples according to CLP and client requirements. GPCs are calibrated using a calibration standard provided by Ultra Scientific, Cat. # CLP-340. Once a successful calibration is achieved it is valid for a period of seven days.

9.2 Standards and Reagents:

Standard reference materials used for routine calibration, calibration checks, and accuracy are obtained from commercial manufacturers. These reference materials are traceable to the source and readily compared to EPA references. Most standards are traceable to NIST; however, certain projects, especially those involving pesticide registration, may necessitate the use of reference standards supplied by the client. New standards are also routinely validated against known standards that are traceable to EPA or NBS reference materials.

Standards are purchased from valid vendors with proven expertise in their field. All standards come with a Certificate of Analysis which is kept on record in the appropriate laboratories. Intermediate standards, if necessary, are prepared in the labs and then QA'd by spiking reagent water with the standard. The spike sample is then carried through the normal extraction and analysis procedures. Criteria for the intermediate spike must meet the method or in-house criteria. If acceptable, the spike is able to be used. If unacceptable, another intermediate standard is prepared and the same steps repeated.

Intermediate and working standards are prepared in the same solvent or solution as the samples that the standard will be spiked.

Primary, intermediate and working standards are all named with specific nomenclature as designated in the QA Department SOP No. 80.0013, Reagent Purchasing and Tracking.

Standards are dated and labeled upon arrival. Any material exceeding its shelf life as described by the methods in QAP Section 10 is discarded and replaced. Standards are periodically analyzed for concentration changes/degradation and inspected for signs of deterioration such as color change and precipitate formation. Standards Receiving and Preparation Logbooks, which contain all pertinent information regarding the source and preparation of each analytical standard, are maintained by each of the MITKEM laboratory departments (Examples, Figures 9.2-1 to 9.2-4).

See Mitkem individual analytical SOPs, sections 7 and 8 for standards preparation procedures.

Solvents are examined for purity prior to use to ensure there is no external source of contamination. For organic solvents, each lot number of solvent is QC'd prior to use. This is accomplished by concentrating or extracting an aliquot of solvent or reagent media in the same manner as the samples and analyzing it for contamination. Any detectable analyte could render the solvent or reagent unsuitable for use. Supervisors make the final decision as to the suitability of the solvent or reagent.

Reagents are stored in the respective laboratories during use. Backup supplies are stored in Mitkem's stockroom. All chemicals and reagents are given a 3-year expiration period unless designated otherwise by the manufacturer. Sometimes the viability of the reagent does not remain throughout the entire 3-year period. In this case, the chemical or reagent is readily discarded.

Chemicals and reagents are logged into the laboratory and each bottle is given a unique ID. The ID is based upon the date of its arrival at Mitkem. The only exceptions include cases/cycletainers of solvents and cases of acids.

Any applicable certificates of analysis (COA) are stored in the individual laboratories or in the QA Department. When a bottle is opened in the laboratory, it is inspected to ensure it meets the requirements of the method. The analyst records his or her initials on the bottle along with the date opened and the ID.

9.3. Lab Pure Water:

For wet chemistry, most standards are prepared in DI reagent water. For inorganic analyses Mitkem uses a US Filter mixed-bed deionization system followed by particle and carbon filters. This is followed by a polishing system using Barnstead E-Pure cartridges optimized for removal of inorganic constituents. Purity is monitored each day of use, using an on-line electrical resistivity meter while drawing water through the DI system, as well as reading the conductivity of the water with a hand-held conductivity meter.

Mitkem uses several systems to generate analyte-free water for use in the Organics laboratory. These systems generate high quality, analyte free water dedicated to the needs of specific analyses. The extractable organics laboratory uses a Barnstead E-Pure system optimized for removal of organic constituents. The volatile organics laboratory uses an in-house activated carbon filtration system to provide analyte free water. As organic contaminants are not measured by a resistivity meter, this is not relied-upon to monitor the quality of organic analyte-free water. Instead laboratory method blanks are used, typically several per working day, to monitor the acceptability of the water for its intended use. Any analyte detected above (half of) the reporting limit is investigated. If this can be traced to the water purification system as its source, maintenance is performed on the water purification system.

9.4. All purchased equipment, materials, and services must meet either specific method requirements, standard requirements, or project specific requirements. These requirements are documented in the individual analytical or project SOPs. Reagents requirements are specified in the Mitkem SOP, SOP 80.0013 Reagent Purchasing and Tracking. The equipment requirements are specified in the individual methods and SOPs.

Figure 9.2-1
Metals Primary Standard Receipt Logbook – Instrument Laboratory

MITKEM CORPORATION

METALS PRIMARY STD RECEIPT LOGBOOK:INSTRUMENT LAB

DATE REC	PRIMARY STD ID	VENDOR	CATALOG#	LOT #	ANALYTE(S)	REC BY	DATE OPENED	EXPIR. DATE	MITKEM ID

100.0038-08/03

Page: ______

Figure 9.2-2
Semivolatile Primary Standard Logbook – Preparation Laboratory

MITKEM CORPORATION SEMIVOLATILE PREP WORKING STANDARD LOGBOOK

PREP DATE	ANALYTE(S)	PRIMARY STD ID	INITIAL CONC.ug/L	AMT. ADDED ml	FINAL VOL. (ml)	FINAL CONC ug/L	Solvent Name: LOT #	WORKING STD ID	PREP BY	EXP DATE

70.0112-09/03

Reviewed by:______________________

Figure 9.2-3
Pesticide/PCB Primary Receipt Logbook

MITKEM CORPORATION PESTICIDE/PCB PRIMARY STD RECEIPT LOGBOOK

DATE REC	PRIMARY STD ID	VENDOR	CATALOG#	LOT #	CONC.	ANALYTE(S)	REC BY	DATE OPENED	DATE EXPIR.

Lab ID: 60.0019-12/06

Reviewed By: ____________________

Figure 9.2-4
Reagent Preparation Logbook – Inorganic Preparation Laboratory

Mitkem Corporation
Inorganic Laboratory
Reagent Preparation Logbook

Date:____________

Reagent/Analysis	Chemical ID	Chemical Lot#	g/mL	Final Volume (ml)	Diluent	Final Conc.	Reagent ID	Exp. Date	Analyst

Reviewed By:____________

10.0 ANALYTICAL PROCEDURES

MITKEM uses the methods specified in Tables 10-1 through 10-6 unless otherwise specified by the client.

Table 10-1
Potable Water Analytical Methods

Parameter	Method Description	Method Reference
1,2-Dibromo-3-chloropropane 1,2-Dibromomethane	Micro extraction GC\ECD Analysis	504.1

Table 10-2
Non-potable Water Priority Pollutant Analytical Methods

Parameter	Method Description	Method Reference
Metals Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Silver, Thallium, Potassium Vanadium, Zinc, Sodium	ICP	200.7
Mercury	Cold Vapor	245.1
Cyanide Aqueous	Midi-distillation Automated	EPA 335.4
Alkalinity	Titration	SM2320
Anions Chloride Sulfate Nitrate Nitrite Phosphate Bromide	Ion Chromatography	EPA 300.0
Chloride	Colorimetric	EPA 325.2
pH	Electrode	SM4500 H+ B
Sulfate	Turbidimetric	SM4500-SO4 E
Ammonia	Distillation/Nesslerization	SM4500-NH3 B
Nitrate	Autoanalyzer	EPA 353.2
Nitrite	Colorimetric	SM4500-NO2 B
Orthophosphate	Ascorbic, Manual	SM4500-P E
Total phosphate	Persulfate, Manual	SM4500-P B3 & E

Table 10-2
Non-potable Water Priority Pollutant Analytical Methods (cont.)

Parameter	Method description	Method Reference
Chemical Oxygen Demand	Spectrophotometric(Closed Reflux)	SM5220-D
Total Organic Carbon	Combustion	EPA 415.1
Phenols	Distillation, Color, Automated	SM5530 B
Total Dissolved Solids	Gravimetric	SM2540 C
Total Solids	Gravimetric	SM2540 B
Total Suspended Solids	Gravimetric	SM2540 D
Total Settleable Solids	Imhoff cones	SM2540 F
Volatile Organics		
Halocarbons	Purge & Trap, GC/MS	624
Aromatics	Purge & Trap, GC/MS	624
Semivolatile Organics	Extraction, GC/MS	625
Organochlorine Pesticides/ PCBs	Extraction, GC/ECD	608
Oil & Grease	Extraction, Gravimetric	1664

Table 10-3
SW-846 Inorganic Analytical Methods

Parameter	Method Description	Method Reference
Metals		
Aqueous	Acid digestion ICAP analysis	Method 3005A/3010A Method 6010C
Solid	Acid digestion ICAP analysis	Method 3050B Method 6010C
Mercury		
Aqueous	Permanganate digestion Cold Vapor analysis	Method 7470A
Solid	Permanganate digestion Cold Vapor analysis	Method 7471A
Hexavalent Chromium		
Aqueous	Diphenyl Carbazide Colorimetric	SM 3500Cr D
Solid	Acid Digestion colorimetric	Method 3060A/7196A
Cyanide		
Aqueous	Midi-distillation Automated	Method 9012B
Solid	Midi-distillation Automated	Method 9012B
pH		
Solid	Electrode	Method 9045C
Ignitability (Flashpoint)		
Aqueous	Pensky-Martens closed cup	Method 1010
Solid	Pensky-Martens closed cup	Method 1010 Mod.
Reactive Cyanide Solid & Aqueous	Distillation Automated	SW 846 7.3.3.2
Reactive Sulfide Solid & Aqueous	Distillation Colorimetric	SW 846 7.3.4.2

Table 10-3
SW-846 Inorganic Analytical Methods (cont.)

Parameter	Method Description	Method Reference
Toxicity Characteristic Leaching Procedure (TCLP)		
Aqueous	Leachate by Filtration	Method 1311
Solid	Leachate Generation	Method 1311
Synthetic Precipitation Leaching Procedure (SPLP)		
Aqueous	Leachate by Filtration	Method 1312
Solid	Leachate Generation	Method 1312

Table 10-4
SW-846 Organic Analytical Methods

Parameter	Sample Preparation	Sample Analysis
Volatile Organic Compounds		
Aqueous	Method 5030	Method 8260C
Solid	Method 5035	Method 8260C
Semivolatile Organic Compounds		
Aqueous	Method 3510C Method 3520C	Method 8270D
Solid	Method 3540C Method 3550B Method 3545 Method 3570	Method 8270D
Organochlorine Pesticides		
Aqueous	Method 3510C Method 3520C	Method 8081A
Solid	Method 3540C Method 3550B Method 3545 Method 3570	Method 8081A
Polychlorinated Biphenyls (Aroclors and Congeners)		
Aqueous	Method 3510C Method 3520C	Method 8082
Solid	Method 3540C Method 3550B Method 3545 Method 3570	Method 8082
Total Petroleum Hydrocarbons		
Aqueous	Method 3510C Method 3520C	Method 8015M
Solid	Method 3540C Method 3550B Method 3545 Method 3570	Method 8015M

Table 10-4
SW-846 Organic Analytical Methods (cont.)

Parameter	Sample Preparation	Sample Analysis
Herbicides		
Aqueous	Method 8151A	Method 8151A
Solid	Method 8151A	Method 8151A
Toxicity Characteristic Leaching Procedure (TCLP)		
Aqueous	Method 1311	
Solid	Method 1311	
Synthetic Precipitation Leaching Procedure (SPLP)		
Aqueous	Method 1312	
Solid	Method 1312	
Gel Permeation Chromatography (GPC)		
Aqueous	Method 3640A	
Solid	Method 3640A	
Florisil Cleanup		
Aqueous	Method 3620B	
Solid	Method 3620B	
Silica Gel Cleanup		
Aqueous	Method 3630C	
Solid	Method 3630C	
Sulfur Cleanup		
Aqueous	Method 3660B	
Solid	Method 3660B	
Sulfuric Acid Cleanup		
Aqueous	Method 3665A	
Solid	Method 3665A	

Table 10-5
CLP-Type Analytical Methods

Parameter	Method Reference
USEPA CLP Organics	OLM04.3, SOM01.1
USEPA CLP Inorganics	ILM04.1, ILM05.3
USEPA Low Level Organics	OLC03.2
NYS-ASP CLP Organics	ASP 2000/2003 SOW
NYS-ASP CLP Organics	ASP 2000/2003 SOW

Table 10-6
Other Analytical Methods

Parameter	Method Reference
Volatile Petroleum Hydrocarbons	
Aqueous	MADEP VPH 1.1
Solid	MADEP VPH 1.1
Extractable Petroleum Hydrocarbons	
Aqueous	MADEP EPH 1.1
Solid	MADEP EPH 1.1
New York State Total Petroleum Hydrocarbon	
Solid	310.13 Mod.
Extractable Total Petroleum Hydrocarbons	
Aqueous	CT ETPH 99-3
Solid	CT ETPH 99-3
Deisel Range Organics	
Aqueous	ME 4.1.25
Solid	ME 4.1.25
Gasoline Range Organics	
Aqueous	ME 4.1.17
Solid	ME 4.1.17

10.1 Analytical References

1. Analysis of Extractable Total Petroleum Hydrocarbons (ETPH) Using Methylene Chloride Gas Chromatograph/Flame Ionization Detection, Environmental Research Institute, University of Connecticut, March, 1999

2. Analytical Services Protocol, Volume 1-8, New York State Department of Environmental Conservation, 2003.

3. Annual Book of ASTM Standards. Part 31-Water. American Society for Testing and Materials, Philadelphia, PA, 1981.

4. Chemical Characteristics of Marine Samples, API Publications No. 4307, API, Washington, D. C.

5. Federal Register. Vol. 55, No. 61, March 29, 1990

6. Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, 3/83 Revision.

7. The EPA 600 Series. Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, Appendix A, 40 CFR Part 136, Federal Register, Vol. 49, No. 209, 1984.

8. Methods of Soil Analysis. Part 2, Chemical and Microbiological Properties, Second Edition, American Society of Agronomy, Inc., Soil Science Society of America, Inc., Madison, WI, 1982.

9. Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA, Washington, D. C., 1998.

10. Test Methods for Evaluating Solid Waste-Physical/Chemical Methods, SW-846, 3rd Edition Update IV. Office of Solid Waste and Emergency Response, USEPA, Washington, D. C., 1998.

11. USEPA Contract Laboratory Program. Statement of Work for Organic Analysis, USEPA, OLM04.3, OLC03.2, and SOM01.1.

12. USEPA Contract Laboratory Program. Statement of Work for Inorganic Analysis, USEPA, ILM04.1, ILM05.3.

11.0 DATA COLLECTION, REDUCTION, VALIDATION AND REPORTING

11.1 Data Collection:

Most of Mitkem's data is uploaded into the Omega LIMS systems directly from the instruments. The exception is the GC's and GC/MS's in which data is first processed in Target and then uploaded into the LIMS. Mitkem is making progress in that the elimination of the Target reporting will occur in the near future.

Either the instrument analyst or data reporting group will upload the data into the LIMS. The person who performs the upload does a technical review to ensure recoveries of CCVs, MS, MSD, and LCS all seem to be correct. A completeness review is done at this time to ensure all applicable samples have been uploaded for all the necessary analytes.

Next, an employee with a technical background will perform the QA process of the uploaded data. This person is either a supervisor or someone with extensive experience in environmental chemistry. Corrections to the run are made at this step if necessary. When the review is complete, this technical person authorizes the data to be reported by "QA-ing" the run in the LIMS. For a more detailed view of the LIMS uploading/review procedure, see SOP No. 110.0028.

11.2 Data Reduction:

Instrument printouts, computer terminal displays, chromatograms, strip chart recordings and physical measurements provide raw data that are reduced to concentrations of analytes through the application of the appropriate calculations.

Equations are generally given within the analytical methods referenced in Section 10. Data reduction may be performed automatically by computerized data systems on the instrument, manually by the analyst, or by PCs using spreadsheet and/or data base software. This software includes Thru-Put's 'TARGET' for the analyses of organic analytes and Omega LIMS for metals, cyanide and mercury analysis. Currently all OLC analyses are processed and reported through Omega at this time. Mitkem expects that all organic data, both CLP and non-CLP, will be processed completely through the LIMS System during 2006.

11.3 Data Verification:

The verification process requires the following checks to be made on data before they are submitted to the client:

- A completeness inspection is required which ensures that all required data are included in the data packages submitted to the client and that the appropriate signatures are present on the data packages.

- A contract compliance screening to ensure that contractual requirements have been satisfied.

- A consistency check to ensure that nominally identical or similar data appearing in different places within a data package are consistent with respect to value and units.

- A correctness check to ensure that reported data have been calculated correctly or transcribed correctly.

11.4 Data Validation:

Data validation is an essential element of the QA evaluation system. Validation is the process of data review and subsequent acceptance or rejection based on established criteria.

The following analytical criteria are employed by MITKEM in the technical evaluation of data:

- Accuracy requirements.
- Precision requirements.
- Detection limit requirements.
- Documentation requirements.

As in the case of EPA/CLP procedures, data acceptance limits may be defined within the method. As one means of tracking data acceptability, quality control charts are plotted for specific parameters determined in similar, homogeneous matrices. Control limits for non-CLP methods are statistically determined annually as analytical results are accumulated.

Upon completion of the evaluation, the evaluator dates and initials the data review checklist as described in Section 11.5 below.

11.5 Data Interpretation and Reporting:

Interpretation of raw data and calculation of results are performed by a scientist experienced in the analytical methodology. Upon completion of data reduction, the scientist signs for the reported results on the data review checklist. For GC/ECD and GC/MS, a technical peer review is performed using the data processing software prior to form generation.

The laboratory supervisor is responsible for the data generated in that department. The supervisor or other senior technical staff performs an independent review of data and completed report forms. Members of the QA staff also check the results on selected sets of data (usually 10%).

11.5.1 Report Formats:

Mitkem uses a flexible data reporting system where final report format is based on the requirements of the client. The two most common types of data reports generated by Mitkem are Level 2 or "commercial-format" and Level 4 or "CLP-format". Mitkem adapts its data report format, wherever possible, to meet customer requirements. Occasionally reports are generated that are a compromise between "commercial" and CLP-format deliverables or are designed to meet the needs of a particular regulatory format or sampling program.

Commercial data reports are generated using the Omega LIMS or MS EXCEL. For the Omega LIMS system, all instrumental analysis data are uploaded from instruments to the LIMS by electronic data transfer. Non-instrumental analysis data or sample preparation data are manually entered into the LIMS. All manual data entry steps are double-checked to insure they are correct, and instrumental data are spot-checked to insure the proper functioning of the data upload system. For data entered into MS-EXCEL, all the pertinent client information and the analysis results are entered manually. The draft report is subject to a 100% technical and completeness review before it is printed in its final form. All data receive a 100% review before they are released to the client as final.

CLP data reports are generated using specialized software, Thru-Put TARGET for many organics analyses, and the CLP report modules in the Omega LIMS for all inorganic and certain organic analyses. These reports also undergo a 100% review before they are released to the client in their final form.

Records are maintained for all data, even those results that are rejected as invalid.

11.5.2 Data Reporting for Massachusetts Drinking Water Samples:

Drinking water data reports generated for clients in the State of Massachusetts need to be reported on state forms. These reports are sent to the client. The client is responsible for forwarding copies of the report to the regional DEP Offices and local officials.

11.6 Levels of Data Review:

MITKEM employs five (5) levels of data review. These are based on requirements outlined in several government and other environmental analysis programs including the U. S. Army Corps of Engineers, Air Force Center for Environmental Excellence (AFCEE), Naval Facilities Engineering Service Center (NFESC), HAZWRAP, EPA Contract Laboratory Program (CLP), as well as commercial engineering firm programs.

The data review and evaluation process is structured to insure that all data reported to customers has been thoroughly reviewed and approved using a multi-step process designed to identify and correct any error. At any step in the data evaluation and review process, the reviewer has the responsibility and authority to return any data not meeting requirements back to the previous step for re-analysis or correction. No reports are released to the client as final data without successfully passing through each step in the data evaluation and review process. The steps of the data review process are documented, generally using a checklist. Several checklists are used, depending on the type and format of analysis data being reviewed. Any data released prior to the completion of the full review process are released with the statement that the data is preliminary pending final review. The word "Preliminary" is automatically printed on the bottom of all data sheets that are generated prior to completion of data review.

The five levels of data review are detailed in **SOP No. 110.0028**. A Flow chart of the data review process follow in Figure 11.6-1.

11.7 Document Control:

All login sheets, Chains-of-Custody (COC) and Sample Condition Forms (SCF) and other sample transmittal documentation are generated in Sample Receiving. A red Workorder File is initiated to contain all workorder-specific hard copy documents. Samples are signed in/out of the sample receiving area by analysts. In the Prep lab, samples and all pertinent information is recorded into logbooks. Once samples are moved to the instrument lab, the transfer of extracts is documented in the transfer logbook. In the instrument lab, the analysis of extracts is recorded in the instrument run log. All analysis data, including ICAL, CAL and raw data are acquired using computer-controlled instruments, and stored on the hard drive of the computer performing data acquisition. Data are automatically copied to the company file server after acquisition. Organics analysis data are processed using Thru-Put Systems' Target software. This system creates a folder on the file server for each analysis fraction for each work order or SDG. This folder contains raw data, processed analysis results, instrument tune, initial calibration and continuing calibration results as well as a copy of the data processing method used. This allows for long-term archiving and complete reconstruction of the data at any time in the future. Data reporting forms and raw data are printed and arranged with all appropriate sample-preparation logbook page copies for technical review.

Inorganic data files are uploaded into Omega LIMS and reporting forms are printed. The original instrument data files and the processed SDG are stored on the file server where they can later be archived by the LIMS Administrator. Hard copy printouts for reporting forms, instrument data hardcopy output and all associated preparation logbook page copies are assembled for technical data review.

The company file server consists of two separate computers, each with an array of multiple hard disk drives, that are continuously mirrored, such that the failure of any single component or computer will not impact the operation of the system, or the ability to recover data. All new files or data are copied to magnetic tape on a daily basis. On a monthly basis full system back up to tape is performed. Following technical review, and generation of the report narrative results go into the workorder file in data reporting. The original copy of the report is sent to the client. The report is also scanned into an optical file database for long-term archiving. As documents are scanned into the database they are recorded for permanent storage on CD-ROM disks. Mitkem's system includes a "jukebox" to provide access to numerous CD-ROMS on an as-needed basis. All other information associated with the report, including data review checklists are kept in the red workorder file. The workorder files are kept onsite in a storage area for approximately 6 months. The files are then shipped to an offsite storage area where they will remain for a total of 7 years. After this time, the files will be destroyed.

11.7.1 Logbooks:

All logbooks are issued and controlled by the QA Department. Logbooks are given a unique ID that includes the mm/yy the logbook was printed. Laboratory personnel must sign for the logbook when it has been released by the QA Department. When logbooks are complete, the analyst returns them to the QA Department for archiving. At that point, a new logbook is released. The archived logbooks are stored in an on-site storage area for approximately 4-6 months and then are boxed and stored in a locked off-site storage facility. Mitkem will archive logbooks for a minimum of ten (10) years.

11.7.2 Workorder/Data Files:

MITKEM is a secured, limited access building. The doors are secured with a keypad entry system. All hard copy information pertaining to the analysis of samples is maintained and stored in a workorder file folder. This information includes all login sheets, COC, SCF, bench sheets and analytical data. Electronic data are also stored by laboratory workorder number on the company file server, and in the optical file database of completed reports. File folders containing all hard copy data and other workorder information are stored in an off-site storage facility for a total of 7 years. The off-site storage facility is a locked storage area. Access is limited to the CFO or his designee and request to retrieve a file will be made to this person.

In the event Mitkem Corporation changes ownership, the maintenance, control, storage and eventual disposal at the end of the appropriate time period, of all records, including client data and QA/QC files, will transfer to the new owners.

In the event Mitkem Corporation decides to cease operations, clients will be notified prior to the cessation of operations and their files/records will be made available to them. Within a designated time period after notification, the client will be responsible for taking custody and the future maintenance of their records. If the client determines they do not want to maintain the records, these will be disposed of properly.

11.7.3 Standard Operating Procedures (SOPs):

SOPs are prepared by the Lab Supervisor and laboratory personnel in conjunction with the QA/QC Director. The QA Director/Staff downloads a copy of the current SOP to the network. The SOPs can be found in Avogadro/Public/QA Public. In addition a .pdf file of the SOP is located in Avogadro/Public/QA Public/SOP-PDF Versions, for sending to clients or for analyst reference.

The laboratory staff revises the SOPs by making changes to the document that is then reviewed by the department supervisor only if the supervisor is not the party responsible for the revisions. Any additional changes are made at this point.

The QA Department is notified that revisions are completed. The QA Director/Staff moves the revised copy of the SOP to the QA directory, QA Safety/SOPs Needing QA Revision. The QA Director makes changes to the document to include revision number and date and title clarification, if necessary.

The QA Director prints a copy of the SOP that is signed by the Lab Manager or Operations Manager, and the QA Director. Copies of the signed SOP are then made for the relevant departments. Each copy is assigned a control number that is recorded on the SOP cover sheet. Copies are distributed to the relevant departments with a review sheet attached. At this time the old copies of the SOP are collected from the labs and destroyed.. Each analyst who performs any duties related to the SOP must review the new version and sign that he or she has read and understands the material there. The signed review sheets are then returned to the QA Department. The SOP copy is stored in the department for easy reference. A new .pdf file is made to overwrite the "old" version in QA Public/SOP-PDF Versions.

SOP review/revisions occur on an annual basis. . The procedure for preparing, reviewing, approving, revising and distributing SOPs as well as the SOP Revision Schedule are described in SOP No. 80.0012.

Minor changes to the SOP between revision dates can be done by making hand-written changes to the document and its copies. The changes must be initialed by the QA Director and incorporated into the next version SOP. Minor changes are recorded in the Minor Revision Record that is a part of the master copy.

11.7.4 Method Updates:

In most cases it is the laboratory's policy to implement new revisions of frequently used methods within six months of the date the method revision is promulgated or published as a final method. The QA/QC Director and Technical Director make the final decision on when a method revision will be adopted by the laboratory. Additionally, if a client specifically requests or mandates that an "older" method, Mitkem will advise the client that it is not the most recent method. If the client still insists upon the older method, Mitkem will comply and make a note in the narrative.

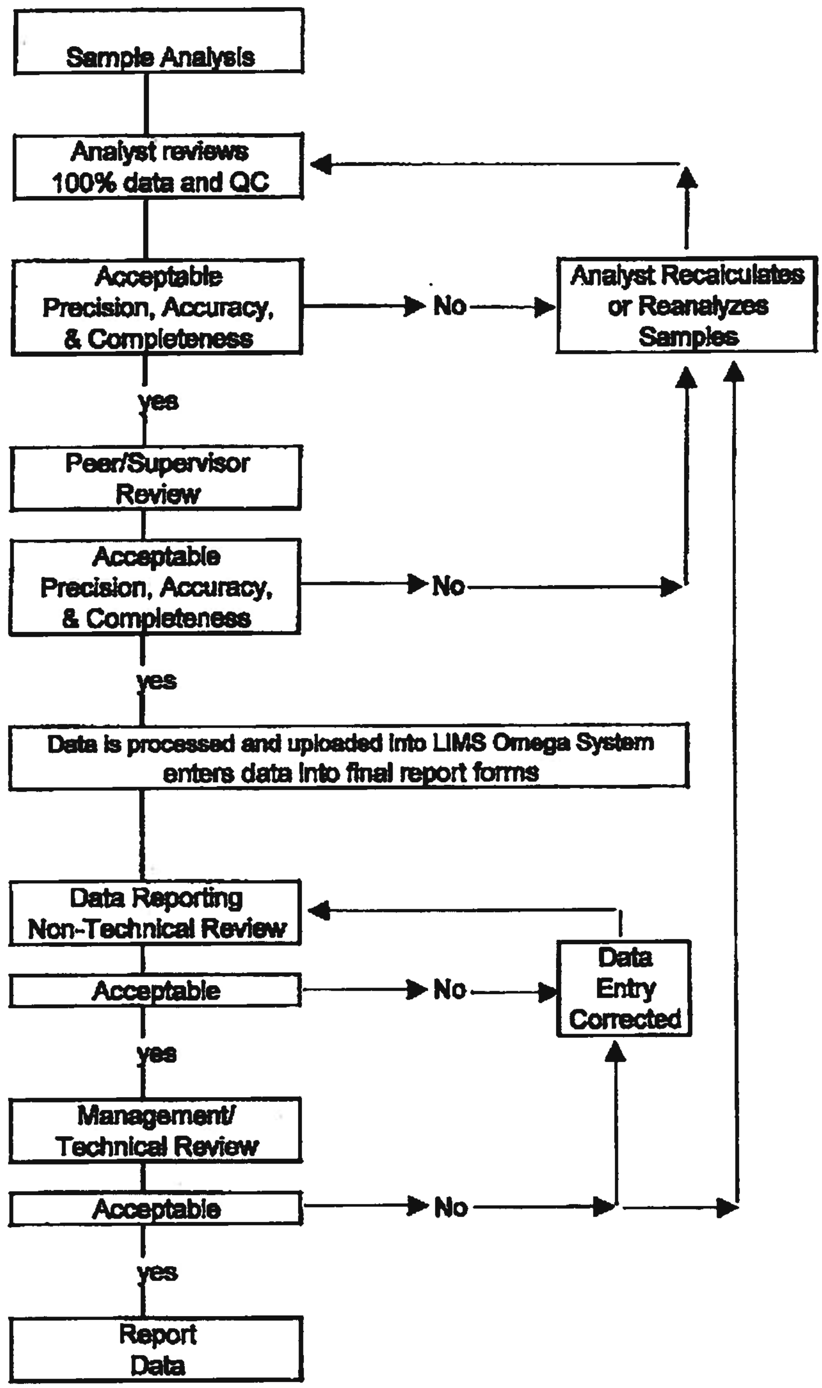
When the laboratory is in the middle of a client's project, the lab will continue using the same revision for the entire sampling event unless advised otherwise by the client. Consequently, once the laboratory has formally adopted a new method revision, both the old and new revision may be in use at the same time, depending on the project.

If a client should not specify which methods to be used, the methods employed by the laboratory shall be fully documented and validated. Additionally, the methods shall be published in a reputable technical journal or text or by a reputable technical organization or instrument manufacturer.

Laboratory-developed methods can be used as long as they have been documented and validated by qualified personnel. In all cases the client should be notified.

Figure 11.6-1
Data Review Flow Diagram

MITKEM CORPORATION
Review Process Flow Diagram



12.0 LABORATORY QUALITY CONTROL CHECKS

MITKEM analytical procedures are based on sound quality control methodology, which derives from three primary sources:

1. Specific EPA and other approved analytical methods, and

2. "Handbook for Analytical Quality Control in Water and Wastewater Laboratories" (EPA 600/4-79-019).

3. Standards for Good Laboratory Practice.

In the application of established analytical procedures MITKEM employs, at a minimum, the QC protocols described in the references found in the Analytical Methods section of this document. Specific projects may require additional quality control measures, due to such factors as difficult sample matrices or use of innovative techniques. For those projects MITKEM will recommend and implement, subject to client approval, QC measures to produce data of known quality.

Each of the MITKEM laboratory departments have an individual QC program, which includes, but is not limited to, the practices described below.

12.1 Method Detection Limit Determination/Verification:

Method Detection Limits are developed annually for certain inorganic and many organic analyses. Per NELAC Standards, MDLs are not required where target analytes are not reported below the lowest calibration standard concentration. For these analyses, results are only reported within the calibration range, and MDLs are not appropriate or needed. For certain inorganic analyses and most organic analyses, Mitkem typically reports analytes below the lowest level of the calibration range, but above the MDL, as estimated and are qualified with the "J" flag. For these analyses MDLs are developed. Mitkem reports estimated values below the calibration range for those analyses where results are able to be confirmed as in dual column confirmation, or by two concurrent determinative tests such as retention time and mass spectra as in GC/MS analyses.

To address special project requirements, MDLs can be determined for those tests which are not routinely reported below calibration range. If a client requests results to be reported below the calibration range without an MDL study, this is clearly identified in the workorder narrative.

Following an MDL study, the determined limits are verified by the analysis of an MDL Verification Standard. This standard is analyzed at approximately 2 to 3 times the calculated MDL.

12.2 Personnel Training:

Chemists who begin their employment at MITKEM are to be instructed under the MITKEM Safety Training Program within the first month. The Safety Training Program includes laboratory basics, safety video and testing, and MSDS instruction.

Before performing any analyses, a chemist is required to read the appropriate protocols and SOPs. The chemist is required to complete an SOP review form which lists all the SOPs he or she has read and understands.

The new analyst must become familiar with the laboratory equipment and the analytical methods, and begins a training period during which he or she works under strict supervision. Independent work is only permitted after the chemist successfully completes an accuracy and precision study.

The study is also commonly referred to as a Demonstration of Capability exercise. Upon the successful completion of the Demonstration of Capability exercise, the QA Department issues a Demonstration of Capability Certificate (DOCC) which is signed by both the QA Director and Operations Manager and filed in the employee's personnel folder, which is stored in the QA Department.

Demonstration of Capability studies require the acceptable recovery of 4 LCS samples for each matrix or the acceptable analysis of a blind spike sample such as a Performance evaluation sample. Acceptance limits are established by the method. It is necessary to pass the study whether for extraction and/or analysis.

Initial and on-going personnel training includes data integrity training. The 4 required elements of the data integrity system include: 1) data integrity training, 2) signed data integrity documentation, 3) in-depth, periodic monitoring of data integrity, and 4) data integrity procedure documentation.

Data integrity training topics will include the need for honesty and full disclosure in all analytical reporting, how and when to report integrity issues and what those issues could be. Employees will understand that infractions of data integrity procedures can result in an investigation that could lead to serious consequences which include immediate termination, and civil or criminal prosecution. At the start of employment all new employees read, discuss and sign a Confidentiality, Ethics and Data Integrity Agreement. Annually, an on-going integrity training session is held. An attendance sheet will be generated for every integrity session.

Data integrity procedures are reviewed and updated annually by senior management.

Training for the EPA Statement of Work occurs according to the above requirements. In addition, analysts are required to read the CLP Statement of Work as a part of the documentation training.

12.3 Control Charts:

For organic and inorganic analyses, the recoveries of analytes in the lab control samples are plotted on control charts. These charts are used to establish control and warning limits.

12.3.1 Control limits are calculated ,compared, and/or updated at least annually from the LCS, MS/MSD, and Surrogate data points for each analyte and matrix using the following equations:

$$Average(\bar{x}) = \frac{\left[\sum_{i=1}^{n} x_i\right]}{n}$$

$$SD = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}}$$

In which:

SD = Standard Deviation
N = number of data points

Warning Limits = Average ± 2 * SD

Control Limits = Average ± 3 * SD

12.3.2 Control limits must be approved by the QA/QC Director and by the Technical Director or Operations Manager prior to adoption by the laboratory. In the event that limits are wider than method recommended limits, the method recommended limits may be adopted and the analytical procedure will be re-evaluated and/or re-determined to identify possible causes. Additionally, in the event that control limits are tighter than 15% from the average, the lab may adopt a control limit of ±15% from the average. If in the experience of the laboratory, statistical control limits are unreasonably wide or narrow, alternative limits may be used until appropriate statistical limits are developed. Alternative limits are based on sources such as Department of Defense Quality Systems Manual published guidelines, EPA limits from the specific test method or from similar methods, laboratory experience with the method or other sources.

12.3.3 Control charts are plotted in EXCEL using the Omega LIMS system.

Data from each laboratory is uploaded into the LIMS. The compounds, recoveries, and date analyzed for each test are recorded in the system. In order for LIMS generated control limits to be valid, all data, including data not meeting existing recovery criteria, must be uploaded. As the laboratory uploads data for a wider range of tests, control charts will be available for these tests. Control charts may be generated for each analyte in the inorganic department to include both metals and wet chemistry parameters, and for a representative sampling of analytes in the organic sections. Each control chart is then printed for review by the QA/QC Director and by the Lab Supervisor. Out of control situations noted on the control chart are discussed with the Supervisor or Technical Director by the QA/QC Director.

An example control chart is presented as Figure 12.3-1. LCS data must be reviewed and evaluated daily against the Control Limits to establish that the system is in control.

12.3.4 The following situations constitute an out of control situation on a control chart:

- One data point above or below the Control Limit line.
- Two consecutive data points above or below the Warning Limit line.
- Six or more consecutive data points above the Average Line or six or more consecutive data points below the Average Line. This situation suggests a trend and suggests the procedure has been changed in some way (for better or worse). The cause for this trend must be investigated.

12.4 General QC Protocols:

12.4.1. Organics Laboratory:

- Trip blanks and holding blanks, when applicable, are analyzed to detect contamination during sample shipping, handling and storage.
- Method blanks, at a minimum of one in every 20 samples, are analyzed to detect contamination during analysis.
- Volatile organic method blanks are analyzed once during each analytical sequence.
- One blank spike (Laboratory Control Sample or LCS) consisting of an analytical sample of laboratory water, anhydrous sodium sulfate, or Ottawa sand with every batch of 20 or fewer samples, is analyzed to determine accuracy.
- Sample spikes and spike duplicates, as requested, are analyzed to determine accuracy and the presence of matrix effects. The Relative Percent Difference (RPD) is also determined for matrix spike/matrix spike duplicates to measure precision. The criteria followed are stated in the individual methods. For batches without a sample duplicate (for example, if insufficient sample volume is provided), a duplicate blank spike (LCSD) is performed to provide for precision measurement.
- Performance evaluation samples from EPA and state agencies are analyzed to verify continuing compliance with EPA QA/QC standards.
- Surrogate standards are added to samples and calculations of surrogate recoveries are performed to determine matrix effect and extraction efficiency.
- Internal standards for GC/MS analysis are added to sample extracts to account for sample-to-sample variation.
- GC analysis of EPA traceable standards to verify working standard accuracy and instrument performance.
- Initial multi-level calibrations are performed to establish calibration curves.
- Instrument calibration is established or verified with every analytical sequence.

- Tuning of GC/MS systems once every 12 hours for CLP and SW-846 methods or 24 hours for methods 624/625 to method specifications is implemented for consistency in data generation.

When QC limits are not met during an analytical run, the source of the problem must be investigated. Following an evaluation of the data, those samples affected must be re-analyzed after the problem has been solved. If QC limits continue to be out of control, the instrument must be checked and/or a service call made and/or further corrective action implemented.

12.4.2. Inorganic Laboratory:

- Trip blanks are analyzed when applicable, to detect contamination during sample shipping, handling and storage.
- Method blanks are analyzed at a minimum of one every 20 samples, to detect contamination during analysis.
- One matrix spike of an analytical sample or laboratory water or soil is made and spike recoveries are calculated with every batch up to 20 samples to determine accuracy. Duplicate samples are analyzed and the RPD between the sample and duplicate is calculated for every batch up to 20 samples. If insufficient volume of sample is received, a note is made in the appropriate preparation logbook.
- Performance evaluation samples from EPA and state agencies are analyzed to verify continuing compliance with EPA QA/QC standards.
- Metals analysis instruments are calibrated for every analytical run.
- QC/LCS checks samples are analyzed during every analytical batch of up to20 samples in order to document accuracy.

When QC limits are not met during an analytical run, the source of the problem must be investigated. Following an evaluation of the data, those samples affected must be re-analyzed after the problem has been solved. If QC limits continue to be out of control, the instrument must be checked and/or a service call made and/or further corrective action implemented.

12.5. Lab Pure Water used for method blanks and dilutions:

Mitkem uses several systems to generate analyte-free water for use in the laboratory. These systems generate high quality, analyte free water dedicated to the needs of specific analyses.

12.5.1. For inorganic analyses Mitkem uses a US Filter mixed-bed deionization system followed by particle and carbon filters. This is followed by a polishing system using Barnstead E-Pure cartridges optimized for removal of inorganic constituents. Purity is monitored using an on-line electrical resistivity meter.

12.5.2. For organic analyses,the extractable organics laboratory uses a Barnstead E-Pure system optimized for removal of organic constituents. The volatile organics laboratory uses an in-house activated carbon filtration system to provide analyte free water. As organic contaminants are not measured by a resistivity meter, this is not a relied-upon method to monitor the quality of organic analyte-free water. Instead, laboratory method blanks are used, typically several per working day, to monitor the acceptability of the water for its intended use. Any analyte detected above (half of) the reporting limit is investigated. If this can be traced to the water purification system as its source, maintenance is performed on the water purification system.

Figure 12.3-1
Example Control Chart

Mitkem Corporation

REC QUALITY CONTROL CHART

Date: *20-Dec-06*

Test Code: **SW8260B_W** **Analyte:** **BROMOFLUOROBENZENE**

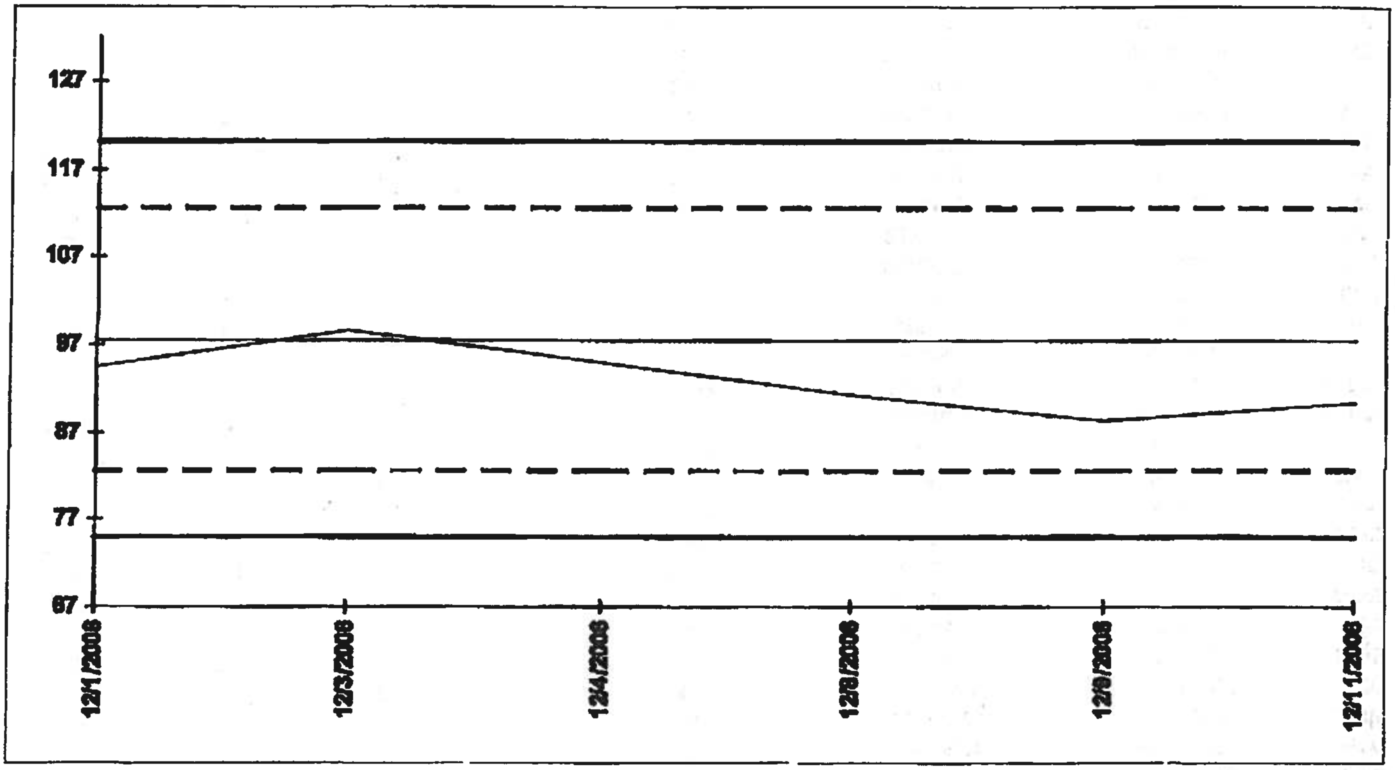
SampType	Sample ID	Analysis Date	Batch ID	Low Limit	High Limit	% Recovery
SAMP	E1838-08A	12/1/2006	27316	75	120	92.6
SAMP	E1838-06A	12/1/2006	27316	75	120	96.9
SAMP	E1838-05A	12/1/2006	27316	75	120	91.7
MBLK	MB-27333	12/3/2006	27333	75	120	92.6
LCS	LCS-27333	12/3/2006	27333	75	120	104.3
SAMP	E1838-01A	12/3/2006	27333	75	120	96.2
SAMP	E1838-03A	12/3/2006	27333	75	120	100.7
SAMP	E1838-02A	12/3/2006	27333	75	120	97.6
SAMP	E1838-04A	12/4/2006	27340	75	120	76.1
SAMP	E1838-07A	12/4/2006	27340	75	120	106.1
LCS	LCS-27340	12/4/2006	27340	75	120	102.2
MBLK	MB-27340	12/4/2006	27340	75	120	95.7
MBLK	MB-27441	12/8/2006	27441	75	120	90.4
SAMP	E1878-04A	12/8/2006	27441	75	120	89.6
SAMP	E1879-05A	12/8/2006	27441	75	120	89.3
SAMP	E1879-04A	12/8/2006	27441	75	120	90.4
SAMP	E1879-03A	12/8/2006	27441	75	120	89.5
SAMP	E1879-02A	12/8/2006	27441	75	120	88.6
SAMP	E1879-01A	12/8/2006	27441	75	120	87.6
SAMP	E1878-07A	12/8/2006	27441	75	120	88.4
SAMP	E1878-06A	12/8/2006	27441	75	120	90.0
SAMP	E1878-05A	12/8/2006	27441	75	120	89.1
SAMP	E1879-06A	12/8/2006	27441	75	120	89.3
LCSD	LCSD-27437	12/8/2006	27437	75	120	97.4
MBLK	MB-27437	12/8/2006	27437	75	120	93.1
LCSD	LCSD-27441	12/8/2006	27441	75	120	91.4
SAMP	E1871-04A	12/8/2006	27437	75	120	98.9
SAMP	E1878-03A	12/8/2006	27441	75	120	89.2
SAMP	E1871-02A	12/8/2006	27437	75	120	92.7
SAMP	E1871-03A	12/8/2006	27437	75	120	92.3
SAMP	E1871-01A	12/8/2006	27437	75	120	91.8
LCS	LCS-27441	12/8/2006	27441	75	120	92.3
SAMP	E1878-02A	12/8/2006	27441	75	120	89.3
LCS	LCS-27437	12/8/2006	27437	75	120	96.9
SAMP	E1879-07A	12/9/2006	27441	75	120	88.2
SAMP	E1843-02A	12/11/2006	27471	75	120	90.7
MBLK	MB-27471	12/11/2006	27471	75	120	89.6
LCS	LCS-27471	12/11/2006	27471	75	120	92.7
LCSD	LCSD-27471	12/11/2006	27471	75	120	90.9
SAMP	E1878-01A	12/11/2006	27471	75	120	87.2

Mitkem Corporation **REC QUALITY CONTROL CHART**

Date: 20-Dec-06

Test Code: SW8260B_W Analyte: BROMOFLUOROBENZENE

SampType	Sample ID	Analysis Date	Batch ID	Low Limit	High Limit	% Recovery



13.0 QUALITY ASSURANCE SYSTEMS AUDITS, PERFORMANCE AUDITS AND FREQUENCIES

The MITKEM Quality Assurance Director and/or staff performs routine internal audits of the laboratory. The frequency of such audits depends on the workload in-house but is done annually, at a minimum. The audits entail reviewing laboratory logbooks and all appropriate operations to ensure that all laboratory systems including sample control, analytical procedures, data generation and documentation meet contractual requirements and comply with good laboratory practices.

13.1 System Audits:

The QA/QC Director audits each individual laboratory annually in order to detect any sample flow, analytical or documentation problems and to ensure adherence to good laboratory practices as described in MITKEM's Standard Operating Procedures and Quality Assurance Plan. An example checklist used in an internal systems audit at MITKEM is presented in Figure 13.1-1.

Areas covered by the internal audit include logbook documentation and review, standard traceability, standard storage and expiration dates, method criteria adherence, instrument maintenance records, SOP review, and knowledge/training of the analysts. Often, deficiencies that have been noted during "outside" audits and outstanding Corrective Actions will also be reviewed.

Upon the completion of the internal audit, a formal audit report is presented to the laboratory supervisor who is given a specific timeframe to respond in writing regarding the deficiencies. The QA Department will do a follow up audit to check that at least the major deficiencies have been corrected. The follow-up audit occurs within 30-45 days from the date of the lab's audit response.

13.2 Performance Audits:

MITKEM participates in external Performance Test (PT) studies under the National Environmental Accreditation Program (NELAP) through the State of New Jersey (Mitkem Laboratory's Primary Accreditation Authority). The QA department of the laboratory administers the Performance Evaluation Samples for Wastewater/Solid Waste (WW/SHW). The Performance Evaluation Samples generally follow a quartely schedule, with wastewater alternating with soil/solid waste.

Several times a year outside agencies (federal, state, or private) may schedule an audit at Mitkem in order to check the laboratory's processes. Most often these audits begin and end with a meeting between auditors and laboratory management. Each individual laboratory is then examined. The QA Department and/or Senior Management Staff are most likely to remain with the auditors at all times during the audit.

Sometime after the audit, Mitkem receives a formal written audit report to which it must respond. The audit report is initially reviewed by the QA Director who may copy and distribute the report to each laboratory supervisor. In several instances, the report is sent electronically and supervisors may receive an electronic version. The supervisors are required to respond to the findings that pertain to his or her department. The QA Director compiles the formal corrective action plan that may undergo several revisions before the auditing authority accepts it.

The QA Director then sends a memo to each supervisor to detail what needs to be done in each department within a specific timeframe. The QA Department then follows up with the labs to ensure procedures have been modified and the corrective actions are in place. In some instances, a LIMS corrective action report is also initiated as a result of an audit finding.

Internally, performance is monitored on a daily basis at MITKEM through the use of surrogate standards, LCS, and MS/MSD samples. Check samples from independent commercial sources are employed routinely in each of the MITKEM laboratory departments and ensure continuing high-level performance. The QA Director may distribute internal blind PE samples to each laboratory department. These blind PE samples can also be used to show on-going analyst proficiency in lieu of 4 LCS studies.

Figure 13.1-1
QA Systems Audit Checklist

Quality Assurance Department
Mitkem Corporation
Warwick, RI

Laboratory Audit Checklist

Date: ______ Auditor: ____________ Department: ______________

Category:

1. Facility

Adequate ventilation ____

____

____

Adequate work areas, counter space ____________________________

____

Chemical storage areas Acids, Flammables ________________________

____

____

Eyewash, showers, inspected? ____________________________________

Tanks Secured ____

Hoods calibrated, adequate ______________________________________

2. Personnel

Do analysts follow the SOP?					Yes / No
Do analysts do an initial demonstration of proficiency study?					Yes / No
Are analysts adequately trained and knowledgeable?					Yes / No

Wearing appropriate PPEs ____

____

Dressed appropriately ____

____

Trained in procedure, training documented? _________________________

____

____

____

Passed proficiency Documented?____

3. SOPs

Standard Operating Procedures					
Are the general SOPs updated annually?					Yes / No
Are SOPs updated annually for each analytical method?					Yes / No
Are SOPs controlled documents?					Yes / No
Are SOPs signed by appropriate individuals?					Yes / No

Notes

4. Chemicals

Labeled correctly?____

Chemicals stored correctly?

Standard ID # ____

Standards traceable?

Are standards QC'd against a second source after each ICAL?				Yes / No
Are standards traceable throughout the lab?				Yes / No
Are expired standards present in the lab?				Yes / No
Is there a defined system for assigning expiration dates?				Yes / No
Is standard freezer temperature monitored?				Yes / No

Notes

5. Logbooks

Does a run logbook exist for each analytical instrument?	Yes / No
Does an instrument maintenance log exist for each instrument?	Yes / No
Are logbooks peer reviewed weekly?	Yes / No
Proper correction techniques?	Yes / No
Empty spaces "z"'d out?	Yes / No
Paginated?	Yes / No
Controlled?	Yes / No
Do logbooks contain all pertinent information to the procedure?	Yes / No
(I.e., method, matrix, reagent lot #, etc.)	

Check good for documentation ______________________________

____

____

Clear, legible, corrections complete______________________________

____

In-dated,______________________________

____

____

6. Equipment

General_Laboratory_Equipment	
Is an NIST traceable thermometer available?	Yes / No
Are lab thermometers calibrated annually against the NIST thermometer?	Yes / No
Are correction factors in use on lab thermometers?	Yes / No
Are Class "S" weights calibrated NIST every 2 years?	Yes / No
Are balances serviced annually?	Yes / No
Are balances calibrated as needed and the calibration recorded?	Yes / No
Is balance calibration acceptance criteria clearly defined and posted?	Yes / No

Maintenance ______________________________

____

Preventive maintenance ______________________________

Calibrated:
Scales ______________________________

Thermometers ______________________________

Hoods ______________________________

Syringes ______________________________

Timers ______________________________

Equipment stored correctly, Glassware, syringes, tools etc.

____

____

____

____

____

:

Analytical_Methods				
Is ICAL documentation maintained on file in the lab?				Yes / No
When %RSD > 15%, is the average adopted?				Yes / No
Is a CCV run at the end of the analytical sequence? (USACE)				Yes / No
Is a Method Blank analyzed after each CCV?				Yes / No
Does analyst review data for false negatives?				Yes / No

14.0 PREVENTIVE MAINTENANCE

Preventive maintenance is a routine practice at MITKEM for all instrumentation. Scheduled preventive maintenance minimizes instrument downtime and subsequent interruption of analysis. All major instrumentation is under service contracts so that downtime (due to catastrophic events) is minimized.

Only those equipment items meeting or exceeding applicable performance requirements are used for data collection. This includes items such as laboratory balances as well as major analytical instruments such as ICPs, GCs and GC/MSs.

MITKEM's laboratory personnel are familiar with the routine and non-routine maintenance requirements of the instruments they operate. This familiarity is based on education, hands-on experience and manufacturer's training courses.

GC Maintenance:

1. The injection septum will be replaced once approximately fifty (50) injections or earlier if a leak develops.

2. The injection liner will be replaced once approximately fifty (50) injections or when initial and/or continuing calibrations fails repeatedly to meet method requirements.

3. The gold seal will be replaced except for septum and liner, and the column will be trimmed whenever an initial calibration is run.

4. The column will be replaced if chromatograms show excessive peak tailing and/or initial and continuous calibration verifications fail repeatedly to meet method requirements.

GC/MS Maintenance:

1. GC injector and liner are cleaned daily for semivolatiles and monthly for volatiles.

2. The column will be replaced if chromatograms show excessive peak tailing and/or initial and continuous calibration verifications fail repeatedly to meet method requirements.

3. The ion source will be cleaned when initial and/or continuing calibration repeatedly fail method specified criteria.

4. The pump oil will be replaced once a year.

ICAP Maintenance:

1. Peristaltic pump tubing will be replaced every sixteen (16) hours of instrument time or sooner when memory effects are manifested.

2. The plasma torch is cleaned with (aqua regia) every 1-2 weeks. If memory effects are manifested the torch will be cleaned immediately.

3. The sample introduction (spray chamber and nebulizer) is cleaned every 2-3 weeks.

4. Air filters are cleaned each time the torch is cleaned or as needed upon visual inspection.

5. Once every six (6) months, under service contract, the instrument undergoes extensive maintenance by a manufacturer's service engineer.

Mercury FIMS 100 Maintenance:

1. Pump tubing is replaced every 48 hours of instrument run time.

2. Sample loops, gas tubing extensions and sample capillaries are replaced as needed.

Lachat 8000 Maintenance:

1. All pump tubing is replaced every 48 hours of instrument run time.

2. Auto sampler arm is lubricated every 48 hours of instrument run time.

3. The manifolds, tubing connections, valves, etc. are cleaned or replaced as needed.

TCLP/SPLP Tumbler Maintenance:

1. The tumbler is checked at every use for number of rotations per minute (30rpms), the ambient temperature checked and documented in the RPS Logbook.

2. If the tumbler is not spinning at 30rpms, motor is cleaned and oiled.

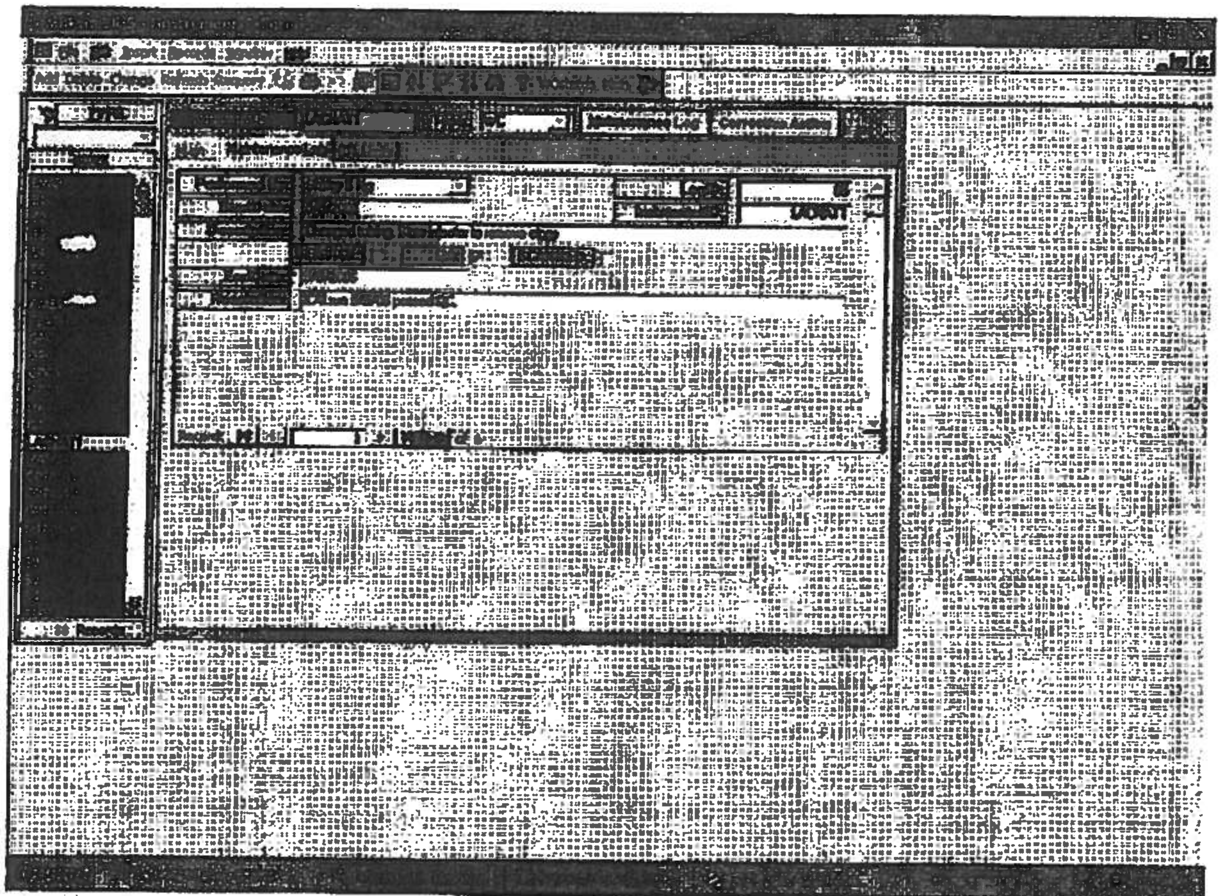
3. If tumbler is not spinning at 30rpms after maintenance, the motor will be replaced.

Instrument maintenance logs are kept for each instrument in the OMEGA LIMS System (figure 14-1). All employees have access to the LIMS system. The person performing the maintenance is required to provide the following information in the online log:

- Equipment identifier
- The inspection, maintenance, calibration or corrective action(s) performed.
- The trigger(s) for the maintenance action(s)
- The identity of the person(s) performing the maintenance
- The date on which the work was performed, and
- The condition of the equipment upon completion of the work.

MITKEM maintains an inventory of replacement parts required for preventive maintenance and spare parts that often need replacement, such as filaments for GC/MS systems and the more mundane electrical fuses and GC column ferrules. To control cost, the appropriate supervisor shall decide the types and numbers of spare parts kept on hand for each equipment item.

Figure 14-1



Example of Instrument Maintenance Log

Figure 14-2
Instrument Maintenance Schedule

Figure 14-2

MITKEM CORPORATION

Preventive Maintenance Schedule

Instrument	Activity	Frequency
Gas Chromatograph (GC)	Injection septum replaced	Every 50 injections
	Injection liner replaced	Every 50 injections
	The column will be replaced if chromatograms show excessive peak tailing and/or initial and continuing calibration verifications fail repeatedly to meet method requirements.	As needed
GC/MS	GC injector and liner replaced	Daily
	The column will be replaced if chromatograms show excessive peak tailing and/or initial and continuing calibration verifications fail repeatedly to meet method requirements.	As needed
	The ion source will be cleaned when initial and/or continuing calibration repeatedly fail method specified criteria.	As needed
	The pump oil is replaced.	Annually
Inductively Coupled Plasma (ICP)	Peristaltic pump tubing is replaced	Every 16 hours of instrument run time
	The plasma torch is cleaned (aqua regia).	Weekly
	The sample introduction (spray chamber and nebulizer) is cleaned	Weekly
	Air filters are cleaned.	Biweekly
	The instrument undergoes extensive maintenance by the manufacturer's service engineer.	Semiannually
Mercury FIMS 100	Pump tubing is replaced	Every 48 hours of instrument run time
	Sample capillary and tubing are replaced	Every 48 hours of instrument run time
	Inside of optical cell is cleaned	Every 48 hours of instrument run time
Lachat 8000	All pump tubing is replaced	Every 48 hours of instrument run time
	Autosampler arm is lubricated	Every 48 hours of instrument run time
	The instrument undergoes extensive maintenance by the manufacturer's service engineer.	Semiannually

15.0 SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, COMPLETENESS, METHODS DETECTION LIMIT AND LINEAR DYNAMIC RANGE

These mathematical equations represent the means of calculating analytical figures of merit on a routine basis at MITKEM. However, they may be supplanted with other calculations if requested by the client. Precision, accuracy and completeness are also discussed in Section 6.

15.1 Precision:

Precision is frequently determined by the comparison of replicates, where replicates result from an original sample that has been split for identical analyses. Standard deviations, *s*, of a sample are commonly used in estimating precision.

Sample standard deviation, *s*:

$$s = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2}$$

where a quantity, x_i (e.g. a concentration), is measured *n* times with a mean, $\bar{x}$.

The relative standard deviation, *RSD* (or sample coefficient of variation, *CV*), which expresses standard deviation as a percentage of the mean, is generally useful in the comparison of three or more replicates (although it may be applied in the case of n = 2).

$$\%RSD = 100\,(s / \bar{x})$$

or

$$CV = 100\,(s / \bar{x})$$

In which: *RSD* = relative standard deviation, or
CV = coefficient of variation
s = standard deviation
$\bar{x}$ = mean

For duplicates (samples that result when an original sample have been split into two for identical analyses), the relative percent difference (*RPD*) between the two samples may be used to estimate precision.

$$RPD = \frac{2(D_1 - D_2)}{(D_1 + D_2)} \times 100\%$$

In which: D_1 = first sample value
D_2 = second sample value (duplicate)

15.2 Accuracy:

The determination of accuracy of a measurement requires knowledge of the true or accepted value for the signal being measured. Accuracy may be calculated in terms of bias as follows:

$$Bias = X - T$$

$$\%Bias = 100\frac{(X - T)}{T}$$

In which: X = average observed value of measurement
T = "true" value

Accuracy also may be calculated in terms of the recoveries of analytes in spiked samples:

$$\%\mathrm{Recovery}(\%R) = 100 \times \frac{(SSR - SR)}{SA}$$

where: SSR = spikes sample result
SR = sample result
SA = spike added

15.3 Completeness:

Determine whether a database is complete or incomplete may be quite difficult. To be considered complete, the data set must contain all QC check analyses verifying precision and accuracy for the analytical protocol. Less obvious is whether the data are sufficient to achieve the goals of the project. All data are reviewed in terms of goals in order to determine if the data set is sufficient.

Where possible, the percent completeness for each set of samples is calculated as follows:

$$\%\text{Completeness} = \frac{\text{valid data obtained}}{\text{total data planned}} \times 100$$

15.4 Method Detection Limit:

The method detection limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is not zero. It is computed as follows from data obtained by repeatedly determining an analyte in a given sample matrix:

1. Analyze at least seven samples of a homogeneous matrix spike that contains the analyte(s) of interest at concentrations of three to five times the expected MDL. The entire sample preparation and analysis protocol must be applied in each analysis; simply preparing one sample and repeating a measurement three or more times on the sample in not acceptable.

2. Upload the acceptable data into LIMS Omega.

3. The LIMS will compute the standard deviation of the results for each analyte using the following equation:

$$\mathrm{MDL} = t_{(n-1,\ \alpha=0.99)}\ (s)$$

Where t is the one-sided student's t value appropriate for the number of samples analyzed, n; α is the statistical confidence level; and s is the standard deviation.

The one-sided t-values are presented below:

Number of samples	t-value
7	3.14
8	2.996
9	2.90
10	2.82

4. The MDL is then checked against 40CFR136 requirements by the QA Department. If the MDL is acceptable then it is uploaded into the LIMS by either the QA Department or LIMS Administrator.

5. Immediately following the determination of the MDL, MDL check samples are analyzed at a concentration approximately equal to 2 x the new MDL. The analyte of interest must be detected at this concentration, or the MDL may require raising.

6. An elevated MDL can be uploaded if necessary into the LIMS as long as documentation is available to show that the applicable method can produce an MDL at least that low. This can commonly occur for ICP

analysis in which extremely low MDLs can cause method compliance issues.

15.5 Linear Dynamic Range:

The linear dynamic range is the concentration range over which the instrument response is linear. It is determined by analyzing a series of standard solutions that extends beyond the non-linear calibration region at both the low and high extremes, and selecting that range of standards which demonstrates a linear relationship between instrument response and concentration.

For ICP analysis, the linear dynamic range is determined by analyzing each metal at 3 different concentrations. The concentration which produces results within a 10% error is determined to be the linear dynamic range. This procedure must be performed per individual method requirements.

ILM5.3 requires the analysis of the linear dynamic range be determined quarterly, with a 5 % error.

16.0 CORRECTIVE ACTION

An essential element of the QA Program, Corrective Action provides systematic, active measures taken in the resolution of problems and the restoration of analytical systems to their proper functioning.

Corrective actions for laboratory problems are described in MITKEM Corporation laboratory standard operating procedures. Personal experience often is most valuable in alerting the bench scientist to questionable results or the malfunctioning of equipment. Specific QC procedures are designed to help the analyst determine the need for corrective actions (see Section 11, Data Reduction, Validation and Reporting). Corrective actions taken by scientists in the laboratory help avoid the collection of poor quality data. Mitkem's corrective action program divides these issues into routine and non-routine corrective actions as described below.

Routine Corrective Action – A routine corrective action is taken when the out-of-control event encountered is one that is detected at the appropriate level in the QA process. Routine corrective actions are defined in the analytical SOP with specific steps to be taken as corrective action (i.e., low surrogate recovery, continuing calibration verifications, project specific protocols that do not meet acceptance criteria, etc.) Routine corrective actions must be documented as described in the analytical SOP, but do not require further documentation in the corrective action logbook. Examples of routine corrective action situations: surrogate/surrogates out, LCS out, CCV out, ICV out, IS area/areas out, typographical errors, random blank contamination, or false positive hit/spectral ID match corrected during data review.

Non-Routine Corrective Action – A non-routine corrective action is taken when the out-of-control event encountered is not typical for the method. For example, QC failures that pass through the final review to the client, procedural errors – not following the SOP, or a situation not being detected by normal QA procedures that could adversely impact the accuracy, precision, etc. of a result. Non-routine corrective actions must be documented in the Corrective Action Request (CAR) logbook. The analyst, using his/her own judgement, may deem any corrective action situation non-routine and formally document it on a CAR. When in doubt about a corrective action, the analysts are instructed to err on the side of formal CAR documentation. Examples of non-routine corrective action situations include: bad standard, expired standard mix being used, incorrect equation, "client-detected" problems, not following SOP protocols, using bad or contaminated lot of chemical/reagent/solvent, deciding to release data not conforming to SOP requirements, compound retention time outside of range, or improper library spectrum that leads to re-occurring mis-identification of compounds.

The essential steps in MITKEM Corporation corrective action system are:

1. Identify and define the problem.

2. Assign responsibility for investigating the problem. Usually this individual is the department supervisor.

3. Investigate and determine the cause of the problem.

4. Determine a corrective action to eliminate the problem and prevent recurrence. Any changes that result from the corrective action investigation must be documented.

5. Assign and accept responsibility for implementing the corrective action.

6. Establish effectiveness of the corrective action and implement it.

7. Verify that the corrective action has eliminated the problem.

8. Both the laboratory and the QA Department need to monitor the corrective action to ensure it is effective.

9. Any corrective actions that cast doubt on the laboratory's compliance with its own policies and procedures may require an internal audit by the QA Department.

This scheme is generally accomplished through the use of Corrective Action Report Forms available to each of MITKEM's laboratories within the OMEGA LIMS system. Use of this report notifies the QA Department of a potential problem as described in SOP No. 80.0007. The QA Director initiates the corrective action by relating the problem to the appropriate laboratory managers and/or project managers who then investigate or assign responsibility for investigating the problem and determine its cause. Once determined, the QA Director will approve appropriate corrective action. Its implementation is later verified through and internal laboratory audit. Once the QA Director feels the system has returned to control, s/he will finalize the CAR using a password protected QA step.

Information contained on corrective action forms is kept confidential within MITKEM and is generally limited to the individuals involved. Severe problems and difficulties may warrant special reports to the President of MITKEM who will ensure that the appropriate corrective actions are taken.

Nonconformance:

Any breech of standard protocols is a nonconformance item that is documented on the Corrective Action Request Form and management informed immediately. The following are nonconformance items:

1. Sample holding time exceeded.

2. Hoods, Class "S" weights, NIST Thermometers, balances, automatic pipettes, being used but not certified.

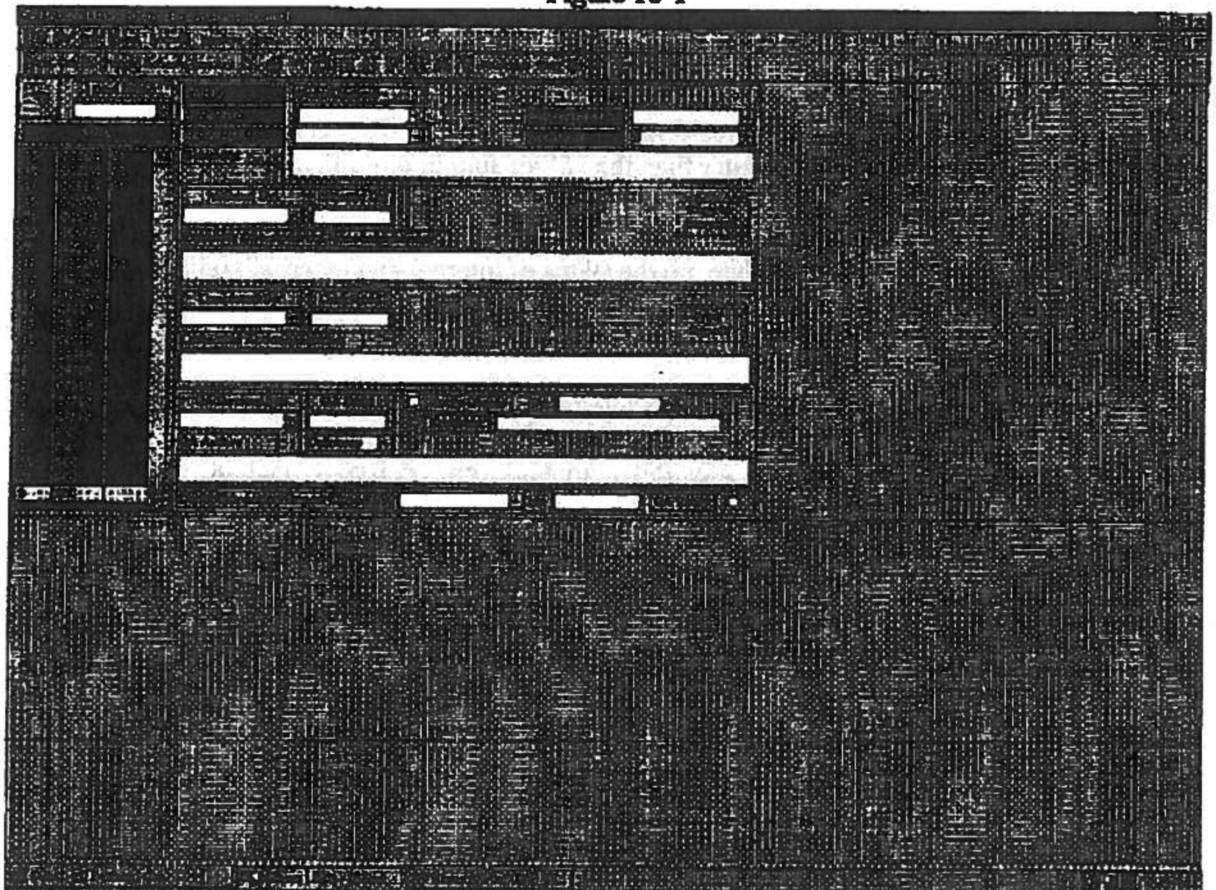
3. Expired standards being used.

4. Manual integration being misrepresented.

16.1 Client Complaints:

Mitkem Corporation ensures client complaints are dealt with quickly and completely. The policies are stated in the laboratory Client Complaint Standard Operating procedure (SOP No. 80.0002).

Figure 16-1



Quality Assurance Corrective Action Request Form

17.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

The MITKEM Quality Assurance Director submits a QA report annually to the Operations Manager and the President of the Laboratory. The report should be completed and submitted no later than the 15th of July in any calendar year.

The report contains detailed laboratory information and QA activities during the previous twelve months. Items to include are the status of internal and external audits, client complaints, quality control activities, resources and staffing. See the following pages for the report format.

Management will review the QA report and respond to outstanding issues. Management will add a review of the suitability of policies and procedures, and any other relevent issues. The response report is due within 30 days of the QA Report receipt.

A copy of the report is kept on file in the QA department.

In case of a severe problem or difficulty, a special report is prepared by the QA Director and submitted immediately to management.

MITKEM CORPORATION
Annual Quality Assurance Report to Management

1. <u>Status of Internal Audits</u>.

2. <u>Status of External Audits</u>

3. <u>Identification of Quality Control issues in the laboratory</u>.

4. <u>Discussion of corrective action issues</u>.

5. Proficiency Testing.

6. Changes in volume and type of work undertaken.

7. Client Feedback.

8. Reports from management and supervisory personnel.

18.0 SAFETY

MITKEM maintains safety program managed by the Health and Safety Officer and the Safety Committee. Responsibilities include many aspects that comply with the Right-to-Know Laws. Training includes:

- Training seminars with information on OSHA safety instruction for new employees.
- Introductory training to include location of fire extinguishers, first aid supplies, etc.
- Chemical Hygiene Plan/Health and Safety manual review when hired initially and then annually thereafter.
- Monthly Safety Committee meetings.
- Centralized MSDS information.
- Maps with safety equipment and all exits noted.
- Posted safety rules.

If a chemical spill occurs, proper actions are described in Mitkem's Contingency Plan. Each department at Mitkem has its own copy of the Contingency Plan. Additionally, the local fire department (Warwick) and hospital (Kent County) also have a copy in case a need arises. All employees are required to review the plan when hired.

Emergency equipment, such as spill control kits, fire extinguishers and fire blankets are located throughout the laboratory areas. The Contingency Plan has instructions for evacuation, notification of emergency authorities and regulatory personnel in the event of a chemical accident.

19.0 WASTE MANAGEMENT

19.1 Pollution Prevention

The waste management option of choice is to prevent pollution by minimizing the amount or types of chemical wastes that are generated. Mitkem's ability to minimize waste generation is limited by the chemical analysis techniques that are required by the EPA or other authors of test methods. As new test methods are utilized in the laboratory, the type and volume of chemical waste generated by the new test is considered. Analysts and Supervisors are encouraged to look for ways to reduce the amount of chemical waste, or the type of chemical waste generated during the testing process; HOWEVER, no method is allowed to be modified without discussion among the Supervisor, Technical Director, QA Director and other management personnel to determine the affect of the change on the resulting data.

19.2. Waste Management

Mitkem has identifies and routinely disposes of chemical wastes in several hazardous waste streams. In general these are acids, caustics, solvent wastes and various laboratory waste solids. No laboratory chemical waste is disposed in the trash or dumped down the drain. All remaining sample volume following testing, and after contract-required disposal date has past, are disposed in one of these waste streams. These wastes are fully described in Mitkem's Waste Management Plan and in Mitkem's Profile Log that has been prepared by Univar, Mitkem's waste hauler. Other hazardous wastes are identified and properly disposed according to these documents.

Continued compliance is monitored monthly by an outside consultant to ensure all RI DEM regulations are met.

20.0 DEFINITIONS, ACRONYMS, ABBREVIATIONS:

ACCURACY: The closeness of agreement between an observed value and An accepted reference value.

BATCH: A group of samples of the same matrix that are processed as a unit. Unless defined differently by a specific analytical method (such as Oil & Grease by Method 1664), the maximum batch size is 20 samples.

BIAS: The deviation due to analytical or matrix effects of the measured value from a known spiked amount.

BLANK: A "clean" matrix analysis. Such as: Equipment Blank, Method Blank, Trip Blank.

CAS: Chemical Abstracts Service, a registry where chemicals are assigned identification numbers.

CCB: Continuing Calibration Blank

CCV: Continuing Calibration Verification standard.

CLP: Contract Laboratory Program. A contract used by EPA to purchase analytical services. Also refers to the test protocols described in that contract. The CLP analyses can be used for EPA or for other clients. CLP-format data reports are arranged as described in the EPA CLP contract, including specified data report pages and all raw data. The CLP analysis scheme includes OLM (Organic Low/Medium-soil and water), OLC (organic low concentration-waters only) and ILM (Inorganic Low/Medium-soil and water) analyses.

CONTROL SAMPLE A QC sample introduced into a process to monitor the performance of the system.

DL: Dilution, not used when the initial analysis is performed at dilution, but is used for a secondary dilution.

DUPLICATE: see Matrix Duplicate, Field Duplicate, and Matrix Spike Duplicate.

EQUIPMENT BLANK A sample of analyte-free water that has been used during sample collection to measure any contamination introduced during sample collection.

ICB: Initial Calibration Blank

ICV: . Initial Calibration Verification standard

IDL: Instrument Detection Limit. Statistical value similar to MDL, but with analyses performed on standards that have not been through the sample preparation process.

FIELD DUPLICATES possible to the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently. These duplicates are useful in documenting the precision of the sampling process.

LAB CONTROL SAMPLE(LCS) A blank spiked with compound(s) representative of the target analytes. This is used to document laboratory performance in a "clean" matrix.

MATRIX: The component or substrate (e.g., water, soil, air, and oil) which contains the analyte of interest.

MATRIX DUPE (DUP) A sample split by the laboratory that is used to document the precision of a method in a given sample matrix.

MATRIX SPIKE (MS) An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

MATRIX SPIKE DUPE (MSD) Laboratory split samples spiked with identical concentrations of target analyte(s). The spiking occurs prior to sample preparation and analysis. They are used to document the precision and bias of a method in a given Sample matrix.

METHOD BLANK (MB) An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

METHOD DETECTION LIMIT (MDL) The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte. For operational purposes, when it is necessary to determine the MDL in the matrix, the

MDL should be determined by multiplying the appropriate one-sided 99% t-statistic by the standard deviation obtained from a minimum of seven analyses of a matrix spike containing the analyte of interest at a concentration estimated to be three to five times the MDL, where the t-statistic is obtained from standard references.

MSA: Method of Standard Additions

ND: Not Detected. Used in conjunction with the reporting limit.

ORGANIC-FREE REAGENT WATER: For volatiles, all references to water in the methods refer to water in which an interferent is not observed at the reporting limit of the compounds of interest. Organic-free reagent water can be generated by passing tap water through a carbon filter bed containing about 1 pound of activated carbon. A water purification system may be used to generate organic-free deionized water.
For semivolatiles and nonvolatiles, all references to water in the methods refer to water in which an Interferent is not observed at the reporting limit of the compounds of interest. Organic-free reagent water can be generated by passing tap water through a carbon filter bed containing about 1 pound of activated carbon. A water purification system may be used to generate organic-free deionized water.

PPB: Parts Per Billion, ug/L, ug/Kg

PPM: Parts Per Million, mg/L, mg/Kg

PQL: Practical Quantitation Limit. Is equivalent to Reporting Limit.

PRECISION: The agreement among a set of replicate analyses.

PS: Post Spike. Spike added at the analysis level (as opposed to at the beginning of sample preparation) to determine interferences.

REPORTING LIMIT: The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The RL is generally 5 to 10 times the MDL. However, it may be nominally chosen other than these guidelines to simplify data reporting. For many analytes the RL concentration is selected as the lowest non-zero standard in the calibration curve. Sample RLs are matrix-dependent, and are adjusted by the amount of sample analyzed, dilution, percent moisture.

RE: Reextraction or Reanalysis

RPD: Relative Percent Difference, used to determine precision.

RRF: Relative Response Factor. Used for quantification with the internal standard procedure.

RT: Retention Time for a chromatographic peak, as calculated from the time of injection.

SD: Serial Dilution

STANDARD ADDITION: The practice of adding a known amount of an analyte to a sample immediately prior to analysis. It is typically used to evaluate interferences.

STANDARD CURVE: A plot of concentrations of known analyte standards versus the instrument response to the analyte. Calibration standards are prepared by successively diluting a standard solution to produce working standards which cover the working range of the instrument. Standards should be prepared at the frequency specified in the appropriate method. The calibration standards should be prepared using the same type of acid or solvent and at the same concentration as will result in the samples following sample preparation. This is applicable to organic and inorganic chemical analyses.

SURROGATE: An organic compound that is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples.

TRIP BLANK: A sample of analyte-free media taken from the laboratory to the sampling site and returned to the laboratory unopened. A trip blank is used to document contamination attributable to shipping and field handling procedures. This type of blank is useful in documenting contamination of volatile organics samples.

From EPA SW-846, Revision 4, and other sources.

MITKEM CORPORATION

INSTRUMENTATION and EQUIPMENT LIST

APPENDIX A

Weight Set Identification:

1. WT1-Organic Prep Weight Set
2. WT2-Organic Prep 100g
3. WT3-Organic Prep 300g
4. WT4-Organic Prep 1kg
5. WT5-Inorganics Weight Set
6. WT6-VOA Weight Set

Mitkem Corporation
Balance List

12/20/2006

Equipment	Manufacturer	Serial #	Date Received	Date in Service	Condition New/Used	Equipment ID	Location
TOP-LOADING Balance	OHAUS	1121230069	2000	2000	New	TL10	Organic
Analytical Balance	Denver	0077138	1995	1995	New	AB-1	Inorganic
TOP-LOADING Balance	OHAUS Voyager	F2921120391055	2001	2001	New	TL9	Inorganic
TOP-LOADING Balance	Denver	0079896	2000	2000	New	TL1	Metals
TOP-LOADING Balance	OHAUS Precision Std.	C22427176	2002	NA	New	TL6	Backup
TOP-LOADING Balance	OHAUS Navigator	1121122373	2002	2002	New	TL11	Unit 3
TOP-LOADING Balance	OHAUS	CD8910	2000	2000	New	TL4	VOA
TOP-LOADING Balance	OHAUS Navigator	1122173423	2003	NA	New	TL12	Inorganic

Mitkem Corporation
Equipment List

12/20/2006

Department: Receiving

Equipment	Manufacturer	Serial #	Date Received	Date In Service	Condition New/Used	Equipment ID	Location
% Solid Oven	Thelco Lab Oven	600011006			used		Unit 3
Walk in Cooler		Not Applicable			used		Receiving
Freeze Dryer	Dura-Stop MP, Dura-Dry MP	TD-12-90-133 Model: TD-00008-A			New		Unit 3

Mitkem Corporation
Equipment List

Department: Organic Prep

Equipment	Manufacturer	Serial #	Date Received	Date In Service	Condition New/Used	Equipment ID	Location
Vortex Concentrator	Labconco	000493001C	Jul-98	Jul-98	New	RV I	O Prep
Vortex Concentrator	Labconco	010595103E	Apr-99	Apr-99	New	RV II	O Prep
Vortex Concentrator	Labconco	011196291E	Jun-01	Jun-01	New	RV III	O Prep
Vortex Concentrator	Labconco	246368	Dec-05	Jan-06	Used	RV IV	O Prep
Vortex Concentrator	Labconco	266438	Dec-05	Jan-06	Used	RV V	O Prep
Vortex Concentrator	Labconco	246505	Dec-05	Jan-06	Used	RV VI	O Prep
Vortex Concentrator	Labconco	266818	Dec-05	Jan-06	Used	RV VII	O Prep
Nitrogen Concentrator Bath	Organomations	17033	Jun-97	Jun-97	New	NZ1	O Prep
Deionized Water Generator	Barnstead Thermodyne	582941018789	Jun-95	Jun-95	New	DI1	O Prep
Pressurized Fluid Extractor	Dionex	98070129	Jun-00	Jun-00	New	PFE1	O Prep
Gel Permeation Chromatograph	J2/AccuPrep	P26D031	Jun-05	Jul-05	New	GPC3	O Prep
Gel Permeation Chromatograph	J2/AccuPrep	06D-1196-4.1	Jul-07	Aug-06	New	GPC4	O Prep
Misonex Ultrasonic Disruptor	Sonicator/Heat systems	Unable to view			New	OPH1	O Prep
Misonex Ultrasonic Disruptor	Sonic Dismembrator Fisher Model 550	Unable to view			New	OPH2	O Prep

Misonex Ultrasonic Disruptor	Sonic Dismembrator Fisher Model 500	Unable to view			New	OPH3	O Prep
Misonex Ultrasonic Disruptor	Sonic Dismembrator Fisher Model 500	Unable to view			New	OPH4	O Prep

Mitkem Corporation
Equipment List

Department: Inorganics : Metals& Wet Chemistry

Equipment	Manufacturer	Serial #	Date Received	Date in Service	Condition New/Used	Equipment ID	Location
Optima 4300DV	Perkin Elmer	077N3102302	Nov-03	Nov-03	New	Optima3	Metals
Optima 3100XL	Perkin Elmer	069N8060801	Nov-98	Nov-98	New	Optima2	Metals
FIMS 100	Perkin Elmer	1131	Mar-00	Mar-00	Used	FIMS	Metals
GPR Centrifuge	Beckman Instruments	7M149	Apr-02	Apr-02	Used	Centrifuge	Unit 3
Apollo 9000	Tekmar/Dohrmann	US03035002	Apr-03	Apr-03	Demo	TOC1	Unit 3
Quick Chem 8000	Lachat Instruments	A83000-1020	Apr-96	Apr-96	New	Lachat	Unit 3
IC	Dionex	95030498E980802	May-03	May-03	New	IC1	Unit 3
Genesys 20	Thermospectronic	3SGD332010	Apr-02	Apr-02	New	Spec 2	Wetchem
Dessicator	Sanplatec Corp	none	June-06	June-06	New	DryKeeper	Unit 3

Mitkem Corporation
Equipment List

Department: Pest/PCB

Equipment	Manufacturer	Serial #	Date Received	Date in Service	Condition New/Used	Equipment ID	Location
GC/ECD	Hewlett Packard	3336A55650	Oct-94	Oct-94	New	E1	Pest/PCB
GC/ECD	Hewlett Packard	3336A59890	Oct-94	Oct-94	New	E2	Pest/PCB
GC/ECD	Hewlett Packard	3235A45554				E3	Pest/PCB
GC/ECD	Hewlett Packard	US00032017				E4	Pest/PCB
GC/ECD	Agilent	US00037060				E5	Pest/PCB
GC/FID	Hewlett Packard	US00001898				F1	Pest/PCB

12/20/2006

Mitkem Corporation
Equipment List

Department: VOA

Equipment	Manufacturer	Serial #	Date Received	Date In Service	Condition New/Used	Equipment ID	Location
GC/MS	Hewlett Packard	3336A55963				V1	VOA
GC/MS	Hewlett Packard	3336A58222				V2	VOA
GC	Hewlett Packard	3336A56504				V3	VOA
GC	Hewlett Packard	2843A21041				V4	VOA
GC/MS	Hewlett Packard	US00007055				V5	VOA
GC/MS	Hewlett Packard	US00031343				V6	VOA
GC	Hewlett Packard	3140A37463				V7	VOA

Mitkem Corporation
Equipment List

Department: VOA

12/20/2006

Equipment	Manufacturer	Serial #	current Instrument	MITKEM ID Number	Equipment TYPE	Location
A/S Model 4552	OI Analytical			A/S-22	Autosampler	VOA LAB
A/S Model 4560	OI Analytical	N111460838		A/S-23	Sample concentrator	VOA LAB
A/S Model 4552	OI Analytical			A/S-24	TRAY	VOA LAB
A/S Model 4560	OI Analytical	H340460074		A/S-25	Sample concentrator	VOA LAB
A/S Model 4551-A	OI Analytical			A/S-26	TRAY	VOA LAB
A/S Model 4560	OI Analytical	M943460129		A/S-27	Sample concentrator	VOA LAB
A/S Model 4552	OI Analytical			A/S-28	TOWER	VOA LAB
A/S Model 4560	OI Analytical	J430460188		A/S-29	Sample concentrator	VOA LAB
LSC 2000 ALS 2016	Tekmar	**OUT OF SERVICE**		A/S-30		VOA LAB
A/S Model 4560	OI Analytical	J651460769		A/S-31	Sample concentrator	VOA LAB
DPM-16 Discrete Purging Multisampler	OI Analytical	D730416521	V4	A/S-32A	DPM	VOA LAB
MHC-16 Multiple Heat Controller	OI Analytical	F445464080	V4	A/S-32B	MHC	VOA LAB
A/S Model 7000	Tekmar	US01170015	V4	A/S-33	Headspace autosampler	VOA LAB

Mitkem Corporation
Equipment List

12/20/2006

Department: SVOA

Equipment	Manufacturer	Serial #	Date Received	Date In Service	Condition New/Used	Equipment ID	Location
GC/MS	Agilent	3435A01848	Oct-94	Oct-94	New	S1	SVOA
GC/MS	Agilent	3449A02133	Oct-94	Oct-94	New	S2	SVOA
GC/MS	Agilent	US72821130	Nov-99	Nov-99	Used	S3	SVOA
GC/MS	Agilent	CN10315002	May-03	May-03	New	S4	SVOA

Mitkem Corporation
Equipment List

12/20/2006

Department: GC AND GC/MS

Equipment	Manufacturer	Serial #	current Instrument	MITKEM ID Number	Equipment TYPE	Location
AUTOSAMPLER	HEWLETT-PACKARD	US12111699 G2614A		A/S-1	TRAY	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	US12109082 G2613A		A/S-2	TOWER	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	CN31623836 G2614A		A/S-3	TRAY	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	CN31630412 G2613A		A/S-4	TOWER	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	US14207448 18596C		A/S-5	TRAY	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	CN13720586 G1513A		A/S-6	TOWER	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	US94706562 G2614A		A/S-7	TRAY	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	US11618592 G2613A		A/S-8	TOWER	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	3522A38799 18596M		A/S-9	TRAY	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	CN13920644 G1513A		A/S-10	TOWER	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	US14307475 18596C		A/S-11	TRAY	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	CN143220863 G1513A		A/S-12	TOWER	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	US514307466 18596C		A/S-13	TRAY	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	CN15121474 G1513A		A/S-14	TOWER	SVOA LAB

12/20/2006

AUTOSAMPLER	HEWLETT-PACKARD	US14207449 18596C		**A/S-15**	TRAY	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	US00001909 G1513A		**A/S-16**	TOWER	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	US92505547 G2614A		**A/S-17**	TRAY	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	US94710320 G2613A		**A/S-18**	TOWER	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	3216A28361 18596B		**A/S-19**	TRAY	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	COULDN'T SEE		**A/S-20**	TOWER 1	SVOA LAB
AUTOSAMPLER	HEWLETT-PACKARD	COULDN'T SEE		**A/S-21**	TOWER 2	SVOA LAB

Laboratory Information System Equipment

1. **Data Collection:**
   - 1.1. 12 - HP chem station software for collecting GC-ECD and GC-MS data
     - 1.1.1. 5 GC-ECD
     - 1.1.2. 4 GC-MS (SVOA)
     - 1.1.3. 4 GC-MS (VOA)
   - 1.2. Hardware varies but is x86 compatible
   - 1.3. OS is Windows, Various Versions (9x, NT, 2000)

2. **Data Storage:**
   - 2.1. Dell Poweredge servers
     - 2.1.1. Dual P IV Xeon processors
     - 2.1.2. 2 GB RAM
     - 2.1.3. 105 GB Storage expandable to 750 GB internally
     - 2.1.4. OS is Windows, Various Versions (NT and 2003)
   - 2.2. LTO tape drive - daily backup, long term archiving and data restoration
   - 2.3. Tape software is Backup Exec (10.x)

3. **Compound Identification:**
   - 3.1. 12 - Target 4.14 chromatographic software
   - 3.2. Hardware is Intel based (3GHZ, 512MB RAM) for Target 4.14
   - 3.3. OS is Windows Xp

4. **Forms Generation:**
   - 4.1. In house forms generation LIMS modules for SW-846, ILM4 and ILM5 metals
   - 4.2. In house forms generation LIMS modules for SW-846, OLC03 and SOM01 organics
   - 4.3. Target-based forms generation for OLM04 and SW-846 organics
   - 4.4. Hardware varies but is x86 compatible
   - 4.5. OS is Windows, Various Versions (2000 and Xp)

MITKEM CORPORATION

CONFIDENTIALITY, ETHICS, and DATA INTEGRITY AGREEMENT

APPENDIX B

CONFIDENTIALITY, ETHICS, AND DATA INTEGRITY

The confidentiality, ethics, and data integrity agreement attached must be signed and dated by all new personnel associated with the data generated by Mitkem Corporation. All said personnel will complete a training course and understand the information stated in the agreement. The course must include the ethical and legal responsibilities including the potential punishments and penalties for improper, unethical, or illegal actions. All personnel must fully understand this information before signing the agreement.

Data Integrity training will be done on an annual basis. If changes to the enclosed integrity agreement are made, then all employees will be required to review and sign. All documents are stored in the employee's personnel file located in the QA Department.

MITKEM CORPORATION

CONFIDENTIALITY, ETHICS AND DATA INTEGRITY AGREEMENT

I. I, ______________________________ *(Name)*, state that I understand the standards of integrity required of me with regard to the duties I perform and the data I report in connection with my employment at Mitkem Corporation.

II. I agree that in the performance of my duties at Mitkem Corporation:

A. I shall not improperly use manual integrations to meet calibration or method QC criteria, such as peak shaving or peak enhancement.

B. I shall not intentionally misrepresent the date or time of analysis by resetting computer or instrument date/time.

C. I shall not falsify analytical results.

D. I shall not report analytical results without proper analysis documentation to support the results; dry-labbing.

E. I shall not selectively exclude data to meet QC criteria, such as calibration points, without technical or statistical justification.

F. I shall not misrepresent laboratory performance by presenting calibration data or QC limits within data reports that are not linked to the data set reported.

G. I shall not represent matrix interference as basis for exceeding acceptance criteria in interference-free matrices, such as method blanks and Laboratory Control Standards (LCS).

H. I shall not manipulate computer software for improper background subtraction or chromatographic baseline manipulations.

I. I shall not alter analytical conditions such as EM voltage, GC temperature program, etc. from standards analysis to sample analysis.

J. I shall not misrepresent QC samples such as adding surrogates after sample extraction, omitting sample preparation steps, or over-spiking/under-spiking.

K. I shall not report analytical results from the analysis of one sample for those of another.

L. I shall not intentionally represent another individual's work as my own.

III. I agree to report immediately any accidental or intentional reporting of non-authentic data either I or another employee may have committed. Such report must be made to any member of Mitkem Corporation's Management (Kin Chiu, Reinier Courant, Edward Lawler, Yihai Ding) or the Quality Assurance Director, either orally or in writing. Every incident will be investigated by senior management. A written corrective action is required of any findings from the investigation.

IV. Any incidents that violate the standards of data integrity can result in immediate termination of the employee as well as civil or criminal charges.

V. Questions pertaining to confidentiality, ethics, and integrity may be posed to any of the above individuals.

VI. I agree not to divulge any pertinent information including but not limited to data and any other information about a project to outside sources without the prior consent from the client.

I understand that failure to comply with the above ethics and data integrity agreement can result in my immediate dismissal from Mitkem Corporation.

_______________________________ _______________________

(Signature) *(Date)*

____

(Print Name)

MITKEM CORPORATION

SUBCONTRACTORS

CONFIDENTIALITY, ETHICS AND DATA INTEGRITY AGREEMENT

I. I, ______________________________ *(Name)*, authorized representative of

______________________________(Subcontractor) state that I understand the standards of integrity required of me and the Subcontractor with regard to the duties performed and the data reported in connection with the analysis/analyses contracted by Mitkem Corporation.

II. Subcontractor agrees that in the performance of analysis for Mitkem Corporation:

A. Subcontractor shall not intentionally report data values or results that are not the actual values measured or observed;

B. Subcontractor shall not modify data values unless the modification can be technically justified through a measurable analytical process;

C. Subcontractor shall not intentionally report the dates and times of data analyses that are not the true and actual dates and times of analyses; and

D. Subcontractor shall not intentionally represent another's work as its own.

III. Subcontractor agrees to report immediately any accidental or intentional reporting of non-authentic data to Mitkem.

IV. Subcontractor agrees not to divulge any pertinent information including but not limited to data and information about any Mitkem projects to outside sources without the prior consent from Mitkem or its clients.

I understand that failure to comply with the above ethics and data integrity agreement can result in immediate termination of the subcontract relationship with Mitkem Corporation.

______________________________ ______________________________
(Signature) *(Date)*

____
(Name)

____
(Title)

ATTACHMENT 2

Table 1

(Analytical Laboratory Testing Program)

Table 1

Analytical Laboratory Testing Program

Remedial Work Plan
100 Fernwood Avenue
Rochester, New York
(NYSDEC Site ID C828119)

Task	Sample Matrix	Parameter	Field Samples	Trip Blanks	MS/MSD	Field Blanks	Analytical Methods	Reporting Levels	Corresponding SCGs
Confirmatory Samples from Existing In-Situ Bioremediation System	Soil	TCL VOCs	4	0	1	1	ASP Method OLM04.3	ASP-B	Part 375 Soil Cleanup Objectives
	Soil	TCL SVOCs	4	0	1	1	ASP Method OLM04.3	ASP-B	Part 375 Soil Cleanup Objectives
	Soil	TPH	4	0	1	1	NYSDOH Method 310.13	MDL	Not Applicable
	Soil	Plate Count	4	0	0	0	USEPA Method 9215C	MDL	Not Applicable
	Water	TCL VOCs	3	1	1	1	ASP Method OLM04.3	ASP-B	TOGS 1.1.1 Groundwater Standards and Guidance Values
	Water	TCL SVOCs	3	0	1	1	ASP Method OLM04.3	ASP-B	TOGS 1.1.1 Groundwater Standards and Guidance Values
	Water	Plate Count	3	0	0	0	USEPA Method 9215C	MDL	Not Applicable
Monitored Natural Attenuation Groundwater Samples	Water	TCL VOCs	up to 56 (up to 7 rounds, up to 8 samples/round)	1	1	1	ASP Method OLM04.3	ASP-B	TOGS 1.1.1 Groundwater Standards and Guidance Values
	Water	TCL SVOCs	up to 56 (up to 7 rounds, up to 8 samples/round)	0	1	1	ASP Method OLM04.3	ASP-B	TOGS 1.1.1 Groundwater Standards and Guidance Values
	Water	Nitrate	up to 56 (up to 7 rounds, up to 8 samples/round)	0	1	1	USEPA Method E300IC	MDL	Not Applicable
	Water	Iron (II)	up to 56 (up to 7 rounds, up to 8 samples/round)	0	1	1	USEPA Method SM3500D	MDL	Not Applicable
	Water	Manganese	up to 56 (up to 7 rounds, up to 8 samples/round)	0	1	1	ASP Method ILM04.1	ASP-B	Not Applicable
	Water	Sulfate	up to 56 (up to 7 rounds, up to 8 samples/round)	0	1	1	USEPA Method E300IC	MDL	Not Applicable
	Water	Methane	up to 56 (up to 7 rounds, up to 8 samples/round)	0	1	1	USEPA Method RSK175	MDL	Not Applicable
	Water	Chloride	up to 56 (up to 7 rounds, up to 8 samples/round)	0	1	1	USEPA Method E300IC	MDL	Not Applicable

VOC = Volatile Organic Compound
SVOC = Semi-Volatile Organic Compound
TCL = Target Compound List
TPH = Total Petroleum Hydrocarbon

ASP = Analytical Services Protocol
NYSDOH = New York State Department of Health
MDL = Method Detection Limit
USEPA = United States Environmental Protection Agency

ATTACHMENT 3

Resume of Ms. Hope Kilmer

HOPE L. KILMER, CHMM

EXPERIENCE
Day Environmental, Inc.: March 2006 to present
Years with Other Firms: Over 14 years

AREAS OF SPECIALIZATION
- Environmental Compliance
- Quality Assurance Officer and DUSR reporting
- Industrial Hygiene Sampling & Analysis Techniques
- Inorganic and Organic Methods & Analysis
- Radiation Safety & Analysis

EDUCATION

State University of New York at Fredonia; B.S. Chemistry 1989
Additional Chemistry and Industrial Hygiene curricula graduate course work

REGISTRATIONS/AFFILIATIONS

- Certified Hazardous Materials Manager (CHMM), ID# 14070
- 24 hour HAZWOPER Emergency Response Training
- 8 Hour OSHA Hazardous Waste Site Worker Refresher Training

RESPONSIBILITIES AND PROJECT EXPERIENCE

Ms. Kilmer has more than 15 years of experience providing sampling information, calibrated equipment, and report data. Ms Kilmer's experience includes working within environmental laboratories performing multiple analysis techniques on various media including: personnel samples, soil, sludge, air, and water; addressing environmental, health, and safety issues within a manufacturing facility, waste characterization, waste management, annual OSHA, RCRA, and Radiation Safety training.

Regulatory Compliance:

Air Permit Data Management and Compliance Reporting, Industrial Facility, Albion, New York: Maintain Access database containing air permit information including materials used and their VOC and HAP emissions, receive monthly material usage reports from the facility and prepare monthly emissions report as per Title V requirement. Identified opportunities for improved data collection, management of database functions, and evaluation of status of compliance against permit conditions. Submitted semi-annual and annual Title V compliance monitoring reports on timely basis.

Clean Water and Oil Pollution Prevention Regulatory Compliance, Industrial Facilities, New York: Performed storm water permitting assessment. Assisted in the preparation of Storm Water Pollution Prevention Plans (SWPPP) and Spill Control and Countermeasures (SPCC) Plans for facilities.

Investigation of ambient air quality, Manufacturing Facility, Rochester, New York: Performed health and safety monitoring including volatile organic compound sampling and particulate monitoring using various sampler types. Evaluated data, prepared and provided a report.

Investigation of ambient air quality, Manufacturing Facility, Arcade, New York: Conducted noise exposure monitoring and an indoor air quality survey in a manufacturing facility. Five individuals were monitored to determine noise exposure and air samples for three different materials were collected at four locations in the building. Evaluated data, prepared, and provided a report.

Polychlorinated Biphenyl (PCB) Annual Log, Metro North Railroad Yards, New York and Connecticut: Prepared the PCB Annual Log for multiple facilities.

RCRA Hazardous Waste Compliance, Industrial Facility, Rochester, New York: Project activities included waste characterization and disposal, preparation of hazardous waste profiles, manifests, the Special Assessment forms for NYS Tax Department, and the Hazardous Waste Report.

RCRA Hazardous Waste Compliance, Multiple Industrial Facilities, Rochester, New York: Preparation of Hazardous Waste Reports.

RCRA Hazardous Waste Compliance, Manufacturing Facility, Rochester, New York: Performed RCRA 40CFR part 265 subpart BB/CC monitoring for a large manufacturing facility.

SARA/EPCRA Regulatory Compliance, Multiple Industrial Facilities, New York: Tasks included preparation of, Toxic Release Inventory and Tier II reports for several facilities.

Site Assessments/Investigations, Rochester, New York: Conducted and prepared associated reports for Phase I site assessment.

Environmental Remediation Activities - Former Manufacturing Facilities, Rochester, New York: Current activities include the evaluation of laboratory data and the preparation of Data Usability Summary Report (DUSR) documentation for submittal to the New York State Department of Environmental Conservation (NYSDEC).

Chemical Technician, Eastman Kodak Company, New York:

Worked within four separate laboratories, Industrial Hygiene Analysis, Inorganic Analysis, Metals Analysis, and Environmental Process Monitoring. Consulted with internal clients to determine needs and provide necessary sampling equipment and media. Assisted in field sampling activities for worker and environment exposure projects. Performed instrument maintenance and calibration.

Lab Analysis: Performed analysis of samples utilizing OSHA, NIOSH, ELAP, and ASTM methods. Samples included Industrial Hygiene personnel dosimeters, silica gel tubes; groundwater, soils, sludge, filters, aqueous solutions, and unknown solid materials. Develop and document methods of analysis for multiple laboratory techniques including Gas, Ion, and HP-Liquid Chromatography techniques; alpha/beta analysis, Segmented flow analysis, Total Organic Carbon, Inorganic Carbon, ICP-Atomic Absorption, FIAS-MHS (Flow Injection Atomic Spectroscopy- Mercury Hydride System) and AA. Developed digestion methods for various materials (waters, solids, sludges, gelatin, bone).

Data Analysis: Designed and wrote reports for various types of sampling, reviewed reports of others for accuracy and data evaluation and validation. Performed analyses using ELAP protocols; stringent quality control programs were followed as determined by state and federal agencies; participated in ELAP proficiency testing.

***Project examples*:**

Cyanide in Air: Determined a method of sampling for cyanide compounds possibly being generated over a development process. The process consisted of several tanks of solutions over which a conveyor system for film operated. The sampling chain was made up of bubblers containing 0.025 M sodium hydroxide solution and calibrated pumps. The air was sampled for 15 and 30 minutes while the process was in operation. The samples were collected into sealed glass vials, analyzed, and results reported to the IH.

Formaldehyde in air: The concern was that formaldehyde was in use in a new manufacturing process. The monitoring was to determine if formaldehyde was being exhausted through a building ventilation system on the roof. Sep-Paks and calibrated pumps were set up at the stacks exits. The exhausts temperatures and velocities were measured and formaldehyde sampled for 5, 15, and 30 minute intervals. Samples were sent to an outside lab for analysis. Upon receipt, the results were checked for data validation and a report generated for the IH.

Methylene Chloride Exposure: An area consisted of several large open vats of methylene chloride and the concern was regarding personnel in the area being exposed to large quantities of the chemical in air. The people were monitored using passive charcoal badges to collect the chemical. The badges were collected after 30 minute and 4 hour intervals and sealed for analysis. The analysis was performed in-house and a report submitted to the IH.

APPENDIX F

LOW FLOW GROUNDWATER PURGING AND SAMPLING LOG

DAY ENVIRONMENTAL, INC.

LOW-FLOW GROUNDWATER PURGING AND SAMPLING LOG

WELL MW-

SECTION 1 - SITE AND WELL INFORMATION

SITE LOCATION: 100 Fernwood Avenue, Rochester, NY   JOB #: NYSDEC Site Number C828119

PROJECT NAME: Former Vogt Manufacturing Facility   DATE: ____

SAMPLE COLLECTOR(S): ____   WEATHER: ____

PID READING IN WELL HEADSPACE (PPM): ____   MEASURING POINT: ____

CASING TYPE: ____   WELL DIAMETER (INCHES): ____

SCREENED INTERVAL [FT]: ____   INITIAL WATER LEVEL (SWL) [FT]: SWL / Date Measured ____ / ____

WELL DEPTH [FT]: ____   DEPTH OF PUMP INTAKE [FT]: ____
(Do NOT Measure Well depth Prior To Purging And Sampling)

LNAPL: ____   DNAPL: ____   OTHER OBSERVATIONS: ____

SECTION 2 – SAMPLING EQUIPMENT

CONTROL BOX: ____   TUBING TYPE: Water, Air

WATER QUALITY METER: ____   WATER LEVEL METER: ____

PUMP TYPE: ____   PURGE GAS: ____

CONTROL BOX DISCHARGE RATE: ____   CONTROL BOX REFILL RATE: ____

STABILIZED PUMP RATE (ml/min): ____   STABILIZED DRAWDOWN WATER LEVEL [FT]: ____

SECTION 3 – WATER QUALITY DATA MONITORING

Time	Pumping Rate (ml/min)	Water Level (ft)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Conductivity (mS/cm)	pH	Temp. (C^0)	Total Vol. Pumped (ml)

SAMPLE OBSERVATIONS: ~

SECTION 4 - SAMPLE IDENTIFICATION AND ANALYTICAL LABORATORY PARAMETERS

SAMPLE ID #	DATE / TIME	SAMPLING METHOD	ANALYTICAL SCAN(S)
		Bladder Pump	

S:\Fieldforms\Fieldforms.2007\Low-Flow Sampling Log-revised 3-28-07.doc

APPENDIX G

SITE-WIDE INSPECTION FORM

ANNUAL SITE-WIDE INSPECTION FORM
FORMER VOGT MANUFACTURING FACILITY
100 FERNWOOD AVENUE
ROCHESTER, NEW YORK
NYSDEC SITE NUMBER: C828119

Date of Inspection: ______________________________

Inspected By: ______________________________

____

____

(Include: name, company, and position of person(s) conducting inspection)

General condition of above ground portions of the in-situ bioremediation system: ______

____

____

____

____

Evidence of damage or blockage of the air influent goose-neck connectors, PVC risers, or air effluent wind turbines: ☐ Yes ☐ No

Describe damage or blockage if observed: ______________________________

____

____

Evidence of damage or blockage of monitoring wells:

☐ Yes ☐ No

Describe damage or blockage if observed: ______________________________

____

____

Additional Comments: ____

____

____

____

____

Action Item(s) Required (attach photographs and/or sketches showing the approximate location of any problems or incidents): ______________________________

____

____

____

____

Action Item(s) completed since last inspection: ___________________________

____

____

____

____

Signatures: ______________________________________

____

APPENDIX H

DRAFT ENVIRONMENTAL EASMENT

County:_______________Site No:______________Contract/Order No:______________

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this _______day of _______________, 2009, between Owner 100 Fernwood Avenue Associates having an office at 183 East Main Street, Rochester, New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of environmental easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and of ensuring the potential restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that environmental easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the addresses of 100 and 142 Fernwood Avenue; 31, 35 and 41 Rosemary Drive; and 25, 29, 33, 39, 43, 49, and 55 Ilex Place, in the City of Rochester of Monroe County, New York known and designated on the tax map of the City of Rochester of Monroe County as tax map parcel numbers 106.27-1-5, 091.83-3-19, 091.83-3-20, 091.83-3-21, 106.27-1-87, 106.27-1-88, 106.27-1-89, 106.27-1-90, 106.27-1-91, 106.27-1-92, and 106.27-1-93 being the same as that property conveyed to Grantor by deed on May 28, 1997, and recorded in the Land Records of the Monroe County Clerk at page 0504, Liber 08873 of Deeds, comprised of approximately 8.095 acres, and hereinafter more fully described in Schedule A attached hereto and made a part hereof (the " Controlled Property"); and

WHEREAS, the Commissioner does hereby acknowledge that the Department accepts this Environmental Easement in order to ensure the protection of human health and the environment and to achieve the requirements for remediation established at this Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the covenants and mutual promises contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number B8-0660-04-05, Site Number C828119 Grantor grants, conveys and releases to Grantee a permanent Environmental Easement pursuant to Article 71, Title 36 of the ECL in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the potential restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The following controls apply to the use of the Controlled Property, run with the land are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees, and any person using the Controlled Property:

A. The Controlled Property may be used for restricted residential, commercial or industrial use with the exception of Area "A" marked on the survey map where no occupied building can be constructed until the remedy in this area is completed to the DEC's satisfaction as long as the following long-term engineering controls are employed:

(i) any future activities, including building renovation/expansion, subgrade utility line repair/relocation, and new construction, which will cause a disturbance of the remaining contaminated soil under the top two feet of surface soil must be conducted in accordance with the Department approved Site Management Plan (SMP);

(ii) vegetable gardens and farming on the Controlled Property is prohibited;

(iii) The use of groundwater underlying the Controlled Property is prohibited. The City of Rochester Code prohibits the use of groundwater as a potable source;

(iv) The potential for vapor intrusion must be evaluated for any buildings developed on the Controlled Property, and any potential impacts that are identified must be monitored or mitigated in accordance with the SMP and applicable guidance in effect at the time of the investigation;

(v) monitor, maintain and replace as necessary groundwater monitoring wells required to be monitored as set forth in the SMP.

The Grantor hereby acknowledges receipt of a copy of the NYSDEC-approved Site Management Plan, dated December 2009 ("SMP"). The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system on the Controlled Property, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. Upon notice of not less than thirty (30) days the Department in exercise of its discretion and consistent with applicable law may revise the SMP. The notice shall be a final agency determination. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Regional Remediation Engineer:
Region 8
NYS DEC
6274 East Avon-Lima Road
Avon, New York 14414

or

Site Control Section
Division of Environmental Remediation
NYS DEC
625 Broadway
Albany, NY 12233

B. The Controlled Property may not be used for a higher level of use such as unrestricted residential use and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an environmental easement held by the New York State Department of Environmental Conservation pursuant of Title 36 to Article 71 of the Environmental Conservation Law.

D. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

E. Grantor covenants and agrees that it shall annually, or such time as NYSDEC may allow, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury that the controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls employed at the Controlled Property were approved by the NYSDEC, and that nothing has occurred that would impair the ability of such control to protect the public health and environment or constitute a violation or failure to comply with any Site Management Plan for such controls and giving access to such Controlled Property to evaluate continued maintenance of such controls.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Controlled Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer the underlying fee interest to the Controlled Property by operation of law, by deed, or by indenture, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This environmental easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this environmental easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person intentionally violates this environmental easement, the Grantee may revoke the Certificate of Completion provided under ECL Article 27, Title 14, or Article 56, Title 5 with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach. Grantor shall then have a reasonable amount of time from receipt of such notice to cure. At the expiration of said second period, Grantee may commence any proceedings and take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement in accordance with applicable law to require compliance with the terms of this Environmental Easement.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar its enforcement rights in the event of a subsequent breach of or noncompliance with any of the terms of this Environmental easement.

6. Notice. Whenever notice to the State (other than the annual certification) or approval from the State is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information: County, NYSDEC Site Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to: Environmental Easement Attorney

Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

Such correspondence shall be delivered by hand, or by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. <u>Recordation</u>. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. <u>Amendment</u>. This environmental easement may be amended only by an amendment executed by the Commissioner of the New York State Department of Environmental Conservation and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. <u>Extinguishment.</u> This environmental easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. <u>Joint Obligation</u>. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Grantor's Name

By:____
Richard Crossed, President
Conifer Development, Inc.

Title: Managing General Partner
100 Fernwood Avenue Associates

Date:_____________

County:________________Site No:_______________Contract/Order No:_______________

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation

By: ____
Alexander B. Grannis, Commissioner

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the _______ day of _________, in the year 2009, before me, the undersigned, personally appeared ___________________, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

____
Notary Public - State of New York

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the _______ day of _________, in the year 2009, before me, the undersigned, personally appeared _________________, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

____
Notary Public - State of New York

SCHEDULE “A”
PROPERTY DESCRIPTION

County:________________Site No:_______________Contract/Order No:_______________

SURVEY

EDMS # 293602

APPENDIX I

NYSDEC PART 375 SOIL CLEANUP OBJECTIVES

375-6.8 Soil cleanup objective tables.

(a) Unrestricted use soil cleanup objectives.

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
Metals		
Arsenic	7440-38-2	13 [c]
Barium	7440-39-3	350 [c]
Beryllium	7440-41-7	7.2
Cadmium	7440-43-9	2.5 [c]
Chromium, hexavalent [e]	18540-29-9	1[b]
Chromium, trivalent [e]	16065-83-1	30 [c]
Copper	7440-50-8	50
Total Cyanide [e, f]		27
Lead	7439-92-1	63 [c]
Manganese	7439-96-5	1600 [c]
Total Mercury		0.18 [c]
Nickel	7440-02-0	30
Selenium	7782-49-2	3.9[c]
Silver	7440-22-4	2
Zinc	7440-66-6	109 [c]
PCBs/Pesticides		
2,4,5-TP Acid (Silvex) [f]	93-72-1	3.8
4,4'-DDE	72-55-9	0.0033 [b]
4,4'-DDT	50-29-3	0.0033 [b]
4,4'-DDD	72-54-8	0.0033 [b]
Aldrin	309-00-2	0.005 [c]
alpha-BHC	319-84-6	0.02
beta-BHC	319-85-7	0.036
Chlordane (alpha)	5103-71-9	0.094

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
delta-BHC [g]	319-86-8	0.04
Dibenzofuran [f]	132-64-9	7
Dieldrin	60-57-1	0.005 [c]
Endosulfan I [d, f]	959-98-8	2.4
Endosulfan II [d, f]	33213-65-9	2.4
Endosulfan sulfate [d, f]	1031-07-8	2.4
Endrin	72-20-8	0.014
Heptachlor	76-44-8	0.042
Lindane	58-89-9	0.1
Polychlorinated biphenyls	1336-36-3	0.1
Semivolatile organic compounds		
Acenaphthene	83-32-9	20
Acenapthylene [f]	208-96-8	100 [a]
Anthracene [f]	120-12-7	100 [a]
Benz(a)anthracene [f]	56-55-3	1 [c]
Benzo(a)pyrene	50-32-8	1 [c]
Benzo(b)fluoranthene [f]	205-99-2	1 [c]
Benzo(g,h,i)perylene [f]	191-24-2	100
Benzo(k)fluoranthene [f]	207-08-9	0.8 [c]
Chrysene [f]	218-01-9	1 [c]
Dibenz(a,h)anthracene [f]	53-70-3	0.33 [b]
Fluoranthene [f]	206-44-0	100 [a]
Fluorene	86-73-7	30
Indeno(1,2,3-cd)pyrene [f]	193-39-5	0.5 [c]
m-Cresol [f]	108-39-4	0.33 [b]
Naphthalene [f]	91-20-3	12
o-Cresol [f]	95-48-7	0.33 [b]

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
p-Cresol [f]	106-44-5	0.33 [b]
Pentachlorophenol	87-86-5	0.8 [b]
Phenanthrene [f]	85-01-8	100
Phenol	108-95-2	0.33 [b]
Pyrene [f]	129-00-0	100
Volatile organic compounds		
1,1,1-Trichloroethane [f]	71-55-6	0.68
1,1-Dichloroethane [f]	75-34-3	0.27
1,1-Dichloroethene [f]	75-35-4	0.33
1,2-Dichlorobenzene [f]	95-50-1	1.1
1,2-Dichloroethane	107-06-2	0.02 [c]
cis -1,2-Dichloroethene [f]	156-59-2	0.25
trans-1,2-Dichloroethene [f]	156-60-5	0.19
1,3-Dichlorobenzene [f]	541-73-1	2.4
1,4-Dichlorobenzene	106-46-7	1.8
1,4-Dioxane	123-91-1	0.1 [b]
Acetone	67-64-1	0.05
Benzene	71-43-2	0.06
n-Butylbenzene [f]	104-51-8	12
Carbon tetrachloride [f]	56-23-5	0.76
Chlorobenzene	108-90-7	1.1
Chloroform	67-66-3	0.37
Ethylbenzene [f]	100-41-4	1
Hexachlorobenzene [f]	118-74-1	0.33[b]
Methyl ethyl ketone (MEK)	78-93-3	0.12
Methyl tert-butyl ether [f]	1634-04-4	0.93
Methylene chloride	75-09-2	0.05

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
n - Propylbenzene [f]	103-65-1	3.9
sec-Butylbenzene [f]	135-98-8	11
tert-Butylbenzene [f]	98-06-6	5.9
Tetrachloroethene	127-18-4	1.3
Toluene	108-88-3	0.7
Trichloroethene	79-01-6	0.47
1,2,4-Trimethylbenzene [f]	95-63-6	3.6
1,3,5-Trimethylbenzene[f]	108-67-8	8.4
Vinyl chloride[f]	75-01-4	0.02
Xylene (mixed)	1330-20-7	0.26

All soil cleanup objectives (SCOs) are in parts per million (ppm).

Footnotes

[a] The SCOs for unrestricted use were capped at a maximum value of 100 ppm. See Technical Support Document (TSD), section 9.3.

[b] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the Track 1 SCO value.

[c] For constituents where the calculated SCO was lower than the rural soil background concentration, as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site.

[d] SCO is the sum of endosulfan I, endosulfan II and endosulfan sulfate.

[e] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

[f] Protection of ecological resources SCOs were not developed for contaminants identified in Table 375-6.8(b) with "NS". Where such contaminants appear in Table 375-6.8(a), the applicant may be required by the Department to calculate a protection of ecological resources SCO according to the TSD.

(b) Restricted use soil cleanup objectives.

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Metals							
Arsenic	7440-38-2	16[f]	16[f]	16[f]	16[f]	13[f]	16[f]
Barium	7440-39-3	350[f]	400	400	10,000 [d]	433	820
Beryllium	7440-41-7	14	72	590	2,700	10	47
Cadmium	7440-43-9	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent [h]	18540-29-9	22	110	400	800	1[e]	19
Chromium, trivalent [h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50-8	270	270	270	10,000 [d]	50	1,720
Total Cyanide [h]		27	27	27	10,000 [d]	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63[f]	450
Manganese	7439-96-5	2,000[f]	2,000[f]	10,000 [d]	10,000 [d]	1600[f]	2,000[f]
Total Mercury		0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	7440-02-0	140	310	310	10,000 [d]	30	130
Selenium	7782-49-2	36	180	1,500	6,800	3.9[f]	4[f]
Silver	7440-22-4	36	180	1,500	6,800	2	8.3
Zinc	7440-66-6	2200	10,000 [d]	10,000 [d]	10,000 [d]	109[f]	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	93-72-1	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e]	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e]	136
4,4'- DDD	72-54-8	2.6	13	92	180	0.0033 [e]	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04[g]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47	1.3	2.9

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
delta-BHC	319-86-8	100[a]	100[a]	500[b]	1,000[c]	0.04[g]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000[c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan II	33213-65-9	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	1031-07-8	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2
Semivolatiles							
Acenaphthene	83-32-9	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	208-96-8	100[a]	100[a]	500[b]	1,000[c]	NS	107
Anthracene	120-12-7	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	56-55-3	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	50-32-8	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1[f]	3.9	56	110	NS	1[f]
Dibenz(a,h)anthracene	53-70-3	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	206-44-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	86-73-7	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd)pyrene	193-39-5	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	91-20-3	100[a]	100[a]	500[b]	1,000[c]	NS	12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
o-Cresol	95-48-7	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	106-44-5	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	85-01-8	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	108-95-2	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	129-00-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Volatiles							
1,1,1-Trichloroethane	71-55-6	100[a]	100[a]	500[b]	1,000[c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33
1,2-Dichlorobenzene	95-50-1	100[a]	100[a]	500[b]	1,000[c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02[f]
cis-1,2-Dichloroethene	156-59-2	59	100[a]	500[b]	1,000[c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	100[a]	500[b]	1,000[c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1[e]	0.1[e]
Acetone	67-64-1	100[a]	100[b]	500[b]	1,000[c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100[a]	100[a]	500[b]	1,000[c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100[a]	100[a]	500[b]	1,000[c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone (MEK)	78-93-3	100[a]	100[a]	500[b]	1,000[c]	100[a]	0.12

2-Butanone

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Methyl tert-butyl ether	1634-04-4	62	100[a]	500[b]	1,000[c]	NS	0.93
Methylene chloride	75-09-2	51	100[a]	500[b]	1,000[c]	12	0.05
n-Propylbenzene	103-65-1	100[a]	100[a]	500[b]	1,000[c]	NS	3.9
sec-Butylbenzene	135-98-8	100[a]	100[a]	500[b]	1,000[c]	NS	11
tert-Butylbenzene	98-06-6	100[a]	100[a]	500[b]	1,000[c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100[a]	100[a]	500[b]	1,000[c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5- Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20-7	100[a]	100[a]	500[b]	1,000[c]	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm).
NS=Not specified. See Technical Support Document (TSD).

Footnotes

[a] The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

[b] The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

[c] The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

[d] The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

[e] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

[f] For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

[g] This SCO is derived from data on mixed isomers of BHC.

[h] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

[i] This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.

[j] This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See TSD Table 5.6-1.