Site Management Plan for the Mr. C's Dry Cleaners Site

East Aurora
Erie County, New York
NYSDEC Site No. 9-15-157

December 2013

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Environmental Remediation
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Revision	Date Submitted	Summary of Revisions	NYSDEC Approval Date
1	2012	Updated from January 2008, including format change to NYSDEC template.	
2	2013	Updated from December 2012, including 2013-2014 Heating Season Indoor Air & Sub-slab Vapor Sampling Plan	11/5/2013

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List of Abbreviations and Acronyms

AMSL	above mean sea level
AS/SVE	air sparging/soil vapor extraction
ATSDR	Agency for Toxic Substances and Disease Registry
BTEX	benzene, toluene, ethylbenzene, and xylenes
BGS	below grade surface
CFR	Code of Federal Regulations
cm/sec	centimeters per second
CPR	cardiopulmonary resuscitation
cVOC	chlorinated volatile organic compound
DCA	dichloroethane
DCE	cis-1,2-Dichloroethene
DER	Division of Environmental Remediation
DHC	*Dehalococcoides* spp.
DUSR	Data Usability Summary Report
EC	engineering control
EEEPC	Ecology and Environment Engineering, P.C.
ELAP	Environmental Laboratory Accreditation Program
EPA	(United States) Environmental Protection Agency
FS	Feasibility Study
GAC	granular activated carbon
IAQ	Indoor Air Quality
IC	institutional control
µg/L	microgram(s) per liter
$\mu g/m^3$	micrograms per cubic meter
Matrix	Matrix Environmental, Inc.
mg/kg	milligram(s) per kilogram
Mr. C's	Mr. C's Dry Cleaners Site
MPI	Malcolm Pirnie, Inc.

List of Abbreviations and Acronyms (cont.)

MRL	minimum risk level
MSDS	Material Safety Data Sheet
MTBE	Methyl-tert-butyl ether
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	operation and maintenance
OM&M	operations, maintenance, and monitoring
OSHA	Occupational Safety and Health Administration
P&ID	process and instrumentation diagram
PCE	tetrachloroethene (also known as perchloroethene)
ppb	parts per billion
ppm	parts per million
PRR	Periodic Review Report
PSA	Preliminary Site Assessment
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RI	Remedial Investigation
ROD	Record of Decision
RP	Responsible Party
RSO	Remedial System Optimization
SMP	Site Management Plan
SCG	standards, criteria, and guidance value
SHASP	Site-Specific Health and Safety Plan
SPDES	State Pollution Discharge Elimination System
SSDS	Sub-slab Depressurization System
SVI	soil vapor intrusion
SVII	Soil Vapor Intrusion Investigation
TAGM	Technical and Administrative Guidance Memorandum
TCE	trichloroethene
TCL	target compound list
Tyree	The Tyree Organization, Ltd.

List of Abbreviations and Acronyms (cont.)

VC	vinyl chloride
VOC	volatile organic compound

1 Introduction and Description of Remedial Program

1.1 Introduction

This document is a required element of the remedial program for the Mr. C's Dry Cleaners Site (hereinafter referred to as the "site"), which is administered under the New York State Department of Environmental Conservation's (NYSDEC's) Inactive Hazardous Waste Disposal Site Remedial Program. The site was remediated by NYSDEC as part of its State Superfund Program to investigate and remediate inactive hazardous waste disposal sites throughout New York State. The State implemented the cleanup plan using money from the 1986 Environmental Quality Bond Act.

1.1.1 General

After completion of the remedial work described in the Construction Closure and Certification Report (EEEPC March 2005), some contamination was left in the subsurface at this site (hereafter referred to as "remaining contamination"). As part of the contractor's scope of work under Contract No. D004180, an Operations, Maintenance, and Monitoring (OM&M) Plan was prepared and accepted for the continued monitoring of the remaining contamination. As part of EEEPC Work Assignment No. D004442-13, a Site Management Plan (SMP) was developed and issued to NYSDEC in January 2008 (EEEPC January 2008).

This Site Management Plan (SMP) was prepared in accordance with NYSDEC's Division of Environmental Remediation template (DER 10) requirements to manage the remaining contamination at the site until the Environmental Deed Restriction is extinguished in accordance with Environmental Conservation Law Article 71, Title 36. All reports associated with the site can be obtained by contacting NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by Ecology and Environment Engineering, P.C. (EEEPC), on behalf of NYSDEC, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC 2010) and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Deed Restriction for the site. The Environmental Deed Restriction, which was granted to NYSDEC and record-

ed with the Erie County Clerk, requires compliance with this SMP and all ECs and ICs placed on the site.

1.1.2 Purpose

The site contains contamination left after completion of the remedial action. To protect public health and the environment during use of the site, ECs have been incorporated into the site remedy to control potential exposures to remaining contamination. The ICs place restrictions on site use and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Deed Restriction for contamination that remains at the site. This plan has been approved by NYSDEC, and compliance with this plan is required by the grantor of the Environmental Deed Restriction and the grantor's successors and assigns. This SMP may be revised only with the approval of NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the site after completion of the remedial action, including (1) implementation and management of all ECs and ICs; (2) monitoring of site groundwater and other media; (3) operation and maintenance of the treatment system; (4) performance of periodic inspections and submittal of Periodic Review Reports (PRRs); and (5) defining criteria for termination of treatment system operations.

To address these requirements, this SMP includes three plans: (1) an Institutional Control and Engineering Control (IC/EC) Plan for implementation and management of EC and ICs; (2) a Site Monitoring Plan for implementation of site monitoring; and (3) an Operation and Maintenance (O&M) Plan for implementation of remedial collection, containment, treatment, and recovery systems (including, where appropriate, preparation of an O&M manual for complex systems).

This SMP also includes a description of PRRs to be used for the periodic submittal of data, information, and recommendations to NYSDEC.

It is important to note the following:

- This SMP details the site-specific implementation procedures that are required by the Environmental Deed Restriction. Failure to properly implement the SMP is a violation of the Environmental Deed Restriction, which is grounds for revocation of the Certificate of Completion; and

- Failure to comply with this SMP is a violation of Environmental Conservation Law, 6 New York Codes Rules and Regulations (NYCRR) Part 375, and is thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will be proposed in writing to NYSDEC's project manager for this site. In accordance with the Environmental Deed Restriction for the site, 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 at 586 Main Street in the village of East Aurora, County of Erie, New York, and is identified as Section 164.20, Block 7 and Lot 24 on the village of East Aurora Tax Map in Deed Book 11124. The approximately 0.5-acre site includes paved and unpaved (lawns and soil fill) areas and is surrounded by residential, municipal, and light commercial properties. A general site location map is provided as Figure 1-1. Mr. C's is located in a one-story building on a concrete slab foundation with an adjacent paved parking lot. Mr. C's occupies the front portion of the building, along Main Street; the remainder of the building is occupied by other commercial businesses. The Mr. C's building is north of Main Street, east of Whaley Avenue, and bounded by commercial and residential properties to the north and east (see Figure 1-2).

The volatile organic compound (VOC) contaminant plume associated with the Mr. C's site extends beyond the immediate treatment system area; therefore, the remedial treatment system encompasses four individual remedial treatment operating units in the village of East Aurora: Mr. C's (NYSDEC Site Number 9-15-157); the former Agway Store and Energy Products site located at 566 Main Street; the First Presbyterian Church located at 9 Paine Street; and a private residence located 27 Whaley Avenue. Information identifying the current property owners surrounding the Mr. C's site is presented in Appendix A. The map is based on village of East Aurora assessments records dates December 2012.

1.2.2 Site History

1.2.2.1 Mr. C's Site

Historic land use in the vicinity of the Mr. C's Dry Cleaners site was determined based on review of Sanborn Fire Insurance maps dating from 1912 to 1958 and interviews with the site owner, as documented in the feasibility study (FS) report for the site (MPI 1996). The site has been occupied by a dry cleaning operation since some time prior to 1970 and by other businesses (laundry, auto repair/spray painting, and a hotel) since 1912. Mr. C's Dry Cleaners has used the site since 1974. The existing building used by Mr. C's is believed to have been built around 1927.

Dry cleaning operations at Mr. C's utilize a solvent consisting primarily of tetrachloroethene, also known as perchloroethene (PCE). The RI (Malcolm Pirnie 1995a) states that, prior to 1985, filters and sludge were disposed of in dumpsters behind the building and collected by the Village of East Aurora. Since 1985, all dry cleaning wastes have been disposed of through a commercial waste disposal firm (NYSDEC 1997).

In December 1991, NYSDEC investigated complaints of odors in a neighboring property southwest of the site. It was determined that condensate from the steam-flushing and vacuuming processes were being disposed of in the sanitary sewers. In 1992, NYSDEC completed a Preliminary Site Assessment (PSA) of the site, which confirmed that site-related contamination was present in nearby groundwater and sanitary sewers. As part of the PSA, NYSDEC also collected air samples from nearby basements, as well as soil vapor, groundwater, and sanitary sewer samples. The analytical results for the samples indicated the presence of PCE. The site was then designated a Class 2 Hazardous Waste Site (Site Number 9-15-157) by NYSDEC, indicating that the site was believed to pose a significant risk to public health and the environment.

A remedial investigation (RI) and FS were performed between 1994 and 1996. A Record of Decision (ROD) was signed in 1997 that proposed in situ air stripping as the site remedy (see Appendix B). Pre-design investigations were performed in 1998 and 1999. An Explanation of Significant Differences was issued in April 2000 as justification for modification to the remedy proposed in the ROD (see Appendix B). Remedial design was completed in October 2000, and construction of an air stripper and a pump-and-treat system was completed in September 2002. Additional information on the remedial action is provided in Section 1.4, and a description of the treatment and monitoring systems is provided in Section 2. Between 2002 and 2012, several modifications and upgrades were made to the site's ECs and ICs as a part of OM&M; these are described in Section 2.

In 2009, the site was reclassified by NYSDEC to a Class 4 site (Site properly closed, requires continued management) that no longer presents a significant risk to public health and/or the environment.

As of May 2012, Mr. C's Dry Cleaners has been operating as a drop-off, pick-up facility only. Also in May 2012, aesthetic changes were made to the building in preparation for AT&T to move into the Mr. C's building. Changes included re-paving the parking lot, removing exterior siding, repainting the side of the building, and interior renovations. Pursuant to the change in use, NYSDEC directed EEEPC to perform subslab vapor sampling for the protection of human health and safety; the sampling results are presented in Section 1.5.2. Note that changes in building use must be reported to NYSDEC, as described in Section 5 of this SMP.

The 1996 ROD anticipated that the site would be remediated within 10 years of implementing the site remedy. Nearly 10 years have passed since implementation, and while the treatment system is effective at removing contamination, the groundwater plume has not been diminished (refer to Section 1.5 for information on remaining contamination).

A pilot study on anaerobic bioremediation and monitored natural attenuation at the site is planned for 2013 to 2014. The pilot study is one component of the Re-

medial System Optimization (RSO) that will be performed to support future modifications to the ROD.

1.2.2.2 Agway Energy Products Site

In proximity to Mr. C's site is the site of the former Agway Energy Products site, located at 866 Main Street, East Aurora, New York. The site was the location of a petroleum spill discovered in 1987. The Energy Products complex occupied the corner lot formed by Main Street and Whaley Avenue until October 1992, when operation as a motor fuel and retail gasoline outlet ceased. Following NYSDEC investigations at the site, buildings and associated underground storage tanks, the fuel pump island, and other on-site structures were demolished between February and March 1993 (Matrix 2003).

Upon completion of site demolition and restoration activities, the owner of the Agway property was required by the NYSDEC Region 9 Spills Program to install, operate, and monitor a small air sparging/soil-vapor extraction system. Matrix Environmental, Inc. (Matrix), installed the remedial system in September 2001 and operated it until June 2004. The operation and maintenance of the Agway air sparging/soil vapor extraction (AS/SVE) system was incorporated into the Mr. C's OM&M scope of work in 2005.

The AS/SVE system was operated and maintained by EEEPC from 2005 to December 2011, when its use was discontinued with the approval of NYSDEC. The system was turned off when monitoring data indicated that the system had reached the limit of its effectiveness. The pilot study will be performed only in two small areas within the extent of groundwater plume, neither of which are on the Agway site in the vicinity of the AS/SVE system. However, one goal of the pilot study is to evaluate the potential for anaerobic bioremediation to achieve site cleanup goals within the plume that are not located in the within the pilot study area. The potential for anaerobic bioremediation in the vicinity of the AS/SVE system cannot be evaluated if the system is running, since the system actively introduces dissolved oxygen in the subsurface, thereby maintaining aerobic conditions. The AS/SVE system will remain off under full implementation of the pilot study. System components were shut down and inventoried in December 2011 for potential reuse at other NYSDEC project sites.

Benzene, toluene, ethylbenzene, and xylenes (BTEX)-contaminated soils at the former Agway site spill area were originally removed from the surface to approximately 12 feet below grade surface (BGS) and replaced with clean fill in the mid-1990s. After groundwater monitoring wells were installed and sampled, additional groundwater treatment had to be performed. A subsurface treatment system consisting of an AS/SVE system was installed. The monitoring wells and system operated from 2000 to 2003. As provided in the November 14, 2003, report by Matrix, analytical results indicated that soil contamination for a number of VOCs exceeded the regulatory limits established by NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 Guidelines. Although the Matrix re-

port states that no further action was required, no analytical data were presented to support the claim.

The 2003 Matrix report indicated that the analytical results for six of the seven monitoring wells sampled only for BTEX were below the state's groundwater quality standard, and that in the remaining well, the results were "slightly" above the standard. However, the analytical results for samples collected from on-site groundwater monitoring wells by EEEPC in September 2005 (EEEPC 2005) indicated that BTEX and VOCs were still present at concentrations above groundwater quality standards. Groundwater contamination, primarily PCE due to the site's proximity and hydraulically downgradient location relative to the Mr. C's site, is remediated by the areawide groundwater pumping wells that discharge into the Mr. C's treatment system.

1.2.2.3 First Presbyterian Church

The First Presbyterian Church and school buildings occupy the northwest corner property bordered by Main Street and Paine Avenue in the village of East Aurora, New York. The original church and community building were constructed circa 1926, and an adjoining school and administrative building were added on the west side in 1961.

Both structures have full basements with poured-concrete floors. The west end of the school basement contains several classroom areas for preschool children. Based on reports of chemical odors by church members, NYSDEC began environmental investigations at the site in October 1991.

Because of continuing complaints of chemical odors in the church basement, in July 2004 NYSDEC and the New York State Department of Health (NYSDOH) requested that EEEPC conduct a Soil Vapor Intrusion Investigation (SVII) at the site (EEEPC 2004a). Additional air filtration devices were installed in classroom areas while investigations into the source of the VOCs detected in the church continued. These studies revealed the presence of VOCs below the basement floor slabs in sufficient quantity to warrant the design and installation of sub-slab depressurization systems (SSDSs). The three SSDS units were installed in September 2004 by Mitigation Technologies, Inc., of Brockport, New York, through a subcontract agreement with OP-TECH Environmental Services, Inc., of Syracuse, New York, under the NYSDEC Spills program.

Analysis of indoor air samples collected on September 20, 2004, indicated a substantial reduction in PCE levels immediately after system installation. Post-commissioning samples were collected again on January 25, 2005, to evaluate the performance of the SSDSs under "heating season" conditions. The analytical results from this sampling effort indicated almost complete removal of PCE in indoor air as a result of the continuous operation of the SSDSs.

Subsequent indoor air sampling conducted by the state confirmed the reduction of the air contaminants to levels below the current NYSDOH guidance value for PCE in indoor residential air.

The continued OM&M of the SSDSs has been incorporated into the Mr. C's OM&M scope of work. The periodic maintenance performed from September 2004 to December 2011 included the replacement of the western SSDS fan in March 2007 and the southern SSDS fan in May 2008 due to problems with the fan bearings.

Routine inspection of the system indicates that the system is still operating within the parameters initially established for the facility.

1.2.2.4 27 Whaley Avenue

Studies in 1992 confirmed the migration of groundwater contamination along the west side of Whaley Avenue to the residential area directly west of the Mr. C's and Agway Energy Products sites. A majority of homes in the area are modest, two- and three-story wood-frame constructions with lot sizes averaging less than 0.5 acres.

In 2004, basement air samples were collected from homes in the Whaley Avenue corridor as part of periodic indoor air sampling program. The analytical results for samples collected from the 27 Whaley Avenue residence indicated the presence of PCE at levels approaching or slightly above the NYSDOH guidance value for residential homes (100 micrograms per cubic meter [$\mu g/m^3$]). As a result, the NYSDOH recommended installation of an air filtration device for the 27 Whaley Avenue residence, which was in place by January 2005. During the initial Indoor Air Quality (IAQ) review in May 2004, the building was vacant and in the process of being purchased, and the unit was removed.

The residence at 27 Whaley Avenue consists of a poured-concrete foundation and wood framing. The building is presently configured as a double residence, capable of housing a family on both the first and second floors. The house is approximately 80 to 90 years old, and the back of the house was damaged by a fire on the second floor in the late 1990s. The building's heating system is re-circulated forced air heated by a natural gas furnace; it does not have central air conditioning.

In July 2004, a soil gas survey was conducted along the north side of Main Street, east and west of Whaley Avenue, and on the east and west side of Whaley Avenue, starting at Main Street and proceeding north approximately 600 feet. While a number of homes were sampled, only the results from the 27 Whaley Avenue residence exceeded the NYSDOH guidance value for PCE in sub-slab air (100 $\mu g/m^3$).

An SSDS was installed at the 27 Whaley Avenue structure in January 2005 by Mitigation Tech (a subcontractor to OP-Tech Environmental Services, Inc., of Tonawanda, New York) and has been operating since that time.

Subsequent indoor air sampling conducted by EEEPC for NYSDEC confirmed that indoor air contaminants levels in the 27 Whaley Avenue residence had dropped to below the current NYSDOH guidance value for PCE in indoor residential air. Routine inspection of the system indicates that the system is still operating within the parameters initially established for the facility. The continued OM&M of the SSDSs has been incorporated into the Mr. C's OM&M scope of work.

1.2.3 Geologic Setting

1.2.3.1 Lithology

The site is situated on top of fill, which overlays glacial deposits dating from the last glacial period. The RI (MPI 1995a) identifies three consolidated stratigraphic units below the unconsolidated units. A geologic cross section from the Feasibility Study (FS) is presented as Figure 1-3. The stratigraphic units are described below.

A. **Unconsolidated Sediments.** Unconsolidated sediments at the site consist primarily of fill, glacial outwash, lacustrine deposits, and glacial till. During the RI, fill was found to a depth of approximately 11 feet BGS. Fill beneath the Mr. C's site was described as clayey silt with gravel overlying gravel with clayey silt and traces of brick fragments. The fill is underlain by 4 to 7 feet of glacial till composed of brown clayey silt with varying amounts of shale fragments.

B. **Gravel and Sand Outwash.** Glacial outwash was encountered in each RI borehole and grades from sandy gravel near the top of the unit to very fine sand at the base. The outwash is approximately 27.5 feet thick and consists of 2 to 26 feet of gravel at the top followed by 1.5 to 12 feet of medium-to-coarse sand with varying amounts of fine sand. Fine and very fine sands were encountered at the base of the outwash unit in most of the RI borings (MPI 1995a).

C. **Lacustrine Deposits.** The glacial outwash is underlain by lacustrine sandy silt. The lacustrine deposits were encountered at an elevation of approximately 888 feet above mean sea level (AMSL) and ranged in thickness from 11.5 and 14.5 feet. These deposits may liquefy when disturbed, are uniform, and are characterized by mostly silt and fine to very fine sand (MPI 1995a).

D. **Stratified Till and Sand.** A sequence of stratified, interbedded, fine-grained till and sand underlies the lacustrine deposits. It was encountered at 90 feet BGS in the deepest exploratory RI boring and was found to be approximately 49.5 feet thick. This sequence contains lenses of stratified medium- and fine-grained sand interbedded with clayey silt and silty clay till layers. The two li-

thologies are separated by a sharp contact with the sand layers varying in thickness from thin laminae to 3 feet and the till ranging in thickness from thin laminae to layers 5 to 11 feet thick (MPI 1995a).

E. **Bedrock**. Based on regional geologic information, bedrock beneath the site is mapped as the Upper Devonian Angola shale of the West Falls Group, which may be approximately 150 to 200 feet BGS (MPI 1995a). No borings or wells at the Mr. C's site encountered bedrock during drilling; the deepest boring extended to a depth of 90 feet. The site is situated on top of the buried bedrock valley of Cazenovia Creek.

1.2.3.2 Hydrostratigraphic Units

Three major hydrostratigraphic units are present beneath the site, including an unconfined aquifer of saturated outwash deposits (outwash aquifer); the underlying lacustrine aquifer; and a confining layer consisting of the stratified till deposits (MPI 1995a). The outwash and lacustrine aquifers are hydraulically connected, with nearly the same hydraulic heads. However, these aquifers are characterized by different hydraulic conductivities and porosities.

Groundwater flow in each hydrostratigraphic unit is generally toward the northwest. Local flow direction is affected by the batch operation of the existing groundwater pumping system. The direction of groundwater flow is shown on Figure 1-4.

A. **Outwash Aquifer.** The outwash aquifer is an unconfined aquifer with a saturated thickness of approximately 18 feet. Wells screened across the entire outwash aquifer exhibited a geometric mean hydraulic conductivity of 0.004 centimeter per second (cm/s) (MPI 1995a). Precipitation and infiltration are the main recharge sources for this aquifer, and there is potential exfiltration from sewers located above the water table. Vertical gradients are very slightly vertically downward, but the groundwater flow in the outwash aquifer is essentially horizontal (MPI 1996).

B. **Lacustrine Aquifer.** The lacustrine aquifer is a rather uniform aquifer with a saturated thickness of approximately 13 feet. Wells screened across the lacustrine aquifer exhibited hydraulic conductivities ranging from 1.5×10^{-4} to 4.9×10^{-4} cm/s (MPI 1995a). During the RI, groundwater flow appeared very similar to the outwash aquifer groundwater flow.

C. **Confining Stratified Till Unit.** This unit consists of interbedded layers of clayey till and sand. The average hydraulic conductivity for the unit was estimated to be 8.8×10^{-6} cm/s (MPI 1995). A previously calculated upward vertical hydraulic gradient for this unit indicated that outwash and lacustine aquifers are not the source of recharge to the stratified till unit (MPI 1995a).

1.3 Summary of Remedial Investigation Findings

An RI was performed from 1993 to 1995 in two phases to characterize the nature and extent of contamination at the site (MPI 1995a, 1995b). Generally, the RI determined the horizontal and vertical extents of the contamination and found that contaminants at the site consisted of PCE, petroleum hydrocarbons resulting from known petroleum spills, and other VOCs, including compounds resulting from PCE degradation.

The highest concentration of PCE was found in soil in the sub-surface near the Mr. C's building by a sanitary sewer lateral. Consequently, the source of PCE in the soils beneath the Mr. C's building was suspected to be leakage from a sanitary sewer lateral. However, sampling of the sewer yielded only trace concentrations of VOCs, so it was concluded that the PCE did not remain in the sewer and that there was no current source. Conceptually, contamination in the soils above the water table would move downward until it reached the groundwater table, where it would partially dissolve and move with the regional groundwater flow.

At the time of the RI, the groundwater plume extended from the Mr. C's building to the west in two branches: one moving to the northwest and extending 300 to 400 feet beyond the Town of Aurora Public Library; and one moving to the southwest to slightly beyond the First Presbyterian Church. The RI defined the source plume as the groundwater plume in the northwestern direction that contained greater than 1,000 ppb of PCE in groundwater.

The following sections summarize site conditions when the RI was performed (1993-1995).

1.3.1 Soil Contamination

The site conceptual model indicated that the presence of PCE and/or its breakdown products in areas other than the source area would be the result of contaminant migration within groundwater; therefore, widespread soil sampling was not required. Instead, a soil gas investigation was performed in the parking lot of the Mr. C's building to identify the source areas of highly contaminated soil. PCE concentrations were below levels that would suggest such a source above the water table, except in two areas: near the sewer lateral and on the west side of the parking area, adjacent to the shoe repair building.

Three soil samples were collected from two soil borings: two soil samples, one at a depth of 6 to 8 feet BGS and one at a depth of 8 to 10 feet BGS, were collected from soil boring one (SB-1), which was installed adjacent to the sewer lateral; and one soil sample was collected from a depth of 6 to 8 feet BGS at soil boring two (SB-2), which was installed in the parking lot west of the Mr. C's Dry Cleaners building. The highest concentration of PCE (48,000 milligrams per kilogram [mg/kg]) was detected in the sample collected from SB-1 at 8 to 10 feet BGS, indicating that past leakage from the sewer lateral is the likely source of the contamination. However, PCE was not detected at concentrations above 5 micrograms per liter (µg/L) in samples collected from the sewer lateral, indicating that the

sewer system was not likely influencing the migration of PCE at the time of the RI. The analytical results for the RI soil samples are summarized in Table 1-1.

Table 1-1 RI Soil Sample Analytical Results

Soil Boring	Depth	PCE (mg/kg)
TAGM 4046 Standard:		**1,400**
SB-1	6 to 8 feet	6,400
SB-1	8 to 10 feet	48,000
SB-2	8 to 10 feet	12,000

Note: TAGM 4046 was replaced by CP-51/Soil Cleanup Guidance in 2010.

1.3.2 Groundwater Contamination

During the RI, groundwater samples were collected from 40 locations across the study area and analyzed for the Target Compound List (TCL) of VOCs. Significant concentrations of PCE and PCE daughter products, including trichloroethene (TCE), 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethene (1,1-DCE), and vinyl chloride (VC), were detected in the saturated portion of the outwash unit. PCE and its daughter products were detected at much lower concentrations in the lower lacustrine unit (see Table 1-2). VOC compounds, including BTEX, were detected in known petroleum spill areas on the former Agway property and the Delia car dealership property, neither of which are not part of the Mr. C's site.

Table 1-2 RI Groundwater Sample Analytical Results

Aquifer	Frequency of Detection of PCE and/or PCE Degradation Products	Highest Detected PCE Concentration (µg/L)
Groundwater Class GA Standard[1]:		**5**
Upper Outwash (source plume)	26 of 35 locations	8,200
Upper Outwash (southwest branch of plume)[2]		390
Base of the Outwash	20 of 27 locations	18,000
Lacustrine	3 of 8 locations	460

Note:
[1] New York State Department of Conservation. 1998. Division of Water Technical and Operational Guidance Series (1.1.1): Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, Division of Water, Albany, New York.
[2] Contamination was not detected in the lower units in the southwestern branch of the plume by the First Presbyterian Church.

Key:
PCE = tetrachloroethene (also known as perchloroethene)
µg/L = microgram(s) per liter

1.3.3 Indoor Air

Indoor air was sampled in March 1994 and April 1995 as part of the RI and again in May 1996 to screen for soil vapor intrusion, which resulted from the partitioning of contaminants in the underlying groundwater aquifer. Samples were collected from the First Presbyterian Church, the village hall, the Boys and Girls Club, Jackson's Bowling Alley, two private residences on Whaley Avenue, and

two private residences on Fillmore Avenue. Prior to the implementing the remedy, PCE was detected in indoor air above the U.S. Environmental Protection Agency's (EPA's) mean indoor air concentration of 21 $\mu g/m^3$ in the basements of the two residences on Whaley Avenue, in the First Presbyterian Church, and in the bowling alley, as presented in Table 6-5 of the Malcolm Pirnie RI Report (June 1995).

1.4 Summary of the Remedial Action

1.4.1 Remedial Goals

The remedial goals selected for the Mr. C's site, as stated in the ROD are:

- Mitigate human health risk by reducing the potential for inhalation of vapors in on-site and off-site basements;
- Mitigate the source area of the contaminant plume to prevent further migration of the chlorinated volatile organic compounds (cVOCs) and reduce volatilization into adjacent basements; and
- Achieve NYSDEC groundwater quality standards to the extent practicable.

Table 1 in the ROD sets forth initial groundwater and soil cleanup objectives for the Mr. C's site. A copy of the ROD is provided in Appendix B.

1.4.2 Selected Remedy

An FS completed by Malcolm Pirnie, Inc. (MPI), in November 1996 recommended remediation of the source plume using in situ air stripping wells. A remedial action consisting of the installation of eight in situ air-stripping wells was selected, and a ROD was signed in March 1997 (see Appendix B). Additional predesign investigations were conducted by Malcolm Pirnie, Inc., in December 1998 and April 1999 to confirm the limits of the groundwater contamination plume.

An Explanation of Significant Differences was issued in April 2000 as justification for the modification of the selected remedy to a conventional groundwater pump-and-treat system, and is included in Appendix B with the ROD.

Remedial design, including the preparation of contract documents and drawings, was completed to a 65% level before Malcolm Pirnie, Inc. (MPI) went out of contract with NYSDEC. EEEPC finalized the contract documents in January 2001, and the project was publicly bid in March 2001. The project was awarded to The Tyree Organization, Ltd. (Tyree), of Latham, New York in May 2001.

The components of the selected remedy included the operation and maintenance of the treatment system and off-site indoor air filters (later replaced with SSDSs); periodic monitoring; and implementation of a monitoring program, including groundwater monitoring, to evaluate the effectiveness of the selected remedy.

1.4.3 Completion of the Remedy

The site was remediated in accordance with the NYSDEC-approved Remedial Design dated October 2000. The following actions were completed during implementation of the Remedial Design:

- Construction of eight pumping wells and 30 observation piezometers;
- Installation of approximately 1,100 linear feet of double-wall groundwater collection piping;
- Improvements within the designated groundwater treatment system space inside the Mr. C's building, including demolition and removal of existing utilities and fixtures;
- Construction of a groundwater treatment system consisting of a sequestering agent feed system, bag filters, a 3,000-gallon holding tank, a low-profile air stripper, and vapor-phase granular activated carbon (GAC);
- Installation of approximately 1,300 linear feet of 4-inch-diameter force main for the discharge of treated groundwater to Tannery Brook; and
- Execution of permanent access agreements and easements (i.e., institutional controls) for the long-term operation of the treatment systems and the network of groundwater pumping wells. All required permanent easements for system access, maintenance, and monitoring, including components on private properties, have been filed with the Erie County Clerk for the project. Refer to Appendix C for copies of the permanent individual property easements. Refer to Appendix D for copies of the private property access agreements.

Remedial activities were completed at the site on September 21, 2002, with the start-up of the groundwater treatment system.

Operation and maintenance (O&M) of the system was performed for 12 months by Tyree after the completion of construction. The O&M services portion of the construction contract was completed in September 2003. OM&M have been performed by EEEPC or their contractor since October 2003. EEEPC contracted O&M Enterprise, Inc., of North Tonawanda, New York, from October 2003 to October 2005 to perform operations, maintenance and monitoring services.

1.4.4 Modifications to the Remedy

Modifications to the original system were made based on an air modeling study performed by EEEPC in September 2004 (EEEPC 2004b). In September 2004, EEEPC prepared and submitted the *Review for the Necessity of Granular Activated-Carbon Units on the Influent Air Stream, Mr. C's Dry Cleaner's Site*. This review evaluated the potential ambient air impacts resulting from the operation of the Mr. C's Dry Cleaners site air stripper without the vapor-phase GAC treatment units. The results of the air modeling study demonstrated that the two vapor-

phase GAC treatment units were unnecessary. The results were subsequently evaluated and accepted by NYSDEC in October 2004. In January 2005, the two vapor-phase GAC treatment units were decommissioned, removed from the Mr. C's Dry Cleaners remedial treatment system, and sent to another NYSDEC site for use. A new flow meter and totalizer were added to the effluent discharge line downstream of the effluent meter installed under the original scope of work. Under a new work assignment to EEEPC in 2007 O&M services were competitively bid in 2007 by EEEPC and awarded to Iyer Environmental Group, PLLC of Orchard Park, New York, which continues to provide O&M services for the site.

1.5 Remaining Contamination

The remaining contamination at the Mr. C's Dry Cleaners site is found primarily in groundwater, with a limited amount present in soil vapor. The following sections present the most recent soil, groundwater, soil vapor, and indoor air sampling results.

1.5.1 Soil Contamination

Soil samples were collected in 2012 during construction of two new wells (EE-3 and EE-4). Samples were collected to a depth of 12 feet in EE-4 and to a depth of 28 feet in EE-3. Two VOCs were detected in the boring for well EE-4, including PCE and methylene chloride. Ten VOCs were detected in the boring for well EE-3, including PCE, TCE, 1,1-DCE, cis-1,2-DCE, vinyl chloride, methylene chloride, acetone, benzene, toluene, and MTBE. All VOCs were detected at concentrations lower than the NYSDEC's *CP-51 Soil Cleanup Guidance* values, except for PCE, for which CP-51 does not provide a specific guidance value for PCE for comparison of the results. CP-51 does state that soil cleanup objectives for organic contaminants including VOCs are capped at 100 parts per million (ppm) for residential use, 500 ppm for commercial use, 1,000 ppm for industrial use. A summary of the detected results for PCE and total VOCs are presented in Table 1-3. The analytical results for these soil samples are presented in the closeout report for monitoring well installation (EEEPC 2012).

1.5.2 Groundwater Contamination

In 2002 and 2003, Tyree collected groundwater samples from the monitoring well network surrounding the site to evaluate the effectiveness of the remedial action. In 2004, 2007, 2009, 2010, and 2012, EEEPC collected groundwater samples from the monitoring well network under the long-term groundwater monitoring program to define the cVOC concentrations and movement of the plume with respect to the cleanup operations. The sample results were summarized in the long-term groundwater monitoring reports issued to NYSDEC. Beginning in 2012, long-term groundwater monitoring results will be reported in the PRRs.

Groundwater beneath the Mr. C's site continues to contain elevated levels of several cVOCs, their breakdown by-products, and aromatic hydrocarbons. Based on the 2012 groundwater monitoring well report (EEEPC 2012), the highest concentrations of these contaminants currently occur in an area measuring approximately 360 feet by 240 feet and centered on monitoring well MPI-6S, which is located

behind the Town of Aurora Library parking lot. The contaminated groundwater plume extends northwest from the former Agway site, presumably beyond monitoring well MPI-6S. The total VOC concentrations in groundwater samples collected from monitoring wells along Fillmore Avenue (north of the plume) were below the groundwater NYSDEC Class GA groundwater standard for total VOCs (5 µg/L).

Table 1-3 2012 Soil Sample Analytical Results

Soil Boring	Depth (ft BGS)	PCE (mg/kg)	Total VOCs (mg/kg)
EE-3	0 to 2	ND	5.7
EE-3	2 to 4	ND	5.1
EE-3	4 to 8	ND	3.8
EE-3	8 to 10	0.70	6.1
EE-3	10 to 12	ND	5.6
EE-3	12 to 14	1.3	6.56
EE-3	14 to 16	51	79.16
EE-3	16 to 18	850	899.70
EE-3	20 to 22	1,700	1,828.78
EE-3	22 to 24	54	304.62
EE-3	24 to 26	ND	34.33
EE-3	26 to 28	27	59.0
EE-4	0 to 2	ND	0.51
EE-4	6 to 8	ND	2.8
EE-4	8 to 10	1.6	4.0
EE-4	10 to 12	2.1	2.1

Key:
ft BGS = feet below ground surface
mg/kg = milligram per kilogram
ND = not detected
PCE = tetrachloroethene
VOCs = volatile organic compounds

PCE was the primary cVOC detected in the groundwater samples. The results of the most recent (2012) groundwater well network sampling indicate the following:

- Eight VOCs (PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride, methyl tert-butyl ether [MTBE], 2-butanone, and acetone) were detected in the groundwater samples at concentrations above the NYSDEC Class GA groundwater standards and guidance values used to screen the groundwater data.

- Acetone and 2-butanone were detected only in well MPI-15B. Acetone was detected at a concentration of 2,300 µg/L and, for clarity, was not included in the interpolation of groundwater contaminant plume contours.

- PCE was detected in samples from 20 wells across the site at concentrations above the groundwater standard for total VOCs (5 µg/L). The highest concen-

tration of PCE (6,800 µg/L, estimated) was detected in a sample collected from monitoring well MPI-6I.

- TCE was detected in samples from 12 wells across the site at concentrations above the groundwater standard for total VOCs (5 µg/L). The highest concentration of TCE (170 µg/L) was detected in a sample collected from pumping well PW-4.

- Cis-1,2-DCE was detected in samples from 10 wells across the site at concentrations above the groundwater standard for total VOCs (5 µg/L). The highest concentration of cis-1,2-DCE (190 µg/L) was detected in a sample collected from monitoring well EE-2.

- Trans-1,2-DCE was detected above the groundwater standard for total VOCs (5 µg/L) in samples from four wells, which were concentrated north of the Agway air sparge system and near to or east of Whaley Avenue, in the gravel parking lot. The highest concentration of trans-1,2-DCE (11 µg/L, estimated) was detected in a sample collected from monitoring well MW-8.

- Vinyl chloride was detected in samples from five wells at concentrations above the reporting limit, which varied by sample depending on the dilution. The reporting limit for every sample was higher than the groundwater standard for vinyl chloride (2 µg/L). The highest concentration of vinyl chloride (18 µg/L) was detected in a sample collected from monitoring well EE-2.

- MTBE was detected above its groundwater guidance value (10 µg/L) in three wells and is confined to the west of Main Street and near to or south of the library. The highest concentration of MTBE (81 µg/L) was detected in a sample collected from monitoring well MPI-3S.

1.5.3 Sub-Slab Soil Vapor and Indoor Air

This section presents select results from the most recent sampling performed at the First Presbyterian Church, the residence at 27 Whaley Avenue, and the Mr. C's treatment building. The NYSDOH does not have guidance values for sub-slab or soil vapors. However, NYSDOH does have relevant guidance values for indoor air (5 µg/m^3 for TCE, and 100 µg/m^3 for PCE). Guidance values are taken from the NYSDOH's *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006).

Sub-slab soil vapor and indoor air results can also be compared with the minimum risk levels (MRLs) for chronic exposure by inhalation, as set by the Agency for Toxic Substances and Disease Registry (ATSDR). An MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects over a specified duration of exposure. These substance-specific estimates, which are intended to serve as screening levels, are used by the ATSDR health assessors and other responders to identify contaminants and potential health effects that may be of concern.

First Presbyterian Church

Indoor air quality and sub-slab soil vapor samples were collected from within the First Presbyterian Church and the SSDS fan unit discharges on January 25, 2005; June 26, 2006; November 14, 2008; November 16, 2010; and December 12, 2011. Table 1-4 presents the analytical results for the most recent indoor air and sub-slab soil vapor samples; the table presents only the results for which chronic inhalation MRLs are available. PCE and TCE remain below NYSDOH guidance values and MRLs. In addition, the concentrations of PCE and TCE in indoor air samples were lower than in the soil vapor samples, which were obtained from the SSDS fan discharge.

The complete analytical results were reported to NYSDEC in the December 2011 Indoor Air Quality Report for the First Presbyterian Church (EEEPC 2012) and are available upon request.

27 Whaley Avenue

Indoor air quality samples were collected from within the 27 Whaley Avenue residence and the SSDS fan unit discharge on February 14, 2005; June 26, 2006; January 21, 2009; and November 16, 2010. Table 1-4 presents the analytical results for the most recent indoor air samples; the table presents only the results for which chronic inhalation MRLs are available. Sub-slab soil vapor sampling is not part of the sampling program at 27 Whaley Avenue. PCE and TCE in indoor air remain below their guidance values and MRLs.

The complete analytical results were reported to NYSDEC in the November 2010 Indoor Air Quality Report for 27 Whaley Avenue (EEEPC 2011) and are available upon request.

Mr. C's Treatment Building

Sub-slab soil vapor samples were collected from beneath the Mr. C's treatment building on May 31, 2012. One sample was collected inside the treatment operations area near the west door, and the other sample was collected between the bag filter and equalization tank. Table 1-4 presents the analytical results samples; the table presents only the results for which chronic inhalation MRLs are available. PCE was detected in both sub-slab soil vapor samples at concentrations significantly above the NYSDOH guidance for PCE (100 $\mu g/m^3$) and its MRL (270 $\mu g/m^3$). An evaluation is underway to determine the feasibility of using the existing blower on the air-stripper to vent the sub-slab vapors, similar to an SSDS.

The complete analytical results were reported to NYSDEC in a letter report (EEEPC 2012) and will be included in the 2012 PRR.

Table 1-4 Remaining Contamination in Sub-Slab Soil Vapor and Indoor Air

Compound	ATSDR MRL[1,2]	Principal Uses	Range of Contaminants (µg/m^3)			
			Mr. C's Building	27 Whaley Avenue	First Presbyterian Church[3]	
			(Soil Vapor)	(Indoor Air)	(Indoor Air)	(Soil Vapor)
Acetone	30.8 µg/m^3 (13 ppmv)	Plastics, fibers, drugs, solvents	20.9 - **313.67**	26.38 - **37.31**	7.82 - 17.56	18.53
Benzene	9.58 µg/m^3 (0.003 ppmv)	Solvent, chemical intermediate, gasoline additive	<15.95 U - <31.07 U	7.34 - 8.39	0.70 J - 0.96	0.57
Carbon tetrachloride	0.189 µg/m^3 (0.03 ppmv)	Refrigerant, propellant, pesticide, cleaning fluid and degreasing agent, component in fire extinguishers, and spot removers	<13.08 U - <79.26 U	**0.50 J** - <3.15 U	<0.63 U	<0.63 U
Chloroform	0.097 µg/m^3 (0.02 ppmv)	Chemicals, may form from chlorine and water	<8.71 U - <13.82 U	**0.29 J** - <2.43 U	<0.49 U	<0.49 U
Chloromethane	100 µg/m^3 (0.05 ppmv)	Chloromethane is an impurity in vinyl chloride; exposure could occur from disposal of vinyl chloride waste. Other sources of exposure are cigarette smoke, polystyrene insulation, aerosol propellants, and chlorinated swimming pools.	<7.75 U - <46.89 U	0.87 - <0.94 U	0.91 - 1.01	0.68
Ethylbenzene	0.26 µg/m^3 (0.06 ppmv)	Inks, insecticides, paints, solvents, production of styrene	<21.68 U - <51.16 U	**5.98 - 6.55**	<0.29 U	<0.29 U
Dichloromethane (aka Methylene Chloride)	1,040 µg/m^3 (0.3 ppmv)	Aerosol propellant, refrigerant	<15.38 U - <93.06 U	20.90 - 27.67	0.28 J - 0.52	0.28 J
N-Hexane	2.11 µg/m^3 (0.6 ppmv)	Solvents, gasoline, quick-drying glues such as rubber cement	**12.34 J - 85.32 J**	**14.63 - 18.16**	<0.16 U - 0.885	0.855
Toluene	300 µg/m^3 (0.08 ppmv)	Gasoline component, solvent, plastics manufacturing	<7.11 U - <42.9 U	32.17 - 35.78	1.02 - 1.99	0.87
PCE	270 µg/m^3 (0.04 ppmv)	Solvent/degreaser, chemical intermediate	**4,278.93 - 21,903.23**	2.71 J - 3.19	<0.41 U - 2.1	56.35

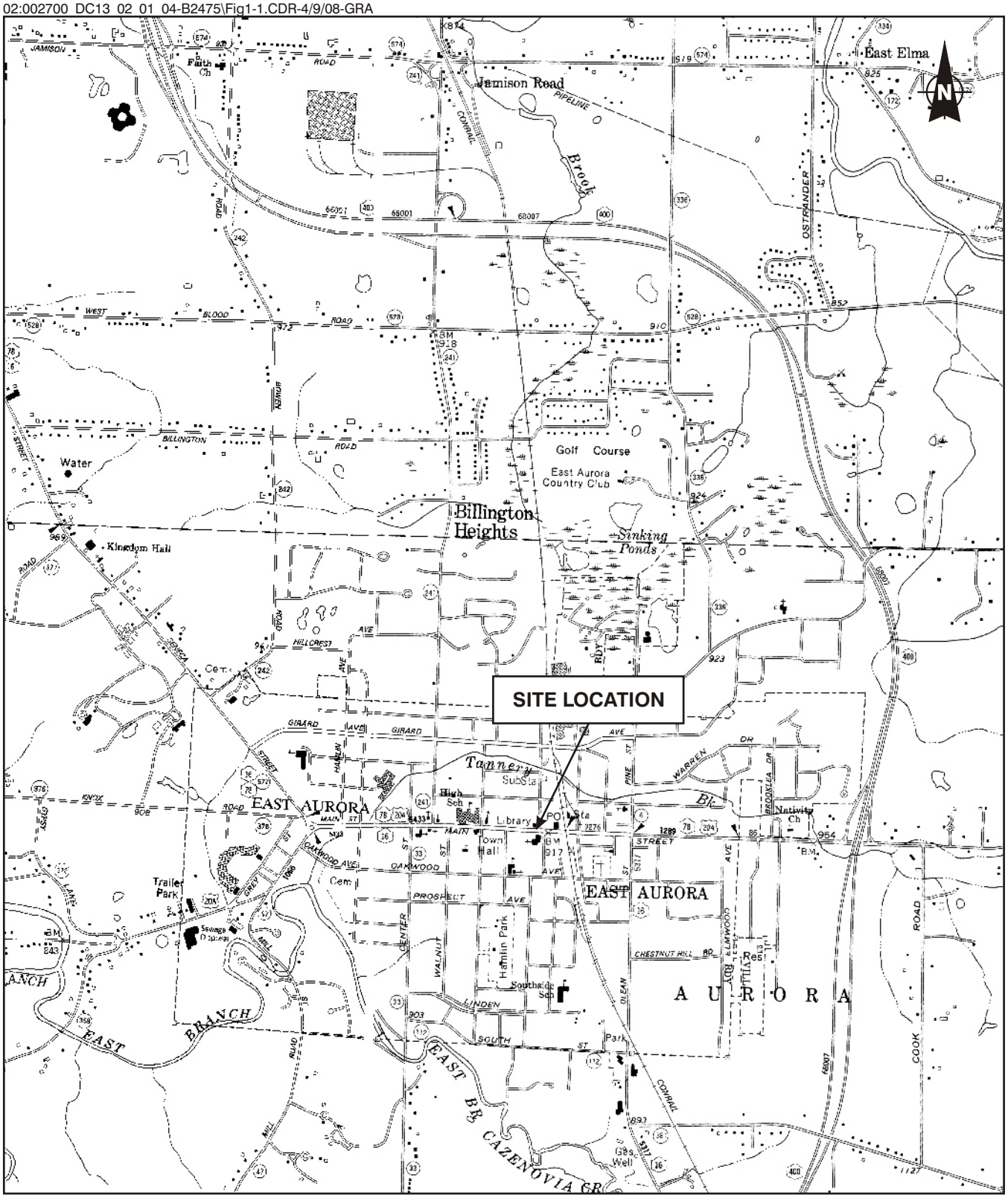
Table 1-4 Remaining Contamination in Sub-Slab Soil Vapor and Indoor Air

Compound	ATSDR MRL[1,2]	Principal Uses	Range of Contaminants (µg/m^3)			
			Mr. C's Building	27 Whaley Avenue	First Presbyterian Church[3]	
			(Soil Vapor)	(Indoor Air)	(Indoor Air)	(Soil Vapor)
TCE	540 µg/m^3 (0.1 ppmv)	Industrial solvent used primarily in metal degreasing and cleaning operations	18.81 J - <58.04 U	<0.28 U - <0.43 U	<0.28 U - <0.28U	3.76
1,4-Dichlorobenzene	600 µg/m^3 (0.1 ppmv)	Deodorant for restrooms, garbage cans, etc.; used to control moths, mold, and mildew	<12.93 U - <78.16 U	<1.02 U	0.6 - 0.9	<0.37 U
Xylenes (total xylenes – m, p, and o)	220 µg/m^3 (0.05 ppmv)	Used in a variety of consumer products, including gasoline, paint varnish, shellac, and rust preventatives	<33.66 U - <209.83 U	34.25 - 34.81	1.21 J - 1.43 J	1.09 J

Notes:
1 The MRL presented is for an chronic inhalation exposure
2 Occupational exposure limits are expressed in terms of mass per volume, or µg/m^3; to convert to ppm in terms of volume per volume, one ppm = (x mg/m3)(24.45)/gram molecular weight at 1 atmosphere and 25 degrees Celsius. (DHHS (NIOSH) Publication Number 2004-101)
3 Soil vapor at the First Presbyterian Church was sampled at the west driveway fan discharge.
4 Bolded values indicate detected concentrations above their MRL.

Key:
ATSDR = Agency for Toxic Substances and Disease Registry
J = estimated value
µg/m^3 = micrograms per cubic meter
MRL = minimal risk level
PCE = tetrachloroethene or perchloroethene
ppmv = parts per million by volume
TCE = trichloroethylene or trichloroethene
U = not detected; lab reporting limit shown

02:002700_DC13_02_01_04-B2475\Fig1-1.CDR-4/9/08-GRA

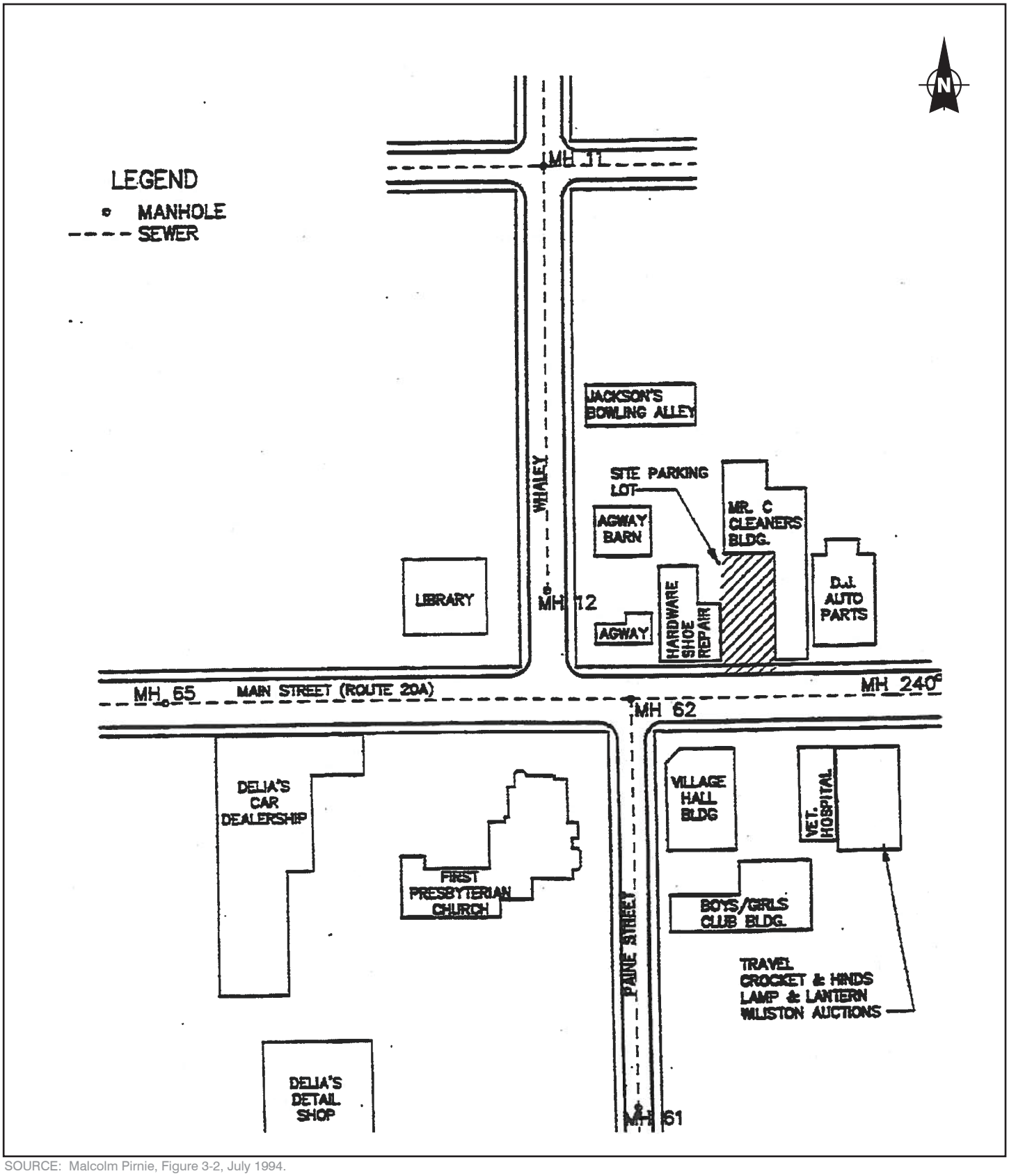


SOURCE: NYS Department of Transportation Raster Quadrangle, 1988.

Scale

0 2,000 4,000 Feet

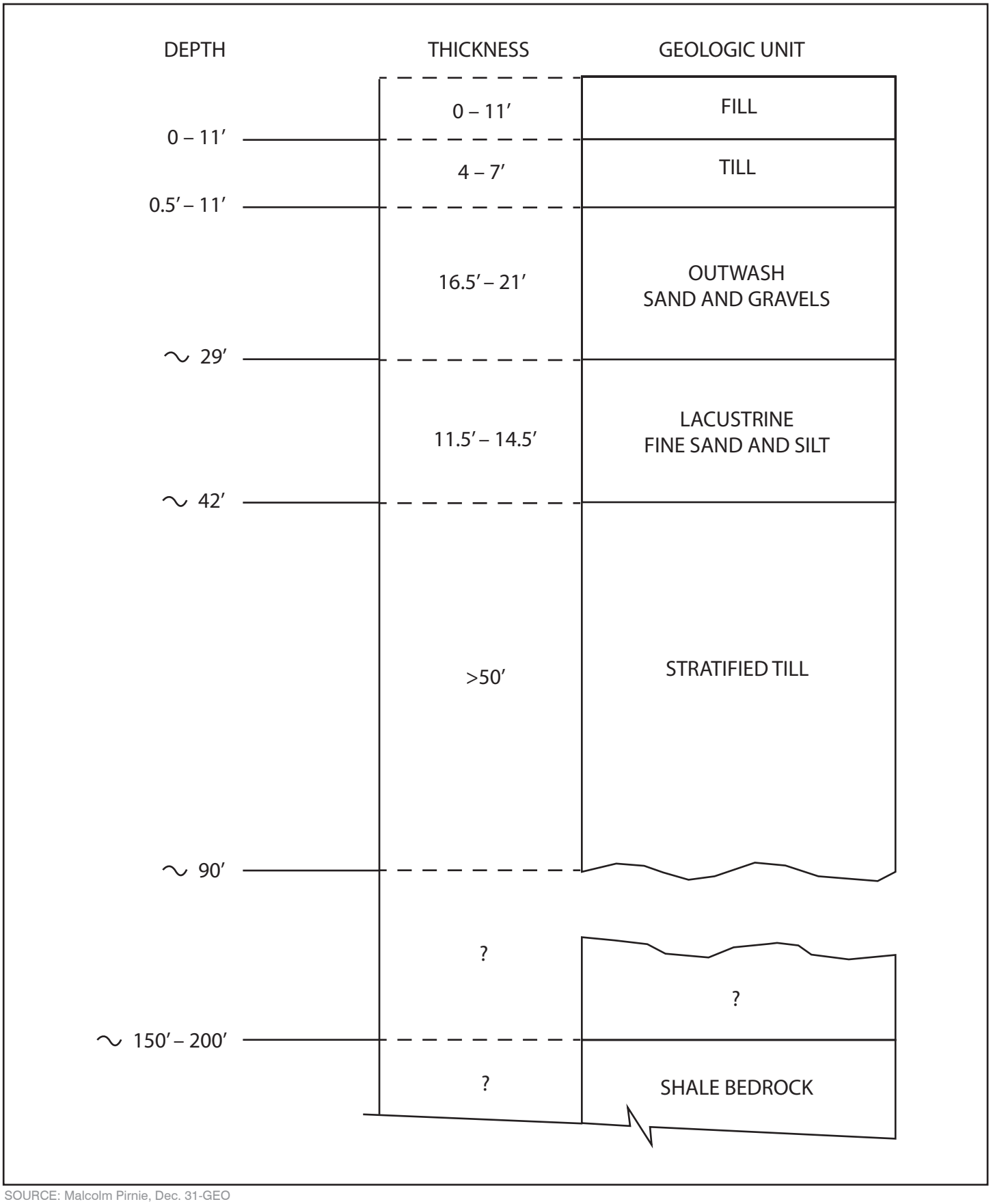
Figure 1-1 General Site Location Map



SOURCE: Malcolm Pirnie, Figure 3-2, July 1994.

SCALE
0 100 200 Feet

Figure 1-2 Mr. C's Site Location Map



SOURCE: Malcolm Pirnie, Dec. 31-GEO

Figure 1-3 Mr. C Cleaners Dry Cleaners Site
Geologic Column

002700.DC13.02.01.02
MrC_GW_Elevation_2010.srf - February 2012

HORIZONTAL SCALE IN FEET

0 120 240 360

W S N m

MPI-15B
904.03

MPI-13B-R

PW-8

EE-2
903.96

PW-6

MPI-6S
904.53

PW-7

MPI-14B-R
903.96

MPI-3S
905.34

MPI-12B

ESI-6
904.38

EE-3
904.14

MPI-4S
905.2

PW-4

PW-5

MPI-4I
905.11

MPI-8S-R

MPI-9S-R

MW-8
905.02

MPI-1S
905.02

ESI-5-R

EE-1

MPI-10B
905.34

PW-2

PW-3

MPI-5S
905.13

MW-11
904.83

MW-7
905.32

EE-4
904.99

RW-1

ESI-3
905.39

MPI-7I-R
904.14

MPI-2S-R
904.99

ESI-2R
904.98

904.25
904.00
904.50
904.75
904.25
904.50
904.75
904.50
904.25
905.00
905.00
904.50
904.75
905.00
904.75

Legend

MW-8
904.52
Well ID with Measured Groundwater Elevation in Feet Above Mean Sea Level

902
Groundwater Elevation Isopleth (Feet Above Mean Sea Level) Contour Interval = 1 Foot

Groundwater Flow Direction and Relative Magnitude of Gradient

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Figure 1-4
Groundwater Elevation Isopleths
For the Outwash Aquifer, February 2012
Mr. C's Dry Cleaners Site
East Aurora, New York

2 Institutional and Engineering Control Plan

2.1 Introduction

2.1.1 General

Since contaminated groundwater and soil vapor exists beneath the site, institutional controls and engineering controls (IC and ECs) are needed to protect human health and the environment. This section identifies the ICs and ECs in place at the site and describes the control plan for managing them. Because the ICs and ECs are components of the SMP, revisions to the IC/EC Plan are subject to approval by NYSDEC.

2.1.2 Description of the IC/EC Plan

The following IC/EC Plan describes: (1) all ICs and ECs on the site; (2) the basic implementation and intended role of each IC and EC; (3) the key components of the ICs to be set forth in the environmental deed restriction; (4) the features to be evaluated during each required inspection and periodic review; and (5) the plans and procedures to be followed for implementation of IC and ECs, such as the performance of a soil vapor intrusion evaluation prior to the construction of any enclosed buildings in the vicinity of the site where the potential for soil vapor intrusion is identified.

2.2 Institutional Controls

2.2.1 General

ICs are necessary to ensure the effectiveness of the remedial action. The main IC for the Mr. C's site will be an environmental deed restriction or an environmental notice, which at the time of the writing of this SMP have not been finalized. This SMP will be updated to include information on the final ICs for the site.

The following or similar language should be added to the filed environmental notice: All requirements of the SMP and all referenced plans (latest revision) on file at the offices of NYSDEC Region 9 must be adhered to. This applies to all current and future property owners.

The ICs required by the environmental notice refer to non-physical mechanisms designed to:

- Restrict the use or development of the site;

- Limit human exposure to site contaminants;
- Prevent any action that would threaten the effectiveness or operation and maintenance of a remedy at or pertaining to the site; and
- Implement, maintain, and monitor ECs.

In addition to the ICs identified above, the environmental notice also stipulates the following:

- Compliance with the SMP;
- Restrictions on the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH;
- Periodic certification of ICs by the responsible party, unless such party is NYSDEC or NYSDEC's designee; and
- Restrictions on future property use that is no less restrictive than "restricted-residential use" as defined by 6 New York Codes, Rules and Regulations (NYCRR) Part 375.

2.2.2 Individual Property Easements and Access Agreements

As described in Section 1.4.3, permanent access agreements and easements were executed in conjunction with the completion of the remedy for the OM&M of site ECs. Refer to Appendix C for copies of the permanent individual property easements. Refer to Appendix D for copies of the private property access agreements.

2.2.3 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures located over areas with remaining contamination, a soil vapor intrusion (SVI) evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential intrusion of 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 would include a vapor barrier and a passive sub-slab depressurization system 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 NYSDOH's *Guidance for Evaluating Vapor Intrusion in the State of New York* (NYSDOH October 2006). 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 (i.e., unvalidated) SVI sampling data will be forwarded to NYSDEC and the 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. The validated SVI data will also be transmitted to the property owner within 30 days of validation. If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the property within 15 days of receipt of the validated data.

SVI sampling results, evaluations, and follow-up actions will be summarized in the next PRR.

2.3 Engineering Controls

2.3.1 Engineering Control Systems

The engineering controls established at the Mr. C's Site consist of an on-site treatment system, pumping wells, a groundwater monitoring well network, and two off-site SSDSs. The ECs shall continue to be operated, maintained, and monitored until the site is deemed by NYSDEC to be no longer capable of discharging contamination or affecting human health and permission to discontinue these controls is granted, in writing, by NYSDEC.

2.3.1.1 On-Site Air-Stripper Treatment System

The VOC treatment system consists of a 3,000-gallon holding tank, in-line bag filters, groundwater feed pumps, a five-tray air stripper, and effluent pumps to the Tannery Brook discharge. A sequestering agent is metered into the influent side of the system to prevent excessive iron deposition and foaming of the stripper trays. A building sump and sump pump, also part of the system, are designed to allow wash water and emergency eye wash collected in the sump from the treatment bay floor slab to be pumped back to the holding tank for processing through the treatment system. Stripper maintenance is performed monthly, including replacement of bag filters, pump lubrication, and monitoring of the sequestering agent feed rate. Blower maintenance, winterization of the system, and pumping of water from influent and effluent manholes are performed on an as-required basis.

The system process and instrumentation diagram (P&ID) is provided as Figure 2-1. Modifications to the groundwater treatment system and its layout have been made since the time of the original remedial design. The current layout of the treatment system is presented on Figure 2-2.

The groundwater treatment system is capable of processing a maximum of 150 gallons of groundwater per minute on a continuous basis. The system includes a sequestering agent feed system, bag filters, a 3,000-gallon holding tank, and a low-profile air stripper. Discharge piping for the system consists of approximately 1,300 linear feet of 4-inch-diameter force main, with three inspection manholes along Whaley Avenue and an outfall structure located at the corner of Ridge Road

and Whaley Avenue, which discharges into Tannery Brook. Remedial treatment system record drawings are provided in Appendix E.

Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of this SMP). Procedures for operating and maintaining the on-site treatment system are documented in the Operation and Maintenance Plan (Section 4 of this SMP).

2.3.1.2 Pumping Well Network

The groundwater treatment system for the Mr. C's site includes a network of eight groundwater pumping wells. Each groundwater extraction well is equipped with a Grundfos well pump and level transducer, which is placed 2 feet above the pump intake. The transducers are programmed to turn the pumps on and off at various water levels in order to maintain a cone of depression in the water table and to extract as much of the groundwater contamination as possible.

There are currently eight active pumping wells around the Mr. C's site. A list of pumping wells and their construction details are provided in Table 2-1. Pumping wells are identified with either "PW" or "RW" for recovery well.

Piezometers were installed in close proximity to the pumping wells, generally spaced at 5-, 10-, 15-, and 20-foot intervals. The piezometers serve to visually monitor groundwater levels around the extraction wells for the creation of a cone of depression in the groundwater table around the well pump. (See Figure 2-3 for as-built locations of clean-out manholes, pumping chambers, pumping wells, piezometers, electric boxes, and discharge point locations.)

Procedures for monitoring the pumping well network are included in the Monitoring Plan (Section 3 of this SMP). Procedures for operating and maintaining the pumping wells are included in the Operation and Maintenance Plan (Section 4 of this SMP).

2.3.1.3 Groundwater Well Network

A network of monitoring wells has been installed to monitor both up-gradient and down-gradient groundwater conditions at the site. There are currently 26 active monitoring wells around the Mr. C's Dry Cleaners Site. Groundwater wells are labeled according to the original company that installed them – MPI for Malcolm Pirnie, MW for Matrix Environmental, ESI for Environmental Science, Inc., and EE for EEEPC. EEEPC also replaced eight wells in 2012, for which the original label was kept, but an "R" qualifier was added (ESI-2-R, MPI-2S-R, MPI-7I-R, MPI-8S-R, MPI-9S-R, MPI-13B-R, and MPI-14BR).

Table 2-1 Well Construction Summary, Mr. C's Dry Cleaners, East Aurora, New York

Well ID	Well Casing/ Screen Inner Diameter (inches)	Total Well Depth (ft TOIC)	TOIC Casing Elevation (ft AMSL)	Ground Elevation (ft AMSL)	Screen Interval (ft BGS)	Sand Pack Interval (ft BGS)	Top of Seal (ft BGS)	Unit Screened	Northing[a]	Easting[a]
EE-1	2	26.37	913.46	913.63	23 - 28	21 - 28.5	15	OA	1008368.502	1140146.786
EE-2	2	31.34	916.3	916.51	22 - 32	20 - 32	15	OA	1008549.179	1139877.201
EE-3	2	28	914.64	914.9	18-28	16-28	14	OA	1008457.12	1139994.78
EE-4	2	14.25	916.69	916.9	5-15	3-15	0.5	OA	1008726.94	1140212.13
ESI-2-R	2	18.9	917.44	917.7	9-19	7-19	5	OA	1008739.35	1140418.33
ESI-3	2	15.42	915.85	916.41	7 - 17	6 - 18	4.1	OA	1008527.962	1140298.338
ESI-5-R	2	14.55	912.19	912.5	5-15	3-15	1	OA	1008162	1140146.65
ESI-6	2	15.93	914.48	914.92	7 - 17	6 - 18	3.8	OA	1008343.484	1139989.729
MPI-1S	2	18.64	915.08	915.38	9 - 19	7.2 - 19.5	5.3	OA	1008428.703	1140109.692
MPI-2S-R	2	18.4	915.63	915.9	8-18	6-18	4	OA	1008365.76	1140310.44
MPI-3S	2	17.41	914.4	914.79	8 - 18	5.7 - 18.5	3.7	OA	1008452.501	1139912.758
MPI-4S	2	20.24	914.82	915.12	11 - 21	8.8 - 21.5	6.8	OA	1008598.538	1140046.256
MPI-4I	2	41.5	915.66	916.12	32 - 42	29.8 - 42.5	4	LA	1008588.814	1140036.833
MPI-5S	2	17.34	916.45	916.78	8 - 18	5.9 - 18.4	3.9	OA	1008746.102	1140160.367
MPI-6S	2	21.65	915.03	915.35	12.3 - 22.3	10 - 23	7.9	OA	1008760.202	1139899.182
MPI-7I-R	2	38.5	915.44	915.8	28.9-38.9	26.5-39	24.5	LA	1008537.71	1140294.84
MPI-8S-R	2	17.4	913.96	914.5	8-18	6-18	4	OA	1008771.32	1140064.97
MPI-9S-R	2	16.52	913.38	914	8-18	6-18	4	OA	1008923.5	1140066.68
MPI-10B	2	31.11	915.68	916.07	16.5 - 31.5	13 - 32	11	OA	1008594.937	1140161.039
MPI-12B	2	34.62	911.19	911.44	20 - 35	15 - 35	11.5	OA	1008126.058	1139971.023
MPI-13B-R	2	29.5	912.69	913.2	16.5-31.5	14.5-31.5	12.5	LA	1009063.59	1139779.59
MPI-14B-R	2	28.2	913.71	914	15-30	13-30	11	LA	1009039.96	1139941.28
MPI-15B	2	28.15	913.72	913.7	NA	NA	NA	OA	1008815.15	1139566.43
MW-7	2	13.97	915.96	916.34	5 - 14.5	NA - 15	3	OA	1008603.486	1140170.72
MW-8	2	13.57	915.62	915.97	5 - 14.5	NA - 15	3	OA	1008719.861	1140104.112
MW-11	2	17.91	914.39	914.4	NA	NA	NA	--	1008565.98	1140177.64
RW-1	6	24.48	NA	NA	17.9 - 27.9	10 - 30	7	OA	1008563.899	1140262.844
PW-2	4	29.02	NA	NA	NA - 32	NA	NA	OA	1008601.547	1140142.874
PW-3	4	28.67	NA	NA	NA - 32	NA	NA	OA	1008646.528	1140166.174
PW-4	4	29.04	NA	NA	NA - 32	NA	NA	OA	1008657.699	1140029.129
PW-5	4	28.47	NA	NA	NA - 32	NA	NA	OA	1008691.158	1140049.864

Table 2-1 Well Construction Summary, Mr. C's Dry Cleaners, East Aurora, New York

Well ID	Well Casing/ Screen Inner Diameter (inches)	Total Well Depth (ft TOIC)	TOIC Casing Elevation (ft AMSL)	Ground Elevation (ft AMSL)	Screen Interval (ft BGS)	Sand Pack Interval (ft BGS)	Top of Seal (ft BGS)	Unit Screened	Northing[a]	Easting[a]
PW-6	4	28.3	NA	NA	NA - 32	NA	NA	OA	1008713.539	1139891.103
PW-7	4	26.49	NA	NA	NA - 32	NA	NA	OA	1008749.764	1139907.169
PW-8	4	26.82	NA	NA	NA - 32	NA	NA	OA	1008792.235	1139824.621
Decommissioned Wells										
ESI-5	2	12.32	912.64	912.9	5 - 15	4 - 16	2	OA	1008162	1140146.65
MPI-2S	2	9.52	NA	NA	8 - 18	6 - 18.5	3.8	OA	1008365.76	1140310.44
MPI-4D	8	NA	NA	915.97	66-76	64-77.5	60	--	1008607.54	1140038.781
MPI-7I	2	13.37	916.14	916.42	29.5 - 39.5	27.1 - 40	5.3	LA	1008537.71	1140294.84
MPI-8S	2	6.54	NA	NA	8 - 18	6 - 18.5	4	OA	1008771.32	1140064.97
MPI-13B	2	31.43	913.25	913.49	17 - 32	15 - 32	10	OA	1009063.59	1139779.59
Abandoned or Missing Wells										
ESI-1 Replacement	2	19.74	916.99	917.35	10.5 - 20.5	8 - 21	4	OA	1008522.429	1140447.504
ESI-2	2	NA	NA	NA	9 - 19	8 - 20	6	OA	1008739.35	1140418.33
ESI-4	2	26.37	NA	NA	5 - 15	4 - 16	2	OA	NA	NA
MW-1	2	NA	NA	NA	12 - 22	10.6 - 22	9	OA	1008619.702	1140120.901
MW-2	2	NA	NA	NA	10 - 15	NA	NA	OA	1008631.906	1140098.904
MW-3	4	NA	NA	NA	7 - 17	6.1 - 18	3.7	OA	1008584.312	1140095.979
MW-4	4	16.67	914.02	914.47	7.3 - 17.3	6.6 - 18	4.7	OA	NA	NA
MW-5	2	NA	NA	NA	10 - 15	NA	NA	OA	1008538.419	1140130.518
MW-6	2	NA	NA	NA	5 - 14.5	NA - 15	3	OA	1008586.532	1140110.819
MW-9	2	NA	NA	NA	5 - 14.5	NA - 15	3	OA	1008700.677	1140221.924
MW-10	2	NA	NA	NA	4 - 13.5	NA - 14	2	OA	1008543.146	1140160.301
MW-14	2	NA	NA	NA	NA - 18.2 (TOIC)	NA	NA	OA	1008587.34	1140174.681
MPI-1D	NA	NA	NA	NA	NA	NA	NA	--	NA	NA
MPI-5D	**Borehole only – no well construction log**									
MPI-5I	NA	NA	NA	NA	32 - 42	30 – 42.5	8	OA	1008745.758	1140168.687
MPI-7D	**Borehole only – no well construction log**									
MPI-9S	2	NA	NA	NA	8 - 18	6.5 - 18.5	4.5	OA	1008923.5	1140066.68
MPI-11B	2	NA	NA	NA	15 - 30	13 - 30.5	8.5	OA	1008806.891	1139663.098

Table 2-1 Well Construction Summary, Mr. C's Dry Cleaners, East Aurora, New York

Well ID	Well Casing/ Screen Inner Diameter (inches)	Total Well Depth (ft TOIC)	TOIC Casing Elevation (ft AMSL)	Ground Elevation (ft AMSL)	Screen Interval (ft BGS)	Sand Pack Interval (ft BGS)	Top of Seal (ft BGS)	Unit Screened	Northing[a]	Easting[a]
MPI-14B	2	27.54	913.18	913.68	15 - 30	11 - 30	8.5	OA	1009039.96	1139941.28
OW-B	2	26.41	NA	NA	22.5 - 27.5	10.5 - 27.5	8	OA	1008734.848	1139901.616
RW-2	4	NA	NA	NA	18 - 28	10 - 28	8	OA	1008725.751	1139901.252

Note:
Wells in *italic text* were previously abandoned or destroyed, or were otherwise not locatable in 2011.

[a] Coordinates system is New York State Plane West Zone (feet). Coordinates are either from Clear Creek Land Surveying, LLC survey on May 31, 2012, or estimated in AutoCAD relative to the May 2012 surveyed locations.

Key:

AMSL = above mean sea level
BGS = below ground surface
ft = feet
LA = Lacustrine aquifer
NA = not available
OA = outwash aquifer
TOIC = top of inner casing

Groundwater monitoring wells are flush-mounted. Figure 2-4 shows typical well construction details, and a summary of monitoring well construction details is presented in Table 2-1. Available boring logs, construction logs, and decommissioning logs are presented in Appendix F. Maps of the groundwater monitoring well network showing well locations and associated analytical data are presented on Figures 2-5a and 2-5b.

Procedures for monitoring the groundwater monitoring well network are included in the Monitoring Plan (Section 3 of this SMP). Procedures for operating and maintaining the monitoring wells are included in the Operation and Maintenance Plan (Section 4 of this SMP) and Appendix I.

2.3.1.4 Off-Site SSDSs

Active SSDSs are installed at the First Presbyterian Church and at the 27 Whaley Avenue residence. The system at the First Presbyterian Church has three fans, and the system at the Whaley Avenue residence has only one fan. The systems currently operate in a continuous mode, 24 hours per day, 365 days per year.

The locations of the SSDSs are shown on Figure 2-6. The record drawings prepared as a part of the SSDS installation documentation are provided in Appendix G. Agreements allowing for system access, maintenance, and monitoring, including components on private properties, have been retained for the project (see Appendix D).

The procedures for monitoring the off-site SSDSs are included in the Monitoring Plan (Section 3 of this SMP). The procedures for operating and maintaining the SSDSs are included in the Operation and Maintenance Plan (Section 4 of this SMP) and Appendix J.

2.3.1.5 Agway AS/SVE System (Decommissioned)

The AS/SVE system at the Agway site was operated and maintained by EEEPC from 2005 to December 2011, when its operation was discontinued with the approval of NYSDEC. Drawings for the Agway AS/SVE system are provided as Appendix H for informational purposes only.

2.3.2 Criteria for Completion of Remediation

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the ROD or other post-remedial decision documents. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC's *Technical Guidance for Site Investigation and Remediation* (NYSDEC 2010).

2.3.2.1 On-Site Treatment System, Pumping Wells, and Monitoring Well Network

The on-site air stripping treatment system and associated groundwater monitoring activities will continue until the concentrations of the remaining groundwater con-

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

2.3.2.2 Off-Site SSDSs

Operation of the SSDSs will not be discontinued unless written approval is granted by NYSDEC. In the event that monitoring data indicate an SSDS is no longer required, a proposal to discontinue the SSDS will be submitted by the property owner to NYSDEC and the NYSDOH.

2.4 Inspections and Notifications

2.4.1 Inspections

Inspections of all remedial components installed at the site will be conducted at the frequency specified in the SMP Monitoring Plan schedule (refer to Section 3). A comprehensive sitewide inspection will be conducted annually, regardless of the frequency of the PRR. The inspections will determine and/or document the following:

- Whether the ECs continue to perform as designed;
- Whether the ECs 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;
- Whether 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) and Appendices I and J. The reporting requirements are outlined in the PRR section of this plan (Section 5).

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

2.4.2 Notifications

The following notifications will be submitted, as needed, by the property owner(s) or designee to NYSDEC:

- Sixty-day advance notice of any proposed changes in site use, as required under the terms of the Environmental Deed Restriction, 6 NYCRR Part 375, and/or Environmental Conservation Law.

- Notice within 48-hours of any damage to or defect in the foundation structures that reduces or has the potential to reduce the effectiveness of an EC. In addition, NYSDEC will be given 48-hour notice prior to implementing any action to mitigate the damage or defect.

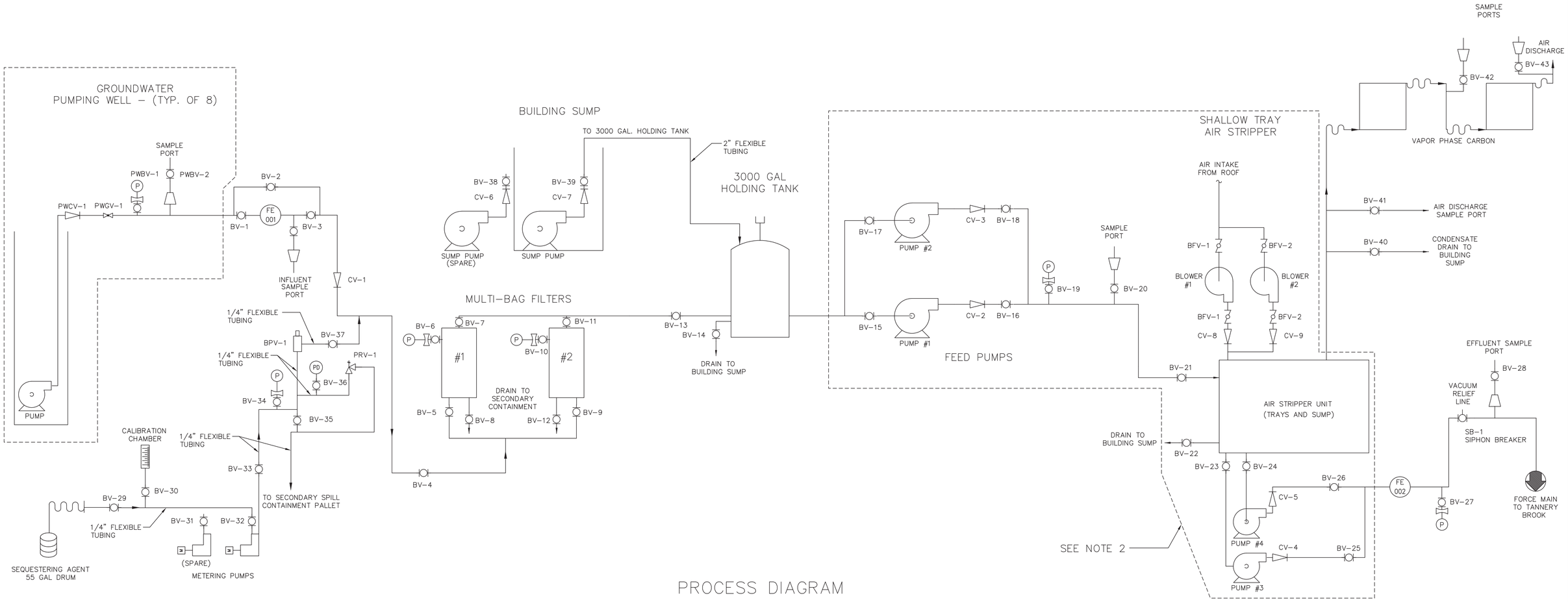
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake, that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written documentation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact on 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 NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

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

- NYSDEC will be notified, in writing, at least 60 days prior to any such change in ownership or responsibility. The notification must include the prospective purchaser's name, contact representative, and contact information. It will also include a certification that the prospective purchaser has been provided with a copy of the administrative documents and all approved work plans and reports, including this SMP.

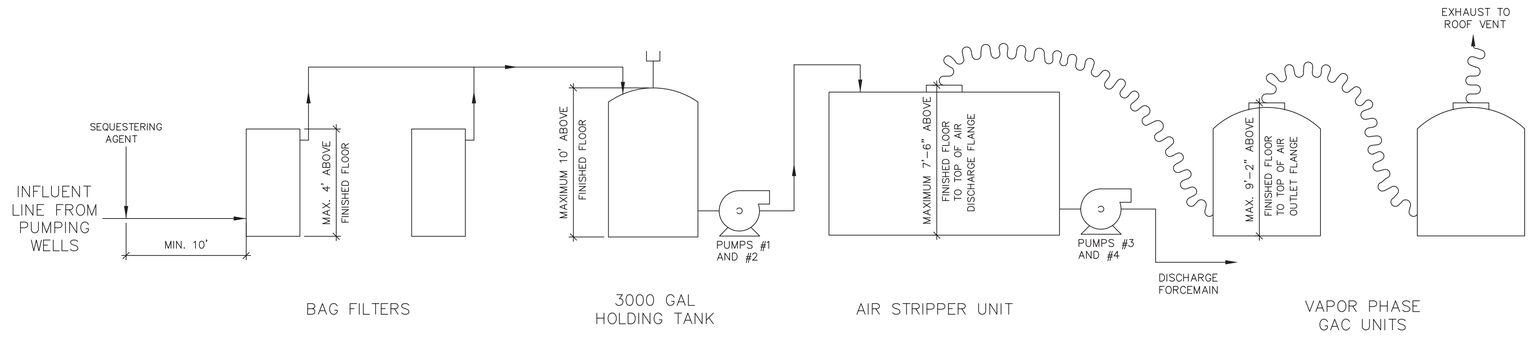
- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing.



PROCESS DIAGRAM

LEGEND:

- GLOBE VALVE (GV)
- BALL VALVE (BV)
- BUTTERFLY VALVE (BFV)
- CHECK VALVE (CV)
- FLEXIBLE HOSE
- METERING PUMP
- VENT
- PRESSURE GAGE WITH GAGE GUARD
- FE 001 — FLOW ELEMENT
- REDUCER/ENLARGER
- PRESSURE RELIEF VALVE (PRV)
- BACK PRESSURE VALVE (BPV)
- PD — PULSATION DAMPENER
- VACUUM BREAKER
- VACUUM RELIEF LINE



PROCESS SECTION

NOTE:

1. ALL PROCESS PIPING TO BE 4" DIA. PVC UNLESS NOTED OTHERWISE.
2. EQUIPMENT IN THIS AREA TO BE PROVIDED BY AIR STRIPPER MANUFACTURER.

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES
DWN
CKD

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
MR. C'S DRY CLEANERS SITE, EAST AURORA, NEW YORK
CONTRACT NUMBER D004180
REMEDIAL DESIGN

GROUNDWATER TREATMENT SYSTEM PROCESS DIAGRAM AND SECTION

NOT TO SCALE

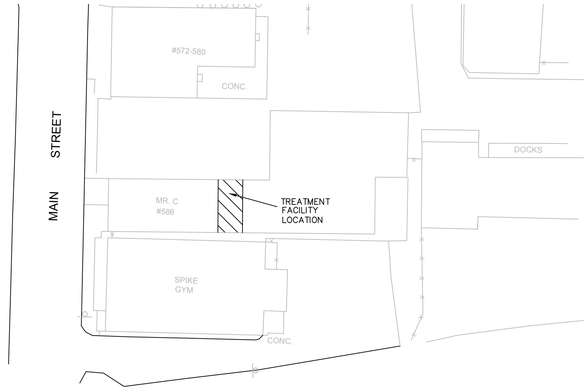
DATE OCTOBER 2000

G SHEET 4 OF 7

CAD REF. NO. 0266G001

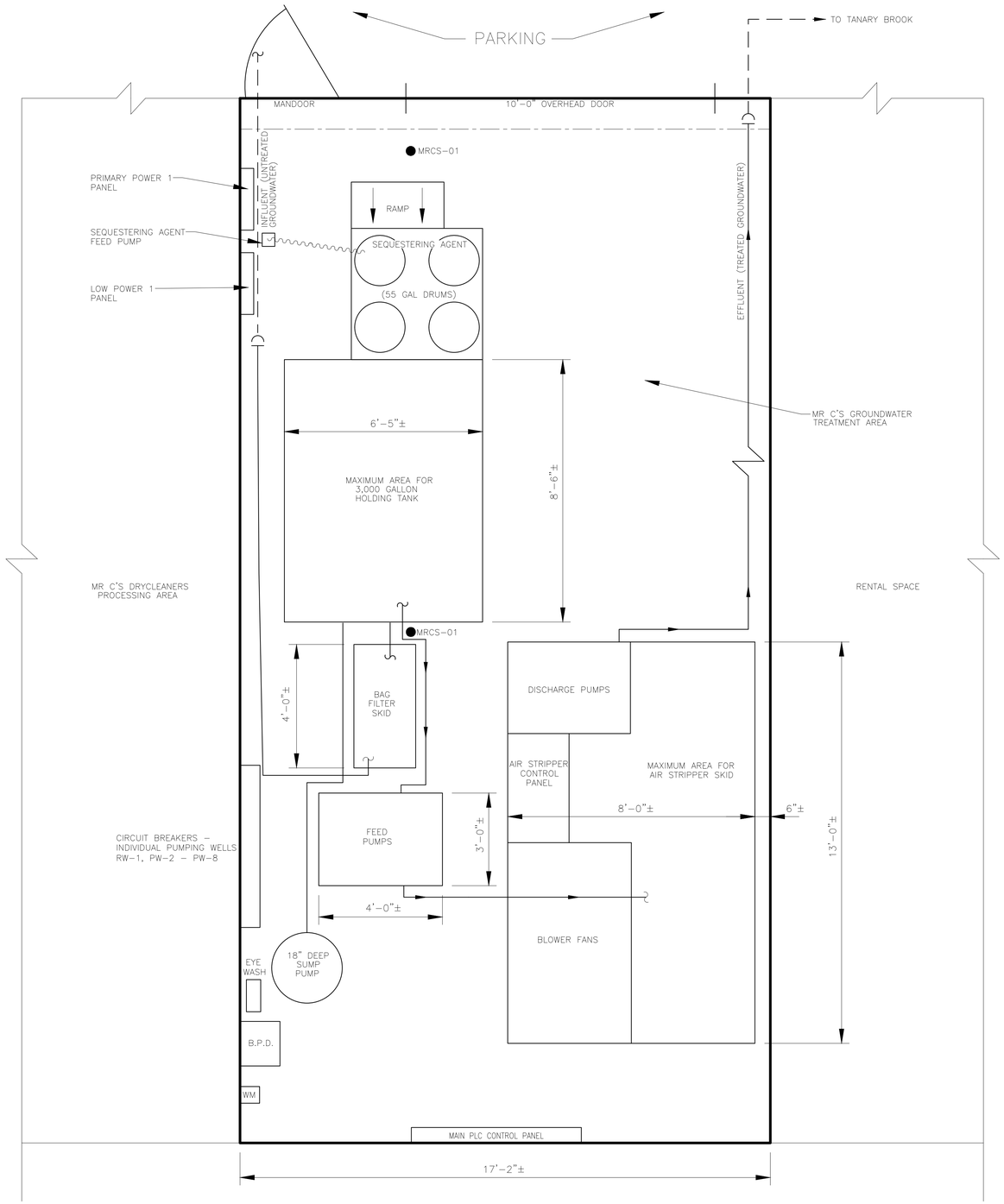
8108 ADMIN I:\ACAD\PROJ\02663362\REMEDIAL DESIGN\02666001 Scale: 1:1 Date: 03/22/2000 Time: 09:02

FIGURE 2-1



SITE LOCATION MAP

SCALE" 1" = 50'-0"



LEGEND

● MRCS-01	SUB-SLAB AIR SAMPLE
B.P.D.	BACKFLOW PREVENTION DEVICE
WM	WATER METER
PLC	PROCESS LOGIC CONTROLS

FLOOR PLAN

SCALE" 1/2" = 1'-0"

SCALE IN FEET

0 100 200 300

DWG NO.	DATE	DESCRIPTION
REFERENCE DRAWINGS		

NO.	DATE	DWN	APP'D	DESCRIPTION
A	8-10-12	KMK	MS	ISSUED FOR REVIEW PURPOSES ONLY
REVISIONS				

ecology and environment engineering p.c.

DESIGNED BY	CHECKED BY
M STEFFAN	M STEFFAN
DRAWN BY	APPROVED BY
KM KRAJEWSKI	M STEFFAN

MR C'S DRY CLEANERS

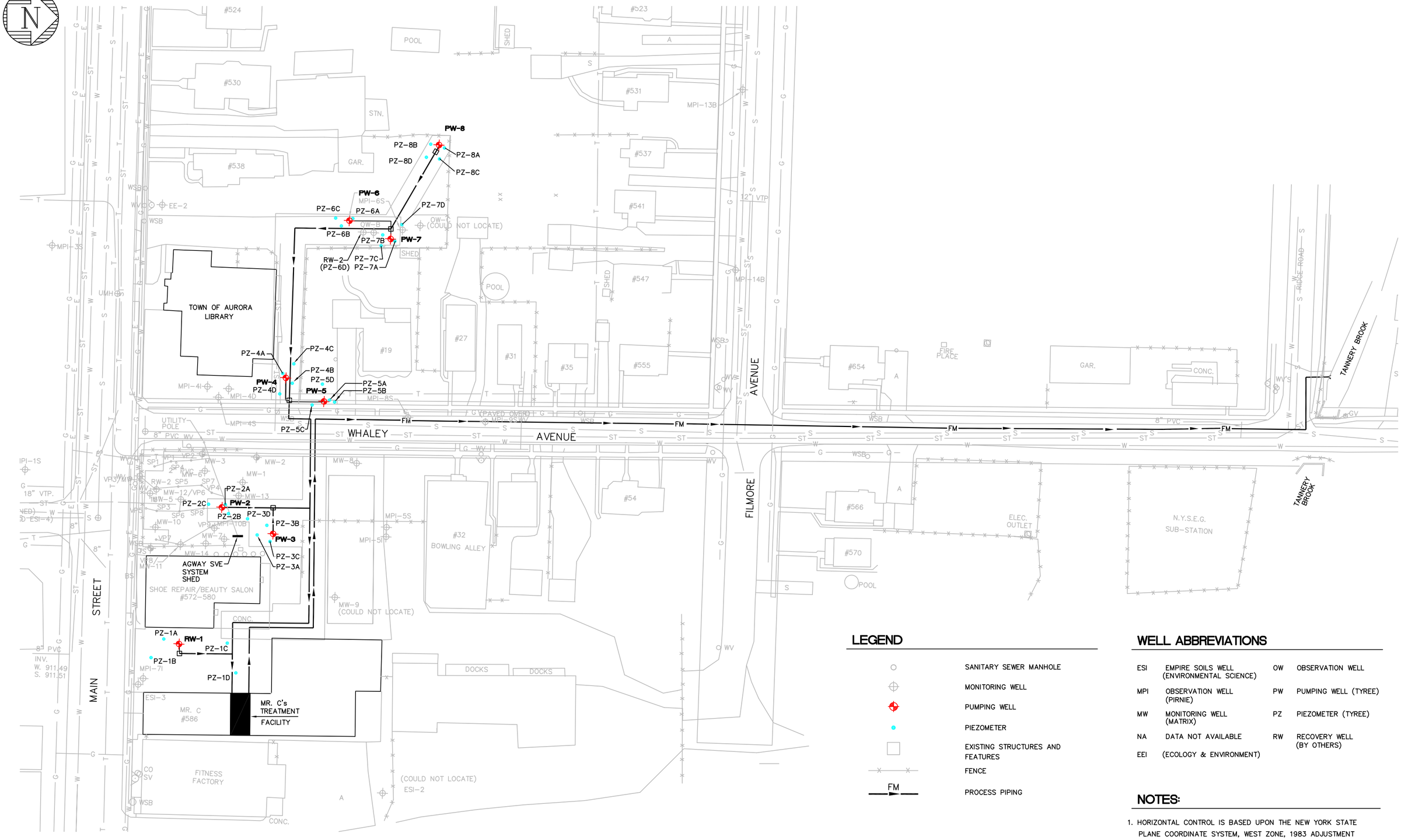
NYSDEC CONTRACT No. D008513

EAST AURORA ERIE NEW YORK

FIGURE 2-2
SUBSLAB AIR SAMPLE LOCATIONS

SCALE	FIRST ISSUED	CAD FILE NO.	SHEET NO.	REV.
AS NOTED	8/10/12	GWTP FPLAN.dwg	Sheet X of X	A

F:\MR C's\GWTP floorplan\GWTP FLOOR PLAN.dwg
BLTPrint: 6/25/12 KMK



LEGEND

- SANITARY SEWER MANHOLE
- MONITORING WELL
- PUMPING WELL
- PIEZOMETER
- EXISTING STRUCTURES AND FEATURES
- FENCE
- PROCESS PIPING (FM)

WELL ABBREVIATIONS

ESI	EMPIRE SOILS WELL (ENVIRONMENTAL SCIENCE)	OW	OBSERVATION WELL
MPI	OBSERVATION WELL (PIRNIE)	PW	PUMPING WELL (TYREE)
MW	MONITORING WELL (MATRIX)	PZ	PIEZOMETER (TYREE)
NA	DATA NOT AVAILABLE	RW	RECOVERY WELL (BY OTHERS)
EEI	(ECOLOGY & ENVIRONMENT)		

NOTES:

1. HORIZONTAL CONTROL IS BASED UPON THE NEW YORK STATE PLANE COORDINATE SYSTEM, WEST ZONE, 1983 ADJUSTMENT (NAD 83) AND WAS OBTAINED FROM A MAP PREPARED BY WENDEL DUCHSCHERER ARCHITECTS AND ENGINEERS PC (NYS SITE No. 9-15-157) NYSDEC CONTRACT No. D004180.
2. ELEVATIONS ARE BASED UPON NORTH GEODETIC VERTICAL DATUM, 1929 (NGVD 1929).
3. BENCHMARK IS LOCATED NEAR THE NORTH EAST CORNER OF MAIN STREET AND PAINE STREET, BEING A BRASS DISC SET IN THE TOP OF CONCRETE BASE – ELEVATION 916.64'

SCALE IN FEET
0 60 120 180

DWG NO.	DATE	DESCRIPTION
REFERENCE DRAWINGS		
DEC 31 ISO.dwg	7/18/94	ISOPOTENTIAL MAP AND CROSS SECTIONS 4/13/94 GROUNDWATER LEVELS MALCOLM PIRNIE INC.
02660003.dwg	10/17/00	REMEDIAL DESIGN PIPING AND WELL LAYOUT PLAN MALCOLM PIRNIE INC.

NO.	DATE	DWN	APP'D	DESCRIPTION
REVISIONS				
A		JJK	DJM	

ecology and environment engineering, p.c.

DESIGNED BY	CHECKED BY
JJ KOHLER	MG STEFFAN
DRAWN BY	APPROVED BY
JJ KOHLER	D.J. MILLER P.E.

MR. C'S DRY CLEANERS SITE

ERIE COUNTY — EAST AURORA, NY

GW PUMPING WELL AND PIEZOMETER LOCATIONS

SCALE	DATE ISSUED	C.A.D. FILE NO.	DRAWING NO.	REV.
1"=60'	9/11/07	IEG Well Map.dwg	Sheet 1 of 1	A

F:\MrC\well analysis dec 2003\ver well map.dwg
BUFFplot: 9/12/07 JJK

FIGURE 2-3

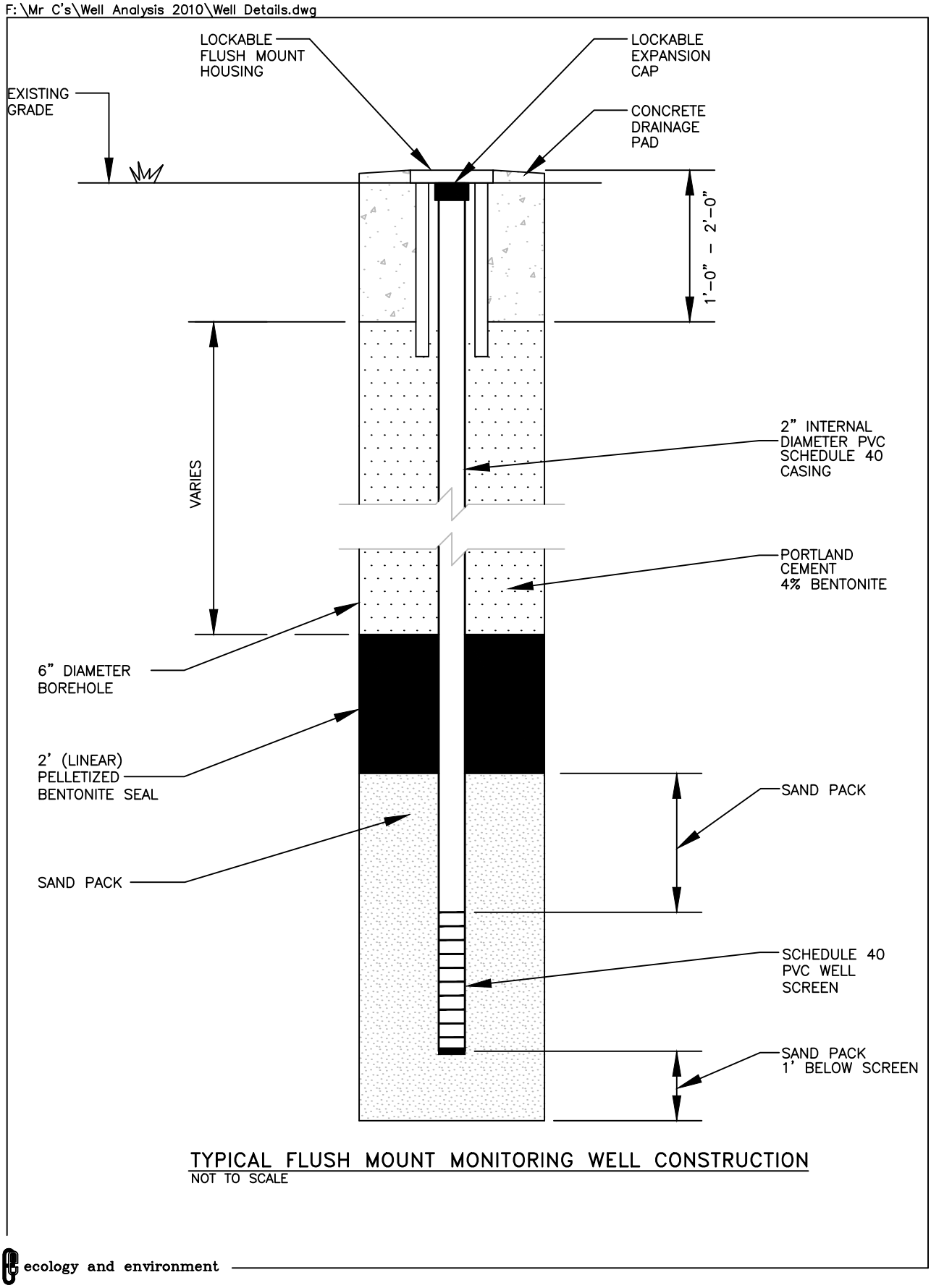


Figure 2-4

TYPICAL FLUSH MOUNT MONITORING WELL
MR.C'S DRY CLEANERS SITE
EAST AURORA, NEW YORK

F:\MC\well Analysis May 2009\Results_revised 6-29-09.dwg

EE-2	6/04	8/07	5/09	5/10	2/12
Chloroform	0.346 ug/L	ND	ND	ND	ND
Methyl tert-butyl ether	1660 ug/L	1670 ug/L	130 ug/L	83 ug/L(J)	54 ug/L
Methylene chloride	0.208 ug/L	ND	ND	ND	ND
Tetrachloroethene	0.387 ug/L	ND	ND	ND	ND
Trihalomethanes, Total	0.346 ug/L	ND	ND	NA	ND
Vinyl chloride	–	ND	38 ug/L	12 ug/L(J)	18 ug/L
cis-1,2-Dichloroethene	–	ND	ND	6.7 ug/L(J)	190 ug/L
1,1-Dichloroethene	NA	NA	NA	NA	1.0 ug/L(J)
1,1-Dichloroethene	NA	NA	NA	NA	.98 ug/L(J)
Chloromethane	NA	NA	NA	NA	1.0 ug/L(J)
trans-1,2-Dichloroethene	NA	NA	NA	NA	1.2 ug/L(J)
Trichloroethene	NA	NA	NA	NA	25 ug/L

PW-6	5/02	10/03	6/04	8/07	5/09	5/10	2/12
Methyl tert-Butyl Ether	8 ug/L	ND	45.5 ug/L	18 ug/L	37 ug/L	27 ug/L	4.0 ug/L(J)
Trichloroethene	3 J ug/L	ND	41.3 ug/L	100 ug/L	120 ug/L	82 ug/L	79 ug/L
Tetrachloroethene	37 ug/L	ND	463 ug/L	1100 ug/L	340 ug/L(J)	970 ug/L(J)	1000 ug/L
Ethylbenzene	5 J ug/L	ND	ND	ND	ND	ND	ND
Xylene	2 J ug/L	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	11.6 ug/L	50 ug/L	300 ug/L(J)	130 ug/L	76 ug/L
trans-1,2-Dichloroethene	ND	ND	0.400 ug/L	ND	3.9 ug/L(J)	ND	ND
1,1-Dichloroethene	ND	ND	0.150 ug/L	ND	ND	ND	0.59 ug/L(J)
1,1-Dichloroethene	ND	ND	0.861 ug/L	ND	ND	ND	ND

PW-7	5/02	10/03	6/04	8/07	5/09	5/10	2/12
Acetone	280 ug/L	ND	ND	ND	ND	ND	ND
Methyl tert-Butyl Ether	85 J ug/L	ND	35.0 ug/L	5.2 ug/L(J)	ND	2.8 ug/L (J)	ND
2-Butanone	680 ug/L	ND	ND	ND	ND	ND	ND
Ethylbenzene	63 J ug/L	ND	ND	ND	ND	ND	ND
Xylene	290 ug/L	ND	ND	ND	ND	ND	ND
Styrene	160 ug/L	ND	NA	ND	ND	ND	ND
Trichloroethene	92 J ug/L	10 ug/L	41.5 ug/L	94 ug/L	29 ug/L	68 ug/L(J)	8.9 ug/L
Tetrachloroethene	4200 ug/L	800 ug/L	2760 ug/L	2400 ug/L	400 ug/L(J)	950 ug/L(J)	550 ug/L
1,1-Dichloroethene	ND	ND	1.06 ug/L	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	7.92 ug/L	25 ug/L	5.7 ug/L	17 ug/L(J)	2.2 ug/L (J)
Toluene	ND	ND	0.188 ug/L	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	0.778 ug/L	ND	ND	ND	ND
Vinyl chloride	ND	ND	0.171 ug/L	ND	ND	ND	ND

MPI-15B	5/02	6/04	8/07	5/09	5/10	2/12
2-Butanone	NS	1.61 ug/L	ND	ND	ND	180 ug/L
Methyl tert-butyl ether	NS	6.39 ug/L	8.3 ug/L(J)	7.4 ug/L	3.3 ug/L(J)	4.1 ug/L(J)
Acetone	NA	NA	NA	NA	NA	2300 ug/L
Chloromethane	NA	NA	NA	NA	NA	1.5 ug/L(J)
Tetrachloroethene	NA	NA	NA	NA	NA	1.1 ug/L(J)

PW-8	5/02	9/03	6/04	8/07	5/09	5/10	2/12
1,1-Dichloroethene	ND	2 ug/L	0.302 ug/L	ND	ND	ND	ND
2-Butanone	ND	46 ug/L	ND	ND	ND	ND	ND
Trichloroethene	4 ug/L	66 ug/L	25.2 ug/L	15 ug/L	28 ug/L	12 ug/L	11 ug/L
trans-1,2-Dichloroethene	ND	2 ug/L	0.722 ug/L	ND	ND	ND	ND
Tetrachloroethene	43 ug/L	110 ug/L	243 ug/L	150 ug/L	200 ug/L(J)	100 ug/L	140 ug/L
cis-1,2-Dichloroethene	1 ug/L	5 ug/L	8.45 ug/L	13 ug/L	30 ug/L	15 ug/L	13 ug/L
Methyl tert-Butyl Ether	16 ug/L	79 ug/L	10.1 ug/L	3.5 ug/L(J)	4.2 ug/L(J)	5.1 ug/L	2.3 ug/L(J)
Acetone	26 ug/L	ND	ND	ND	ND	ND	ND
Xylene	10 ug/L	ND	ND	ND	ND	ND	ND
Ethylbenzene	3 ug/L	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	–	–	–	7.2 ug/L(J)	ND	ND	ND

MPI-6S	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Acetone	ND	20 ug/L	ND	ND	ND	ND	ND
Trichloroethene	ND	15 ug/L	125 ug/L	58 ug/L	94 ug/L	69 ug/L	30 ug/L(J)
Tetrachloroethene	ND	1200 ug/L	3480 ug/L	4900 ug/L	8100 ug/L(J)	6200 ug/L(J)	6800 ug/L
cis-1,2-Dichloroethene	ND	2 ug/L	3.26 ug/L	3.8 ug/L(J)	14 ug/L	27 ug/L	ND
Methyl tert-Butyl Ether	1000 ug/L	23 ug/L	2.59 ug/L	ND	1.8 ug/L(J)	3.6 ug/L(J)	ND
trans-1,2-Dichloroethene	ND	ND	0.48 ug/L	ND	ND	ND	ND
2-Butanone	NA	NA	1.28 ug/L	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	0.167 ug/L	ND	ND	ND	ND

MPI-3S	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Benzene	ND	1 ug/L	ND	ND	ND	ND	ND
Methyl tert-Butyl Ether	1700 ug/L	560 ug/L	390 ug/L	240 ug/L	190 ug/L (J)	110 ug/L(J)	81 ug/L
Tetrachloroethene	ND	ND	0.495 ug/L	ND	ND	2.6 ug/L(J)	ND
1,2-Dichloroethane	ND	1.4 ug/L	0.538 ug/L	ND	ND	ND	ND

MPI-4S	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Tetrachloroethene	2 ug/L	2 ug/L	1.63 ug/L	5.0 ug/L	NS	2.3 ug/L(J)	ND
cis-1,2-Dichloroethene	14 ug/L	16 ug/L	87.8 ug/L	140 ug/L	NS	61 ug/L	ND
Methyl tert-Butyl Ether	8 ug/L	11 ug/L	4.26 ug/L	ND	NS	ND	ND
Vinyl Chloride	4 ug/L	ND	5.53 ug/L	20 ug/L	NS	6.0 ug/L	ND
Acetone	9 ug/L	ND		ND	NS	ND	ND
1,1-Dichloroethene	1 ug/L	ND		ND	NS	ND	ND
Benzene	5 ug/L	ND	1.22 ug/L	ND	NS	ND	ND
2-Butanone	3 ug/L	ND	ND	ND	NS	ND	ND
Chloroform	ND	ND	0.722 ug/L	ND	NS	ND	2.7 ug/L(J)
Isopropylbenzene	ND	ND	0.108 ug/L	ND	NS	ND	ND
trans-1,2-Dichloroethene	ND	ND	1.05 ug/L	ND	NS	ND	ND
Trichloroethene	ND	ND	4.27 ug/L	2.4 ug/L	NS	1.1 ug/L(J)	ND
Trihalomethanes, Total	NA	NA	0.722 ug/L	ND	NS	NA	ND
Bromodichloromethane	NA	NA	NA	NA	NS	NA	3.4 ug/L(J)
Bromoform	NA	NA	NA	NA	NS	NA	1.2 ug/L(J)
Dibromochloromethane	NA	NA	NA	NA	NS	NA	3.5 ug/L(J)

MPI-13B/MPI-13BR	5/02	9/03	6/04	8/07	5/09	5/10	6/12
Trichloroethene	ND	0.57 ug/L	ND	ND	NS	NS	0.8 ug/L(J)
Benzene	ND	1.4 ug/L	ND	ND	NS	NS	ND
Tetrachloroethene	ND	3.2 ug/L	0.403 ug/L	5.0 ug/L(J)	NS	NS	3.6 ug/L(J)
2-Butanone	NA	NA	0.979 ug/L	ND	NS	NS	ND
Acetone	NA	NA	4.01 ug/L	ND	NS	NS	ND
Carbon disulfide	NA	NA	0.440 ug/L	ND	NS	NS	ND

PW-4	5/02	10/03	6/04	8/07	5/09	5/10	2/12
Trichloroethene	ND	35 ug/L	57.9 ug/L	74 ug/L(J)	100 ug/L	120 ug/L	170 ug/L
Tetrachloroethene	50 ug/L	200 ug/L	2850 ug/L	1600 ug/L	2400 ug/L(J)	2300 ug/L(J)	2200 ug/L(J)
cis-1,2-Dichloroethene	ND	490 ug/L	8.68 ug/L	19 ug/L	34 ug/L	36 ug/L	44 ug/L
Acetone	100 ug/L	ND	ND	ND	ND	ND	ND
2-Butanone	1400 ug/L	ND	ND	ND	ND	ND	ND
Ethylbenzene	210 ug/L	ND	ND	ND	ND	ND	ND
Xylene	1200 ug/L	ND	ND	ND	ND	ND	ND
Styrene	360 ug/L	ND	NA	ND	ND	ND	ND
Methyl tert-butyl ether	ND	ND	22.0 ug/L	23 ug/L	64 ug/L	33 ug/L	0.95 ug/L(J)
Toluene	ND	ND	0.193 ug/L	ND	ND	ND	ND
Vinyl chloride	ND	ND	0.981 ug/L	3.3 ug/L(J)	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	0.680 ug/L	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	0.485 ug/L	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	0.211 ug/L	ND	ND	ND	ND
Benzene	ND	ND	0.121 ug/L	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	1.2 ug/L	ND	3.9 ug/L(J)	ND	1.8 ug/L(J)

MPI-12B	5/02	9/03	6/04	8/07	5/09	5/10	2/12
cis-1,2-Dichloroethene	NS	NS	3.46 ug/L	9.4 ug/L(J)	16 ug/L	17 ug/L	NS
Methyl tert-butyl ether	NS	NS	341 ug/L	170 ug/L	90 ug/L	110 ug/L	NS
Tetrachloroethene	NS	NS	0.422 ug/L	ND	2.8 ug/L(J)	ND	NS
Trichloroethene	NS	NS	0.294 ug/L	ND	ND	ND	NS

PW-5	5/02	10/03	6/04	8/07	5/09	5/10	2/12
Acetone	200 ug/L	ND	ND	ND	ND	ND	ND
2-Butanone	3300 ug/L	ND	ND	ND	ND	ND	ND
Tetrachloroethene	170 ug/L	2000 ug/L	3220 ug/L	2000 ug/L	4200 ug/L(J)	4300 ug/L(J)	3100 ug/L(J)
Ethylbenzene	310 ug/L	ND	ND	0.209 ug/L	ND	ND	ND
Styrene	510 ug/L	ND	NA	ND	ND	ND	ND
Trichloroethene	ND	99 ug/L	78.6 ug/L	95 ug/L	140 ug/L	190 ug/L	87 ug/L
cis-1,2-Dichloroethene	ND	8 ug/L	8.17 ug/L	21 ug/L	21 ug/L	16 ug/L	16 ug/L
Xylene	1100 ug/L	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	0.801 ug/L	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	0.346 ug/L	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	0.194 ug/L	ND	ND	ND	ND
Benzene	ND	ND	0.114 ug/L	ND	ND	ND	ND
Methyl tert-butyl ether	ND	ND	10.1 ug/L	3.7 ug/L(J)	2.6 ug/L(J)	4.8 ug/L(J)	ND
trans-1,2-Dichloroethene	ND	ND	2.61 ug/L	6.5 ug/L(J)	12 ug/L	6.4 ug/L	5.9 ug/L
Vinyl chloride	ND	ND	0.415 ug/L	ND	ND	ND	ND

ESI-6	5/02	9/03	6/04	8/07	5/09	5/10	2/12
1,1-Dichloroethane	ND	0.67 ug/L	0.616 ug/L	ND	ND	ND	1.0 ug/L(J)
Trichloroethene	44 ug/L	16 ug/L	19.2 ug/L	14 ug/L	17 ug/L	10 ug/L(J)	13 ug/L
Tetrachloroethene	1180 ug/L	230 ug/L	514 ug/L	240 ug/L	320 ug/L(J)	140 ug/L(J)	200 ug/L(J)
cis-1,2-Dichloroethene	130 ug/L	26 ug/L	23.6 ug/L	20 ug/L	27 ug/L	5.9 ug/L(J)	17 ug/L
Methyl tert-Butyl Ether	48 ug/L	5.3 ug/L	29.2 ug/L	7.5 ug/L(J)	7.4 ug/L	3.5 ug/L(J)	ND
trans-1,2-Dichloroethene	ND	ND	0.290 ug/L	ND	ND	ND	ND
Vinyl chloride	ND	ND	0.605 ug/L	ND	ND	ND	ND

EE-3 (NEW)	2/12
cis-1,2-Dichloroethene	0.7 ug/L(J)
Methyl tert-butyl ether	29 ug/L
Tetrachloroethene	3.3 ug/L(J)
Vinyl chloride	1.3 ug/L

MPI-4I	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Trichloroethene	120 ug/L	280 ug/L	137 ug/L	580 ug/L	180 ug/L	120 ug/L(J)	22 ug/L(J)
Tetrachloroethene	160 ug/L	690 ug/L	556 ug/L	1300 ug/L	640 ug/L(J)	400 ug/L(J)	14 ug/L(J)
cis-1,2-Dichloroethene	16 ug/L	48 ug/L	49.4 ug/L	160 ug/L	780 ug/L(J)	880 ug/L(J)	74 ug/L
Methyl tert-Butyl Ether	140 ug/L	40 ug/L	28.3 ug/L	23 ug/L	13 ug/L	14 ug/L(J)	ND
trans-1,2-Dichloroethene	ND	ND	1.53 ug/L	21 ug/L	4.4 ug/L(J)	2.0 ug/L(J)	ND
Vinyl chloride	ND	ND	0.196 ug/L	ND	ND	ND	1.3 ug/L
1,1-Dichloroethene	–	–	–	ND	ND	1.0 ug/L(J)	ND
Benzene	NA	NA	NA	NA	NA	NA	.62 ug/L(J)

MPI-8S/MPI-8SR	5/02	9/03	6/04	8/07	5/09	5/10	6/12
	NS	NS	NS	NS	NS	NS	–
cis-1,2-Dichloroethene	NA	NA	NA	NA	NS	NS	5.0 ug/L
Methyl tert-butyl ether	NA	NA	NA	NA	NS	NS	0.58 ug/L(J)
Tetrachloroethene	NA	NA	NA	NA	NS	NS	180 ug/L
trans-1,2-Dichloroethene	NA	NA	NA	NA	NS	NS	1.6 ug/L(J)
Trichloroethene	NA	NA	NA	NA	NS	NS	22 ug/L

MPI-9S/MPI-9SR	5/02	9/03	6/04	8/07	5/09	5/10	6/12
	NS	NS	NS	NS	NS	NS	–
Tetrachloroethene	NA	NA	NA	NA	NS	NS	.75 ug/L(J)

MPI-14B/MW-14BR	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Vinyl chloride	ND	ND	1.06 ug/L	ND	NS	NS	ND
cis-1,2-Dichloroethene	ND	ND	2.93 ug/L	2.8 ug/L(J)	NS	NS	1.3 ug/L(J)
Methyl tert-butyl ether	ND	ND	2.99 ug/L	ND	NS	NS	ND
Tetrachloroethene	1 ug/L	ND	0.175 ug/L	ND	NS	NS	10 ug/L(J)
Trichloroethene	ND	ND	0.191 ug/L	ND	NS	NS	1.0 ug/L(J)
trans-1,2-Dichloroethene	ND	ND	1.60 ug/L	ND	NS	NS	ND
Acetone	ND	ND	4.06 ug/L	9.6 ug/L(J)	NS	NS	ND
1,2-Dichloroethane	ND	ND	0.340 ug/L	ND	NS	NS	ND
Chloromethane	NA	NA	NA	NA	NS	NS	0.6 ug/L(J)

LEGEND

- SANITARY SEWER MANHOLE
- MONITORING WELL
- PUMPING WELL
- PIEZOMETER
- EXISTING STRUCTURES AND FEATURES
- FENCE
- PAINE STREET — MAJOR AREA STREETS
- WELLS CIRCLED = NOT FOUND (EITHER ABANDONED, DECOMMISSIONED, OR MISSING)

WELL ABBREVIATIONS

EEI	(ECOLOGY & ENVIRONMENT)	PW	PUMPING WELL (TYREE)
ESI	EMPIRE SOILS WELL (ENVIRONMENTAL SCIENCE)	PZ	PIEZOMETER (TYREE)
MPI	OBSERVATION WELL (MALCOLM-PIRNIE)	RW	RECOVERY WELL (BY OTHERS)
MW	MONITORING WELL (MATRIX)	SP	SPARGE POINT
NA	DATA NOT AVAILABLE	VP	VAPOR COLLECTION POINT
OW	OBSERVATION WELL	MPI-7IR	REPLACEMENT WELL

ANALYTICAL ABBREVIATIONS

ug/L	MICROGRAMS PER LITER
ND	NOT DETECTED
NS	NOT SAMPLED
NA	NOT ANALYZED
–	NOT ANALYZED OR NOT DETECTED
(J)	ESTIMATED VALUE
(UJ)	ANALYZED FOR BUT NOT DETECTED AT THE DETECTION LIMIT INDICATED

NOTES:

1. ONLY DETECTED COMPOUNDS ARE PRESENTED.
2. HORIZONTAL CONTROL IS BASED UPON THE NEW YORK STATE PLANE COORDINATE SYSTEM, WEST ZONE, 1983 ADJUSTMENT (NAD 83).
3. ELEVATIONS ARE BASED UPON NORTH GEODETIC VERTICAL DATUM, 1929 (NGVD 1929).
4. BENCHMARK IS LOCATED NEAR THE NORTHEAST CORNER OF MAIN STREET AND PAINE STREET, BEING A BRASS DISC SET IN THE TOP OF CONCRETE BASE – ELEVATION 916.64'
5. ALL ANALYTICAL WORK PERFORMED IN JUNE 2004 WAS ANALYZED USING METHOD 524.1 FOR VOLATILE ORGANIC COMPOUNDS.
6. AUGUST 2007 ANALYTICAL WORK PERFORMED USING CLP METHOD OLM04.2.

SEE FIGURE 2-5b FOR SUMMARY OF MONITORING WELL INFORMATION EAST OF WHALEY AVE AND PAINE STREET.

SCALE IN FEET
0 60 120 180

REFERENCE DRAWINGS		
DWG NO.	DATE	DESCRIPTION
DEC 31 150.dwg	7/18/94	ISOPOTENTIAL MAP AND CROSS SECTIONS 4/11/94 GROUNDWATER LEVELS MALCOLM PIRNIE INC
02660003.dwg	10/17/00	REMEDIAL DESIGN PIPING AND WELL LAYOUT PLAN MALCOLM PIRNIE INC.

REVISIONS				
NO.	DATE	DWN.	APP'D	DESCRIPTION
D	7/20/12	KMK	MGS	UPDATED PER FEB/JUNE 2012 SAMPLE EVENT
C	8/8/10	KMK	MGS	UPDATED PER MAY 2010 SAMPLE EVENT
B	8/30/09	KMK	MGS	UPDATED PER MAY 2009 SAMPLE EVENT
A	12/8/07	KMK	MGS	UPDATED PER AUGUST 2007 SAMPLE EVENT

FIGURE 2-5a
SUMMARY OF GROUNDWATER ANALYTICAL DATA
MR.C'S DRY CLEANERS SITE LOCATION MAP (WEST)
EAST AURORA, NEW YORK

F:\MrC\well Analysis May 2009\Results_revised 6-29-09.dwg

MW-4	5/02	9/03	6/04	9/05	8/07
Vinyl Chloride	ND	47 ug/L	41.0 ug/L	590 ug/L	ND
Trichloroethene	23 ug/L	54 ug/L	27.9 ug/L	7.0 ug/L	ND
Benzene	24 ug/L	46 ug/L	4.80 ug/L	21.0 ug/L	5.4 ug/L(J)
trans-1,2-Dichloroethene	1 ug/L	7 ug/L	2.87 ug/L	3.4 ug/L	ND
Tetrachloroethene	130 ug/L	95 ug/L	278 ug/L	5.3 ug/L	ND
cis-1,2-Dichloroethene	200 ug/L	250 ug/L	515 ug/L	570 ug/L	2.5 ug/L(J)
Acetone	3 ug/L	ND	ND	ND	ND
Ethylbenzene	2 ug/L	ND	4.42 ug/L	7.7 ug/L	ND
Xylene-Total	170 ug/L	ND	0.704 ug/L	ND	1.3 ug/L
1,3,5 – Trimethylbenzene	120 ug/L	ND	NA	ND	ND
tert – Butylbenzene	2 ug/L	ND	0.447 ug/L	ND	ND
1,2,4 – Trimethylbenzene	10 ug/L	ND	0.243 ug/L	ND	ND
Isopropylbenzene	ND	ND	1.76 ug/L	3.4 ug/L	4.2 ug/L(J)
n-Propylbenzene	ND	ND	2.94 ug/L	ND	ND
m,p-Xylene	NA	ND	0.282 ug/L	0.55 ug/L	ND
o-Xylene	NA	ND	0.422 ug/L	0.8 ug/L	ND
sec-Butylbenzene	ND	ND	1.15 ug/L	ND	ND
Toluene	3 ug/L	ND	0.373 ug/L	2.3 ug/L	ND
1,1-Dichloroethene	ND	ND	0.320 ug/L	1.2 ug/L	ND
Cyclohexane	ND	ND	ND	75.0 ug/L	110 ug/L
Methylcyclohexane	ND	ND	ND	22.0 ug/L	22.0 ug/L
Methyl tert-butyl ether	ND	ND	ND	ND	ND

MW-6	5/02	9/03	6/04	9/05	8/07	5/09	5/10	2/12
Trichloroethene	ND	2 ug/L	NS	NS	NS	NS	NS	NS
Tetrachloroethene	68 ug/L	74 ug/L	NS	NS	NS	NS	NS	NS
cis-1,2-Dichloroethane	ND	2 ug/L	NS	NS	NS	NS	NS	NS

MW-7	5/02	9/03	6/04	9/05	8/07	5/09	5/10	2/12
Trichloroethene	ND	8 ug/L	4.34 ug/L	3.2 ug/L	ND	1.4 ug/L(J)	1.5 ug/L(J)	ND
Tetrachloroethene	240 ug/L	3300 ug/L	1170 ug/L	2000 ug/L	830 ug/L	700 ug/L(J)	770 ug/L(J)	670 ug/L(J)
cis-1,2-Dichloroethene	ND	ND	3.73 ug/L	0.76 ug/L	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	0.379 ug/L	ND	ND	ND	ND	ND
Methyl tert-butyl ether	ND	ND	0.315 ug/L	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	–	–	ND	ND	ND	1.7 ug/L(J)	1.9 ug/L(J)	ND

MW-8	5/02	9/03	6/04	9/05	8/07	5/09	5/10	2/12
Trichloroethene	720 ug/L	16 ug/L	10.4 ug/L	100.0 ug/L	590 ug/L	16 ug/L	14 ug/L	92 ug/L
trans-1,2-Dichloroethene	50 ug/L	1 ug/L	0.481 ug/L	3.8 ug/L	24 ug/L	12 ug/L	6.4 ug/L	11 ug/L(J)
Tetrachloroethene	3900 ug/L	310 ug/L	299 ug/L	570.0 ug/L	960 ug/L	210 ug/L(J)	200 ug/L(J)	250 ug/L(J)
cis-1,2-Dichloroethene	40 ug/L	5 ug/L	2.36 ug/L	15.0 ug/L	390 ug/L	9.4 ug/L	6.5 ug/L	15 ug/L(J)
2-Butanone	ND	ND	1.88 ug/L	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	0.157 ug/L	ND	ND	ND	ND	ND
Methyl tert-butyl ether	ND	ND	0.135 ug/L	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	35 ug/L	ND	2.0 ug/L(J)	ND
Methylcyclohexane	–	–	–	–	2.5 ug/L	ND	ND	ND

PW-3	5/02	9/03	6/04	9/05	8/07	5/09	5/10	2/12
Trichloroethene	ND	6 ug/L	7.32 ug/L	8.9 ug/L	7.2 ug/L(J)	6 ug/L	4.6 ug/L(J)	4.3 ug/L(J)
Tetrachloroethene	820 ug/L	850 ug/L	595 ug/L	560 ug/L	290 ug/L	300 ug/L(J)	260 ug/L	220 ug/L(J)
cis-1,2-Dichloroethene	ND	6 ug/L	6.43 ug/L	4.0 ug/L	2.8 ug/L(J)	4.3 ug/L(J)	3.5 ug/L(J)	ND
Methyl tert-Butyl Ether	ND	4 ug/L	0.401 ug/L	ND	ND	ND	ND	ND
Acetone	51 ug/L	ND	ND	ND	ND	ND	ND	ND
2-Butanone	350 ug/L	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	20 ug/L	ND	ND	ND	ND	ND	ND	ND
Xylene	120 ug/L	ND	ND	ND	ND	ND	ND	ND
Styrene	11 ug/L	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	0.407 ug/L	ND	ND	ND	ND	ND
Benzene	ND	ND	0.148 ug/L	ND	ND	ND	ND	ND
Chloroform	ND	ND	0.133 ug/L	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	2.94 ug/L	3.4 ug/L	5.0 ug/L(J)	6.2 ug/L	3.2 ug/L(J)	ND
Trihalomethanes, Total	NA	NA	0.133 ug/L	ND	ND	NS	NA	ND
Vinyl chloride	ND	ND	ND	1.7 ug/L	ND	ND	ND	ND

MPI-1S	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Trichloroethene	ND	1.5 ug/L	9.87 ug/L	6.5 ug/L(J)	1.2 ug/L(J)	ND	1.4 ug/L(J)
Tetrachloroethene	10 ug/L	41 ug/L	123 ug/L	97 ug/L	54 ug/L	40 ug/L	44 ug/L(J)
cis-1,2-Dichloroethene	ND	0.86 ug/L	3.90 ug/L	ND	1.1 ug/L(J)	1.3 ug/L(J)	1.3 ug/L(J)
Vinyl chloride	ND	ND	0.346 ug/L	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	0.337 ug/L	ND	ND	ND	ND
Chloromethane	NA	NA	NA	NA	NA	NA	.74 ug/L(J)

MPI-5S	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Vinyl Chloride	NA	5 ug/L	1.98 ug/L	15 ug/L	2.7 ug/L(J)	2.9 ug/L(J)	6.1 ug/L
Trichloroethene	NA	6 ug/L	3.66 ug/L	2.7 ug/L(J)	3.6 ug/L(J)	3.7 ug/L(J)	6.9 ug/L
trans-1,2-Dichloroethene	NA	2 ug/L	3.87 ug/L	6.0 ug/L(J)	10 ug/L	6.2 ug/L	6.8 ug/L
Tetrachloroethene	NA	36 ug/L	38.3 ug/L	4.9 ug/L(J)	15 ug/L(J)	16 ug/L	29 ug/L(J)
cis-1,2-Dichloroethene	NA	5 ug/L	3.81 ug/L	8.4 ug/L(J)	7.7 ug/L	4.2 ug/L(J)	6.0 ug/L
Methyl tert-butyl ether	NA	ND	0.114 ug/L	ND	ND	ND	ND
2-Butanone	NA	ND	0.994 ug/L	ND	ND	ND	ND
Benzene	NA	ND	0.304 ug/L	ND	ND	ND	ND

MPI-5I	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Methyl tert-Butyl Ether	NA	4 ug/L	NS	NS	NS	NS	NS

MW-5	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Xylene	5700 ug/L	ND	NS	NS	NS	NS	NS
Vinyl Chloride	ND	7 ug/L	NS	NS	NS	NS	NS
Trichloroethene	21 ug/L	ND	NS	NS	NS	NS	NS
Benzene	220 ug/L	15 ug/L	NS	NS	NS	NS	NS
trans-1,2-Dichloroethene	ND	ND	NS	NS	NS	NS	NS
Tetrachloroethene	83 ug/L	2 ug/L	NS	NS	NS	NS	NS
cis-1,2-Dichloroethene	48 ug/L	16 ug/L	NS	NS	NS	NS	NS
Methyl tert-Butyl Ether	ND	3 ug/L	NS	NS	NS	NS	NS
Toluene	160 ug/L	3 ug/L	NS	NS	NS	NS	NS
Ethylbenzene	25 ug/L	ND	NS	NS	NS	NS	NS
1,3,5 – Trimethylbenzene	470 ug/L	ND	NS	NS	NS	NS	NS
1,2,4 – Trimethylbenzene	920 ug/L	ND	NS	NS	NS	NS	NS

EE-4	2/12
cis-1,2-Dichloroethene	3.3 ug/L(J)
trans-1,2-Dichloroethene	8.6 ug/L
Tetrachloroethene	.68 ug/L(J)
Vinyl chloride	4.6 ug/L(J)
Cyclohexane	8.4 ug/L
Isopropylbenzene	3.3 ug/L(J)
Methylcyclohexane	17 ug/L
Trichloroethene	.81 ug/L(J)

ESI-5/ESI-5R	5/02	9/03	6/04	8/07	5/09	5/10	6/12
Tetrachloroethene	ND	0.52 ug/L	0.196 ug/L	4.6 ug/L(J)	ND	ND	ND

ESI-4/EE-1	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Chloroform	ND	0.54 ug/L	0.521 ug/L	ND	ND	ND	NS
1,1,1-Trichloroethane	0.7 ug/L	2.4 ug/L	14.7 ug/L	9.6 ug/L(J)	12 ug/L	7.5 ug/L	NS
Trichloroethene	0.5 ug/L	3.6 ug/L	ND	ND	ND	ND	NS
Tetrachloroethene	14 ug/L	63 ug/L	5.91 ug/L	3.1 ug/L(J)	4.5 ug/L(J)	3.8 ug/L(J)	NS
cis-1,2-Dichloroethene	ND	1.2 ug/L	ND	ND	ND	ND	NS
Methyl tert-butyl ether	ND	ND	8.51 ug/L	4.2 ug/L(J)	1.6 ug/L(J)	ND	NS
Trihalomethanes, Total	NA	NA	0.521 ug/L	ND	ND	NA	NS
1,1-Dichloroethane	ND	ND	1.16 ug/L	ND	ND	ND	NS
1,1-Dichloroethene	ND	ND	0.284 ug/L	ND	ND	ND	NS
2-Butanone	NA	NA	0.965 ug/L	ND	ND	ND	NS
Benzene	ND	ND	0.325 ug/L	ND	ND	ND	NS
Acetone	NA	ND	1.85 ug/L	ND	ND	ND	NS

RW-1	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Chloroform	ND	ND	0.839 ug/L	ND	1 ug/L(J)	ND	.61 ug/L(J)
cis-1,2-Dichloroethene	ND	ND	2.31 ug/L	ND	2.4 ug/L(J)	ND	1.0 ug/L(J)
1,1-Dichloroethane	ND	ND	0.275 ug/L	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	0.531 ug/L	ND	1.3 ug/L(J)	ND	1.3 ug/L(J)
Trihalomethanes, Total	NA	NA	0.839 ug/L	ND	1 ug/L(J)	NA	ND
Trichloroethene	ND	1 ug/L	2.09 ug/L	ND	1.5 ug/L(J)	ND	1.5 ug/L(J)
Tetrachloroethene	4 ug/L	74 ug/L	410 ug/L	140 ug/L	190 ug/L(J)	54 ug/L	250 ug/L(J)
Methyl tert-Butyl Ether	ND	3 ug/L	1.03 ug/L	ND	ND	ND	ND
Chloromethane	NA	NA	NA	NA	NA	NA	.91 ug/L(J)

MW-10	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Acetone	ND	14 ug/L	NS	NS	NS	NS	NS
cis-1,2-Dichloroethene	ND	3 ug/L	NS	NS	NS	NS	NS
Tetrachloroethene	12 ug/L	ND	NS	NS	NS	NS	NS

MPI-7I/MPI-7IR	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Trichloroethene	NA	2 ug/L	1.54 ug/L	ND	6.5 ug/L	ND	ND
Tetrachloroethene	NA	4 ug/L	5.13 ug/L	2.9 ug/L(J)	490 ug/L(J)	ND	1.8 ug/L(J)
cis-1,2-Dichloroethene	NA	8 ug/L	8.53 ug/L	12 ug/L	18 ug/L	10 ug/L	ND
2-Butanone	NA	ND	1.17 ug/L	ND	ND	ND	ND
Methyl tert-butyl ether	NA	ND	0.178 ug/L	ND	ND	ND	ND
Vinyl chloride	NA	ND	0.223 ug/L	ND	ND	ND	ND
Chloroform	–	–	–	ND	11 ug/L(J)	ND	ND
1,1,1-Trichloroethane	–	–	–	ND	1.1 ug/L(J)	ND	ND
Bromodichloromethane	–	–	–	ND	1.9 ug/L(J)	ND	ND
Chloromethane	NA	NA	NA	NA	NA	NA	1.4 ug/L(J)

PW-2	5/02	9/03	6/04	9/05	8/07	5/09	5/10	2/12
Trichloroethene	ND	11 ug/L	5.57 ug/L	4.4 ug/L	9.3 ug/L(J)	7.5 ug/L	6.5 ug/L	2.2 ug/L(J)
Tetrachloroethene	430 ug/L	1400 ug/L	1090 ug/L	2000 ug/L	1300 ug/L	1200 ug/L(J)	910 ug/L(J)	770 ug/L(J)
cis-1,2-Dichloroethene	ND	5 ug/L	3.82 ug/L	2.0 ug/L	ND	2.8 ug/L(J)	1.3 ug/L(J)	ND
Methyl tert-Butyl Ether	ND	3 ug/L	0.617 ug/L	ND	ND	ND	ND	ND
Acetone	14 ug/L	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	24 ug/L	ND	ND	ND	ND	ND	ND	ND
Xylene	65 ug/L	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	0.290 ug/L	ND	ND	4.1 ug/L(J)	ND	ND
1,1,1-Trichloroethane	ND	ND	0.344 ug/L	ND	ND	ND	ND	ND

ESI-2/ESI-2R	5/92	4/94	2/12
Tetrachloroethene	1 ug/L	NS	1.1 ug/L(J)
Chloromethane	NA	NA	.89 ug/L(J)

ESI-3	5/02	9/03	6/04	8/07	5/10	2/12
1,1,1Trichloroethane	ND	1 ug/L	0.882 ug/L	2.0 ug/L(J)	ND	2.0 ug/L(J)
Trichloroethene	ND	2 ug/L	7.03 ug/L	ND	ND	.77 ug/L(J)
Tetrachloroethene	220 ug/L	440 ug/L	655 ug/L	250 ug/L	250 ug/L	200 ug/L(J)
cis-1,2-Dichloroethene	ND	4 ug/L	12.4 ug/L	2.8 ug/L	ND	ND
Methyl tert-Butyl Ether	9 ug/L	1 ug/L	1.02 ug/L	ND	ND	ND
1,1-Dichloroethane	ND	ND	0.469 ug/L	ND	ND	.76 ug/L(J)
Chloroform	ND	ND	1.14 ug/L	2.4 ug/L	ND	.84 ug/L(J)
Trihalomethanes, Total	NA	NA	1.14 ug/L	ND	NA	ND
Chloromethane	NA	NA	NA	NA	NA	.95 ug/L(J)

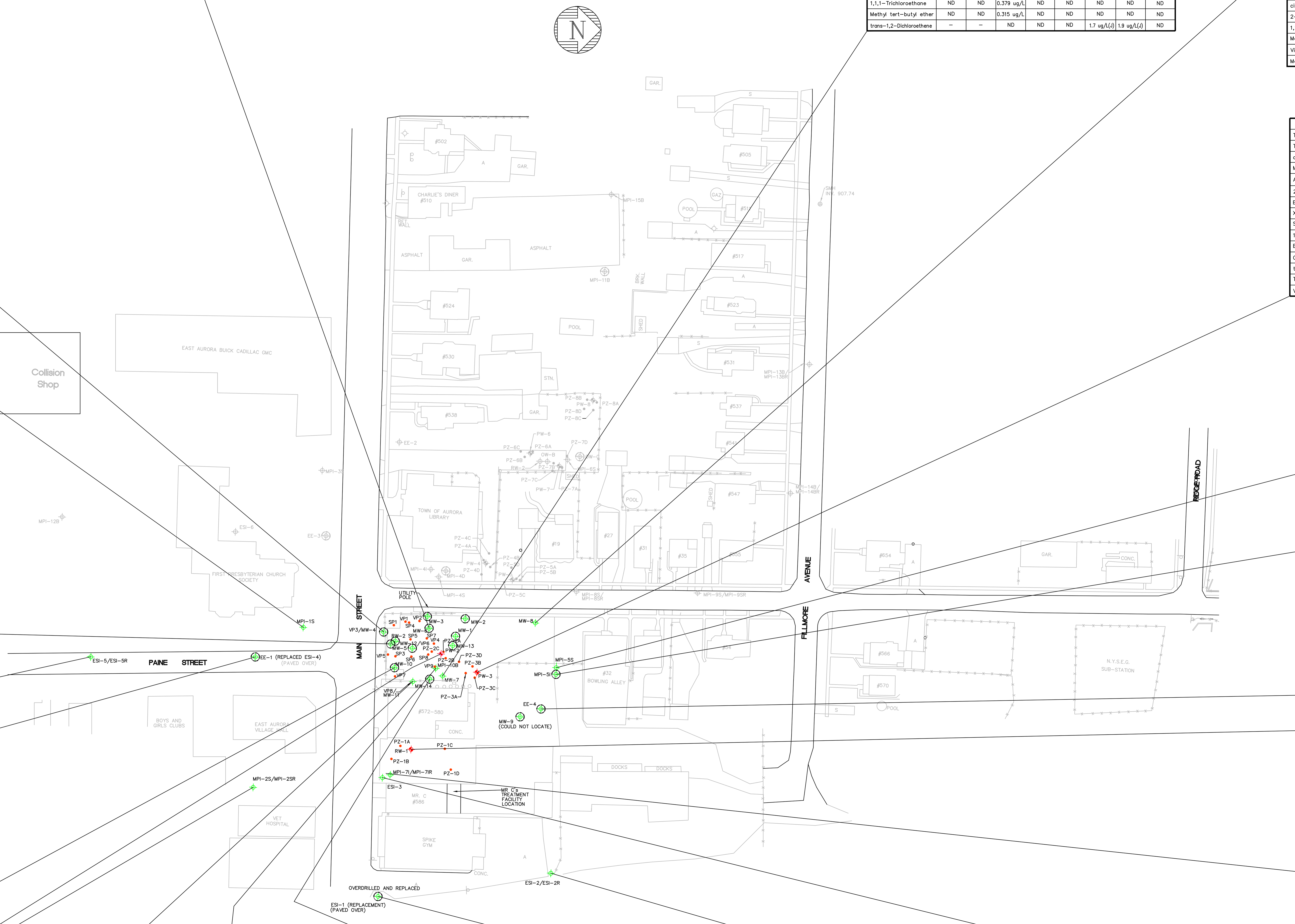
MW-11	5/10	2/12
cis-1,2-Dichloroethene	3.4 ug/L(J)	1.2 ug/L(J)
Trichloroethene	6 ug/L	5.8 ug/L
Tetrachloroethene	1600 ug/L(J)	1500 ug/L(J)
Chloromethane	NA	0.68 ug/L(J)
trans-1,2-Dichloroethene	NA	1.2 ug/L(J)

MPI-10B	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Trichloroethene	ND	1 ug/L	5.03 ug/L	ND	5.1 ug/L	4.3 ug/L(J)	3.6 ug/L(J)
Benzene	ND	3 ug/L	ND	ND	ND	ND	ND
Tetrachloroethene	82 ug/L	320 ug/L	1070 ug/L	790 ug/L	450 ug/L(J)	250 ug/L(J)	250 ug/L(J)
cis-1,2-Dichloroethene	ND	2 ug/L	5.09 ug/L	ND	3.3 ug/L(J)	1.3 ug/L(J)	1.1 ug/L(J)
Methyl tert-Butyl Ether	ND	2 ug/L	1.89 ug/L	ND	ND	ND	1.1 ug/L(J)
Trihalomethanes, Total	NA	NA	0.149 ug/L	ND	ND	NA	ND
trans-1,2-Dichloroethene	ND	ND	0.588 ug/L	ND	ND	ND	ND
Chloroform	ND	ND	0.149 ug/L	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	0.24 ug/L	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	0.926 ug/L	ND	ND	ND	ND

MW-14	5/02	9/03	6/04	8/07	5/09	5/10	2/12
Tetrachloroethene	NS	NS	180 ug/L	NS	NS	NS	NS

ESI-1/ESI-1 (REPLACEMENT)	5/92	1/93	4/94	6/04	8/07	5/09	5/10	2/12
1,2 Dichloroethene	2 ug/L	ND	ND	NA	ND	NS	NS	NS
Trichloroethene	2 ug/L	ND	3 ug/L	1.28 ug/L	ND	NS	NS	NS
Tetrachloroethene	2 ug/L	0.9 ug/L	ND	1.47 ug/L	9.3 ug/L(J)	NS	NS	NS
Carbon disulfide	NA	NA	ND	0.557 ug/L	ND	NS	NS	NS
Chloroform	NA	NA	ND	0.485 ug/L	ND	NS	NS	NS
cis-1,2-Dichloroethene	NA	NA	NA	0.103 ug/L	ND	NS	NS	NS

MPI-2S/MPI-2SR	4/94	1/95	6/04	2/12
1,1,1 Trichloroethane	14 ug/L	12 u/L	NS	4.1 ug/L(J)
Benzene	ND	2 ug/L	NS	ND
Chloroform	NA	NA	NA	1.8 ug/L(J)
Tetrachloroethene	NA	NA	NA	1.9 ug/L(J)



LEGEND

- SANITARY SEWER MANHOLE
- MONITORING WELL
- PUMPING WELL
- PIEZOMETER
- EXISTING STRUCTURES AND FEATURES
- FENCE
- PAINE STREET — MAJOR AREA STREETS
- WELLS CIRCLED = NOT FOUND (EITHER ABANDONED, DECOMMISSIONED, OR MISSING)

WELL ABBREVIATIONS

EEI	(ECOLOGY & ENVIRONMENT)	PW	PUMPING WELL (TYREE)
ESI	EMPIRE SOILS WELL (ENVIRONMENTAL SCIENCE)	PZ	PIEZOMETER (TYREE)
MPI	OBSERVATION WELL (MALCOLM-PIRNIE)	RW	RECOVERY WELL (BY OTHERS)
MW	MONITORING WELL (MATRIX)	SP	SPARGE POINT
NA	DATA NOT AVAILABLE	VP	VAPOR COLLECTION POINT
OW	OBSERVATION WELL	MPI-7IR	REPLACEMENT WELL

ANALYTICAL ABBREVIATIONS

ug/L	MICROGRAMS PER LITER
ND	NOT DETECTED
NS	NOT SAMPLED
NA	NOT ANALYZED
–	NOT ANALYZED OR NOT DETECTED
(J)	ESTIMATED VALUE
(U)	ANALYZED FOR BUT NOT DETECTED AT THE DETECTION LIMIT INDICATED

NOTES:

1. ONLY DETECTED COMPOUNDS ARE PRESENTED.
2. HORIZONTAL CONTROL IS BASED UPON THE NEW YORK STATE PLANE COORDINATE SYSTEM, WEST ZONE, 1983 ADJUSTMENT (NAD 83).
3. ELEVATIONS ARE BASED UPON NORTH GEODETIC VERTICAL DATUM, 1929 (NGVD 1929).
4. BENCHMARK IS LOCATED NEAR THE NORTHEAST CORNER OF MAIN STREET AND PAINE STREET, BEING A BRASS DISC SET IN THE TOP OF CONCRETE BASE – ELEVATION 916.64'
5. ALL ANALYTICAL WORK PERFORMED IN JUNE 2004 WAS ANALYZED USING METHOD 524.1 FOR VOLATILE ORGANIC COMPOUNDS.
6. AUGUST 2007 ANALYTICAL WORK PERFORMED USING CLP METHOD OLM04.2.

SEE FIGURE 2-5a FOR SUMMARY OF MONITORING WELL INFORMATION WEST OF WHALEY AVE AND PAINE STREET.

SCALE IN FEET: 0 60 120 180

DWG NO.	DATE	DESCRIPTION
DEC 31 ISO.dwg	7/18/94	ISOPOTENTIAL MAP AND CROSS SECTIONS 4/13/94 GROUNDWATER LEVELS MALCOLM PIRNIE INC.
0266G003.dwg	10/17/00	REMEDIAL DESIGN PIPING AND WELL LAYOUT PLAN MALCOLM PIRNIE INC.

REFERENCE DRAWINGS

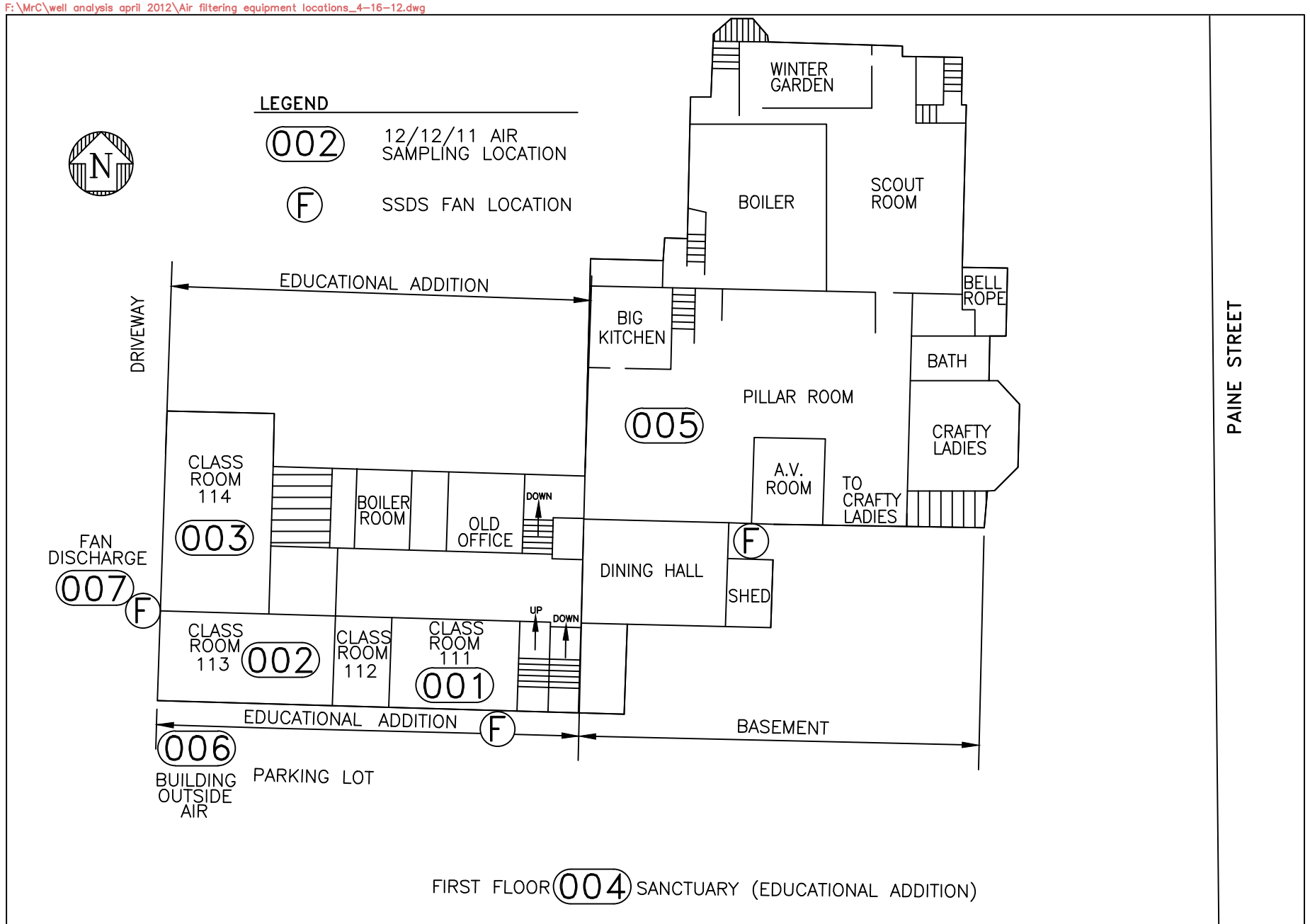
NO.	DATE	DWN	APP'D	DESCRIPTION
D	7/20/12	KMK	MGS	UPDATED PER FEB/JUNE 2012 SAMPLE EVENT
C	6/8/10	KMK	MGS	UPDATED PER MAY 2010 SAMPLE EVENT
B	6/30/09	KMK	MGS	UPDATED PER MAY 2009 SAMPLE EVENT
A	12/6/07	KMK	MGS	UPDATED PER AUGUST 2007 SAMPLE EVENT

REVISIONS

FIGURE 2-5b
SUMMARY OF GROUNDWATER ANALYTICAL DATA
MR.C'S DRY CLEANERS SITE LOCATION MAP (EAST)
EAST AURORA, NEW YORK

ecology and environment engineering p.c.

F:\MrC\well analysis april 2012\Air filtering equipment locations_4-16-12.dwg



ecology and environment

APPROXIMATE SCALE IN FEET

0 30 60 90

FIGURE 2-6
DECEMBER 12, 2011, AIR SAMPLING LOCATIONS
PRESBYTERIAN CHURCH, EASI AURORA, NEW YORK

3 Site Monitoring Plan

3.1 Introduction

The overall goals of this remediation effort are provided in Section 1 of this SMP. As part of the remediation effort, the monitoring of groundwater, soil vapors, and other media, including sampling and analysis, shall be performed in a manner acceptable to NYSDEC. This section provides a summary and a description of the site monitoring and sampling plans for groundwater and soil vapor/indoor air. These monitoring activities must continue until the remedial objectives have been achieved, or until NYSDEC determines that continued operation is technically impracticable or infeasible.

3.1.1 General

This Site Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site and all affected site media identified below. This Monitoring Plan may be revised only with the written approval of NYSDEC. The SMP and the latest revisions to the SMP shall be filed with NYSDEC.

3.1.2 Purpose and Frequency

Monitoring programs are in place for the groundwater plume, the on-site treatment system, and off-site SSDSs. No monitoring program is in place for on-site or off-site soils.

The Site Monitoring Plan describes the methods to be used for the following:

- Sampling and analysis of all appropriate media;
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards;
- Assessing achievement of the remedial performance criteria;
- Periodically evaluating site information 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, the Site Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Analytical sampling program requirements, including independent validation of analytical data;
- Quality Assurance/Quality Control (QA/QC) requirements; and
- Reporting requirements.

3.2 Remedial Performance Monitoring Requirements

Annual monitoring of the performance of the remedy and overall reduction in groundwater contamination is conducted and reported in the PRR. Any future modifications to the monitoring frequency will be determined by NYSDEC.

Monitoring includes inspections of site ECs and sampling of site media. The Analytical Program for the Mr. C's site includes the analysis of groundwater, indoor air (for vapor intrusion), and treated effluent discharge water from the treatment system. Table 3-1 presents the schedule of routine inspections to be performed under each monitoring program.

Table 3-1 Mr. C's Inspection Schedule

Monitoring Program	Inspection Frequency[1]	ECs[2,3]
Groundwater	Annually	Monitoring wells
Treatment System	Bi-monthly, or as needed	Air stripper and its components, pumping wells, piezometers
Vapor Intrusion	Annually, or as needed	SSDS components, seals

Notes:
[1] The inspection frequency will be as indicated unless otherwise specified by NYSDEC.
[2] Specific requirements for inspections are described in Section 4 of this plan.
[3] Reporting requirements are summarized in Section 5 of this plan.

Sampling protocols for these monitoring programs are described in Section 3.3. A bioremediation pilot study planned for implementation in 2013 and 2014 includes the additional analysis of dissolved gases and microbial populations of *Dehalococcoides* spp. (DHC). This study is not included in this SMP due to its pilot status. The results of the pilot study will be incorporated into a remedial system optimization report after the conclusion of the pilot study (planned 2014).

Procedures for operating and maintaining the Mr. C's on-site remedial treatment system, including inspection requirements, are documented in the O & M Plan (Section 4 of this SMP).

3.2.1 Treatment System Monitoring Program

The treatment system performance must be monitored to confirm that the remedy continues to be effective in achieving remedial goals. Monitoring of the treatment system performance will be performed as follows:

- Comparing treated effluent sample results to the State Pollution and Discharge Elimination System (SPDES) Equivalency Permit requirements to assess the extent to which the treatment system is protective of human health and the environment;

- Comparing the influent and effluent VOC concentrations to assess the efficiency of the treatment system at removing VOCs; and

- Evaluating trends in contaminant levels in the groundwater plume and the extent of the plume to determine whether the remedy continues to be effective in achieving remedial goals. Groundwater contaminant levels will be compared with NYSDEC Class GA groundwater standards.

Sampling protocols are described in Section 3.3 of this plan. The requirements for the treatment system inspection and maintenance, including the pumping and monitoring wells, are presented in Section 4 of this plan.

3.2.2 Soil Vapor Intrusion Monitoring Program

Vapor intrusion must be monitored to confirm that the remedy continues to be effective in protecting public health and mitigating human health risk by reducing the potential for inhalation of vapors in on-site and off-site basements. Monitoring will include annual inspections and sampling at existing SSDSs and additional investigations as needed. The requirements for soil vapor intrusion evaluation are presented in Section 2.2.3. The requirements for SSDS inspections and maintenance are presented in Section 4 of this plan.

The sampling requirements for soil vapor and indoor air are described in Section 3.3. The effectiveness of the vapor mitigation systems will be assessed by comparing sample results to the NYSDOH guidance values (2006) and ASTDR MRLs for chronic inhalation.

3.3 Sampling Protocols

Sampling requirements for the main monitoring programs at the site are summarized in Table 3-2 and outlined in detail in Sections 3.3 and 3.4.

3.3.1 Air-Stripper Sampling Protocol

The site O&M subcontractor will be responsible for sampling and analysis of the treatment system performance. The subcontractor shall utilize the existing sampling ports located on the treatment system to obtain performance samples. Performance samples shall be shipped to a NYSDOH Environmental Laboratory Accreditation Program (ELAP) -certified laboratory for all compliance analyses. All samples will be preserved as required and shipped in a timely manner to ensure

analysis within maximum holding times. All samples will be shipped under a standard chain-of-custody for sign-off release for all parties handling the environmental samples prior to laboratory receipt.

Table 3-2 Mr. C's Sampling Schedule and Analytical Methods

Monitoring Program	Sampling Frequency[1]	Matrix	Analysis
Groundwater	Annually	Groundwater	VOCs by EPA Method 8260B
Treatment System	Monthly, or as needed	Water (influent and effluent)	VOCs by EPA Method 8260B Hardness by EPA Method 130.2 pH by EPA Method 150.1
Vapor Intrusion	Annually, or as needed	Air	VOCs by TO-15

Notes:
[1] The sampling frequency will be as indicated unless otherwise specified by NYSDEC.

The O&M subcontractor shall collect one influent groundwater sample to the air stripper, after the equalization tank, and one effluent sample after the air stripper. Samples will be analyzed for VOCs by EPA Method 8260B, hardness by EPA Method 130.2, and pH by EPA Method 150.1.

The site effluent discharge criteria were initially established as a SPDES Equivalency Permit during the design phase of the Contract Documents in 2000. The influent and effluent from the remedial treatment system have been sampled and analyzed since the system became operational in September 2002. In February 2005, based on 30 months of historical analytical information prepared and submitted by EEEPC, the permit was modified by NYSDEC Region 9 to eliminate analyses for metals, total dissolved solids, and suspended solids. The current effluent criteria used for the site and analytical compliance results from the remedial treatment system at the Mr. C's site are presented in Table 3-3.

Table 3-3 Mr. C's Dry Cleaners Site, Effluent Criteria and Analytical Compliance Criteria

Parameter	Daily Maximum[1]	Units
Flow	216,000	gpd
pH	6.0 to 9.0	standard units
1,1-Dichloroethene	10	µg/L
1,2-Dichloroethane	10	µg/L
Trichloroethene	10	µg/L
Tetrachloroethene	10	µg/L
Vinyl Chloride	10	µg/L
Benzene	5	µg/L
Ethylbenzene	5	µg/L
Methylene Chloride	10	µg/L

Table 3-3 Mr. C's Dry Cleaners Site, Effluent Criteria and Analytical Compliance Criteria

Parameter	Daily Maximum[1]	Units
1,1,1-Trichloroethane	10	µg/L
Toluene	5	µg/L
MTBE	NA	µg/L
o-Xylene	5	µg/L
m, p-Xylene	10	µg/L
Total Xylenes	NA	µg/L
Iron, total	600	µg/L
Aluminum	4,000	µg/L
Copper	48	µg/L
Lead	11	µg/L
Manganese	2,000	µg/L
Silver	100	µg/L
Vanadium	28	µg/L
Zinc	230	µg/L
Total Dissolved Solids	850	mg/L
Total Suspended Solids	20	mg/L
Hardness	NA	mg/l
Cyanide, Free	10	µg/L

Note:
[1] "Daily Maximum" excerpted from Attachment E of Addendum 1 to the Construction Contract Document.
[2] Shaded parameters were deleted by NYSDEC in February 2005

3.3.2 Groundwater Sampling Protocols

Groundwater monitoring will be performed on an annual basis to assess the performance of the remedy. The sampling frequency may be modified only with the approval NYSDEC. The SMP will be modified to reflect any changes in sampling plans approved by NYSDEC.

Groundwater samples shall be collected annually from the active groundwater monitoring wells and pumping wells listed in Table 2-1, and the groundwater levels in the wells shall be recorded when the sampling is performed. The samples shall be analyzed for VOCs by EPA Method 8260B and by an ELAP-certified laboratory.

The groundwater sampling procedures for the Mr. C's network of wells is found in Appendix I.

3.3.3 Sub-slab Soil Vapor and Indoor Air Sampling Protocols

The site OM&M Contractor shall be responsible for annual sampling and analysis of the sub-slab soil vapor and indoor air sampling at the existing SSDS and per the requirements of Appendix J.

Air sampling will be performed using an evacuated stainless steel Summa® canister, and analysis for VOCs will be performed using gas chromatographic analysis in accordance with EPA Method TO-15. Using this method, compounds can be detected at part per billion, and analysts can identify individual compounds by comparing its spectrum to more than 130,000 stored spectra.

Indoor air samples will be collected and analyzed to evaluate the effectiveness of the SSDS at the 27 Whaley Avenue residence. Three ambient air samples will be collected during each sampling event: one basement sample, one first floor sample, and one outdoor (ambient) sample.

Sub-slab soil vapor and indoor air samples will be collected and analyzed to evaluate the effectiveness of the three SSDSs installed at the First Presbyterian Church. Air sampling locations for the First Presbyterian Church are identified on Figure 2-6. The sampling locations include:

- A location outside and upwind of the building to collect one ambient air sample to establish background levels;
- Four locations in the basement educational wing, including one in classroom 111, one in classroom 113, one in classroom 114, and one in the Pillar Room;
- One in the first floor sanctuary; and
- One of the three SSDS discharge points located on the outside of the church.

3.4 Quality Assurance/Quality Control

All sampling and analyses shall be performed in accordance with the requirements of the generic Quality Assurance Project Plan (QAPP) prepared for the site (see Appendix K). Site-specific requirements will be considered in the development of a sampling work plan or field sampling plan, which will be generated prior to conducting the Mr. C's site monitoring programs. The main components of the generic QAPP include the following:

- QA/QC objectives for data measurement;
- Sampling program:
  - Sample containers will be properly washed and decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such;
  - Sample holding times will be in accordance with the NYSDEC Analytical Service Protocols; and
  - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary;
- Sample tracking and custody;

- Calibration procedures:
  - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions; and
  - The laboratory will follow all calibration procedures and schedules as specified in EPA Method SW-846 (EPA 1995) and subsequent updates that apply to the instruments used for the analytical methods;

- Analytical procedures;

- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain-of-custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method;

- Internal QC and checks;

- QA performance and system audits;

- Preventative maintenance procedures and schedules; and

- Corrective action measures.

3.5 Reporting Requirements

Forms and any other information generated during regular monitoring events and inspections shall be kept on file with the owner or site representative. All forms and other relevant reporting formats used during the monitoring/inspection events will be subject to approval by NYSDEC and submitted at the time of the PRR, as specified below.

All monitoring results will be reported annually to NYSDEC in the PRR. A letter report will also be prepared (if required by NYSDEC), subsequent to each sampling event. The letter report will include, at a minimum:

- The date of the event;

- The names of the personnel who conducted the sampling;

- A description of the activities performed;

- The type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air);

- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation);

- Sample results with comparison to appropriate standards, criteria, and guidance values (SCGs);
- A figure identifying sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format into the EQuIS database);
- Any relevant observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Deliverables shall be submitted in either hard copy or digital format as required by NYSDEC.

4 Operation and Maintenance Plan

4.1 Introduction

This O&M Plan describes the ECs in place at the former Mr. C's Site and provisions for the continued proper O&M of the remedy components (see Table 4-1 for general system performance requirements). The ECs include the air-stripping treatment system, two SSDSs to mitigate soil vapor exposure, and monitoring wells for use in evaluating contaminant trends.

Table 4-1 General System Performance Requirements

System Parameter	Performance Required
General	• System operation at least 90% during the 12-month O&M reporting period.[1] • Maximization of all treatment operating systems to achieve the regulatory discharge requirements and site cleanup goals.
Groundwater Extraction/Recovery System	Monitor water levels in pumping wells and observation piezometers and maintain a positive cone of depression around each pumping well.
Groundwater Treatment System	Meet NYSDEC SPDES limits for treated groundwater discharged to Tannery Brook.

Note:
[1] System up-time percentage shall be measured by dividing the total number of operational hours achieved in the month by the total numbers of hours in that month.

NYSDEC shall be notified prior to the performance of any repair work on or replacement of a monitoring well. All such work shall be documented in the subsequent PRR.

4.2 Mr. C's On-Site Treatment System

The Mr. C's treatment system is described in Section 2.3.1. A copy of the system P&ID is provided as Figure 2-1, and a copy of the treatment building layout is provided as Figure 2-2.

Normal O&M work shall consist of regularly scheduled bi-monthly site visits to inspect general system operations, record discharge readings, and perform general system balancing and maintenance requirements. Monthly samples shall be taken

and submitted to a third-party laboratory for analysis of the influent and effluent groundwater (see Section 3.3).

The O&M subcontractor shall be responsible for the performance of regularly scheduled O&M activities. In addition, the O&M contractor shall respond to and repair treatment system shutdowns, pump failures, and level control issues on an as-needed basis, as further outlined below. The O&M subcontractor shall provide the necessary labor, equipment, materials, and health and safety protection to successfully operate, maintain, and monitor the overall treatment system at the Mr. C's Dry Cleaners site.

Any changes or improvements to the system components or control must be described in full along with any associated manufacturer's literature and a description of preventative maintenance in the form of O&M Manual Addenda, which will be incorporated into the SMP.

4.2.1 Air-Stripper Operation, Cleaning, and Repairs

The air-stripper shall be maintained to achieve an operation up-time of at least 90% during each 12-month monitoring period. System up-time percentage shall be measured by dividing the total number of operational hours achieved in the month by the total numbers of hours in that month or reporting period. The air-stripper will be operated in a way to maximize the ability of the air-stripper to remove VOCs and to meet the SPDES Equivalency Permit limits for treated groundwater discharged to Tannery Brook. See Table 4-2 for discharge limits.

The air-stripper shall be inspected bi-weekly to determine and document its physical condition and to identify the maintenance necessary to ensure that it remains operational. A copy of the system and support equipment O&M manual is included as Appendix L. Sample inspection forms are included in Appendix M. Repairs or equipment replacement should be completed within 10 days after inspection.

Table 4-2 Treatment System Monitoring Frequencies

Parameter	Treatment Facility Influent	Bag Filters	Air Stripper Influent	Blower Inlet	Air Stripper Air Discharge	Air Stripper Effluent
Temperature	NA	NA	NA	NA	NA	Bi-monthly
pH	NA	NA	Monthly	NA	NA	Monthly
Pressure	NA	Bi-monthly	Bi-monthly	Bi-monthly	NA	Bi-monthly
Flow Rate	Bi-monthly	NA	NA	NA	Bi-monthly	Bi-monthly
VOCs Concentrations	NA	NA	Monthly	NA	NA	Monthly
Total VOCs Removed	NA	NA	Calculate	NA	NA	Calculate
Hardness	NA	NA	Monthly	NA	NA	Monthly

Normal system O&M shall include replacement of bag filters and review and control of the sequestering agent as necessary; recording pressure and vacuum gauge readings; and recording system flow measurements from blowers and fans, etc. Any discrepancies or irregularities in system operation shall be corrected and so noted in the weekly reports.

The air stripper and associated equipment shall be cleaned and maintained in accordance with the manufacturer's required frequencies, or more frequently, based on actual site conditions that may be encountered during OM&M. Disposal of on-site solid wastes derived from filters and debris shall be performed only with the written permission of EEEPC's project manager.

Local power outages or equipment failure can affect operation of the remedial treatment system. To limit these downtimes, the system has an auto-dialer that sends an alarm to the OM&M subcontractor and EEEPC if an equipment failure, power outage, or a high water level in the equalization tank occurs. In addition, the treatment facility can be called at (716) 652-0094 to check on the status of the equipment in the building.

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

4.2.2 Pumping Well Operations, Cleaning, and Repairs

The pumping wells will be operated in a way to maximize the ability of the air-stripper to remove VOCs and to meet the SPDES Equivalency Permit limits for treated groundwater discharged to Tannery Brook. See Table 4-2 for discharge limits.

Normal operation and maintenance of the system shall include maintaining a positive cone of depression around each pumping well. Routine inspections of the pumping wells will require O&M personnel to record water levels and pressures in project-installed piezometers and pumping wells according to the frequency specified on Table 4-3.

Table 4-3 Pumping Well Monitoring Frequencies

Parameter	Pumping Wells (each)	Piezometers (each)
Pressure	Bi-monthly	NA
Groundwater Elevations	Monthly	Monthly

The pumping wells and electrical boxes shall be inspected bi-monthly for operating conditions during each bi-monthly inspection event. Sample inspection forms for the site pumping wells are included in Appendix I, K, and M. Where conditions warrant pump repair and replacement, level transducer adjustment or

replacement, or electrical lead replacement, these services shall be performed during the normal system operation and maintenance period.

Any repair and/or replacement of a monitoring well shall be performed based on an assessment of its structural integrity and overall performance. Repairs or equipment replacement shall be completed within 10 days after inspection.

Some minor problems that may be encountered during inspection, and typical solutions, include the following:

- Level transducer problems – adjust or replace as necessary;
- Electrical lead malfunction – adjust or replace as necessary;
- Missing or deteriorated well identification markings – re-label as necessary;
- Cracked anti-percolation pad – replace with new pad;
- Rusty cap lock – replace;
- Casings that have peeling paint or are rusty – remove loose paint and rust and repaint;
- Bent casings – repair if possible. If the casing cannot be repaired to allow for sampling, then the pumping well may have to be decommissioned and replaced (to be determined by NYSDEC); and
- Leaking seals or cap – replace with watertight items.

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

4.3 Groundwater Monitoring Wells

4.3.1 Monitoring Well Repairs

The groundwater monitoring well network must be maintained to permit annual monitoring in accordance with Section 3, Site Monitoring Plan. Inspections of the monitoring wells should be conducted prior to scheduled sampling times to allow scheduled sampling to proceed as planned (see Section 3 for inspection frequencies). Any repair and/or replacement of a monitoring well shall be performed based on an assessment of its structural integrity and overall performance. Repairs or equipment replacement shall be completed within 10 days after inspection.

Some minor problems that may be encountered during inspection, and typical solutions, include the following:

- Missing or deteriorated well identification markings – re-label as necessary;
- Cracked anti-percolation pad – replace with new pad;
- Rusty cap lock – replace;
- Casings that have peeling paint or are rusty – remove loose paint and rust and repaint;
- Bent casings – repair if possible. If the casing cannot be repaired to allow for sampling, then the monitoring well may have to be decommissioned and replaced (to be determined by NYSDEC); and
- Leaking seals or cap – replace with watertight items.

If biofouling or silt accumulation occurs in an on- or off-site monitoring well, the well should be physically agitated, surged, and then redeveloped. If the redevelopment renders the well unusable, the monitoring well shall be properly decommissioned and replaced in accordance with this SMP.

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

4.3.2 Groundwater Monitoring Well Decommissioning

If a monitoring well is determined to be unusable for obtaining samples because of damage or any other reason, the well shall be decommissioned as described in NYSDEC's *Groundwater Monitoring Well Decommissioning Procedures* (NYSDEC 2009).

Well decommissioning without replacement shall be performed only with the prior approval of NYSDEC. Well abandonment shall be performed in accordance with NYSDEC's latest version of the *Groundwater Monitoring Well Decommissioning Procedures* (NYSDEC 2009). Monitoring wells that are decommissioned because they have become unusable shall be reinstalled in the nearest available location approved by NYSDEC.

4.3.3 Installation of New or Replacement Groundwater Monitoring Wells

If it is determined that a new or replacement monitoring well needs to be installed, the well(s) shall be installed as described in the EPA's *Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells* (EPA 1989) and agreed to by NYSDEC. If the new monitoring well is intended to replace an existing monitoring well, the new monitoring well shall be installed approximately 5 feet from the existing monitoring well and to the same

depth of the monitoring well it is replacing. If the new monitoring well is for a new location, the well location and depth will be determined by NYSDEC. A typical flush-mount groundwater monitoring well is shown on Figure 2-4.

4.4 Off-Site SSDS Operation and Maintenance

Off-site SSDSs are operated by the property owners of the buildings in which they are installed. In accordance with the notification requirements in the Institutional and Engineering Control Plan in Section 2 of this SMP, property owners are responsible for providing power to the systems and for reporting maintenance requests and changes in property ownership or use to NYSDEC.

All monitoring wells and components of the SSDSs shall be inspected annually to determine their physical condition and to identify necessary maintenance required to allow the monitoring wells to remain operational. The annual inspection of the facility and SSDSs will also be used to assess whether any structural or facility changes have occurred that could affect the operation of the SSDSs. Inspections of the SSDSs should be conducted prior to scheduled sampling times to allow scheduled sampling to proceed as planned (see Section 3 for Media Monitoring Programs). The results of the inspections must be documented on a monitoring well inspection checklist. Inspection forms are included in Appendix I.

Any minor problems with the physical condition of the existing monitoring wells (problems that will not prevent or interfere with sampling) should be identified during each inspection. Some minor problems that may be encountered during inspection, and typical solutions, include the following:

- Missing or deteriorated mitigation system labels – re-label as necessary;
- Fan bearing issues or broken fans – replace as necessary;
- Cracked sub-slab or compromised floor seal – re-seal with approved sealant;
- Compromised conduit and pipe supports – replace as necessary; and
- Leaking or cracked piping or joints – seal or replace with air-tight couplings.

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

5 Inspections, Reporting, and Certifications

5.1 Site Inspections

Inspections of all remedial components installed at the site shall be conducted at the frequency specified in the SMP Monitoring Plan schedule (see Table 3-1). A comprehensive sitewide inspection shall be conducted annually, regardless of the frequency of the PRR. The inspections will determine and document the following:

- Whether the ECs continue to perform as designed;
- Whether these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Deed Restriction (one filed);
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- Whether site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system.

Inspections shall be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (see Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this plan (see Section 5.2).

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

5.1.1 Sitewide Inspection

Sitewide inspections shall be performed at least once a year and after all severe weather conditions that may affect ECs. Based on the results of the inspection, a

report shall be compiled that provides sufficient information to assess the following:

- Compliance with all ICs, including changes in site use;
- The condition and effectiveness of all ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted, including, where appropriate, confirmation sampling and health and safety inspections performed as part of the sitewide inspection;
- Compliance with the permits and schedules included in this SMP; and
- Whether site records are up-to-date.

Sitewide inspections shall be performed as scheduled, and interim inspections shall be performed as needed. Inspection reports (scheduled and interim) shall be submitted to NYSDEC in a timely manner. All inspection reports shall be included as part of the annual PRR.

5.1.2 Inspection Frequency

All inspections shall be conducted at the frequencies specified in the schedules provided in Section 3, Site Monitoring Plan, of this SMP (see Table 3-1). At a minimum, a sitewide inspection shall be conducted annually (see Section 5.1.1).

Inspection frequency is subject to change with the approval of NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of the air-stripper system has been reported or an emergency occurs that is deemed likely to affect the operation of the system.

All inspection and monitoring reports shall be sent to:

Mr. William Welling
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau E
625 Broadway, Albany, New York 12233-7016

5.1.3 Inspection Forms, Sampling Data, and Maintenance Reports

Information obtained during all inspections and monitoring events shall be recorded on the appropriate forms for each respective sampling work plan (see Appendix M for inspection forms).

5.1.4 Evaluation of Records and Reporting

The inspection and site monitoring data will be evaluated to determine whether:

- The ICs and ECs are in place, functioning properly, and are effective in attaining the remediation goals specified in the ROD;
- The monitoring plan is being implemented;
- Operation and maintenance activities are being conducted properly; and
- Based on the above items, the site remedy continues to be protective of public health and the environment and is performing as designed.

5.2 Periodic Review Report

A PRR shall be submitted annually to NYSDEC, beginning 18 months after the Certificate of Completion or equivalent document (e.g., Satisfactory Completion Letter, No Further Action Letter) is issued. In the event that the site is subdivided into separate parcels with multiple owners, a single PRR shall be prepared in accordance with NYSDEC's *Technical Guidance for Site Investigation and Remediation* (NYSDEC 2010) and submitted within 45 days of the end of each certification period. The PRR shall include the following:

- Identification, assessment, and certification of all ICs and ECs 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, including comments and conclusions;
- Data summary tables that include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These shall include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Graphical representations of the distributions of contaminants of concern, by media (groundwater and soil vapor);
- The results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period shall submitted electronically in a NYSDEC-approved format; and

- A site evaluation that includes the following:
  - The compliance of the remedy with the requirements of the ROD,
  - The effectiveness of all 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 SMP for each media being monitored,
  - Recommendations regarding any necessary changes to the remedy and/or SMP, and
  - The overall performance and effectiveness of the remedy.

The PRR shall be submitted in hard-copy format to the NYSDEC Central Office and the Region 9 Office, and in electronic format to the NYSDEC central and regional offices and the NYSDOH, Bureau of Environmental Exposure Investigation.

5.2.1 Certifications of Institutional and Engineering Controls

Certifications of ICs and ECs are not required so long as NYSDEC or its representative is the responsible party (RP) for site management. In the event that site management is taken over by the property owner or the owner's designated site representative, a qualified environmental professional or NYS PE will prepare the following certifications in a PRR. The RP will continue to prepare periodic certifications through the PRR until NYSDEC notifies the RP in writing that this certification is no longer needed. Certifications will not be made until after the last inspection of the reporting period.

For ICs, the certification will include the following:

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

- The ICs employed at this site are unchanged from the date the control was put in place, or are compliant with NYSDEC-approved modifications;

- Nothing has occurred that would impair the ability of the Institutional Controls to protect the public health and environment;

- Nothing has occurred that would constitute a violation or failure to comply with any site-specific requirements of the SMP;

- Access to the site will continue to be provided to NYSDEC to evaluate the remedy, including access to evaluate the continued maintenance of the ICs;

- 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 in compliance with the environmental notice;
- The information presented in this report is accurate and complete; and
- 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."

For ECs, the certification will include the following:

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

- Inspection of the site to confirm the effectiveness of each engineering control required by the remedial program was performed under my direction;
- Each engineering control employed at this site is unchanged from the date the control was put in place, or are compliant with NYSDEC-approved modifications;
- Nothing has occurred that would impair the ability of the Engineering Controls to protect public health and the environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site-specific requirements of the SMP;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of the engineering controls;
- 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 in compliance with the environmental notice;
- Each engineering control is performing as designed and is 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;

- The information presented in this report is accurate and complete; and

- 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."

The signed certifications will be included in the PRR described below.

If for any reason one or more of the above statements cannot be certified, the certification cannot be completed and a corrective measures plan must be submitted to NYSDEC (see Section 5.4).

5.3 Reporting Exceedances of Standards, Criteria, and Guidance Values

If VOCs or other contaminants are detected at concentrations exceeding the SCGs defined by NYSDEC for groundwater, indoor air, or effluent from the treatment system, the exceedance must be reported to NYSDEC as soon as the information becomes available. The interim analytical results will then be evaluated by NYSDEC to determine whether further analytical testing or interim remedial actions are needed. New York State currently does not have any SCG values for concentrations of chemicals in soil vapor.

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 IC or EC, a corrective measures plan shall be submitted to 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 has been approved by NYSDEC.

All records and information regarding maintenance shall be included as a part of the site inspection report. If maintenance is projected for the future or cannot be completed as a result of winter weather or other difficulties, it shall be noted in the site inspection report. Records of all completed maintenance efforts, including any transportation and disposal of waste, shall also be included in the site inspection report.

In order to comply with the above submittal times, it may be necessary to prepare and submit interim reports to NYSDEC to supplement the semiannual reports.

6 Health and Safety Plan

A site-specific Health and Safety Plan (SHASP) must be developed for the work assignments to be conducted. As required by NYSDEC's *Technical Guidance for Site Investigation and Remediation* (NYSDEC 2010), the O&M subcontractor's HASP included in this SMP can be used as a guide when producing an SHASP for the activities, or separately for each activity, as required. A copy of the O&M subcontractor's HASP is provided in Appendix N-1. A copy of the HASP for groundwater and air sampling is provided as Appendix N-2

All staff should be aware of Occupational Safety and Health Administration (OSHA) hazardous communication requirements. Personnel should review all required Material Safety Data Sheets (MSDSs) and instructions pertaining to all anticipated chemicals prior to the initiation of any work.

6.1 Preparation of a Site-Specific Health and Safety Plan

In accordance with the requirements of 29 Code of Federal Regulations (CFR) 1910.120, an SHASP must be prepared prior to initiating field activities at the site. The SHASP should include the following:

- The names of key personnel responsible for site health and safety, including an appointed site Health and Safety Officer;
- A safety and health-risk analysis for each site task and operation;
- Employee training requirements;
- Specification of PPE to be used by employees for each of the site tasks and operations being conducted;
- Medical surveillance requirements;
- Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used;
- Site control measures;
- Decontamination procedures;

- Site standard operating procedures; and
- A contingency plan for responses to emergencies.

6.2 Training

All personnel performing monitoring, inspection, or remediation activities at the Mr. C's Site must complete OSHA's 40-hour health and safety training course for work at hazardous waste sites. This includes 8-hour refresher training, first aid/ cardiopulmonary resuscitation (CPR) training, and annual physical examinations.

6.3 Emergency Telephone Numbers

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions. The emergency telephone number list is provided as Table 6-1.

Table 6-1 Emergency Contact Numbers

Medical, Fire, and Police	9-1-1
One Call Center	(800) 272-4480 (three-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

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 Mr. William Welling, NYSDEC Division of Environmental Remediation.

NYSDEC – Albany O&M Section 518-457-0927

NYSDEC – Project Manager, William Welling 518-402-9814

These emergency contact lists must be maintained in an easily accessible location at the site. The list will also be posted prominently at the site and made readily available to all personnel at all times.

7 References

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_____. 1995. SW-846, Third Edition (Update II-B). January 1995.

A Tax Map and Assessment Records of Mr. C's and Surrounding Properties

A1 –578 Main St - Brownschidle

A2 – 538 Main St – People Inc

A3 – 594 Main St – Future Fitness

A4 – 510 Main St - Krastev

A5 – 511 Fillmore - Iwankow

A6 – 572 Main St - Doeing

A7 – 586 Main St - Deltora

A8 – 584 Main St - Deltora

A9 – 566 Main St – Intrepid Auto

A10 – 550 Main St – Aurora Twn Pub Lib

A11 – 9 Paine St – First Presb Church

A12 – 27 Whaley Ave - Dubois

A13 – 19 Whaley Ave - Pitt

A14 – Tax Map

B Record of Decision

B1 – 1997 Record of Decision

B2 – 2000 Explanation of Significant Differences

C

Project Permanent Easement Institutional Controls

D

Private Property Access Agreements

E

Record Drawings for the On-Site Treatment System

F

Monitoring and Pumping Well Logs

F1 – Well Construction Information

F2 – Well Decommissioning Logs

G

Record Drawings for Off-Site SSDS

G1 – Record Drawings Prepared for the First Presbyterian Church as Part of the SSDS Installation Documentation

G2 – Record Drawings Prepared for 27 Whaley Avenue as Part of the SSDS Installation Documentation

H

System Drawings for the Agway AS/SVE (Decommissioned)

Groundwater Sampling Procedures

J

Indoor Air and Sub-Slab Sampling Procedures

K

Generic Quality Assurance Project Plan

L

Mr. C's Dry Cleaners Site Operations and Maintenance (O&M) Plan

M

Mr. C's Dry Cleaners Site Operations and Maintenance (O&M) Plan Inspection Forms

M1 – Example Mr. C's Dry Cleaners Site OM&M Site Inspection Form

M2 – Example Piezometer Water Level Log

M3 – Blank SSDS Inspection Forms

M4 – Well Inspection Form

N

Mr. C's site-specific Health and Safety Plan

N-1 – Operations, Maintenance, and Monitoring Services

N-2 – Groundwater and Air Sampling