# PROPOSED REMEDIAL ACTION PLAN
# Former Rochester Metal Etching Company
## Rochester, Monroe County, New York
## Site No. 828100

February 2011

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

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## SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the Former Rochester Metal Etching Company (RME) Site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this proposed remedy. As more fully described in Sections 3 and 5 of this document, the operational history of the site resulted in the disposal of hazardous wastes, including metals and chlorinated volatile organic compounds (CVOCs). These wastes have contaminated the soil, groundwater and soil vapor at the site, and have resulted in:

- a significant threat to human health associated with potential exposure to soil and groundwater and a potential or current exposure to soil vapor.
- a significant environmental threat associated with the potential impacts of contaminants to groundwater.

To eliminate or mitigate these threats, the Department proposes the implementation of institutional and engineering controls including: an environmental easement with periodic certification; the maintenance of an impermeable cover system over the site limits; and the installation of soil vapor intrusion mitigation for the on-site building.

The proposed remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for this preference. The Department will select a final remedy for the site only after careful consideration of all comments received during the public comment period.

The Department has issued this PRAP as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375. This document is a summary of the information that can be found in greater detail in the September 2007 Remedial Investigation (RI) and Feasibility Study (FS) Report, and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

Central Library of Rochester and Monroe County
115 South Avenue
Rochester, NY 14604
Ph: 585-428-7300
Hours: Mon, Thurs: 9am-9pm
Tues, Wed and Fri: 9am-6pm
Sat: 9am-5pm [Closed July - Labor Day]
Sun: 1pm-5pm [September - May]

By appointment only:
Edward Hampston, Project Manager
NYSDEC Central Office
625 Broadway
Albany, New York 12233-7017
(518) 402-9814
Toll free:(888) 459-8667

Linda Vera, Citizen Participation Specialist
NYSDEC Region 8 Office
6274 E. Avon-Lima Road
Avon, New York 14414
(585) 226-5324

The Department seeks input from the community on all PRAPs. A public comment period has been set from February 22, through March 24, 2011 to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for March 16, 2011 at the Rochester City Hall, Conference Room 309A, 30 Church St., Rochester, NY, beginning at 6:30 pm.

At the meeting, the results of the RI/FS will be presented along with a summary of the proposed remedy. During the meeting, questions will be answered and written comments may be submitted on the PRAP. Written comments may also be sent to Mr. Hampston at the above address through March 24, 2011.

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP, based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department’s final selection of the remedy for this site.

## SECTION 2: SITE LOCATION AND DESCRIPTION

The Rochester Metal Etching Company (RME) site is located at 100 Lake Avenue in Rochester, Monroe County, New York. The main feature of the 0.2 acre site is a two story building surrounded by paved parking areas and walkways. The site, located within the Community Center zoning district, is near the intersection of Lake Avenue and Spencer Street within a developed urban area of downtown Rochester. The site property, currently used for commercial purposes, is generally flat with the exception of the southeast corner of the property, which dips to the east. Based on the monitoring wells and site topography, the groundwater flows to the east/northeast towards the Genesee River, located approximately 500 ft to the east of the RME site. At this location, the Genesee River is located within a gorge which is 100 feet below the elevation of the RME site. Refer to Figure 1 for a Site Location Map.

The surrounding properties include commercial and industrial parcels which are covered by buildings and pavement (paved parking or roads). The site is bounded to the north by a mixed use building (commercial first floor/apartments upper floors) and a vehicle rental location across Spencer Street, to the west across Lake Avenue by parking lots, to the east by a frozen food facility, and to the south by a diner.

The RME site is underlain by unconsolidated glacial till deposits consisting of fine sand and silt with varying amounts of fine to coarse gravel and Lockport Group bedrock. The overburden soil is generally unsaturated with localized occurrence of water at the overburden/bedrock interface. The thickness of overburden/depth to bedrock ranges from 3.5 ft beneath the site building to approximately 13 ft in the parking lot on the west side of the building.

## SECTION 3: SITE HISTORY

### 3.1: Operational/Disposal History

The RME facility manufactured etched and lithographed metal name plates from 1967 until 1996 when manufacturing operations ceased. Ferric chloride was reportedly used to etch stainless steel and brass, and hydrofluoric acid and hydrochloric acid solutions were used to etch aluminum. Chlorinated VOCs consisting of tetrachloroethene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (1,1,1-TCA) were used for degreasing. Prior uses that appear to have led to site contamination include metal plating, machining and etching, along with the improper disposal of process wastewater into a series of sumps, drains and trenches.

According to a 1974 permit file sketch, the RME facility contained etching tanks, a plate cleaning room, loading dock, paint spray booth, burning machining, talc cleaner booth, buffing wheels, TCE degreaser, and a ink drying oven. Processes associated with the former RME facility primarily consisted of etching using aluminum, bronze (alloy based typically of copper, although aluminum and nickel may also be used), copper, nickel, monel (nickel/copper alloy), steel (a wide range of alloys that may include antimony, chromium, cobalt, copper, manganese, nickel, thallium, vanadium, etc.), brass (alloy of copper and zinc), silver, and zinc. Additional operations consisted of cutting, printing, coating, and painting of etched plates. Nickel plating was also performed at the facility from approximately 1975 to 1979.

A wastewater pretreatment system was installed in 1976 to pretreat spent etching solutions before being discharged to the city sewer system. Before 1976, the spent solution was discharged to the city sewer system without pretreatment. Brown sludge was reportedly produced by the facility operations and placed in dumpsters prior to off-site disposal. The sludge continued to be managed in that manner until 1990 when the sludge was identified and managed as hazardous waste.

### 3.2: Remedial History

In 2001, the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

In November of 1989, soil excavation work was performed by Lozier Architects/Engineers at 10 White Street, an adjacent property located to the northeast of the RME site. During the excavation, the soil was observed to be discolored. A subsequent investigation revealed that the soil and groundwater at 10 White Street property were impacted by RME site constituents including metals (soil and groundwater) and chlorinated solvents (soil only). To address the potential off-site migration of RME site constituents toward the downgradient property, a collection trench system was installed by the property owners of 10 White Street in 1992 between RME and 10 White Street. The collection system consisted of a collection trench and an outdoor sump which pumped the water to a collection and treatment tank located in the basement of the RME facility. The liquid from the sump was treated along with RME's usual production waste. Operation of the collection and treatment system was discontinued in 1996 when all RME treatment systems were either shut down or removed.

In 1998 and 1999, the Department conducted a preliminary investigation of the RME facility. The preliminary investigation included the installation and sampling of shallow overburden monitoring wells, surface and subsurface soil sampling, and sump and storage tank sampling. Groundwater samples were collected from the on-site shallow overburden monitoring wells and from three bedrock monitoring wells previously constructed on the adjacent property to the northeast. Of the three bedrock monitoring wells, one well was installed within the overburden/bedrock interface and the remaining two wells were installed within the confined bedrock unit. The results of the bedrock monitoring wells revealed metals contamination in all three wells and VOC contamination within the shallow bedrock monitoring well. No VOC contamination was detected within the confined bedrock monitoring wells. Overall, the results of the Department investigation indicated widespread soil contamination by metals on the RME property. The investigation also revealed that the groundwater at the site contained metals and chlorinated solvents at levels above NYS groundwater standards.

The investigation data led to the listing of the Rochester Metal Etching (RME) Company site as a Class 2 Inactive Hazardous Waste Disposal Site in 2001, the subsequent completion of the RME site RI/FS, and the development of this PRAP.

## SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include: The Rochester Metal Etching Company and The Brotherhood, MC Inc., the current property owner.

The PRPs declined to implement the RI/FS at the site when requested by the Department. After the remedy is selected, the PRPs will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRPs, the Department will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the state for recovery of all response costs the state has incurred.

## SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and the environment.

## 5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between October 2004 and September 2006. The field activities and findings of the investigation are described in the RI report.

The RI included the following activities:

- Waste material sampling from sumps and trenches for VOC and metals analysis;
- Surface soil sampling for metals analysis;
- Subsurface soil sampling for VOC, metals, SVOC, pesticides and PCB analysis;
- Monitoring well sampling of on-site overburden wells and off-site overburden/bedrock interface and bedrock wells for VOC, metals, SVOC, pesticides and PCB analysis; and
- Soil vapor intrusion (SVI) sampling at the RME site building and three off-site properties which included the collection of soil vapor, indoor air and outdoor air sampling for VOC analysis.

### 5.1.1: Standards, Criteria, and Guidance (SCGs)

To determine whether the groundwater, soil and soil vapor/air samples contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on the Department's "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

- Soil SCGs are based on the Department's Cleanup Objectives included in 6 NYCRR Subpart 375-6 - Remedial Program Soil Cleanup Objectives.

- Concentrations of VOCs in air were evaluated using the air guidelines provided in the NYSDOH guidance document titled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," (the NYSDOH Guidance) dated October 2006. Indoor air concentrations of TCE, PCE and methylene chloride were also compared to air guideline values derived by the NYSDOH contained within Section 3.2, Table 3.1 of the NYSDOH SVI Guidance.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized in Section 5.1.2. More complete information can be found in the RI report.

### 5.1.2: Nature and Extent of Contamination

This section describes the findings of the RI for all environmental media that were investigated.
As described in the RI report, many waste, surface soil, subsurface soil, groundwater, indoor air, soil vapor and outdoor air samples were collected to characterize the nature and extent of contamination. Samples collected during the RI were submitted for volatile organic compounds (VOCs), inorganic compounds (metals), semi-volatile organic compounds (SVOCs), pesticides and polychlorinated biphenyls (PCBs) analysis. Site characterization sample results collected as part of the Department's *Site Investigation Report, September 2000,* were also used to evaluate the nature and extent of the soil and groundwater contamination and are discussed below as appropriate. As

summarized in Table 2, the main categories of contaminants that exceed their SCGs are chlorinated volatile organic compounds (CVOCs) and inorganic compounds (metals). For comparison purposes, where applicable, SCGs are provided for each medium.

Chemical concentrations are reported in parts per billion (ppb) for water and parts per million (ppm) for soil. Air samples are reported in micrograms per cubic meter ($\mu g/m^3$).

Figures 2 through 6 and Table 2 summarizes the degree of contamination for the contaminants of concern in surface soil, subsurface soil, groundwater, soil vapor and indoor air and compare the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

### Waste Materials

The sumps (SMP-1, SMP-2 and SMP-3) and trenches (TR-1, through TR-5) located in the basement areas of the RME facility where plating operations were conducted, were investigated as potential pathways for the migration of constituents into subsurface soil and groundwater below the facility. Waste material and standing water samples were collected from the structures and analyzed for metals and volatile organic compounds. Elevated concentrations of copper and chromium were detected in the sump and trench samples providing evidence that these structures were used to convey process wastes. The highest concentrations of copper and chromium detected in these structures were found in the trench waste materials at concentrations greater than 4,000 ppm. Other inorganic constituents were also detected in these structures at elevated concentrations. Trace levels of TCE and acetone were detected in the sumps and trench at low level concentrations (< 1 ppm). Standing water collected from sump SMP-1 revealed detectable concentrations of copper, lead, and zinc at concentrations greater than 20,000 ppb. No VOCs were detected in the water collected from the sump. The locations of waste material samples are illustrated on Figure 2.

Waste identified during the RI/FS was addressed during the work completed in 2005 by The Brotherhood, MC Inc. (current site property owners). The work, described in Section 5.2, involved filling the sumps and trenches with concrete and thus eliminating these structures as potential pathways for hazardous waste transport. It is unknown if the trenches were properly cleaned prior to filling with concrete. So, although the waste may remain, it is either encased within the concrete or capped with the concrete, thus minimizing the migration of the waste from this area.

### Surface Soil

Twelve surface soil samples were collected from a depth of 0-2 inches below surface vegetation from the previously exposed soil area located in the southeast corner of the site. The surface soil samples were analyzed for inorganic compounds. Elevated concentrations were primarily detected for chromium, copper, lead, mercury and zinc. The inorganics having the highest frequency of exceeding applicable SCGs included chromium which exceeded the Part 375 unrestricted SCG of 30 ppm in all samples collected, copper which exceeded the Part 375 unrestricted SCG of 50 in all samples collected, lead which exceeded the Part 375 unrestricted SCG of 63 in all samples collected, mercury which exceeded the Part 375 unrestricted SCG of 0.18 ppm in 10 of 12 samples collected, and zinc which exceeded the Part 375 unrestricted SCG of 109 ppm in all samples collected. When compared to Part 375 commercial SCGs, the frequency of surface soil exceedences was much lower than unrestricted exceedences. Metals in surface soil that exceeded the Part 375 commercial SCGs included arsenic in 1 of 12 samples, barium in 3 of 12 samples, chromium in 2 of 12 samples, copper in 3 of 4 samples, and lead in 7 of 12 samples.

The presence of these levels of metals in surface soils suggests that metal etching wastes may have been discharged in some manner to the ground surface outside the basement door. During the time of surface soil sampling, this relatively small portion of area (approximately 15 feet by 40 feet) was the only exposed soil located on the site and all other surface areas were either covered by the building foundation or asphalt/concrete cover. The exposed soil area was covered with asphalt in 2009 and therefore these soils no longer pose a threat as a direct contact pathway. Additionally, the asphalt serves as a cover over the inorganic waste, thus reducing the infiltration of water into the contamination and the migration of the contamination into groundwater. The locations of the surface soil samples are illustrated on Figure 2 and summarized within Table 2.

Three background soil samples, designated as BS-1, BS-2 and BS-3, were collected off-site along Spencer Street and analyzed for metals and SVOCs. The background soil sample results revealed detectable concentrations of inorganic constituents less than the Part 375 SCGs for unrestricted uses, except for hexavalent chromium, copper, lead, mercury and zinc. Hexavalent chromium exceeded the Part 375 SCG of 1 ppm in two (2) background samples at 12 ppm. Copper exceeded the Part 375 SCG of 50 ppm in one (1) background sample at 98 ppm. Lead exceeded the Part 375 SCG of 63 in two (2) background samples at 66 and 347 ppm. Mercury exceeded the unrestricted use SCG of 0.18 ppm in one (1) background samples at 0.38 ppm. Zinc exceeded the Part 375 SCG of 109 in one (1) background sample at 205 ppm.

In background samples, SVOC concentrations were less than Part 375 SCGs for unrestricted uses, except at location BS-2 where four PAHs were detected above the applicable Part 375 SCGs. At location BS-2, benzo(k)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, and benzo(a)anthracene were detected at 12, 14, 2.9, and 15 ppm, respectively. It is common for background samples collected from urban areas to have PAH concentrations above Part 375 SCGs for unrestricted uses. The locations of the background soil samples are illustrated in Figure 3.

Surface soil contamination identified during the RI/FS was addressed during the IRM completed in 2009 which involved paving the entire site and thus eliminating the potential of direct contact with contaminated soils on site as described in Section 5.2.

### Subsurface Soil

Subsurface soil samples were collected beneath the building footprint at 17 locations at depths ranging from just below the foundation flooring to six feet below the flooring. Soil samples were collected outside of the Site building footprint at 15 locations at depth ranging from ground surface to 12 feet below grade. Subsurface soil samples collected during the Site Investigation and RI were analyzed for inorganic compounds, VOCs, SVOCs, pesticides and PCBs. In general, the soil sample results indicated the widespread presence of discolored soil and the presence of inorganic constituents detected above Part 375 SCGs for unrestricted uses. Soil samples were described within the soil boring logs as including brownish yellow, red, green, and pink stains which can be suggestive of metal etching wastes. The locations of the subsurface soil samples are illustrated on Figure 2 and summarized within Table 2.

Copper and chromium were frequently detected above Part 375 SCGs for unrestricted uses and other metals were detected above the Part 375 SCGs less frequently. Copper exceeded the Part 375 SCG of 50 ppm in 28 of the 43 subsurface soil samples collected and chromium exceeded the Part 375 SCG of 30 ppm in 26 of 47 surface soil samples collected. The highest concentration of copper, 13,400 ppm, was detected in deeper soil (3 to 5 ft) at SB-10 located next to the collection trench beneath the site building. At NR-2, located within 30 feet of SB-10, the highest concentration of chromium was detected in upper soil (0 to 2 feet interval) at 10,300 ppm. The analytical results suggest that metal etching wastes entered the ground under the RME building. The trench and sumps inside the RME building historically provided a likely pathway to the subsurface soil and groundwater.

North of the former RME facility (MW-2, SB-2, and SB-3), copper was detected in soil exceeding the Part 375 SCG for unrestricted uses, including deeper soil intervals (between 8 and 10 feet). At SB-3, chromium was also in deep soil exceeding Part 375 SCGs for unrestricted uses. Since the ground surface in this area is covered by pavement, it is likely that the migration of metals from under the building accounts for the detection of metals in subsurface soils at these locations. The elevated levels of metals detected in groundwater from MW-2 support this inference, as metals dissolved in groundwater may be transported to downgradient locations.

When compared to Part 375 commercial SCGs, the frequency of soil exceedences was much lower than unrestricted exceedences. Copper and chromium exceeded the Part 375 commercial SCGs 21 of 43 and 5 of 47 samples, respectively. Other metals less frequently exceeding the commercial SCGs included arsenic in 4 of 47 samples, barium in 1 of 47 samples, hexivalent chromium in 1 of 23 samples, and lead in 3 of 47 samples.

Organic constituents (VOCs, SVOCs, and pesticides and PCBs) were not detected or were detected in soil at concentrations less than the applicable Part 375 SCGs for unrestricted uses, except for the VOC acetone and SVOCs pentachlorophenol, and phenol.

Acetone exceeded the Part 375 SCG for unrestricted uses in 21 of the 29 soil samples collected. The detection of acetone ranged from non-detect to 1 ppm, compared to Part 375 SCG for unrestricted uses of 0.05 ppm. Acetone may have been used as a solvent at the RME facility. However, historic documents that were reviewed as part of the RI did not account for its use at the facility.

Phenol was detected at SB-11, at 12 ppm, exceeding the Part 375 unrestricted SCG of 0.33 ppm. Pentachlorophenol was detected at SB-14 at 1.0 ppm, exceeding the Part 375 unrestricted SCG of 0.8 ppm. Phenols are utilized in a variety of uses, including paint removal, which may have been associated with metal etching products. The isolated detection of organic compounds indicates that while these compounds may be associated with the RME site, their occurrence in soil appears limited.

Subsurface soil contamination identified during the RI/FS will be addressed in the remedy selection process.

### Groundwater

Groundwater samples were collected from three overburden (MW-1, MW-2 and MW-3), one overburden/bedrock interface (MW-3B) and two bedrock (MW-1B and MW-2B) monitoring wells during the RI. Two overburden monitoring wells (MW-2 and MW-3) were also sampled in 2009 during a limited supplemental groundwater investigation. Overburden monitoring well MW-4 was consistently dry and therefore, no groundwater samples have been obtained from this location. MW-1 was also dry in 2004 and 2009 and was unable to be sampled during these sampling events. The groundwater samples were analyzed for metals, VOCs, SVOCs, pesticides and PCBs. Analytical results of groundwater sampling completed during the RI and supplemental sampling were similar to previous investigation results and identified the presence of chlorinated VOCs in overburden groundwater and inorganic constituents in overburden and bedrock groundwater at levels above the SCGs. The locations of the sampled monitoring wells are illustrated on Figure 4 and summarized within Table 2.

Groundwater samples analyzed for metals were collected from the overburden, overburden/bedrock interface and bedrock. Groundwater samples collected during the RI were visually observed to contain suspended particles and contain elevated levels of turbidity > 100 NTU. The groundwater samples collected during the RI were not filtered prior to analysis for metals. Groundwater samples collected in 2009, which were filtered prior to analysis, revealed much lower concentrations of metals. This suggests that turbidity may have contributed to the higher metal concentrations detected during the 2004 and 2006 groundwater sampling events.

In general, metals contamination was seen in the overburden, overburden/bedrock interface, and bedrock groundwater. The most frequent SCG exceedences were seen in the inorganic compounds chromium, copper, lead, manganese, and nickel. Chromium exceeded the SCG in 6 of 11 samples and ranged in concentration from non-detect to 2,310 ppb in the overburden well MW-2. Copper exceeded the SCG in 7 of 12 samples and ranged in concentration from 50 ppb to 9,260 ppb in the overburden well MW-3. Lead exceeded the SCG in 7 of 12 samples and ranged in concentration from non-detect to 695 ppb in the bedrock well MW-1B. Manganese exceeded the SCG in 10 of 12 samples and ranged in concentration from non-detect to 111,000 ppb in the bedrock well MW-1B. Nickel exceeded the SCG in 6 of 12 samples and ranged in concentration of non-detect from 1,170 ppb in overburden/bedrock interface well MW-3B. The concentrations of inorganic constituents detected in groundwater appear variable over time and have not exhibited any clear trends. The variability of concentrations of inorganic constituents may be related to the amount of recharge and the turbidity of samples.

Overburden groundwater VOC exceedences include cis-1,2-dichloroethene (cis-1,2-DCE) and trichloroethene (TCE) which exceeded the SCG in 5 of 13 and 6 of 13groundwater samples collected since 2004, respectively. The highest concentrations of cis-1,2-DCE and TCE detected during the 2009 groundwater sampling were in MW-2, located north of the on-site building, at concentrations of 41 ppb and 190 ppb, respectively. Historic SCG exceedences of tetrachloroethene (PCE) and 1,1,1-trichloroethane (1,1,1-TCA) were also detected in the overburden wells. PCE and 1,1,1-TCA were most recently detected at 17 ppb and 66 ppb, respectively, in MW-2 during the 2006 sampling event. The presence of unrelated chlorinated VOCs TCE and 1,1,1-TCA in groundwater suggests the use of at least two separate chemicals. Although the TCE and 1,1,1-TCA are chemically different, they could have been used for the same purpose (i.e, degreasing) during the historical operation of the RME site and may have originated in the same place.

Groundwater samples were collected for VOCs twice from the overburden/bedrock interface monitoring well MW-3B, located downgradient of the on-site building. The SCG was exceeded for cis-1,2-DCE (at 19 ppb) during the most recent groundwater sampling event at this location (2006). Acetone (at 110 ppb) and 2-butanone (at 120 ppb) only exceeded the applicable SCG during the 2004 sampling event within the overburden/bedrock interface. No VOCs were detected within the four bedrock groundwater samples collected from MW-1B or MW-2B during the RI.

SVOCs and pesticides/PCBs were not detected in groundwater samples exceeding the SCGs.

Four (4) off-site grab groundwater samples, designated as GP-1, GP-3, GP-4 and GP-5, were collected upgradient and/or cross gradient of the site along the western side of Lake Avenue and northern side of Spencer Street. The grab samples were advanced to bedrock refusal via a geoprobe and groundwater samples were submitted for VOC analysis. Groundwater was encountered and collected from four of the six locations advanced. No site contaminants were detected within any of the off-site grab groundwater samples. However, unrelated BTEX compounds were detected within 3 of the 4 grab groundwater samples indicating the presence of a separate upgradient source. Elevated concentrations of gasoline compounds were detected in grab sample GP-4, located southwest of the Site. Grab sample GP-5, located at the corner of Spencer Street and Lake Avenue, was observed to contain a sheen and strong petroleum odor and interference by an unknown petroleum hydrocarbon was detected by the laboratory. Grab sample GP-3, located directly upgradient of site well MW-3, was non-detect with exception of toluene at 3.3 ppb. The varying depth to groundwater and bedrock detected during the installation of the grab samples, in addition to the poor overburden groundwater recharge, indicates that groundwater in the overburden in the vicinity of the site is sporadic and limited. The locations of the upgradient groundwater samples are illustrated in Figure 5.

A spill report, SPILL No. 0911080, has been opened for the unknown petroleum hydrocarbons found upgradient of the site.

Groundwater contamination identified during the RI/FS will be addressed in the remedy selection process.

### Soil Vapor/Sub-Slab Vapor/Air

During the RI, soil vapor intrusion (SVI) sampling was completed in 2004 at the on-site RME building and in 2006 at three (3) off-site properties located in the vicinity of the site. The SVI sampling included the collection of subslab soil vapor, indoor air, and outdoor air samples to evaluate the potential for exposures via soil vapor intrusion. Indoor air sampling was also conducted at one (1) off-site property in 2004 as well as within the on-Site RME building in 2006. Based on the SVI sampling, TCE and methylene chloride were the only VOCs detected in indoor air samples at concentrations exceeding their respective SCG of 5 $\mu g/m^3$ and 60 $\mu g/m^3$. Specifically, TCE was detected in 6 of 17 indoor air samples at concentrations exceeding the SCG of 5 $\mu g/m^3$ and methylene chloride was detected in 3 of 6 indoor air samples at concentrations exceeding the SCG of 60 $\mu g/m^3$. All of the indoor air exceedences occurred within the first floor and basement indoor air samples of the on-site RME building, no exceedences were detected within any of the off-site properties. The VI sampling locations are shown on Figure 6 and a summary of the VOCs detected in indoor air and subslab vapor air samples are provided in Table 2.

The SVI sampling results were also reviewed in accordance with the *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, dated October 2006. The following summarizes the evaluation of the soil vapor intrusion and indoor air sampling:

- Mitigation was recommended for the on-site RME building due to the presence of TCE at elevated concentrations in sub-slab vapor and corresponding indoor air samples collected in 2004. Elevated concentrations of cis-1,2-DCE, PCE and 1,1,1-TCA were also detected in the subslab and/or indoor air during the 2004 soil vapor sampling event. Additional indoor air samples collected in 2006 confirmed the presence of TCE at concentrations exceeding the NYSDOH Guideline of 5 $\mu g/m^3$ in air. Following the soil vapor intrusion and indoor air sampling, the installation of a soil vapor intrusion mitigation system (sub-slab depressurization system) was recommended for the on-site RME building.

- Mitigation was recommended for one (1) off-site commercial/mixed use property due to the presence of TCE at an elevated concentration in 1 of the 2 subslab samples collected in 2006. TCE was also detected in the basement and first floor indoor air samples collected but at concentrations well below the NYSDOH Guideline of 5 $\mu g/m^3$ in air. Elevated concentrations of PCE were also detected in sub-slab vapor during the 2006 SVI sampling event. Following the soil vapor intrusion sampling, the Department offered to install a soil vapor intrusion mitigation system at no cost to the property owner. The owner subsequently declined the mitigation system installation.

- Monitoring was recommended for one (1) off-site manufacturing property due to the presence of TCE in 1 of 2 subslab samples collected in 2006. TCE was also detected in the indoor air samples collected but at concentrations well below the NYSDOH Guideline value of 5 µg/m$^3$ in air. Indoor air sampling, conducted at this property in 2004, did not reveal any concentrations exceeding the NYSDOH Guidelines. Following the soil vapor intrusion sampling, the Department offered to monitor the property at no cost to the property owner. The owner subsequently declined additional SVI sampling.

- No further action was recommended for one (1) off-site commercial property. At this location, low concentrations of TCE were detected within sub-slab vapor and indoor air. Following the soil vapor intrusion sampling, the Department notified the property owner that the detected VOC concentrations were considered to be associated with indoor and/or outdoor sources rather than soil vapor intrusion given the concentrations detected in the sub-slab sample.

Other VOCs were detected in the soil vapor intrusion samples detected in the sub-slab vapor, basement air, and first floor air samples. The presence and concentrations of these compounds is consistent with typical background levels of VOCs in indoor and outdoor air.

Soil vapor and/or indoor air contamination identified during the RI/FS will be addressed in the remedy selection process.

## 5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS. Although no IRMs were approved by the Department, The Brotherhood, MC Inc. (the current site property owner) conducted the following work:

- ***Concrete Filling of Basement Sumps and Collection Trenches***
  The sumps and the trench associated with the RME site facility provided the primary preferential pathways identified for the transport and migration of site constituents to subsurface soil and groundwater. In 2005, the owners of the RME site filled in the sumps and the trench with concrete, eliminating these structures as potential pathways for the transport of materials from inside the facility to subsurface media. It is unknown if the trenches were properly cleaned prior to filling with concrete.

- ***Site Cover***
  In 2009, the owners of the RME site paved the entire site with asphalt, including the previously exposed surface soil area located in the southeast corner of the site. The boundaries of the site are either covered by asphalt paving or the site building, thus eliminating the potential of direct contact with contaminated soils on site.

## 5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 4.6 of the RI report. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

At and around the site, people are not drinking the contaminated groundwater because the area is served by a public water supply that obtains its water from a different source. Direct contact with contaminated soils at the site is not expected because the site is covered with pavement and buildings. The building and site pavement provide a cover over the contamination which minimizes the infiltration of water into the waste and the migration of waste into the groundwater. However, a potential exists for people to be exposed to site-related contaminants as follows:

- Exposure to contaminated surface soil and sub-surface soil could occur by either direct contact with or ingestion of soil. The site is covered with a building, paving and concrete and public access is limited by fencing; therefore, exposure to contaminated soil is not likely. Workers who dig or enter excavations on-site or off-site could potentially be exposed to contaminated soil through dermal contact and/or incidental ingestion.

- Inhalation of VOCs from contaminated groundwater could occur via soil vapor intrusion into the indoor air of overlying structures on and off-site.

## 5.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

The Fish and Wildlife Impact Analysis, which is included in the RI report, presents a detailed discussion of the potential impacts from the site to fish and wildlife receptors. The following potential environmental exposure pathways and ecological risks have been identified:

- The RME building and nearby properties are located within an urban setting and are surrounded by pavement or other buildings, therefore, the extensive pavement existing on-site eliminates most potential pathways to on-site terrestrial receptors.

- Seven rare, threatened, or endangered species are listed within a 2-mile radius of the RME site, but habitat for these species is not present on site. The endangered bird species includes one species listed within a 0.5 mile radius.

- The RME site drains primarily toward the Genesee River, located approximately 500 feet east of the RME site. The Genesee River flows north and discharges into Lake Ontario, approximately 6 river miles downstream. The potential migration of contaminants from the overburden groundwater on the RME site to the Genesee River is considered complete, but is limited due to the lack of contiguous groundwater in the overburden which restricts the affected groundwater to the vicinity of the site. The potential migration of contaminants from the bedrock groundwater to the Genesee River is also considered complete, but the potential affects from RME site constituents would not be expected to result in detectable increases in the levels of constituents in the river due to the fact that infiltration of water into the waste material is minimized by the cover over the site.

## SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to chlorinated volatile organic compounds (CVOCs) and metals in soil and groundwater;

- the release of residual contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and

- the release of contaminants from groundwater beneath structures into indoor air of overlying structures through soil vapor intrusion

Further, the remediation goals for the site include attaining to the extent practicable:

- ambient groundwater quality standards; and

- the air guidelines provided in the Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006.

## SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Former Rochester Metal Etching Company Site were identified, screened and evaluated in the FS report which is available at the document repositories established for this site. Alternatives 1 through 4, discussed below, were developed and evaluated as part of this PRAP report.

A summary of the remedial alternatives that were considered for this site are discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

## 7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated soils, groundwater and soil vapor at the site.

### Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

### Alternative 2: No Action with Site Management

The No action with Site Management Alternative recognizes the work at the site completed by the PRP described in Section 5.2 and that Site Management and Engineering Controls, and Institutional Controls are necessary to confirm the effectiveness of the PRP work. This alternative maintains engineering controls which were part of the PRP work and includes institutional controls, in the form of and environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at the site after the PRP work.

Specifically, Alternative 2 would consist of the implementation of an environmental easement which would be used to restrict the site to commercial uses and the use of groundwater at the site, and require the site property owner to maintain the site cover (pavement/building foundation). Under this alternative, the site owner would be responsible for consenting to the environmental easement for the site property.

| | |
|---|---|
| *Present Worth:* | *$92,000* |
| *Capital Cost:* | *$30,000* |
| *Annual Costs:* | |
| *Years 1-30:* | *$6,000* |

### Alternative 3: Soil Vapor Intrusion Mitigation with Site Management

This alternative would consist of the following: the installation, operation, and maintenance of a soil vapor intrusion mitigation system (sub-slab depressurization system) for the on-site building, institutional and engineering controls for the site property, and periodic reviews. Institutional controls (environmental easement) would be used to restrict the site to commercial uses and the use of groundwater at the site. The maintenance of the site engineering control (site cover) would be required to prevent exposure to contaminated soil and groundwater. A site management plan would also be required for the maintenance and operation of the on-site soil vapor intrusion mitigation system as well as include provisions for potential future exposures to contaminated subsurface soils and groundwater (i.e., during building demolition or remodeling). Under this alternative the site owner would be responsible for the installation and maintenance of the soil vapor intrusion mitigation system required for the on-site building as well as consenting to the environmental easement for the site property.

*Present Worth:......................................................................................................$175,000*
*Capital Cost:..........................................................................................................$35,000*
*Annual Costs:*
*Years 1-30:............................................................................................................$11,000*

### Alternative 4: Restoration to Pre-Disposal or Unrestricted Conditions

This remedy meets all of the SCGs listed in Section 5.1.1 and soil will meet the unrestricted soil clean objectives listed in Part 375-6.8 (a). The remedy would include the demolition of the 5,000 square foot on-site building in order to expose contaminated on-site soil. Once the building is demolished, the contaminated on-site soil would be excavated and disposed off-site. The depth of soil excavation would be to the top of bedrock (approximately between 3.5 and 13 feet below grade surface). Any groundwater encountered during the soil excavation would be required to be dewatered and properly disposed off-site. Clean fill would be placed within the excavation to the grade surface. The excavation and off-site disposal of the soil would eliminate the metals source area and the potential VOC source area, and therefore prevent future exposures.

*Present Worth:..................................................................................................$2,000,000*
*Capital Cost:......................................................................................................$2,000,000*
*Annual Costs:.................................................................................................................$0*

## 7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

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

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

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

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

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

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

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Table 1.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

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

9. Community Acceptance. Concerns of the community regarding the RI/FS reports and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

**Table 1**
**Remedial Alternative Costs**

| Remedial Alternative | Capital Cost ($) | Annual Costs ($) | Total Present Worth ($) |
|---|---|---|---|
| No action | $0 | $0 | $0 |
| No action with Site Management | $30,000 | $6,000 | $92,000 |
| Soil Vapor Intrusion Mitigation with Site Management | $35,000 | $11,000 | $175,000 |
| Restoration to Pre-Disposal or Unrestricted Conditions | $2,000,000 | $0 | $2,000,000 |

## SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 3, Soil Vapor Intrusion Mitigation with Site Management, as the remedy for this site. The elements of this remedy are described at the end of this section.

The proposed remedy is based on the results of the RI and the evaluation of the alternatives presented in the FS and PRAP. Alternative 3 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It would achieve the remediation goals for the site by preventing exposure to contaminated soils and groundwater and mitigating potential exposures to soil vapor. Alternative 3 will prevent the potential exposure to contaminated soil, groundwater, and soil vapor intrusion through the implementation of soil vapor intrusion mitigation with site management. The proposed remedy will prevent exposure to groundwater and soil by land use restrictions and engineering controls, respectively, and prevent exposure to soil vapor through the required installation and operation of a sub-slab depressurization system within the on-site building. The building and site pavement currently provides a cover system over the contamination which minimizes the infiltration of water into the waste and the migration of waste into the groundwater and eliminates direct exposure. This alternative will not restore the site to pre-disposal conditions, but would be protective of the public health and environment and would be implemented at a considerably lower cost.

Alternative 1 (No action) and Alternative 2 (No action with Site Management) do not meet the threshold criteria discussed in Section 7.2 and will not be evaluated further. Alternative 4, by removing all soil contaminated above the unrestricted soil cleanup objective, meets the threshold selection criteria. Alternative 3 will also comply with the threshold criteria but to a lesser degree. Because Alternatives 3 and 4 satisfy the threshold criteria, the six balancing criteria are particularly important in selecting a final remedy for the site.

Alternatives 3 and 4 have short-term impacts which could easily be controlled, however, Alternative 3 will have a much smaller impact as Alternative 4 would require the off-site transportation of contaminated soil and groundwater. The time needed to achieve the remediation goals will be the shortest for Alternative 3 and longest for Alternative 4.

Long-term effectiveness is best accomplished by those alternatives involving excavation of the contaminated overburden soils (Alternative 4). Since most of the residual soil contamination is beneath the site building, Alternative 4 would require the demolition of the building as well as the excavation of soil to the top of bedrock (depth of bedrock ranges from 6 to 13 feet below grade surface). Alternative 4 would result in removal of all of the soil chemical contamination at the site and would remove the need for property use restrictions and long-term monitoring. For Alternative 3, site management will remain effective, but will require property use restrictions and periodic reviews.

Alternative 3 will control potential exposures through the implementation of engineering and institutional controls. Maintenance of the engineering control (i.e., site cover) will also reduce the mobility of contaminants by decreasing the infiltration of surface water runoff through the waste, but it will not reduce the volume of contaminants remaining at the site. Alternative 4, excavation and off-site disposal, would reduce the volume of waste on-site. Approximately 3,400 cubic yards of material will be removed with Alternative 4.

Alternative 3 is favorable in that it is readily implementable. Alternative 4 is also implementable, but would require the demolition of the currently occupied site building and the volume of soil excavated under this alternative would necessitate increased truck traffic on local roads for several months.

The costs of the alternatives vary significantly. Alternative 3 has a low cost, but the contaminated soil and groundwater will not be addressed other than by engineering and institutional controls. With its large volume of soil to be handled, Alternative 4 (excavation and off-site disposal) would have the highest present work cost.

Since the foreseeable use of the site is commercial, Alternative 3 will be less desirable because at least some contaminated soil above the Part 375 6.8(b) commercial soil cleanup objectives will remain on the property whereas Alternative 4 would remove the contaminated soil permanently. However, the residual contamination with Alternative 3 will be controllable with the implementation of engineering (i.e., site cover) and institutional (i.e. environmental easement) controls and periodic reviews. With Alternative 4, removing all of the contaminated soil would result in the removal of most of the unsaturated overburden on-site and site use restrictions would not be necessary.

Alternative 3 is preferred as the site remedy because it is protective to human health and the environment, will control potential exposures, will allow the continued use of the site building for commercial purposes, could be implemented quickly and is low cost. The estimated present worth cost to implement the remedy is $175,000. The cost to construct the remedy is estimated to be $35,000 and the estimated average annual costs for 30 years is $11,000.

## 8.2 Elements of the Proposed Remedy

The elements of the proposed remedy are as follows:

A. Response Actions:

1. A soil vapor intrusion mitigation system (sub-slab depressurization system) will be installed within the site building located at 100 Lake Avenue. The guidelines for soil vapor intrusion mitigation can be found in NYSDOH's "Guidance for Evaluating Soil Vapor Intrusion in the State of New York."

2. A soil vapor intrusion mitigation system was offered to the property owners of one off-site mixed use building in 2006. The owners subsequently declined the installation of a system. Should the

owners request to have a system installed in the future, the NYSDEC shall make provisions for the installation of a system and/or soil vapor intrusion monitoring if determined to still be needed at that time. As noted in Section 5.1.2, indoor air quality was not impacted within the property building and soil vapor intrusion mitigation was recommended based on sub-slab VOC concentrations.

3. Soil vapor intrusion monitoring was offered to the property owners of one off-site manufacturing building in 2006. The owners subsequently declined the monitoring. Should the owners request to have the property monitored in the future, the NYSDEC shall determine if soil vapor intrusion monitoring is still appropriate. As noted in Section 5.1.2, indoor air quality was not impacted within the property building and monitoring was recommended based on sub-slab VOC concentrations.

B. Engineering Controls:

1. Maintain the cover over the limits of the site property which includes asphalt paving, concrete paving, sidewalks, and the building footprint.
2. Maintain a soil vapor intrusion mitigation system (sub-slab depressurization) that mitigates the current exposure of vapor intrusion within the on-site building.
3. The operation of the components of the remedy would continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

C. Institutional Controls:

1. Imposition of an institutional control in the form of an environmental easement for the controlled property that would include:

(a) limit the use and development of the controlled property to:

☐ residential use ☐ restricted residential use ☒ commercial use ☒ industrial use

☐ passive recreational use ☐ active recreational use

☐ other

(b) restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH;

(c) prohibit agriculture or vegetable gardens on the controlled property;

(d) require compliance to the Department approved Site Management Plan;

(e) require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).

2. The remedy would require the development, Department approval, and implementation of a Site Management Plan for the site which would include the following:

   (a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering systems for the site and manages future development of the site including:

   - (i) provisions for management of future excavations in area of residual contamination,
   - (ii) groundwater restrictions,
   - (iii) management and inspection of the final engineering cover system,
   - (iv) and maintaining site access controls and Department notification;

   (b) an Operation and Maintenance Plan to assure continued operation, maintenance, monitoring, inspection, and reporting of the active components of the remedy.

   - (i) provisions to maintain all active components of the operation, maintenance, monitoring plan.
   - (ii) maintaining site access controls and Department notification;
   - (iii) providing the Department access to the site and O&M records.

   (c) a Monitoring Plan to assess the performance and effectiveness of the remedy.

   - (i) provision to evaluate the potential for vapor intrusion for any new buildings developed on the site, including provision for mitigation of any impacts identified;
   - (ii) provision to evaluate the potential for soil vapor intrusion for existing buildings if building use changes significantly.
   - (iii) provision to evaluate the potential for soil vapor intrusion at certain existing off-site buildings if it comes to our attention that building use has changed significantly or if a vacant building becomes occupied.

# TABLE 2
# Nature and Extent of Contamination
November 1998 – September 2006

| SURFACE SOIL | Contaminants of Concern | Concentration Range Detected (ppm)[a] | SCG[b] (ppm)[a] | Frequency of Exceeding SCG |
|---|---|---|---|---|
| **Inorganic Compounds** | Arsenic | 3.9 – 26 | 13 | 3 of 12 |
| | Barium | 85 – 1150 J | 350 | 3 of 12 |
| | Cadmium | 1.1 – 3.9 J | 2.5 | 4 of 12 |
| | Chromium | 33 J – 1890 J | 30 | 12 of 12 |
| | Hex. Chromium | ND – 23 J | 1 | 1 of 9 |
| | Copper | 160 – 6110 | 50 | 4 of 4 |
| | Lead | 290 J – 12500 J | 63 | 12 of 12 |
| | Mercury | 0.06 – 0.9 | 0.18 | 10 of 12 |
| | Nickel | 10 J – 190 J | 30 | 4 of 12 |
| | Silver | 0.32 – 10 J | 2 | 5 of 12 |
| | Zinc | 247 - 1010 | 109 | 12 of 12 |

| SUBSURFACE SOIL | Contaminants of Concern | Concentration Range Detected (ppm)[a] | SCG[b] (ppm)[a] | Frequency of Exceeding SCG |
|---|---|---|---|---|
| **Inorganic Compounds** | Arsenic | 3 – 19 | 13 | 5 of 47 |
| | Barium | 11 – 451 | 350 | 2 of 47 |
| | Cadmium | ND – 3.7 | 2.5 | 2of 47 |
| | Chromium | 3 – 10300 | 30 | 26 of 47 |
| | Hex. Chromium | ND – 1700 J | 1 | 13 of 23 |
| | Copper | 9.6 – 13400 | 50 | 28 of 43 |
| | Lead | 4.2 – 4270 | 63 | 16 of 47 |
| | Mercury | 0.03 - 0.74 | 0.18 | 7 of 35 |
| | Nickel | 4.2 – 259 | 30 | 10 of 47 |
| | Silver | ND – 4.1 | 2 | 4 of 46 |
| | Zinc | 19 - 737 | 109 | 13 of 47 |
| **Volatile Organic Compounds (VOCs)** | 1,1,1-Trichloroethane | ND - 0.014 | 0.68 | 0 of 24 |
| | 1,2-Dichloroethane | ND - 0.001 | 0.02 | 0 of 22 |
| | Acetone | ND - 1.0 D | 0.05 | 21 of 29 |
| | Benzene | ND - 0.034 | 0.06 | 0 of 21 |

| SUBSURFACE SOIL | Contaminants of Concern | Concentration Range Detected (ppm)[a] | SCG[b] (ppm)[a] | Frequency of Exceeding SCG |
|---|---|---|---|---|
| | Chloroform | ND - 0.001 | 0.37 | 0 of 22 |
| | cis-1,2-Dichloroethene | ND - 0.03 | 0.25 | 0 of 21 |
| | Methylene Chloride | ND - 0.001 | 0.05 | 0 of 22 |
| | Tetrachloroethene | ND - 0.16 | 1.3 | 0 of 26 |
| | Toluene | ND - 0.019 | 0.7 | 0 of 21 |
| | Trichloroethene | ND - 0.087 | 0.47 | 0 of 28 |
| | Xylenes | ND- 0.13 | 0.26 | 0 of 22 |
| **SVOCs** | Pentachlorophenol | ND - 1.0 | 0.8 | 1 of 9 |
| | Phenol | ND - 12 | 0.33 | 1 of 10 |
| **Pesticides/ PCBs** | Pesticides and PCBs | ND | --- | 0 of 3 |

| GROUNDWATER | Contaminants of Concern | Concentration Range Detected (ppb)[a] | SCG[b] (ppb)[a] | Frequency of Exceeding SCG |
|---|---|---|---|---|
| **Inorganic Compounds** | Arsenic | ND - 563 | 25 | 3 of 11 |
| | Barium | ND – 3120 | 1000 | 2 of 12 |
| | Beryllium | ND – 4.6 J | 3 | 2 of 11 |
| | Cadmium | ND – 17.7 | 5 | 3 of 12 |
| | Chromium | ND – 2310 | 50 | 6 of 11 |
| | Copper | 50 – 9260 | 200 | 7 of 12 |
| | Lead | ND – 695 | 25 | 7 of 12 |
| | Manganese | ND – 111000 | 300 | 10 of 12 |
| | Mercury | ND – 1.4 | 0.7 | 2 of 11 |
| | Nickel | ND – 1170 | 100 | 6 of 12 |
| | Selenium | 5.6 – 150 | 10 | 4 of 6 |
| | Silver | ND – 2340 | 50 | 2 of 11 |
| | Zinc | ND – 4140 EJ | 2000 | 2 of 12 |
| **Volatile Organic Compounds (VOCs)** | 1,1,1-Trichloroethane | ND - 170 | 5 | 2 of 13 |
| | 2-Butanone | ND - 120 | 50 | 1 of 13 |
| | Acetone | ND - 110 | 50 | 1 of 13 |
| | Chloroform | ND - 12 | 7 | 1 of 13 |
| | cis-1,2-Dichloroethene | ND - 41 | 5 | 5 of 13 |
| | Methylene Chloride | ND - 32 | 5 | 1 of 13 |

| GROUNDWATER | Contaminants of Concern | Concentration Range Detected (ppb)[a] | SCG[b] (ppb)[a] | Frequency of Exceeding SCG |
|---|---|---|---|---|
| | Tetrachloroethene | ND - 17 | 5 | 2 of 13 |
| | Trichloroethene | ND - 460 | 5 | 6 of 13 |
| **SVOCs** | SVOCs | ND | --- | 0 of 1 |
| **Pesticides/ PCBs** | Pesticides and PCBs | ND | --- | 0 of 1 |

| INDOOR AIR | Contaminants of Concern | Concentration Range Detected (µg/m$^3$)[a] | SCG[b] (µg/m$^3$)[a] | Frequency of Exceeding SCG |
|---|---|---|---|---|
| **Volatile Organic Compounds (VOCs)** | 1,1,1-Trichloroethane | ND - 76 | NS | NA |
| | 1,1-Dichloroethane | ND - 1.1 | NS | NA |
| | 1,1-Dichloroethene | ND - 0.99 | NS | NA |
| | 1,2,4-Trimethylbenzene | ND - 88 | NS | NA |
| | 1,2-Dichloroethene (total) | ND - 2.1 | NS | NA |
| | 2,2,4-Trimethylpentane | ND - 270 | NS | NA |
| | 2-Propanol | ND - 54 | NS | NA |
| | 4-Ethyltoluene | ND - 64 | NS | NA |
| | Acetone | ND - 1,700 | NS | NA |
| | Benzene | 1.2 - 77 | NS | NA |
| | Bromodichloromethane | ND - 1.6 | NS | NA |
| | Carbon Disulfide | ND - 2.1 | NS | NA |
| | Chloroform | ND - 19 | NS | NA |
| | Chloromethane | ND - 2.3 | NS | NA |
| | cis-1,2-Dichloroethene | ND - 2.1 | NS | NA |
| | Cyclohexane | ND - 33 | NS | NA |
| | Ethylbenzene | 0.87 - 65 | NS | NA |
| | Heptane | ND - 41 | NS | NA |
| | Hexane | 1.6 - 110 | NS | NA |
| | m&p-Xylenes | 1.9 - 190 | NS | NA |
| | Methyl Ethyl Ketone | ND - 120 | NS | NA |
| | Methylene Chloride | 2.8 - 690 | 60 | 3 of 6 |
| | o-Xylene | ND - 69 | NS | NA |
| | Tetrachloroethene | ND - 17 | 100 | 0 of 17 |
| | Toluene | 6.8 - 570 | NS | NA |

| | | | | |
|---|---|---|---|---|
| | Trichloroethene | ND - 110 | 5 | 6 of 17 |
| | Trichlorofluoromethane | ND - 43 | NS | NA |
| | Xylene (total) | 2 - 280 | NS | NA |

| **SOIL VAPOR** | **Contaminants of Concern** | **Concentration Range Detected (µg/m$^{3}$)[a]** | **SCG[b] (µg/m$^{3}$)[a]** | **Frequency of Exceeding SCG** |
|---|---|---|---|---|
| **Volatile Organic Compounds (VOCs)** | 1,1,1-Trichloroethane | 0.33 J - 6000 | NS | NA |
| | 1,1-Dichloroethene | ND - 670 | NS | NA |
| | 1,2-Dichloroethene (total) | ND - 520 | NS | NA |
| | Benzene | ND - 35 | NS | NA |
| | Carbon Disulfide | ND - 400 | NS | NA |
| | Chloroform | ND - 220 | NS | NA |
| | cis-1,2-Dichloroethene | ND - 520 | NS | NA |
| | Cyclohexane | ND - 76 | NS | NA |
| | Methyl Methacrylate | ND - 570 | NS | NA |
| | Methylene Chloride | ND - 270 | NS | NA |
| | Tetrachloroethene | ND - 103 | NS | NA |
| | Toluene | ND - 83 | NS | NA |
| | Trichloroethene | 1.3 - 21000 | NS | NA |

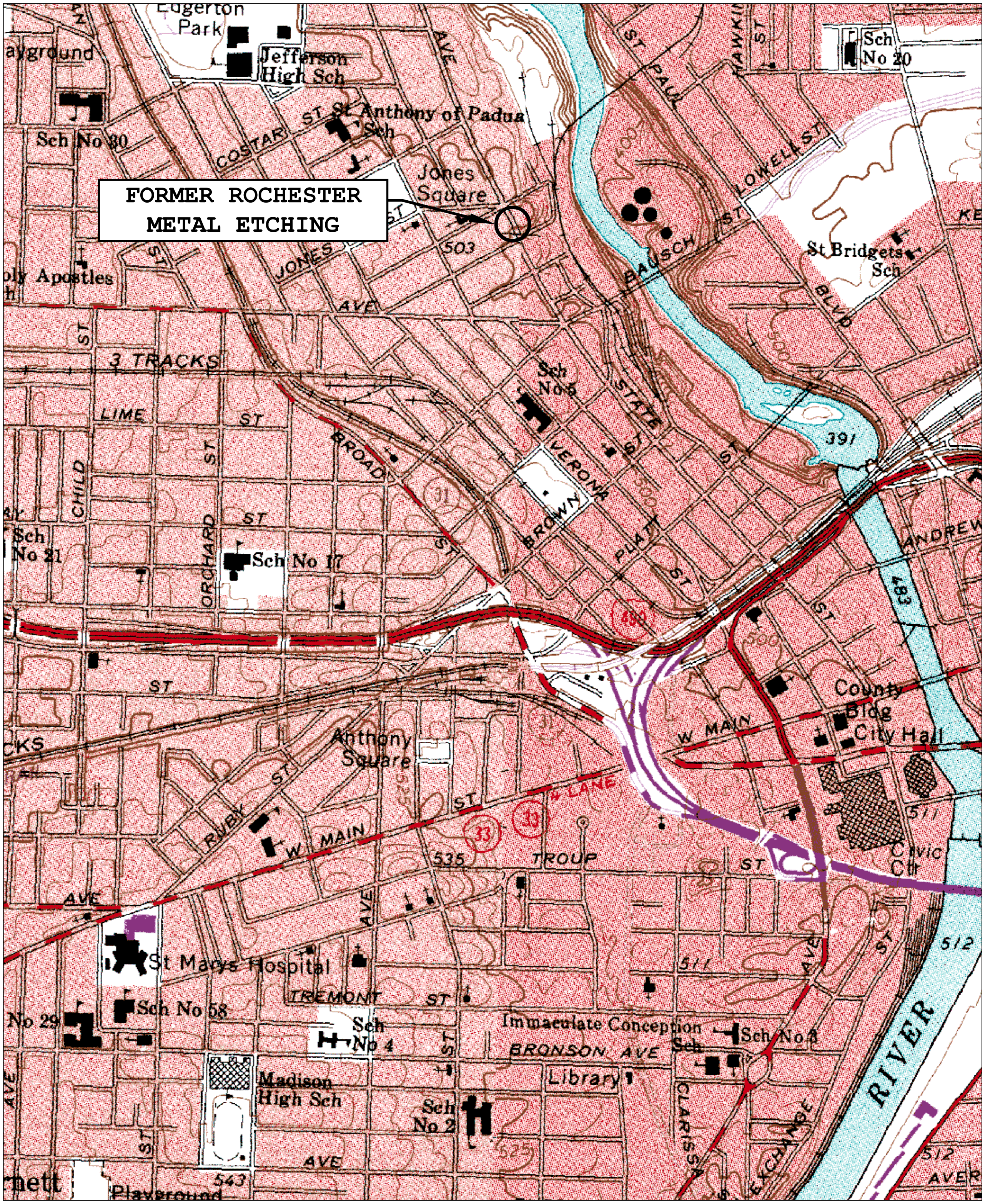
[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m3 = micrograms per cubic meter

[b] SCG = standards, criteria, and guidance values;

1. Groundwater, drinking water, and surface water SCGs are based on the Department's "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.
2. Soil SCGs are based on the Department's Cleanup Objectives contained within 6 NYCRR Subpart 375-6 - Remedial Program Soil Cleanup Objectives for Unrestricted Use.
3. Concentrations of VOCs in air were evaluated using the air guidelines provided in the NYSDOH guidance document titled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," dated October 2006.
4. Concentrations of VOCs in air were compared to air guideline values contained within Table 3.1 and typical background levels of VOCs in indoor and outdoor air using the background levels provided in the NYS guidance document titled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," dated October 2006. The background levels are not SCGs and are used only as a general tool to assist in data evaluation.

ND = Compound Not Detected
NS = SCG Not Specified for this compound
NA = Not Applicable
SB = Site Background

Aug 29, 2007 – 1:53pm



# FIGURE 1

NYSDEC
FORMER ROCHESTER METAL ETCHING FACILITY
ROCHESTER, NEW YORK

## SITE LOCATION MAP

10653.33909.001
AUGUST 2007

NOT TO SCALE

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I:\DIV71\Projects\10653\33909\dwg\33909-001.dwg

Aug 29, 2007 - 1:50pm

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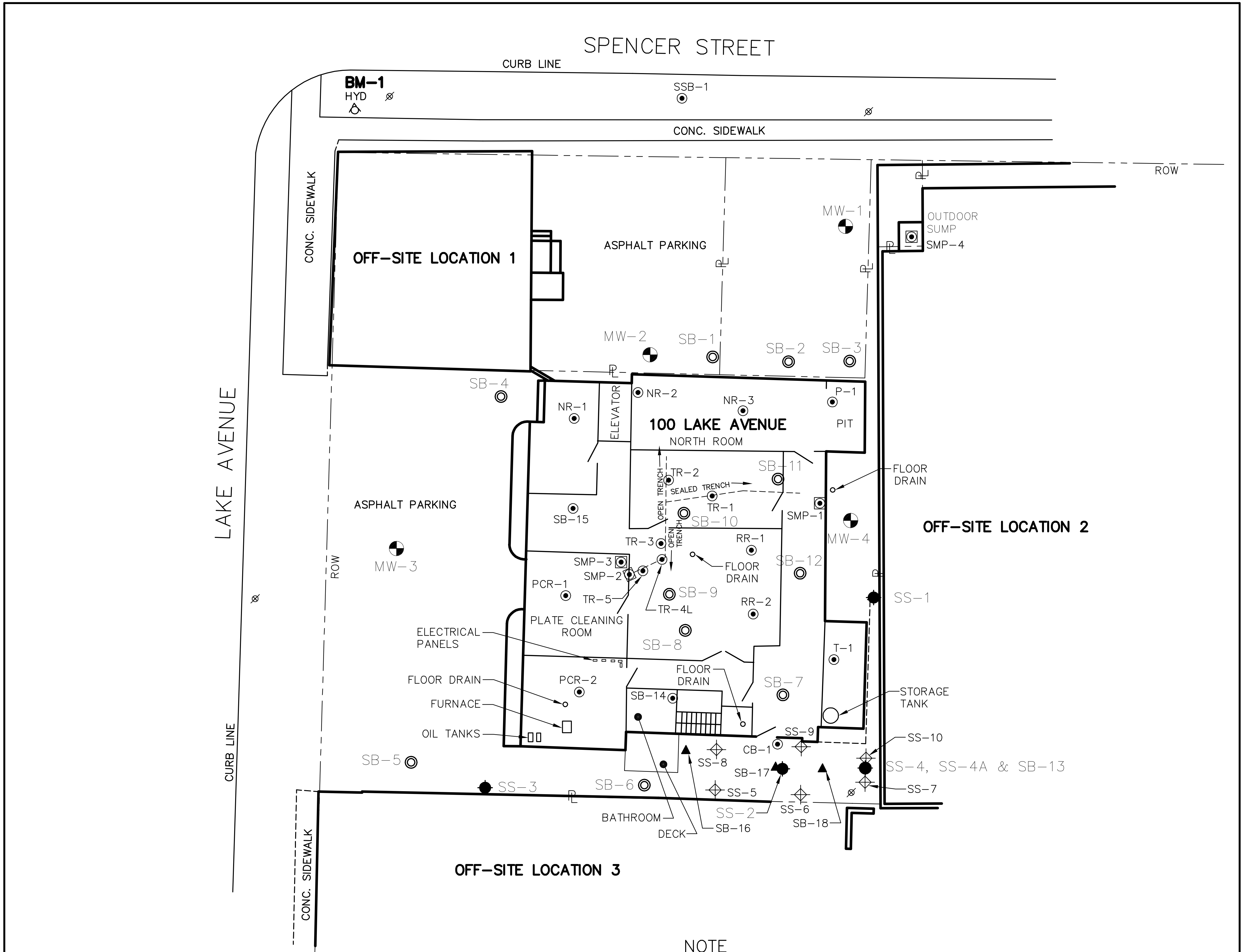
# FIGURE 2



NOTE

DRAWING ADAPTED FROM DRAWINGS PROVIDED BY LARSON ENGINEERS.

LEGEND

◐ MONITORING WELL

● 1998-1999 SOIL SAMPLE

◎ 1998-1999 SOIL BORING

⊕ 2006 SOIL SAMPLE

▲ 2006 SOIL BORING

ø UTILITY POLE

N/F NOW OR FORMERLY

∘ FLOOR DRAIN

⊙ RI SAMPLE LOCATION

-·-·-· TRENCH

- - - - PROPERTY LINE

NEW YORK STATE
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
ALBANY, NEW YORK

ON-SITE AND SPENCER ST.
SAMPLE LOCATIONS

30 0 30
1"=30'

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ENGINEERS INC.

# FIGURE 3

This document was developed in color. Reproduction in B/W may not represent the data as intended.

## LEGEND

🟥 BACKGROUND SAMPLE LOCATION

ROCHESTER METAL ETCHING
SITE #8-28-100

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
ALBANY, NEW YORK

## BACKGROUND SOIL SAMPLE LOCATIONS

0 30 60 120
Feet

AUGUST 2007
10653.33909

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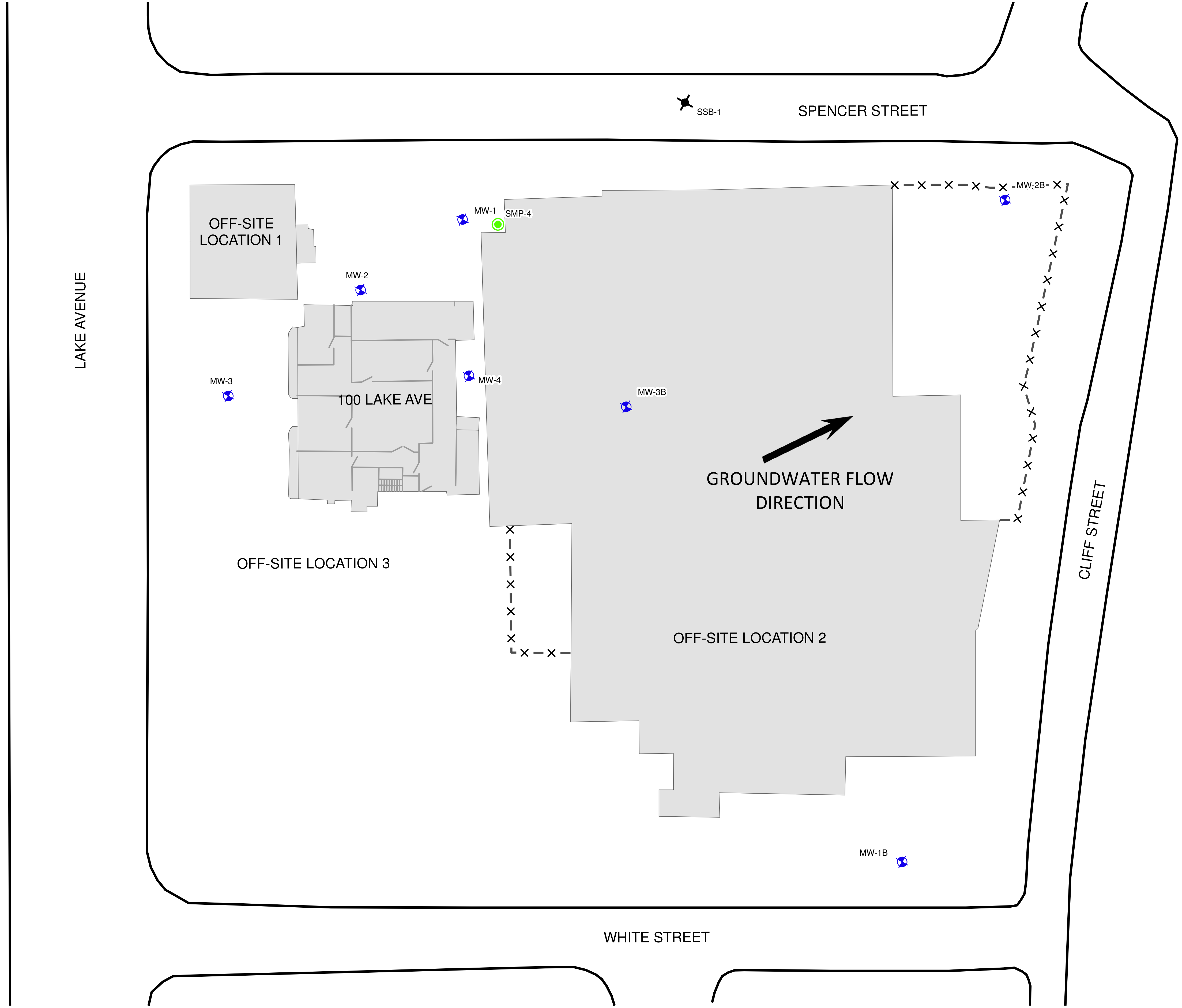
T:\10653_NYSDEC\Rochester_Metals\MXD\33909\Background_Locsrev8-07.mxd

PLOT DATE: 08/17/07 DIV. 71 LSR

# FIGURE 4



**LEGEND**

- ⊕ MONITORING WELL
- ✚ Temporary Monitoring Well
- ● Sump 4 Sample Location

ROCHESTER METAL ETCHING
SITE #8-28-100

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
ALBANY, NEW YORK

## LOCATION OF GROUND WATER MONITORING WELLS

0 20 40 80
Feet

AUGUST 2007
10653.33909

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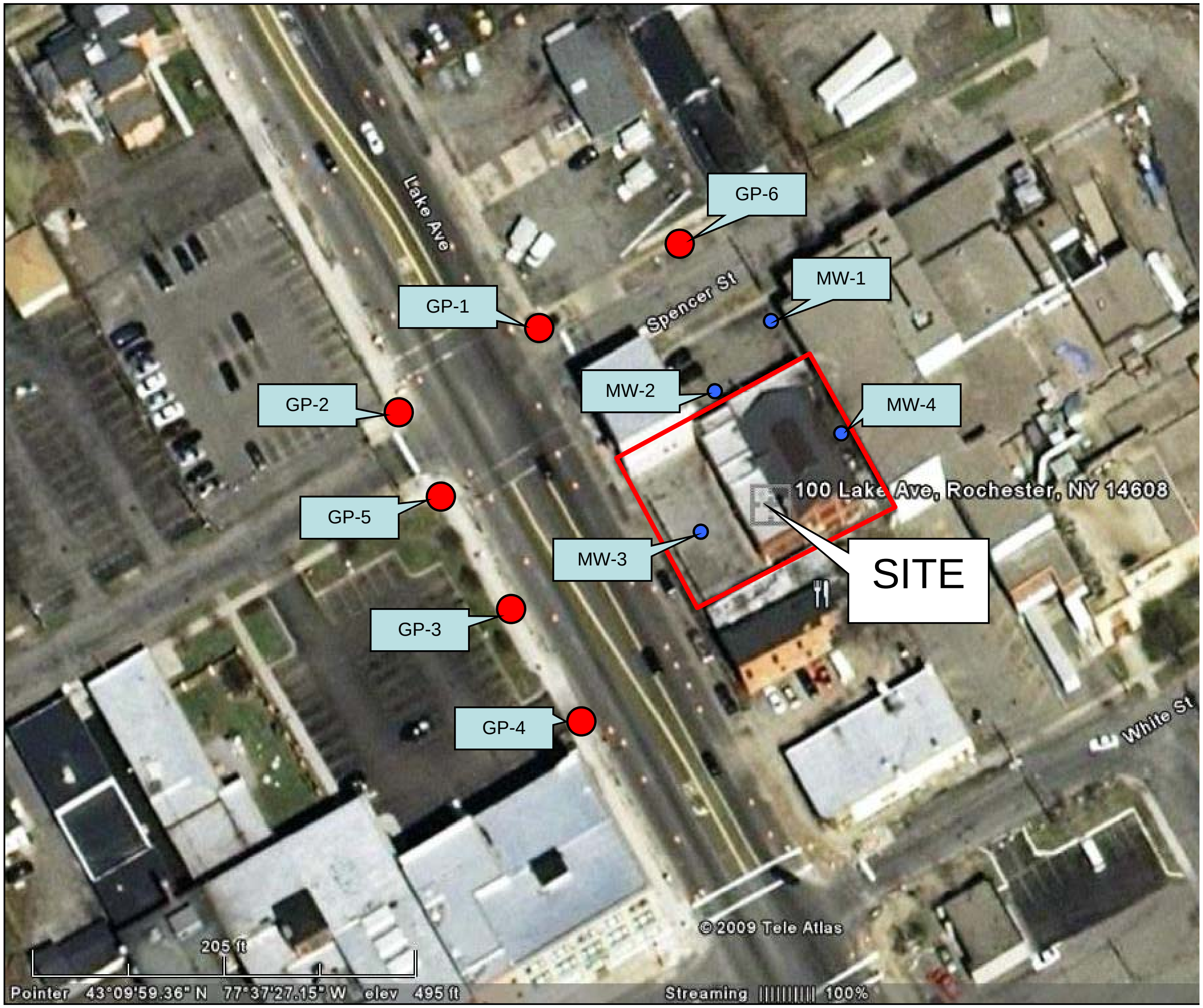
PLOT DATE: 08/17/07 DIV. 71 LSR

# FIGURE 5



LEGEND

🔴 Upgradient GW Grab Locations

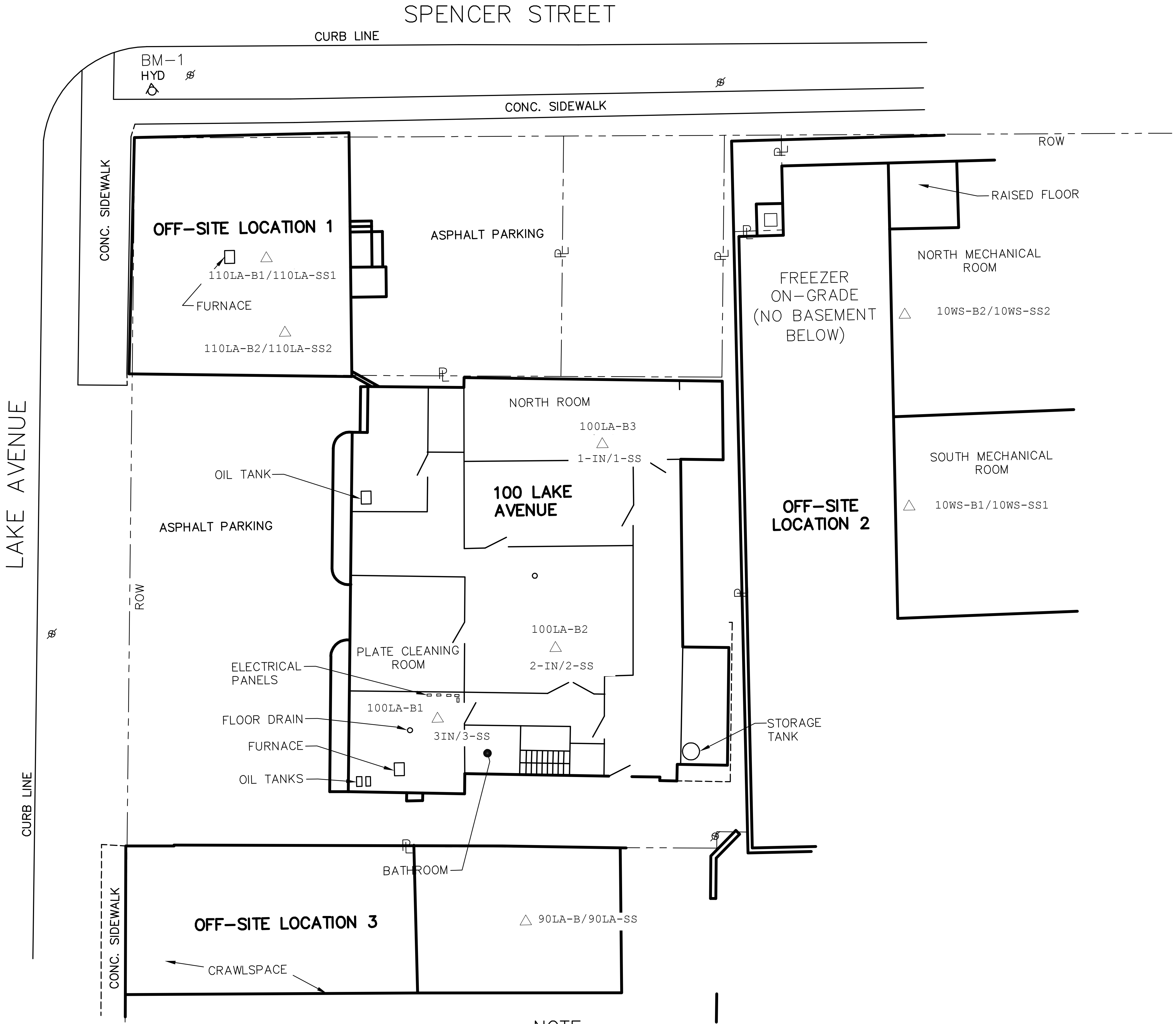
🔵 Existing MW Locations

ROCHESTER METAL ETCHING
SITE #8-28-100

NEW YORK STATE
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
ALBANY, NEW YORK

UPGRADIENT
GROUNDWATER
SAMPLE LOCATIONS

# FIGURE 6



NOTE

FIGURE ADAPTED FROM DRAWINGS PROPOSED BY LARSON ENGINEERS (1999), AS PRESENTED IN THE SITE INVESTIGATION REPORT (NYSDEC 2000).

LEGEND

△ PAIRED INDOOR AND SUB-SLAB SAMPLE LOCATION

ROCHESTER METAL ETCHING
SITE #8-28-100

NEW YORK STATE
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
ALBANY, NEW YORK

## VAPOR INTRUSION SAMPLE LOCATIONS

20 0 20
1"=20'

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