2/7/2008

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION
PRAP/ROD ROUTING SLIP

TO: Sal Ervolina, Assistant Division Director

FROM: The attached is submitted for your approval by:

NAME	INITIAL	DATE
Project Manager: Valerie Woodward		2/19/08
Section Chief/RHWRE: Joseph White		2/19/08
Bureau Director: Robert Knizek for		2/20/08

DATE: 2/7/2008

RE: **Site Name** Preferred Electric Motors, Inc. **Site Code** 828106
City ROCHESTER **County** Monroe

☐ **PRAP** S10485

- ☐ Draft PRAP
- ☑ Clean copy of the PRAP
- ☑ Redline/Strikeout version of the PRAP
- ☑ Copies of edits to PRAP (Sal's/Dale's)
- ☑ Site Briefing Report
- ☒ NYSDOH concurrence letter
- ☐ USEPA concurrence letter Attached

PRAP Release Approvals

Ass't Div Director: _____
Sal Ervolina 2/26/08

Division Director: _____
Dale Desnoyers 2/26/08

☐ **ROD**

- ☐ Draft ROD
- ☐ Signature-ready copy of the ROD
- ☐ Redline/Strikeout version of the ROD
- ☐ Copies of edits to ROD (Sal's/Dale's)
- ☐ Site Briefing Report
- ☐ NYSDOH concurrence letter
- ☐ USEPA concurrence letter

ROD Signoff

Ass't Div Director: _____
Sal Ervolina

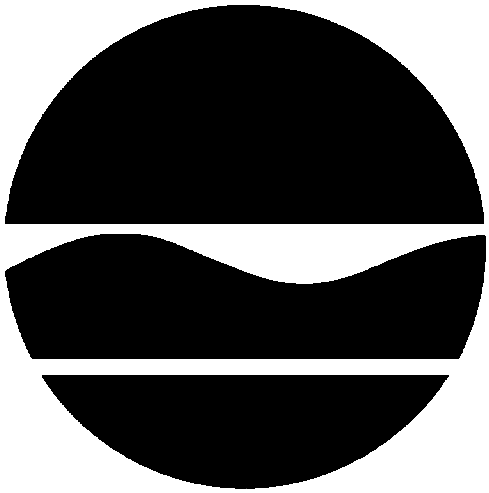
☐ **BRIEFING**
Date:_____ **Time:**_____ **Room:**_____

c: Dale Desnoyers
Other reviewers who are invited to Briefing

PROPOSED REMEDIAL ACTION PLAN
Preferred Electric Motors

Rochester, Monroe County, New York
Site No. 828106

February, 2008



Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

PROPOSED REMEDIAL ACTION PLAN

Preferred Electric Motors

Rochester, Monroe County, New York
Site No. 828106
February, 2008

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 Preferred Electric Motors 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, improper storage of 55 gal drums resulting in a spill and general facility operation spills have resulted in the disposal of hazardous wastes, including chlorinated chemical compounds and petroleum compounds. These wastes have contaminated the subsurface soils and groundwater at the site, and have resulted in:

- a significant threat to human health associated with potential exposure to contaminated subsurface soils in the driveway and parking area.
- a significant threat to human health associated with current and potential exposure to vapors entering indoor air on adjacent properties.
- a significant environmental threat associated with the current and potential impacts of contaminants to groundwater.

To eliminate or mitigate these threats, the Department proposes excavation of contaminated soils, application of bio-degradation enhancing chemicals to the bedrock in the excavation area, backfilling and constructing a cover system over residual contamination, and the installation of a vapor mitigation system in each of two adjacent homes.

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 February 2007 "Preferred Electric Motors Remedial Investigation/Feasability Study (RI/FS) Report", and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

Lincoln Branch
Rochester Public Library
851 Joseph Ave
Rochester NY 14621

NYSDEC
Central Office
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233-7013
Toll Free (888) 459-8667
Hours: Monday - Friday
8:30 a.m. - 4:30 p.m.
[Contact the Project Manager -
Valerie Woodward for an appointment]

NYSDEC
Region 8 Office
6274 E Avon-Lima Rd.
Avon, NY 14414 - 519
(585) 226-5326
Hours: Monday - Friday
8:30 a.m. - 4:30 p.m.
(Contact Lisa LoMaestro Silvestri for an
appointment)

The Department seeks input from the community on all PRAPs. A public comment period has been set from March 1, 2008 to March 31, 2008 to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for March 11, 2008 at the Library of the Henry W. Longfellow School #36, 85 St. Jacob St, Rochester NY 14621 beginning at 5:30 PM.

At the meeting, the results of the RI/FS will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP. Written comments may also be sent to Ms. Woodward at the above address through March 31, 2008.

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 Site is located at 42 Fernwood Avenue, in the City of Rochester, Monroe County, New York (Figure 1). The Site is situated on 0.35 acres in a mixed commercial and residential use area and consists of a 13,215 square foot manufacturing building with a paved/gravel parking lot (Figure 2). The Site is surrounded by residential property. The east wall of the Site building is a common wall with a neighboring storage building. JML Optical, a designer, manufacturer and distributor of precision optical components and systems, is located approximately 60 feet northwest of the Site (vacated in the spring of

2006). A former textile manufacturing facility (Vogt Manufacturing Corporation) is located approximately 1300 feet east of the Site, at 100 Fernwood Avenue. The former textile manufacturing facility (owned by Conifer Development) is currently participating in the Department's Brownfield Cleanup Program, and investigations and/or remedial activities are currently planned for that property.

Overburden soils at the site are approximately eight feet thick. Bedrock in the vicinity of the site consists of near horizontally bedded Upper Silurian age dolomite and shales. The sedimentary bedrock in the Rochester area generally strikes from north-west to south-east or west to east, with a dip to the south southwest of 1 to 2 degrees.

Most of the Site is covered by the Preferred Electric Motors' building. Rainwater from the roof of the building is diverted into the city storm drains. Rainwater that does not infiltrate into the gravel portion of the driveway flows to storm drains located on Fernwood Avenue. Storm water flows to a wastewater treatment plant that discharges to Lake Ontario.

Lake Ontario is the regional groundwater discharge for the area. Groundwater at the Preferred Electric Motors site occurs primarily in the bedrock/overburden interface and the water table has been measured at depths ranging from 4.4 to 12.4 feet below ground surface (elevation 473.9 to 478.7 feet above mean sea level) across the area of investigation. Groundwater flows both north and south from a groundwater divide located near the north end of the site running east-west. The groundwater flow may be influenced by sewer lines which are trenched 2 to 4 feet into bedrock along the center line of Fernwood Ave. and 4 to 6 feet into bedrock along the center line of Portland Avenue. There are no known drinking water wells located within the area.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

Between 1911-1951 the site was owned by W.A Margander and Co. Contractors. The southern and northern sections of the building were added during that time for an automobile repair shop and equipment storage. Preferred Electric Motors (Preferred Electric Motors) Inc, bought the property in August 1952. The company refurbished and repaired motors which they cleaned in a degreaser tank located in the north west corner of the building. Reportedly, Preferred Electric Motors ordered approximately 3-4 drums of solvent per year in the late 1990's. In 2000 several 55 gallon drums were found to be leaking and were removed. Spent solvent drums were reportedly stored outside in the parking area.

3.2: Remedial History

Preferred Electric Motors contracted Environmental Products and Services to remove fifteen 55-gallon drums of spent solvent, and remove the top several inches of soil from the site yard for off-site disposal in May/June 2000. Preferred Electric Motors ceased remedial activities due to lack of funds. The Department conducted a limited post surface soil removal action, surface and sub-surface soil sampling in June 2000. A state-funded Interim Remedial Measure (IRM) was initiated in August 2000, to remove the abandoned Underground Storage Tank (UST), excavate and dispose the contaminated soils off-site, and install and operate a soil vapor extraction (SVE) system at a neighboring residence. The UST and surrounding contaminated soil was removed in February 2001. The SVE has been in operation since November 2000. In 2000, 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.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRP) 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 PRP for the site, documented to date, include: Preferred Electric Motors, Inc.

The PRP declined to implement the RI/FS at the site when requested by the Department. After the remedy is selected, the PRP will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRP, the Department will evaluate the site for further action under the State Superfund. The PRP is 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 June/2004 and February/2007. The field activities and findings of the investigation are described in the RI report.

The work was performed in two phases and included:

- Geophysical survey of the Site yard to delineate the former excavation area, and identify underground piping/structures;
- Samples of the oil from the building floors were analyzed for PCB;
- Soil and water sample from within the floor drains;
- Geoprobe® subsurface soil samples and rock core sampling;
- Subsurface soil samples from monitor well borings;
- Installation and sampling of shallow bedrock monitoring wells:
- A site survey of the horizontal and vertical location of various site features;
- Background surface soil samples;
- Groundwater sampling;
- Geoprobe® soil gas sampling;
- Sub-slab soil vapor sampling;
- Indoor air sampling;

5.1.1: Standards, Criteria, and Guidance (SCGs)

To determine whether the soil, groundwater, and air 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 ("Technical and Administrative Guidance Memorandum [TAGM] 4046; Determination of Soil Cleanup Objectives and Cleanup Levels." and 6 NYCRR Subpart 375-6 : Remedial Program Soil Cleanup Objectives).

- Concentrations of VOCs in air are evaluated using the air guidelines provided in the "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," dated October 2006, for the contaminants, trichloroethene (TCE), tetrachloroethene (PCE), and 1,1,1 trichloroethane (1,1,1-TCA).

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 investigation for all environmental media that were investigated. As described in the RI report, many soil, groundwater, and air samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceed the SCGs were volatile organic compounds (VOCs) known as chlorinated solvents. For comparison purposes, where applicable, SCGs are provided for each medium.

Chemical concentrations are reported in parts per billion (ppb) for water and waste, and parts per million (ppm) for soil. Air samples are reported in micrograms per cubic meter (mcgg/m^3).

Table 1 summarizes the degree of contamination for the contaminants of concern in subsurface soil, groundwater, and air and compares 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

Several empty drums of TCE were in the building, as well as two full drums of "CTD Plus – Cold Tank Degreaser" and five drums of solid waste/soil and one drum of liquid waste from past remedial efforts located in the former equipment storage area. Waste identified during the RI/FS was addressed during the IRM conducted on September 2005 as described in Section 5.2.

Subsurface Soil

Volatile organic compounds (VOCs), consisting primarily of chlorinated solvents and their degradation products (1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2 DCE), trans-1,2-dichloroethene (trans-1,2 DCE), and vinyl chloride), were detected in all the Geoprobe® borings. VOCs in excess of the soil cleanup objectives were detected at three Geoprobe® locations around the former removal action excavation (GP 14,and 17). Refer to figure 3 and 4 for Geoprobe® borings locations.

The maximum concentrations of TCE and PCE were detected at GP-14, southwest of the former excavation and on the adjacent property. 1,1,1-TCA was detected at concentrations above the soil cleanup objectives at one boring BS-1. The highest VOC detections were generally in the deeper soils just above bedrock, although concentrations detected at GP-17, located just east of the former removal area, were highest in the shallow soils. Several semi volatile organic compounds (SVOC) were detected above soil cleanup objectives at one location, GP-7. These include benzo(a)anthracene, benzo(b)pyrene, benzo(a)fluoranthene), benzo(k)fluoranthene, chrysene, and dibenz(a,h)anthracene. Subsurface soil contamination identified during the RI/FS will be addressed in the remedy selection process.

Groundwater

The groundwater analytical results indicate a groundwater source area in the vicinity of MW-1 with the VOC contaminants migrating to the south and to a lesser degree to the north. Refer to figures 5,6 and 7 for monitoring well and groundwater sample locations. Detected concentrations of TCE and xylene, near the former degreaser location, exceeded NYS Class GA groundwater standards of 5 ppb for both

compounds. The highest concentrations of the chlorinated solvent compounds 1,1,1- TCA, 1,1-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2 DCE, vinyl chloride, and PCE were detected in a groundwater sample collected from MW-1, located in the driveway immediately south of the Site building. The highest concentration of TCE was detected in MW-2 located approximately 100 feet south of MW-1. The highest concentrations of benzene, toluene, ethyl benzene, and xylene m/p were detected at MW-1 and all exceeded the NYS groundwater standards. Detections of petroleum compounds also exceeded NYS standards at locations MW-2, MW-3, GP-01, and JML-1. Analytical results for all VOC compounds are below NYS standards to the east and to the west of the site. SVOCs, pesticides, and PCBs were not detected at concentrations above NYS standards or guidance values.

The highest concentrations of PCE and TCE were detected in MW-2 located approximately 100 feet south of MW-1. Concentrations of TCE were detected north of the site building in monitoring wells JML-1 and MW-5, and in Geoprobe® groundwater grab samples GW-002 and GW-003. In addition to the chlorinated solvents 1,1,1-TCA and TCE, their breakdown products (1,1-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2 DCE, and vinyl chloride) were also detected in MW-1, MW2, MW-5,and MW-10. Fuel-related VOCs were detected above NYS standards in MW-1 and MW-2. Benzene was detected above NYS standards at MW-9 but this is likely not site-related due to its location both along the axis of the groundwater divide bisecting the site and on the other side of the 48-inch sewer trench along Portland Avenue. Vinyl chloride was detected above NYS standards at MW-10, but this detection also is not likely site-related based on its location south of the site, south of the 24-inch sewer main below Fernwood Avenue. Analysis of samples from MW-1, MW-2, MW-3 and MW-4 detected iron, magnesium, and sodium above NYS guidance values. In addition, manganese was detected slightly above guidance values in MW-1. Metals detected were normally natural occurring constituents in groundwater. There does not appear to be a source of metals contamination or migration of metals from the site. Groundwater concentrations identified during the RIFS will be addressed in the remedy selection process.

Floors

Three samples were taken of oil and soil residue from the floor within the PEM Building (Figure 4). Samples were taken from three separate rooms, one from the former metal press area one form the metal work area and one from the former degreaser/oven area and analyzed for PCBs. PCBs were detected in all three samples with Aroclor-1248 detected at concentrations ranging from 7.1 ppm to 8.4 ppm and Aroclor-1260 detected at 6.3 and 5.4 ppm in sample OS-001 (former metal work area) and OS-003 (former metal press area) respectively. The 6 NYCRR 375 Residential Use Soil Cleanup Objectives for total PCBs of 1.0 ppm is used for comparison because the site is zoned residential (R1) with a variance for a business. Detected concentrations are less than the 50 ppm concentration requiring cleanup under Toxic Substance Control Act (TSCA) guidelines, but above most guideline numbers for unrestricted facility use (i.e. 1.0 mg/kg under TSCA).The contaminated floors identified during the RI/FS will be addressed in the remedy selection process.

Floor Drains

A water sample was collected from Floor Drain 3, located near the former bathroom and oil storage room (Figure 4). Analysis of the drain water sample SW-001 showed concentrations of six chlorinated solvent related VOCs, including; TCE, cis-1,2-DCE, PCE, 1,1-dichloroethane, 1,1-dichloroethene, and trans-1,2-dichloroethene. Nineteen metals were also detected in the drain water sample. Because these samples were collected from a floor drain, there are no applicable standards or guidelines. No site-related surface water contamination of concern was identified during the RI/FS.

One soil sample SD-001 was collected from Floor Drain 1, located in the former equipment storage room. 1,2-DCA and 1,2-dichloropropane were detected at high concentrations. The total VOC concentration in the soil sample was 9.6 ppm. The total SVOCs were detected at a concentration of 116 ppm. The majority of the SVOCs detected were polycyclic aromatic hydrocarbons. The highest SVOCs detected were 2,4-dimethylphenyl, fluoranthene and phenanthrene. Two pesticides were detected in the drain sample: 4,4-DDE and gamma-chlordane. Metals were also detected in the drains soil sample.

Metals that may be related to historic processes at the Site include chromium, copper, lead, nickel and zinc. Because these samples were collected from a floor drain, they will be cleaned to meet the residential soil cleanup objectives. The contaminated drains identified during the RI/FS will be addressed in the remedy selection process.

Soil Vapor/Sub-Slab Vapor/Air

Soil vapor, sub-slab soil vapor and indoor air samples were collected to evaluate the potential for human exposures to VOCs volatilizing from soils and groundwater.

Two sub-slab soil vapor samples were collected from beneath the Preferred Electric Motors building (SV-1 and SV-2, shown on Figure 4). A sample from the existing soil vapor extraction system installed at 40 Fernwood Avenue, and several soil gas samples (GV-1 through GV-7) from locations around the Preferred Electric Motors building (Figure 3) were also collected. A number of VOCs were detected at low concentrations. GV-1 and GV-2 located south of the site and south of MW-2 showed elevated concentrations of petroleum compounds and solvent related VOCs. The highest detection of chlorinated solvents,1,1,1-TCA and TCE, was in GV-6, located in the driveway southeast of MW-1. Two sub-slab soil vapor samples, SV-1 and SV-2, were collected from beneath the Preferred Electric Motors building during the initial soil vapor sampling event. Low concentrations of fuel related VOCs were detected. SV-1 contained the highest level of PCE detected during this sample event. 1,1,1-TCA and TCE were not detected in sub-slab samples. In addition to the two sub-slab samples collected on-site, a sample (EP-001) was collected from the soil vapor extraction (SVE) treatment system at the residence adjacent to the Preferred Electric Motors facility. No chlorinated solvents were detected.

Analytical results from the initial soil gas and sub-slab soil vapor survey were used in the selection of locations for the vapor intrusion investigation. As a result, 11 sub-slab soil vapor samples, 11 basement indoor air samples and 12 first floor indoor air samples were collected from 12 private residences/ businesses. Two of the locations were on Portland Avenue and 10 were on Fernwood Avenue. Four outdoor ambient air samples were collected to evaluate background air. Twelve residences in all were tested for soil vapor intrusion. Of these twelve, one mitigation system was installed and two residences require additional monitoring.

Soil vapor contamination identified during the RI/FS was addressed during the IRM of neighboring residences as described in Section 5.2.

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. Two IRMs were conducted at this site.

September 2005

Several empty drums of TCE were noted in various locations in the building, as well as, two full drums of “CTD Plus – Cold Tank Degreaser” located in the former equipment storage area and five drums of solid waste/soil. Also one drum of liquid waste from past remedial efforts were found at the site. The IRM consisted of the removal and proper disposal of these wastes materials.

January 2007

Mitigation measures were taken at one off-site location to address potential human exposures (via inhalation) to volatile organic compounds associated with soil vapor intrusion. The IRM consisted of the installation of a sub-slab depressurization system at the off-site residence.

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 6.1 of the RI report which is available at the document repository for the site. 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.

Potential exposure pathways for this site include:

- The majority of the site is paved or covered with structures, therefore, exposure to contaminated sub-surface soil is not likely. The potential exists for on site workers to be exposed to contaminated floors existing within the building.

- The surrounding area is served by public water, so exposure to contaminated groundwater is not likely. The potential exists for utility workers to be unknowingly exposed to contaminated groundwater that is migrating to the buried utilities along Fernwood Avenue.

- The NYSDEC and NYSDOH have investigated and evaluated the potential for exposures related to soil vapor intrusion in residences off-site, and actions have been taken to minimize the potential for future exposures to occur.

These potential pathways would be addressed through the remediation proposed for the 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 following environmental exposure pathways and ecological risks have been identified:

Areas of contamination exist surrounding the former excavation of the underground storage tank and drum storage area in subsurface soils and to a lesser degree in shallow bedrock to the southwest of the facility. The locations are: the former UST excavation, behind the house on the adjoining property, to the southeast of the former excavation in the subsurface soils underlying site utilities, and likely extending onto the adjoining property and to the north of the former excavation under the Site building. The soils pose a risk if disturbed through excavation.

Site contamination has impacted the groundwater resource in the shallow aquifer. Contaminated groundwater is intercepted by a sewer line trench along Fernwood Ave. and does not go further south to the residential area. There are currently no groundwater uses at the site itself or in the immediate vicinity (e.g. domestic or industrial wells), and no expected future uses of groundwater at 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 solvents and petroleum compounds in subsurface soil, groundwater and indoor air.
- exposures of persons at or around the site to PCBs in concrete floors of the Building.
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and
- the release of contaminants from groundwater, subsurface soil in the parking area and under buildings, into indoor air and ambient air through soil vapor intrusion.

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

- ambient groundwater quality standards.

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 Preferred Electric Motors were identified, screened and evaluated in the FS report which is available at the document repositories established for this site.

A summary of the remedial alternatives that were considered for this site is 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, soil vapor, floor at the site.

Alternative 1: No Further Action

Present Worth: *$785,000*
Capital Cost: *$57,000*
Annual Costs:
(Years 1-5): *$61,000*
(Years 6-10): *$38,000*
(Years 11-30): *$26,000*
Periodic Costs
(Years 5,10,15,20,25,30) *$5,000*

The No Further Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only of groundwater and two home vapor intrusion mitigation systems, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative #2: Limited Action
(Institutional Controls, Floor Cleaning, Sub-Slab Depressurization Systems, and Long-term Monitoring)

Present Worth: *$984,000*
Capital Cost: *$256,000*
Annual Costs:
(Years 1-5): *$61,000*
(Years 6-10): *$38,000*
(Years 11-30): *$26,000*
Periodic Costs
(Years 5,10,15,20,25,30) *$5,000*

Institutional controls would be implemented to restrict future use of the Site as part of an environmental easement. Implementation of the environmental easement would include the development of a Site Management Plan and use restrictions prohibiting subsurface activity and installation of drinking water wells in the area of contamination.

Concrete floors of the first floor within the site building would be decontaminated using a solvent wash. Once confirmatory sampling has been performed to insure sufficient removal of contaminants, an application of epoxy sealant would be required.

Sub-slab depressurization systems would be installed in on- and off-site commercial and residential buildings in accordance with the Vapor Intrusion Guidance (NYSDOH, 2006). The systems would limit the potential for exposure via vapor intrusion to workers inside the site building and occupants of several neighboring residences. Sub-slab depressurization systems would be designed, constructed, tested, and maintained in accordance with the "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (NYSDOH, 2006). It is assumed that a standard sub-slab depressurization system consisting of a single fan, 4-inch PVC piping, pressure gauge, and minimal caulking and sealing would be necessary per building. It is assumed that four (4) such systems on and off-site would potentially be required.

Two wells would be installed to be used for monitoring purposes. One well would be located between the Site and sewer line. The other well shall be located across Fernwood Ave from MW2 and drilled to a depth of 25 feet.

A long-term monitoring program would be implemented for the Site and would include sampling and analysis of four groundwater locations for metals, VOCs, and natural attenuation parameters. This would

also include periodic inspections of all off-site mitigation systems to insure proper operation. The resulting data and information would be incorporated into Annual Reports for the Site.

Alternative #3: Soil Vapor and Groundwater Extraction /Treatment
(Pre-design Investigations, Institutional Controls, SVE System, Groundwater Extraction System and Treatment, Floor Cleaning, Sub-Slab Depressurization Systems, Asphalt Cover, and An Operation, Maintenance, and Monitoring Program)

Present Worth: *$1,412,000*
Capital Cost: *$447,000*
Annual Costs:
(Years 1-5): . . . . . *.$123,000*
(Years 6-10): *$100,000*
Periodic Costs
(Years 5,10) *$7,000.00*

The Alternative 3 includes everything explained in Alternative 2 with the addition of the following:

A soil vapor extraction system (SVE) would be installed to prevent exposure to contaminated soil vapor. SVE involves the application of a vacuum to the soil to remove volatile contaminants from the soil. The extracted contaminants are captured for treatment prior to discharge to the atmosphere. SVE can be implemented using vertical or horizontal extraction wells. Horizontal extraction wells can be installed either in trenches or using horizontal (directionally drilled) borings, depending on contaminant zone geometry, drill rig access, and other site-specific factors. A geomembrane or other low-permeability material may be used to prevent short circuiting of the extraction wells and to increase the radius of influence. Operation, maintenance, and monitoring of the on-site treatment system would include maintenance and sampling of the SVE system. Periodically, the activated carbon would be removed, sent off-site for regeneration, and replaced with new or regenerated carbon.

Groundwater extraction wells would be installed as part of this alternative to lower the groundwater table to expose contaminated soils within the saturated zone to SVE. Extracted groundwater would be treated onsite prior to discharge. Replacement of the asphalt cover over the excavated area of the parking lot at the Site would reduce infiltration of precipitation and would minimize short-circuiting of the SVE system to ambient air.

A monitoring program would be implemented for the Site and would include sampling and analysis of four groundwater locations for metals, VOCs, and natural attenuation parameters. This would also include periodic inspections of all off-site mitigation systems insure proper operation. Results of long term monitoring and evaluation of natural attenuation processes would be incorporated into an Annual Report for the Site.

Alternative #4:Limited Source Removal
(Pre-design Investigations, Institutional Controls, Excavation, Enhanced Biodegradation, Floor Cleaning, Sub-Slab Depressurization Systems, Asphalt Cover, and An Operation, Maintenance, and Monitoring Program)

Present Worth: *$1,093,000*
Capital Cost: *$483,000*
Annual Costs:
(Years 1-5): *$61,000*
(Years 6-10): *$38,000*
(Years 11-30): *$26,000*
Periodic Costs
(Years 5,10,15,20,25,30) *$7,000*

The Alternative 4 includes everything explained in Alternative 2 with the addition of the following:

This alternative would include the excavation of approximately 450 cubic yards of contaminated soil down to bedrock outside the footprint of the on-site building. Sampling would be conducted during the excavation activities to determine the full extent of the excavation. Characterization sampling of the excavated soils would be conducted at a rate of one sample per 50 cubic yards for purposes of off-site treatment and disposal. During the excavation process, building drains would be flushed and cleaned.

Implementation of the enhanced biodegradation at the Site would include the placement of an organic substrate at the bedrock interface prior to backfilling of the excavations which would promote biodegradation of chlorinated solvent-related VOCs in the shallow bedrock aquifer groundwater and saturated soil. The excavation would be backfilled with clean soil from an approved source. Replacement of the asphalt cover over the excavated area of the parking lot at the Site would reduce infiltration of precipitation and reduce migration of any residual contamination. Based on monitoring data additional applications of organic substrate would be injected into shallow bedrock at the source area.

Alternative #5: SVE and Limited Source Removal
(Pre-design Investigations, Institutional Controls, Excavation, Enhanced Biodegradation, SVE system, Groundwater Extraction System and Treatment, Floor Cleaning, Sub-Slab Depressurization Systems, Asphalt Cover, and An Operation, Maintenance, and Monitoring Program)

Present Worth: *$1,406,000*
Capital Cost: *$610,000*
Annual Costs:
(Years 1-5): *$121,000*
(Years 6-8): *$98,000*
Periodic Costs
(Year 5) *$7,000*

Alternative 5 is the combination of approaches explained in Alternative 2, Alternative 3 and Alternative 4 which includes the following: the placement of institutional controls, cleaning of concrete floor, installation and maintenance of on-site and off-site sub-slab depressurization systems, installation of new wells to be used in the long-term monitoring of the site, soil vapor extraction/ groundwater extraction systems, excavation of contaminated soils, placement of organic substrate on bedrock and long term monitoring.

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.

Alternative 1 would not provide any additional protection of human health and the environment. Alternatives 2 through 5 would provide protection of human health and protection of the environment through restricting access to and use of the Site and would address potential soil vapor intrusion issues

through implementation of sub-slab depressurization. Alternatives 3 through 5 would provide additional protection of human health and the environment through the removal and treatment of residual source contamination.

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.

All the alternatives, with the exception of Alternative 1 No Further Action, meet the applicable SCG requirements. Alternative 4 would prevent vapor intrusion into indoor air and comply with guidance values associated with air. However, since some contaminated soil is left in place under the building footprint in Alternative 2 and 4, they do not restore the site to pre-disposal conditions as Alternative 3 and 5 attempt with the installation of an SVE system. Nevertheless, in Alternative 4, contaminated soil beneath the parking lot would be removed and biological enhancement applied to the exposed bedrock. As a result an initial decrease in contaminant concentrations in groundwater would be expected and followed by a gradual decrease in contaminant concentrations over time.

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

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

Components of Alternative 2 would have no short term impacts to the local community and the environment. Components of Alternatives 3, 4, and 5 would have short term impacts on the local community from increased truck traffic, street congestion, noise and dust from soil excavation and SVE installation. Measures would be taken to minimize noise, erosion, fugitive dust, and risks to site workers. The estimated total time to implement these Alternatives is 1 to 2 years. Alternative 3 and 5 would be the most intrusive over the long term by assuming the use of the equipment storage room portion of the on-site building for housing of the SVE and groundwater depression systems, which may result in disruption to occupant activities. Also maintaining access to the equipment could be a problem during for the operation and maintenance of the system.

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.

Alternatives 2, 3, 4, and 5 are anticipated to meet remedial goals for soil vapor upon completion of remedial activities. Alternatives 3, 4, and 5 are estimated to achieve remedial goals for soil and groundwater within10, 20, and 8 years, respectively.

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.

Alternative 1 and 2 depend solely on natural attenuation as the primary treatment. Alternatives 3, 4, and 5 would be expected to reduce risks to human health and the environment by addressing the sources of groundwater and soil vapor contamination at the Site. Alternative 3 would reduce contamination through removal of contaminated vapor and groundwater. Alternative 4 would reduce contamination through source removal and would reduce the volume of waste on-site. Approximately 448 cubic yards of material would be removed from the parking area of the site. Also the treatment of shallow bedrock while exposed before backfilling the excavation would further reduce contamination in the source area.

Alternative 5 combines the components of both Alternative 3 and 4, and would therefore address the greatest amount of contamination.

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.

Implementation of the SVE groundwater extraction component of Alternatives 3 and 5 may be complicated by site hydrogeology, namely the presence of the water table near the bedrock / overburden interface and fractures within the weathered water-bearing zone of the bedrock.

Alternatives 4 and 5 include the excavation, transportation, and off-site disposal of source materials. The techniques that would be used for excavation are all well-developed and commonly used; however, the presence of the site building, adjacent buildings, lack of space, and utilities would likely complicate excavation. The treatment and/or disposal techniques and any required permitting are not anticipated to be difficult to implement.

Contractors to provide the excavation and transportation services would be easily obtained. Permitted and available treatment and/or disposal facilities are anticipated to be available, though the distance to these locations may likely be substantial. Construction of the asphalt cover, as proposed under Alternative 3, 4, and 5, could provide some minimal limitation to future remedial actions if ever required.

Alternative 4 would result in the removal of approximately 75% of contaminated soil exceeding SCG's at the Site above bedrock and attempt to treat the upper layers of the bedrock to remove contamination from shallow groundwater. Alternative 4 would significantly reduce the need for operation and maintenance but could potentially increase the need for long-term monitoring. It may not eliminate the contamination entirely from the site, but it would reduce contamination in groundwater in an area where the lateral extent of groundwater impact is very limited.

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 2.

The cost of the alternatives varies significantly. Although Alternative 2 is less expensive than Alternatives 3, 4 and 5, it would not reduce contamination at the site. The cost of Alternative 3 and 5 exceed alternative 4 in annual costs and present worth. Alternative 4 and 5 are very favorable because the remedy would eliminate a significant portion of the contaminated soil which is a continuing source of groundwater contamination at the site. The costs of Alternatives 5 exceed Alternatives 3 and 4 by combining these two alternatives.

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.

8. **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.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative #4, Limited Source Removal, Institutional Controls, Enhanced Biodegradation, Sub-Slab Depressurization Systems, Asphalt Cover, Site Closure Report, and An Operation, Maintenance, and Monitoring Program as the remedy for this site (Figure 8). 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 alternatives presented in the FS.

Alternative 4 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 eliminating potential human exposure from migrating vapors and reduce the concentrations of contamination in groundwater and soil by excavating accessible contaminated soils exceeding the SCG's, treating exposed bedrock and side walls with organic substrate and leaving residual contaminated soils under the building foot print where it would be effectively coved by the building's concrete slab.

The estimated present worth cost to implement the remedy is $1,093,000. The cost to construct the remedy is estimated to be $483,000 and the estimated average annual costs for 20 years is $610,000.

The elements of the proposed remedy are as follows:

1. A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. It includes:

   Design Element
   - 2 additional monitoring wells would be installed. One would be located between the site and the sewer line and one would be located across Fernwood Ave from MW2 (to a depth of 25 feet);
   - A survey would be conducted to find utility lines and obstructions under the ground surface;
   -Secondary applications of organic substrate to bedrock;

   Remedy Element
   - Excavation of contaminated soil outside the building footprint would be conducted and sampling would be done to refine the extent of the excavation;
   - The enhanced biodegradation would include the placement of an organic substrate to the bedrock interface and to the excavation side walls to promote biodegradation of chlorinated solvents; Additional applications of organic substrate would be applied based on monitoring results;
   - The excavation would be backfilled with clean soil;
   - A cover system would be installed over excavated areas;
   - Floor surfaces would be cleaned with a solvent wash and sealed with epoxy coating.
   - Sub-slab depressurization systems would be installed.

2. Imposition of an institutional control in the form of an environmental easement that would require (a) compliance with the approved site management plan; (b) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; and (c the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls.

3. Development of a site management plan which would include the following institutional and engineering controls: (a) management of the final cover system to restrict excavation. Excavated soil would be tested, properly handled to protect human health and safety and in a manner acceptable to the Department; (b) continued evaluation of the potential for vapor intrusion, including provision for mitigation of any impacts identified; (c) monitoring of groundwater; (d) identification of any use restrictions on the site; and (e) provisions for the continued proper operation and maintenance of the existing vapor mitigation systems.

4. The property owner would provide a periodic certification of institutional and engineering controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal would: (a) contain certification that the institutional controls and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; (b) allow the Department access to the site; and (c) state that nothing has occurred that would impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

Since the remedy results in untreated hazardous waste remaining at the site, a monitoring program would be instituted. This would included: monitoring well sampling; monitoring home mitigation systems to insure proper operation and effectiveness; and insure that institutional controls and site management plans are followed. This program would allow the effectiveness of the asphalt cover and home vapor intrusion mitigation systems to be monitored and would be a component of the long-term management for the site.

TABLE 1
Nature and Extent of Contamination

SURFACE SOIL (0-2 feet depth)	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Trichloroethene	0.003 - 18	10	1 / 12
Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	3.5	1	1 / 1
	Benzo(a)pyrene	2.7	1	1 / 1
	Benzo(b)fluoranthene	2.3	1	1 / 1
	Benzo(k)fluoranthene	2.7	1	1 / 1
	Chrysene	3.4	1	1 / 1
	Dibenz(a,h)anthracene	0.61	0.33	1 / 1
	Indeno(1,2,3-cd)pyrene	1.8	0.5	1 / 1
Inorganics Compounds	Chromium	38.5	22	1 / 1
SUBSURFACE SOIL	**Contaminants of Concern**	**Concentration Range Detected (ppm)[a]**	**SCG[b] (ppm)[a]**	**Frequency of Exceeding SCG**
Volatile Organic Compounds (VOCs)	Tetrachloroethene	0.002 - 390	5.5	1 / 32
	Trichloroethene	0.002 - 22	10	2 / 32
FLOOR SURFACE	**Contaminants of Concern**	**Concentration Range Detected (ppm)[a]**	**SCG[b] (ppm)[a]**	**Frequency of Exceeding SCG**
PCB/Pesticides	Aroclor-1248	7.1 - 8.4	1	3 / 3
	Aroclor-1260	5.4 - 6.3	1	2 / 3
FLOOR DRAINS	**Contaminants of Concern**	**Concentration Range Detected (ppm)[a]**	**SCG[b] (ppm)[a]**	**Frequency of Exceeding SCG**
Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	2.2 - 6.6	1	2 / 2
	Benzo(a)pyrene	3.4 - 6.9	1	2 / 2
	Benzo(b)fluoranthene	2.8 - 6.3	1	2 / 2
	Benzo(k)fluoranthene	2.4 - 4.8	1	2 / 2
	Chrysene	3.9 - 8.1	1	2 / 2
	Dibenz(a,h)anthracene	0.61 - 0.61	0.33	2 / 2
	Indeno(1,2,3-cd)pyrene	2.7 - 4.6	0.5	2 / 2
	pentachlorophenol	38.0 - 4.6	2.4	2 / 2
Inorganics Compounds	Cadmium	33.8 - 29.5	2.5	2 / 2
	Chromium	74.8 - 78.0	22/36	2 / 2
	Copper	792.0 - 690.0	270	2 / 2
	Lead	4440.0 - 4170.0	400	2 / 2
	Mercury	0.9 - 0.83	0.81	2 / 2

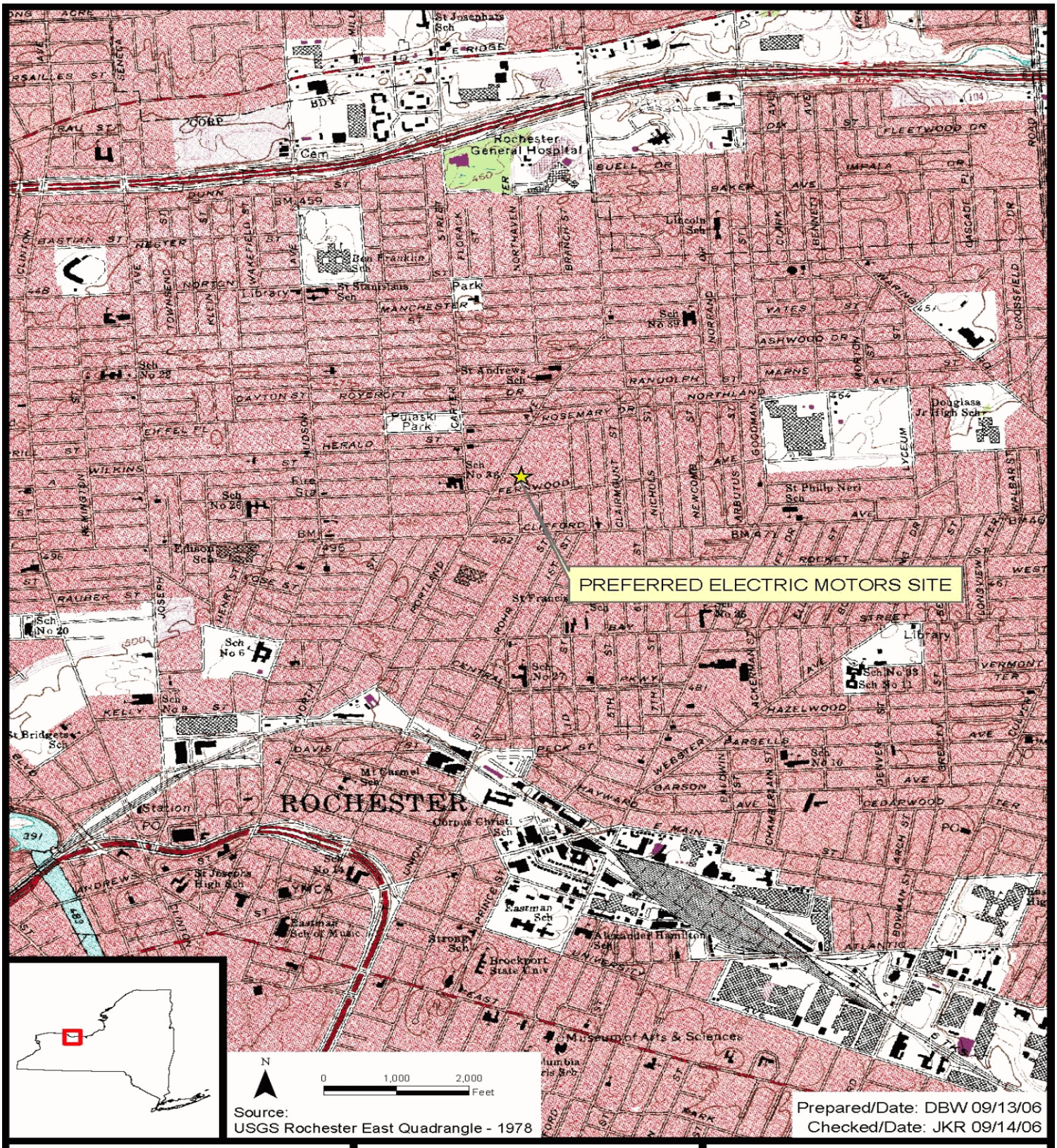
GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	0.4 - 2500	5	6 / 38
	1,1-Dichloroethane	2 - 730	5	7 / 38
	1,1-Dichloroethene	0.8 - 52	5	4 / 38
	Benzene	0.7 - 130	1	10 / 38
	Chloroform	0.81 - 11	7	1 / 38
	Cis-1,2-Dichloroethene	0.96 - 70	5	9 / 38
	Ethyl benzene	0.7 - 40	5	4 / 38
	Isopropylbenzene	1 - 15	5	4 / 38
	Tetrachloroethene	1.2 - 88	5	6 / 38
	Toluene	0.5 - 8	5	4 / 38
	trans-1,2-Dichloroethene	0.64 - 20	5	3 / 38
	Trichloroethene	0.6 - 400	5	15 / 38
	Vinyl chloride	1 - 34	2	7 / 38
	xylene -mp	0.18 - 110	5	4 / 38
Semivolatile Organic Compounds (SVOCs)	2,4-Dimethylphenol	1 - 1	1	1 / 3
Inorganic Compounds	Iron	618 - 8810	300	4 / 4
	Magnesium	27200 - 67900	35000	3 / 4
	Manganese	35.2 - 320	300	1 / 4
	Sodium	33700 - 114000	20000	4 / 4
	Chloride	14700 - 396000	250000	4 / 11
	Nitrate as N	940 - 10500	10000	1 / 11
	Sulfide	1650 - 1650	50	1 / 11
SEWER	**Contaminants of Concern**	**Concentration Range Detected (ppb)[a]**	**SCG[b] (ppb)[a]**	**Frequency of Exceeding SCG**
Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	1 - 5.5	NA	2 / 10
	1,1-Dichloroethane	1 - 2.9	NA	2 / 10
	Acetone	5 - 220	NA	10 / 10
	Benzene	1 - 1.2	NA	1 / 10
	Bromodichloromethane	1 - 1.1	NA	2 / 10
	Carbon Disulfide	1 - 1	NA	1 / 10
	Chloroform	1 - 6.4	NA	9 / 10
	Chloromethane	1 - 1	NA	1 / 10
	Cis-1,2-Dichloroethene	1 - 3	NA	6 / 10
	Toluene	1 - 7.9	NA	8 / 10
	Trichloroethene	1 - 1.6	NA	2 / 10
	Vinyl chloride	1 - 4	NA	1 / 10
	xylene,m/p	1 - 1.2	NA	1 / 10

SEWER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
SOIL VAPOR	**Contaminants of Concern**	**Concentration Range Detected ($\mu g/m^3$)[a]**	**SCG[b] (mcg/m^3)**	**Frequency of Exceeding SCG**
Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	9.2 - 130	NA	NA
	Cis-1,2-Dichloroethene	100 - 100	NA	NA
	Tetrachloroethene	2 - 11	NA	NA
	Trichloroethene	5.1 - 970	NA	NA
SUB SLAB SOIL VAPOR	**Contaminants of Concern**	**Concentration Range Detected ($\mu g/m^3$)[a]**	**SCG[b] (mcg/m^3)**	**Frequency of Exceeding SCG**
Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	6.7 - 2300	1000	1/16
	Tetrachloroethene	11 - 15	1000	0/16
	Trichloroethene	8.7 - 2800	250	1/16
AIR	**Contaminants of Concern**	**Concentration Range Detected ($\mu g/m^3$)[a]**	**SCG[b] (mcg/m^3)**	**Frequency of Exceeding SCG**
Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	0.14 - 3.5	NA	NA
	Tetrachloroethene	0.14 - 0.88	NA	NA
	Trichloroethene	0.14 - 29	NA	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, ppm, in soil;
$\mu g/m^3$ = micrograms per cubic meter
[b] SCG = standards, criteria, and guidance values;
TOGS 1.1.1
6 NYCRR Part 375

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	OM&M	Total Present Worth
No Action	$57,000	$728,000	$785,000
2	$256,000	$728,000	$984,000
3	$447,000	$9 65,000	$1,412,000
4	$483000	$610,000	$1,093,000
5	$610,000	$7 96,000	$1,406,000

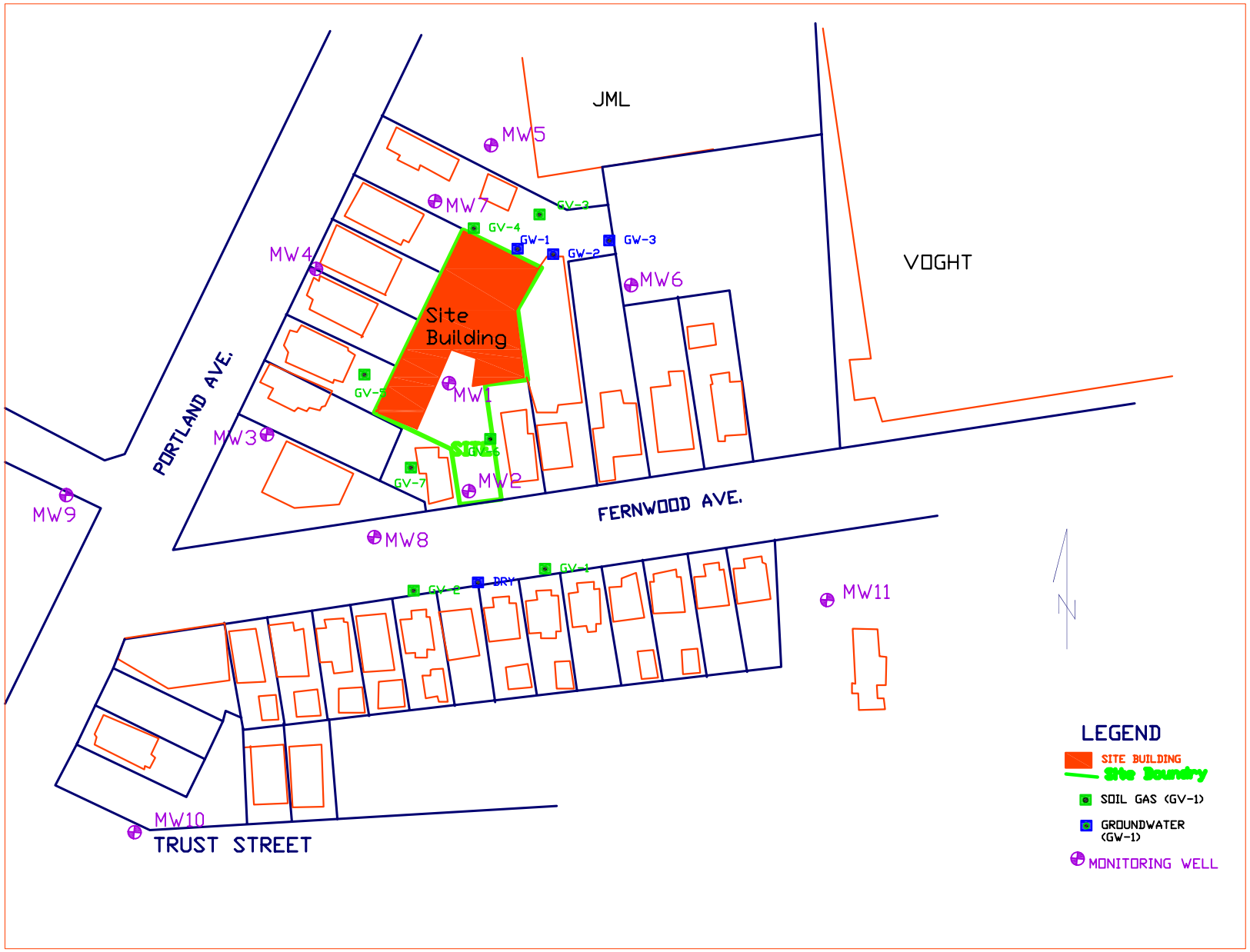


NYSDEC
Preferred Electric Motors Site
Rochester, New York

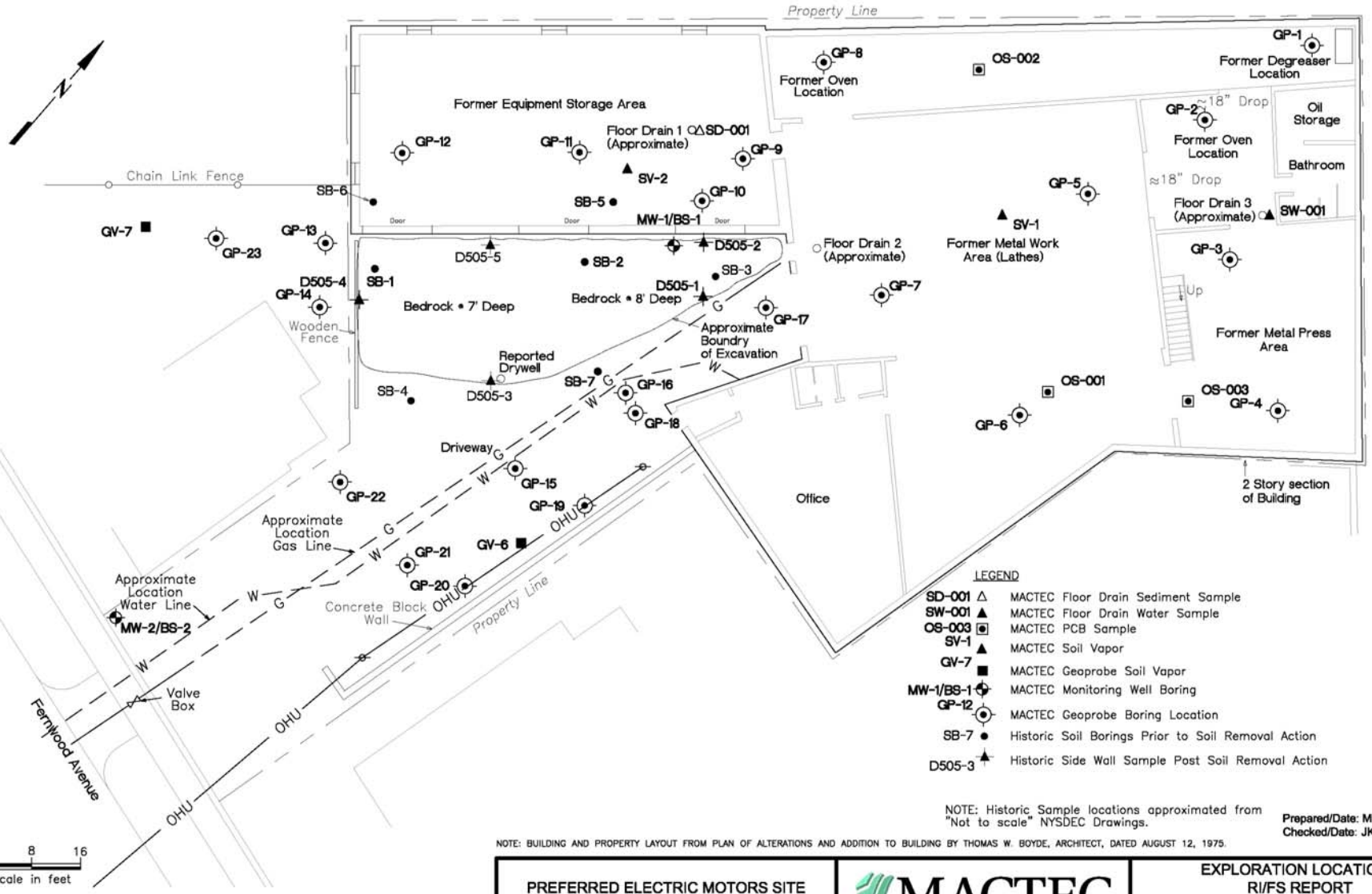
MACTEC

Site Location
RI/FS Report
Project 3612042020 Figure 1

LOCATION OF DRUM AND UST REMOVALS - FIGURE 2



WELLS, BORINGS AND SOIL GAS - FIGURE 3



NOTE: Historic Sample locations approximated from "Not to scale" NYSDEC Drawings.

Prepared/Date: MRS 10/26/06
Checked/Date: JKR 11/29/05

NOTE: BUILDING AND PROPERTY LAYOUT FROM PLAN OF ALTERATIONS AND ADDITION TO BUILDING BY THOMAS W. BOYDE, ARCHITECT, DATED AUGUST 12, 1975.

PREFERRED ELECTRIC MOTORS SITE
ROCHESTER, NEW YORK

MACTEC

EXPLORATION LOCATIONS
RI/FS REPORT
Project 3612042020
Figure 1

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PZ-1

PZ-2

JML Optical

Portland Avenue

MW-5
1,1,1-TCA 3 J
TCE 21
Cis-1,2-DCE 26

MW-7

JML-1
1,1,1-TCA ND
TCE 7 J
BTEX 3.8 J

GP-1
1,1,1-TCA ND
TCE 14
BTEX 130

MW-4
1,1,1-TCA ND
TCE 0.6 J

JML-2

MW-6
1,1,1-TCA ND
TCE 0.6 J

MW-1
1,1,1-TCA 2500 D
TCE 13 J
1,1-DCA 730
1,1-DCE 52
Cis-1,2-DCE 31 J
PCE 14 J
trans-1,2-DCE 12 J
Vinyl chloride 31 J
BTEX 218 J

Preferred Electric Motors Site

MW-3
1,1,1-TCA ND
TCE ND
BTEX 61 J

MW-2
1,1,1-TCA 7 J
TCE 87
1,1-DCA 140
Cis-1,2-DCE 14
PCE 9 J
Vinyl chloride 6 J
BTEX 40.1 J

MW-9

MW-8

Fernwood Avenue

MW-11

MW-10

Trust Street

Legend

- Sewer Mains
- Site Boundary
- Buildings
- Property Lines
- MACTEC Well (shallow Bedrock)
- JML Well (overburden)
- Geoprobe Groundwater
- Microwell

Notes:
2002 Aerial photo from NYS GIS Clearinghouse.
Wells Surveyed by Lu Engineering.
Samples collected by Mactec in June 2005.
1,1,1-TCA + TCE results shown for all sample locations.
If no results shown, no samples were collected from that location.
All results shown in µg/L. BOLD indicates exceedence of NYS Criteria.

N

0 50 100 Feet

Prepared/Date: DBW 10/27/06
Checked/Date: JKR 10/28/06

NYSDEC
Preferred Electric Motors Site
Rochester, New York

MACTEC

Phase I GW Results - VOC's Round 1
Results June 2005
Project 3612042020 Figure 5

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PZ-1
1,1,1-TCA ND
TCE ND

PZ-2
1,1,1-TCA ND
TCE 4 J

JML Optical

Portland Avenue

JML-1
1,1,1-TCA 0.4 J
TCE 50

JML-2
1,1,1-TCA ND
TCE ND

MW-5
1,1,1-TCA 17
TCE 21
1,1-DCA 14
Cis-1,2-DCE 28

MW-7
1,1,1-TCA ND
TCE ND

MW-4
1,1,1-TCA ND
TCE ND

MW-6
1,1,1-TCA ND
TCE 1 J

MW-1
1,1,1-TCA 1500
TCE 12 J
1,1-DCA 590
1,1-DCE 47 J
Cis-1,2-DCE 35 J
PCE 13 J
trans-1,2-DCE 15 J
Vinyl chloride 29 J
BTEX 164 J

Preferred Electric Motors Site

MW-2
1,1,1-TCA 95
TCE 400
1,1-DCA 550
1,1-DCE 25 J
Cis-1,2-DCE 70
PCE 88
Vinyl chloride 27 J
BTEX 147 J

MW-3
1,1,1-TCA ND
TCE ND

MW-9
1,1,1-TCA ND
TCE 0.9 J

Fernwood Avenue

MW-8
1,1,1-TCA ND
TCE ND

Dry

MW-11
1,1,1-TCA ND
TCE ND

Trust Street

MW-10
1,1,1-TCA ND
TCE ND

Legend

- Sewer Mains
- Site Boundary
- Buildings
- Property Lines
- MACTEC Well (shallow Bedrock)
- JML Well (overburden)
- Groundwater
- Microwell

Notes:
2002 Aerial photo from NYS GIS Clearinghouse.
Wells Surveyed by Lu Engineering.
Samples collected by Mactec in April 2006.
1,1,1-TCA + TCE results shown for all sample locations.
If no results shown, no samples were collected from that location.
All results shown in µg/L. BOLD indicates exceedence of NYS Criteria.

N
0 50 100
Feet

Prepared/Date: DBW 10/27/06
Checked/Date: JKR 10/28/06

NYSDEC
Preferred Electric Motors Site
Rochester, New York

MACTEC

Phase II GW Results - VOC's Round 3
Results April 2006
Project 3612042020 Figure 6

PZ-1
474.03

PZ-2
473.31

MW-5
473.66

MW-7
475.79

MW-4
475.21

JML-1

JML-2

MW-6
477.51

MW-1
475.89

MW-3
474.39

MW-9
476.24

MW-2
474.27

MW-8*
476.94

MW-11
477.65

MW-10
476.5

474
475
476
477
478

Portland Avenue

Fernwood Avenue

Trust Street

Legend

Type

- Mactec Microwell (not measured)
- MACTEC Well (shallow Bedrock)
- JML Well (overburden)
- Interpreted Potentiometric Surface
- Interpreted Potentiometric Surface (inferred)
- Interpreted Groundwater Flow Direction

- Site Boundary
- Buildings
- Property Lines
- Sewer Mains

Notes:
Water levels collected 5/1/2006 (JML wells and MW-8* not used in contouring)
2002 Aerial photo from NYS GIS Clearinghouse.

N
0 60 120
Feet

Prepared/Date: CRS 01/18/07
Checked/Date: JWP 01/25/07

NYSDEC
Preferred Electric Motors Site
Rochester, New York

MACTEC

Groundwater Contours May 06
RI/FS Report
Project 3612042020 Figure 7

LOCATION OF PROPOSED SOIL REMOVAL & WELLS- FIGURE 8