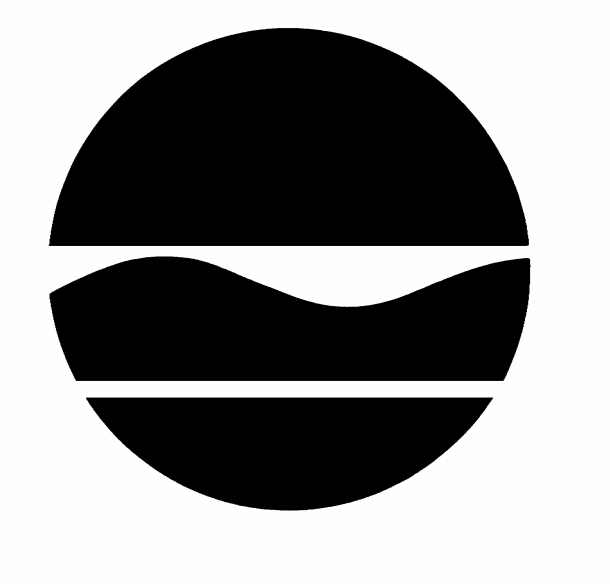
PROPOSED REMEDIAL ACTION PLAN
METAL ETCHING CO., INC.
Freeport, Nassau County, New York
Site No. 130110

February 2007



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 Metal Etching Co., Inc 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, historical operations and waste disposal practices have resulted in the disposal of hazardous wastes, including volatile organic compounds (VOCs) and metals. These wastes have contaminated the soil, groundwater, and sediment at the site, and have resulted in:

- a significant threat to human health associated with current and potential exposure to soil, soil vapor, and groundwater.

- a significant environmental threat associated with the current and potential impacts of contaminants to soil, groundwater, and sediment.

To eliminate or mitigate these threats, the Department proposes the excavation of VOC and metals hot spots, limited excavation of sediments in Freeport Creek, continued operation of the on-site sub-slab depressurization systems, and monitoring of groundwater.

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 January 2007 "Remedial Investigation (RI) Report", the January 2007 Feasibility Study (FS), and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

Freeport Memorial Library
144 West Merrick Road
Freeport, NY 11520
(516) 379-3274

NYSDEC Region 1 Headquarters
SUNY Campus
Loop Road Building 40
Stony Brook, NY 11790-2356
Attn: William Fonda
(631) 444-0350

NYSDEC Central Office
11th Floor, 625 Broadway
Albany, NY 12233-7015
Attn: Heide-Marie Dudek, P.E.
(518) 402-9622

The Department seeks input from the community on all PRAPs. A public comment period has been set from February 12, 2007 to March 12, 2007 to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for March 1, 2007 at the Freeport Library beginning at 7:00 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. Heide-Marie Dudek, P.E. at the above address through March 12, 2007.

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 Metal Etching site (site) is located in Nassau County at 435 South Main Street, Freeport, New York, adjacent to the Freeport Creek. A Site Location Map is presented as Figure 1. The site is approximately 1.05 acres (Figure 2). The site is currently used as a boat dealership, marina, and boat storage yard. Two buildings, a 2,400 sq ft maintenance building and a 1,200 sq ft office building, occupy the site. In addition to these buildings, a large two story boat storage rack is located along the southern border of the study area. The site is bounded to the north by Ray Street, to the west by South Main Street, and the south by Freeport Creek. The topography of the site is relatively flat, with a bulkhead along Freeport Creek.

The site is underlain by glacial outwash deposits that generally consist of varying amounts of sand, silt, and clay. The upper three to four feet of material on the eastern portion of the study area is made up of a densely compacted fill material consisting mainly of gravel and debris (such as brick and wood timbers). Below the fill material is a highly organic humus horizon composed of plant organics and shells. This horizon occurs between four and 11 feet below ground surface (bgs). Well-sorted sands and silts are present below this horizon to approximately 30 feet bgs. Between 30 and 35 feet bgs, clay was encountered. The total depth of the clay was not determined. However, the United States Geological Service (USGS) records indicate that this clay layer is approximately 20 feet in thickness.

Groundwater within the site, which is encountered between three to five feet bgs, is tidally influenced with radial flow towards Freeport Creek. Due the study area's proximity to Freeport Creek, the shallow

groundwater encountered at the study area is saline and therefore unsuitable for drinking. The nearest public supply well is located approximately 6,000 feet north (upgradient) of the study area, and thus is not impacted by the study area's contamination.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

According to available documents, the site has been used for commercial purposes since sometime prior to 1966. The exact date is unknown. Flores Manufacturing, a producer of handbags, operated at the site until 1966. Flores Manufacturing's handbag production process included decorative plating using nickel, chrome, and cadmium. From 1966 to 1999, Metal Etching Corporation manufactured metal nameplates, instrument panels, rulers, and miscellaneous plated products at the site. The process included anodizing, chromate conversion, and chrome/nickel plating. From 1973 to 1982, Metal Etching Corporation operated under the name of Plastic Associates. From 1982 until 1999, the company operated under the Metal Etching Corporation. All operations at the facilities were terminated by 1999. Most site buildings were demolished by 2001.

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 2001, during the site building demolition, limited decontamination and investigatory work was performed under the oversight of NYSDEC. Two 4000-gallon tanks, which formerly contained ferric chloride, were decontaminated and removed. The concrete floor of the demolished building was also cleaned.

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: Freeport Creek Associates, LLC; Metal Etching Company, Inc.; Plastics Associates (P.A. Industries); and Flores Manufacturing.

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 May 2004 and March 2005. The field activities and findings of the investigation are described in the RI report.

The Site RI was conducted using the Triad Approach to investigate site groundwater, soil, sediment, surface water, soil vapor, and indoor air. The Triad Approach is a dynamic methodology that allows for real-time data management to guide the field investigations. The remedial study area includes the 1.05 acre site and an additional 1.01 acres located immediately to the south and east that are operated with the site as one parcel Major components of the RI included a utility survey and geophysical investigation, on-site and off-site soil gas survey, tidal study, indoor air sampling, and soil, groundwater, sediment and surface water sampling.

5.1.1: Standards, Criteria, and Guidance (SCGs)

To determine whether the soil, groundwater, sediment, soil vapor and indoor 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)

- Sediment SCGs are based on the Department's "Technical Guidance for Screening Contaminated Sediments."

- 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.

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, soil vapor, indoor air, surface water and sediment samples were collected to characterize the nature and extent of contamination. As seen in Figures 3 through 10, the main categories of contaminants that exceed their SCGs are VOCs, and inorganics (metals). Primary VOCs detected include tetrachloroethene (PCE) and its degradation products trichloroethene (TCE), 1,2-dichloroethene (DCE), and vinyl chloride (VC). Other VOCs detected above their respective SCG include benzene, toluene, ethylbenzene, xylene, methyl tertiary-butyl ether (MTBE), naphthalene, and chlorobenzene. Metals detected are ubiquitous with historical industrial activites and include, but are not limited to, chromium, copper, nickel, and zinc. 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, and sediment. Air samples are reported in micrograms per cubic meter ($\mu g/m^3$).

Figures 3 through 10 summarize the degree of contamination for the contaminants of concern in soil and groundwater 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.

Subsurface Soil

The study area soil was characterized by the installation of 69 borings, collection of 273 soil samples which were analyzed for VOCs and metals. As presented in Figure 3, 25 samples at 17 sample locations detected VOCs above their respective SCGs. Benzene, toluene, ethylbenzene, xylene, MTBE, naphthalene, chlorobenzene, PCE, TCE, DCE, and VC were detected above their respective SCGs (Table 1). The distribution of VOCs in soil can be described as four different areas; eastern area, western area, eastern central area, and western central area. The contamination in the eastern portion of the site is predominately petroleum related compounds, with exceedances of ethylbenzene, chlorobenzene, and xylene. In the western portion of the site, near the location of the former fuel oil underground storage tank (UST), xylene and naphthalene were detected above their SCG.

The central portion of the site is divided into the eastern central area and the western central area. The western central area is at the southend side of the 1,200 sq ft building, slightly west of the former plating building. Only TCE was detected above its SCG in this area. The eastern central area of the site is located south of the 2,400 sq ft building and includes the former waste storage/drum storage area. PCE, TCE, and MTBE were the most frequently detected VOCs in this area that exceeded their SCGs. PCE concentrations ranged from non-detect (ND) to 4.3 ppm. TCE concentrations ranged from ND to 10 ppm, while MTBE concentrations ranged from ND to 1.5 ppm. Breakdown compounds of PCE and TCE were also detected in this area, but did not exceed their respective SCGs.

Metals were ubiquitously found across the site at concentrations exceeding their SCGs. The presence of metals in the soil is likely the result of historical activities, airborne pollution from the facility, and natural sources. The predominant constituents of concern are chromium, copper, nickel, and zinc (Table 1). In general, these metals were found at the highest concentrations in the upper seven feet of the soil. As shown on Figure 4, concentrations of metals decrease with depth.

In addition to the on-site soil study, two samples were collected from the existing on-site storm system during the remedial investigation and analyzed for VOCs, SVOCs, pesticides/PCBs and metals. The metals, nickel, copper, and zinc, were detected at concentrations exceeding SCGs (Table 1)

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

Groundwater

The groundwater investigation was completed in two stages. The initial phase collected groundwater samples from the 65 borings installed as part of the soil investigation. The groundwater samples were collected at the water table of each boring and analyzed for VOCs and metals. The data collected during the initial phase was then used to locate 10 permanent monitoring wells on the site. Seven wells were installed at the water table interface, while at three locations an additional well was installed to approximately 30 feet bgs directly above the clay layer.

VOCs, predominately MTBE and PCE (with its degradation products TCE, DCE, and VC) were detected in both the initial phase samples and the subsequent monitoring well samples (Table 1 and Figures 5 through 10).

PCE was detected at the water table at concentrations ranging from ND to 250 ppb, while at depth it was detected at concentrations ranging from ND to 1,600 ppb. The highest concentrations of PCE were at depth, were detected west and south of the 2,400 sq ft building in monitoring wells MW-2D and MW-7D. Concentrations of TCE, DCE, and VC followed a similar distribution pattern as PCE, with the frequency of DCE and VC detections rising as PCE and TCE detections declined. The concentration detected and the distribution pattern of the VOCs substantiates that degradation is occurring in the subsurface.

MTBE, a former component of gasoline, was detected across the site at concentrations ranging from ND to 2,100 pbb. The highest concentration of MTBE was located in the area of a suspected UST south west of the 2,400 sq ft building.

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

Surface Water

Eight surface water samples were collected from Freeport Creek in conjunction with sediment samples along the perimeter of the site. Two VOCs (ethylbenzene and xylene) along with one metal (copper) were detected above their SCG (Table 1). These detections were most likely due to boating activities in the area and are not considered related to the site.

No site-related surface water contamination of concern was identified during the RI/FS. Therefore, no remedial alternatives need to be evaluated for surface water.

Sediments

Eight sediment samples were collected in Freeport Creek along the site perimeter and analyzed for VOCS, semivolatile organics (SVOCs), pesticides, PCBs, and metals. No site related SVOCs, pesticides and PCBs were detected at concentrations exceeding their SCGS. Three metals, nickel, chromium and zinc were detected in two sediment samples above their SCGs (Table 1) at two locations.

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

Soil Vapor/Sub-Slab Vapor/Air

To assess the potential for migration of VOCs emanating from contaminated groundwater or soil, a soil vapor survey was conducted within the study area from July 2004 through March 2005. Initially Gore Sorber samplers were used to collect soil vapor samples at the site. PCE and/or TCE was detected in each sample. Based on this data, a soil vapor intrusion study was completed at the two on-site buildings. Subslab vapor samples and indoor air samples were collected at each building. The subslab vapor sample collected at the 1,200 sq ft building reported PCE at 292 ug/m3 and TCE at 187 ug/m3. The indoor air sample taken at this building was non-detect for PCE and had a reported TCE concentration of 1 ug/m3. The subslab vapor sample collected at the 2,400 sq ft building, reported PCE at 5,772 ug/m3 and TCE at 16,014 ug/m3. Indoor air sample results at this building reported PCE at 1 ug/m3 and TCE at 2 ug/m3. An indoor air study was conducted off-site from December 2005 to October 2006, no indoor air issues were noted.

Soil vapor and indoor air contamination identified during the RI/FS was addressed during the IRM 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.

Mitigation measures were taken at the two on-site buildings to address potential human exposures (via inhalation) to volatile organic compounds associated with soil vapor intrusion. Sub-slab depressurization systems were installed beneath each building , each system uses an in-line ventilation fan to vent vapors from beneath the buildings.

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 5 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.

Contact exposure to on-site contaminated surface and sub-surface soil is a potential exposure pathway. However, the majority of the site is covered with concrete or gravel therefore, contact exposure is not likely. In addition, the site is surrounded by a fence further minimizing the potential for public exposure.

Ingestion of on-site contaminated groundwater is a potential exposure pathway. However, the area is served with public water and therefore, ingestion exposure is not likely.

On-site inhalation exposure of contaminated indoor air via vapor intrusion is a potential exposure pathway. However, mitigation systems have been installed on both on-site buildings; therefore, the exposure to contaminated soil vapor is minimized. The potential for soil vapor intrusion and resulting inhalation exposures at off-site structures has been evaluated and site-related contamination has not been found to impact off-site structures.

Ingestion and direct contact exposure with contaminated surface water and/or sediment in the Freeport Creek is a potential exposure pathway. However, direct contact and/or ingestion exposure is not likely due to limited access to the creek for public receptors. In addition, the site is located in a highly industrialized stretch of the Freeport Creek, which is not likely to be used for recreational use.

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 existing and potential impacts from the site to fish and wildlife receptors.

The following environmental exposure pathways and ecological risks have been identified:

- Sediments in the Freeport Creek, a tidal estuary, may become affected by surface water run-off containing levels of metals that may affect survival of benthic organisms and may bioaccumulate in fish.

However, based upon the fish and wildlife resources and exposure pathways identified in this assessment, and the results of the screening analysis, no site-related adverse impacts to fish and wildlife resources have occurred or are expected to occur on, adjacent to, or within a 0.5-mile radius of the Former Metal Etching Site, with the possible exception of the storm drain, sanitary sewer, and sediments in the vicinity of SED-04.

Site contamination has also impacted the groundwater resource in the surficial aquifer.

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 VOCs and metals in soil, groundwater, sediment, and indoor air;
- environmental exposures of flora or fauna to VOCs and metals in soil, groundwater, and sediment;
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and
- the release of contaminants from soil and groundwater into indoor air through soil vapor.

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 Metal Etching Co, Inc Site 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, sediments, surface water, groundwater, soil vapor, and indoor air at the site.

Alternative 1: No Further Action

The No Further Action alternative recognizes remediation of the site conducted under a previously completed IRM. To evaluate the effectiveness of the remediation completed under the IRM, only continued monitoring is necessary.

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: Surface Cover, Soil Vapor Extraction, and Monitored Natural Attenuation

Present Worth: *$2,200,000*
Capital Cost: *$250,000*
Annual Costs:
(Years 1-30): *$64,000*

Alternative 2 (Figure 11) would be comprised of the following actions: installation and maintenance of a surface cover, installation of a Soil Vapor Extraction (SVE) system, monitored natural attenuation of groundwater and sediment, removal of sediment from the on-site storm water system, closure and removal of any USTs, continued operation of the sub-slab depressurization systems and an environmental easement.

Under this alternative potential contact with site contamination would be reduced and/or eliminated with the installation of an asphalt or ballast cover across exposed portions of the site. An SVE system would be used to remediate VOC contamination within the vadose zone, thereby reducing the ongoing source of groundwater contamination. The system would be installed in three segments: one segment would be installed along the eastern portion of the site, the second segment along the north east portion of the site, and the third segment along the southern portion of the site. The sub-slab depressurization systems installed as an IRM would continue to operate under this alternative.

Additionally, groundwater and sediment would be monitored to confirm that attenuation of contaminants continues.

To ensure compliance with the objectives of this alternative, an environmental easement would be put in place requiring a site management plan. The site management plan would be developed to: i) address residual contaminated soils that may be excavated from the site during future redevelopment. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; ii) provide maintenance of the surface cover; iii) provide long-term groundwater monitoring; iv) provide operation and maintenance of the sub-slab depressurization system and SVE system; v) evaluate the potential for vapor intrusion for buildings developed on the site, including provision for mitigation of any impacts identified; vi) and identify any use restrictions.

Alternative 3: Hot Spot Excavation to Water Table, Surface Cover, Sediment Removal, and Groundwater Monitored Attenuation

Present Worth: *$2,200,000*
Capital Cost: *$1,500,000*
Annual Costs:
(Years 1-30): *$23,000*

Alternative 3 (Figure 12) would be comprised of the following actions: hot spot excavation limited to the depth of the groundwater table, installation and maintenance of a surface cover, limited sediment removal from Freeport Creek, monitoring of groundwater, removal of sediment from the on-site storm water system, closure and removal of any USTs, continued operation of the sub-slab depressurization systems and an environmental easement.

Under this alternative potential contact with site contamination would be reduced and/or eliminated, and the source of continuing groundwater contamination removed by excavation of soils with VOCs and metals exceeding their respective SCGs to the extent practical. Excavation would be limited to the depth of the groundwater table approximately 5 feet bgs. Excavated soil would be disposed of properly at an off-site facility. Remaining subsurface contamination would be assessed based upon sampling of the groundwater. Excavated areas would be backfilled with soil meeting the requirements of 6 NYCRR Part 375. Areas that are currently not covered, and where excavation is not practicable, will receive a cover of asphalt or ballast underlain by a demarcation layer.

During the remedial design, further delineation of Freeport Creek sediment contamination will be completed in the area of SED-04. Results of this delineation will determine the bounds of the limited sediment removal within Freeport Creek.

Upon completion of the excavation activities, groundwater would be monitored to confirm the effectiveness of the remedy.

To ensure compliance with the objectives of this alternative, an environmental easement would be put in place requiring a site management plan. The site management plan would be developed to: i) address residual contaminated soils that may be excavated from the site during future redevelopment. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; ii) provide maintenance of the surface cover; iii) provide long-term groundwater monitoring; iv) provide operation and maintenance of the sub-slab depressurization system; v) evaluate the potential for vapor intrusion for buildings developed on the site, including provision for mitigation of any impacts identified; vi) and identify any use restrictions.

Alternative 4: Hot Spot Excavation to 14 feet bgs, Backfill with Zero Valent Iron (ZVI), Limited Sediment Removal, and Groundwater Monitored Attenuation

Present Worth: *$4,800,000*
Capital Cost: *$4,100,000*
Annual Costs:
(Years 1-30): *$22,000*

Alternative 4 (Figure 13) would be comprised of the following actions: hot spot excavation to the depth of 14 feet bgs, backfill with a soil and zero valent iron (ZVI) mixture, installation and maintenance of a surface cover, limited sediment removal from Freeport Creek, monitoring of groundwater, removal of sediment from the on-site storm water system, closure and removal of any USTs, continued operation of the sub-slab depressurization systems and an environmental easement.

Under this alternative potential contact with site contamination would be reduced and/or eliminated, and the source of continuing groundwater contamination removed by excavation of soils with VOCs and metals exceeding their respective SCGs to the extent practical. Excavation would be limited to a depth of 14 feet bgs. Excavated soil would be disposed of properly at an off-site facility. Remaining subsurface contamination would be assessed based upon sampling of the groundwater. Excavated areas would be backfilled with a soil and ZVI mixture to help accelerate groundwater attenuation. Areas that are currently not covered, and where excavation is not practicable, will receive a cover of asphalt or ballast underlain by a demarcation layer.

During the remedial design, further delineation of Freeport Creek sediment contamination will be completed in the area of SED-04. Results of this delineation will determine the bounds of the limited sediment removal within Freeport Creek.

Upon completion of the excavation and backfill activities, groundwater would be monitored to confirm the effectiveness of the remedy.

To ensure compliance with the objectives of this alternative, an environmental easement would be put in place requiring a site management plan. The site management plan would be developed to: i) address residual contaminated soils that may be excavated from the site during future redevelopment. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; ii) provide maintenance of the surface cover; iii) provide long-term groundwater monitoring; iv) provide operation and maintenance of the sub-slab depressurization system; v) evaluate the potential for vapor intrusion for buildings developed on the site, including provision for mitigation of any impacts identified; vi) an identify any use restrictions.

Alternative 5: Hot Spot Excavation to 14 feet bgs, SVE System, ZVI Wall, and Limited Sediment Removal

Present Worth: *$8,400,000*
Capital Cost: *$7,300,000*
Annual Costs:
(Years 1-30): *$35,000*

Alternative 5 (Figure 14) would be comprised of the following actions: hot spot excavation to a maximum depth of 14 feet bgs, installation of a SVE system, installation of a ZVI wall, limited sediment removal from Freeport Creek, removal of sediment from the on-site storm water system, closure and removal of any USTs, continued operation of the sub-slab depressurization systems and an environmental easement.

Under this alternative potential contact with site contamination would be reduced and/or eliminated, and the source of continuing groundwater contamination removed by excavation of soils with VOCs and metals exceeding their respective SCGs to the extent practical. Depth of excavation would be limited to 14 feet bgs. Excavated soil would be disposed of properly at an off-site facility. Excavated areas would be backfilled with soil meeting the requirements of 6 NYCRR Part 375. Areas that are currently not covered, and where excavation is not practicable, will receive a cover of asphalt or ballast underlain by a demarcation layer.

To address residual groundwater contamination, an ZVI wall would be installed on-site to intercept groundwater flow to Freeport Creek.

Additionally, to treat residual VOC contamination beneath the existing site buildings, a SVE system would be installed.

During the remedial design, further delineation of Freeport Creek sediment contamination will be completed in the area of SED-04. Results of this delineation will determine the bounds of the limited sediment removal within Freeport Creek.

To ensure compliance with the objectives of this alternative, an environmental easement would be put in place requiring a site management plan. The site management plan would be developed to: i) address residual contaminated soils that may be excavated from the site during future redevelopment. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; ii) provide maintenance of the surface cover; iii) provide maintenance of the ZVI wall; iv)long-term groundwater monitoring; v) provide operation and maintenance of the sub-slab depressurization system and SVE system; vi) evaluate the potential for vapor intrusion for buildings developed on the site, including provision for mitigation of any impacts identified; vii) an identify any use restrictions.

Alternative 6: Excavation of all Contaminated Soil to 14 feet bgs, ZVI Wall, and Limited Sediment Removal

Present Worth: *$26,000,000*
Capital Cost: *26,000,000*
Annual Costs:
(Years 1-30): *$12,000*

Alternative 6 (Figure 15) would be comprised of the following actions: excavation of contamination to a maximum depth of 14 feet bgs, installation of a ZVI wall, limited sediment removal from Freeport Creek, removal of sediment from the on-site storm water system, closure and removal of any USTs, continued operation of the sub-slab depressurization systems and an environmental easement.

Under this alternative potential contact with site contamination would be reduced and/or eliminated, and the source of continuing groundwater contamination removed by excavation of soils with VOCs and metals exceeding their respective SCGs. Depth of excavation would be limited to 14 feet bgs. To facilitate the removal of VOC contaminated soil beneath the on-site buildings, the buildings would be removed. Excavated soil would be disposed of properly at an off-site facility. Excavated areas would be backfilled with soil meeting the requirements of 6 NYCRR Part 375.

To address any residual groundwater contamination, an ZVI wall would be installed on-site to treat and intercept groundwater flow.

During the remedial design, further delineation of Freeport Creek sediment contamination will be completed in the area of SED-04. Results of this delineation will determine the bounds of the limited sediment removal within Freeport Creek.

To ensure compliance with the objectives of this alternative, an environmental easement would be put in place requiring a site management plan. The site management plan would be developed to: i) address residual contaminated soils that may be excavated from the site during future redevelopment. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; ii) provide maintenance of the surface cover; iii) provide maintenance of the ZVI wall; iv)long-term groundwater monitoring; v) provide operation and maintenance of the sub-slab depressurization system; vi) evaluate the potential for vapor intrusion for buildings developed on the site, including provision for mitigation of any impacts identified; vii) and identify any use restrictions.

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 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.

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-Effectivness. 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.

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 3, (Hot Spot Excavation to Water Table, Surface Cover, Sediment Removal, and Groundwater Monitored Attenuation) 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 alternatives presented in the FS.

Alternative 3 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the remaining criteria described in Section 7.2. Alternative 3 would achieve the remedial goals (as described in Section 6) by eliminating the most significant source of contamination in the soil. By removing the source area, it would create the conditions needed to restore groundwater quality to the extent practicable. Alternatives 2, 4, 5, and 6 would also comply with these threshold criteria, however they do not present the best balance for the remaining criteria.

Because Alternatives 2 through 6 satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Alternatives 2 through 5 all have short term impacts that are easily controlled by standard construction means. However Alternatives 4 and 5, in comparison to Alternatives 2 and 3, would have a greater impact in the short term due to the necessity for dewatering the excavation area and soil. Alternative 6, due to the extensive nature of its excavation and the building demolition, would have the greatest impact on the surrounding areas and the potential risk to workers is the greatest.

Achieving long-term effectiveness is best accomplished by excavation and removal of the source of groundwater contamination, such as proposed in Alternatives 3 through 6. Alternative 3 is favorable because it removes, to the extent practicable, the vadose zone source of groundwater contamination. Since the majority of the VOC and metal contamination in the soil is located in the vadose (above the groundwater table), Alternative 3 would result in the removal of the majority of the source area without having to excavate into the groundwater.

All Alternatives proposed are implementable, however of the six alternatives, Alternatives 4, 5, and 6 require excavation below the groundwater table. This type of excavation activity will require dewatering of the excavation and soil, treatment of dewatering water, and the potential need for shoring or benching of the excavation. While these requirements are implementable, due to the constraints of the site size, the brackish nature of the site groundwater, and the tidal influence of Freeport Creek, Alternatives 4, 5, and 6 will be more difficult to implement than Alternative 3 (which does not require excavation below the groundwater table). In addition to the excavation implementation issues, Alternatives 5 and 6 require a ZVI wall. The ZVI wall may be difficult to construct due to the tidal influence of Freeport Creek and the space limitations of the site.

With the exception of Alternative 1 and 2, the other alternatives reduce the volume, and thereby the toxicity and mobility, of waste on-site via soil excavation. The extent of excavation varies by alternative. The anticipated volumes of removal for Alternatives 3, 4, 5, and 6 are 1,650 cubic yards (cy), 4,871 cy, 6,857 cy, and 46,667 cy, respectively.

Alternatives 2 and 3 would also achieve reduction in toxicity, mobility, and volume through natural attenuation of the VOCs in the groundwater. Whereas, Alternatives 4, 5, and 6 use natural attenuation augmented by zero valence iron degradation of VOCs to further reduce toxicity, mobility, and volume.

The cost of alternatives varies significantly. As the volume of soil excavated increases, the level of complexity of the excavation increases, thereby further increasing cost. The costs for Alternative 2 through 6 are presented in Table 2.

The estimated present worth cost to implement the remedy is $2,200,000. The cost to construct the remedy is estimated to be $1,500,000 and the estimated average annual costs for 30 years is $23,000/yr..

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. This will include delineating the boundaries of sediment excavation within Freeport Creek.

2. Hot spot excavation, to the extent practicable, of VOC and metal contaminated soil to the depth of groundwater table. Excavated material would be disposed of properly at an off-site facility. Excavated areas would be backfilled with soil meeting the requirements of 6 NYCRR Part 375.

3. Sediment in the on-site stormwater system would be removed and disposed of properly at an off-site facility.

4. Determination if any USTs still exist on-site would be completed. If USTs are present, they would be closed and removed in accordance with NYSDEC regulations.

5. Areas that are not currently covered, and where excavation is not practicable, would receive a cover of asphalt or ballast underlain by a demarcation layer.

6. Upon completion of the additional Freeport Creek Study and delineation of site related contamination in the area of SED-04, a limited sediment removal from Freeport Creek would be completed.

7. A long-term groundwater monitoring program will be implemented to confirm the effectiveness of the remedy.

8. Imposition of an institutional control in the form of an environmental easement that would require (a) limiting the use and development of the property to commercial use, which would also permit industrial use, in conformance of local zoning; (b) compliance with the approved site management plan; (c) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; and (d) submission of a periodic certification of institutional and engineering controls to the Department by the property owner.

9. 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 below the soil

cover's demarcation layer, pavement, or buildings. Excavated soil would be tested, properly handled to protect the health and safety of workers and the nearby community, and would be properly managed in a manner acceptable to the Department; (b) continued evaluation of the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified; (c) monitoring of soil vapor and groundwater; (d) identification of any use restrictions on the site; and (e) provisions for the continued proper operation and maintenance of the components of the remedy.

10. 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.

11. 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.

Since the remedy results in untreated hazardous waste remaining at the site, a long-term monitoring program would be instituted. A groundwater monitoring program will be implemented This program would allow the effectiveness of the remedy to be monitored and would be a component of the long-term management for the site.

Table 1
Metal Etching Standards, Criteria, and Guidance

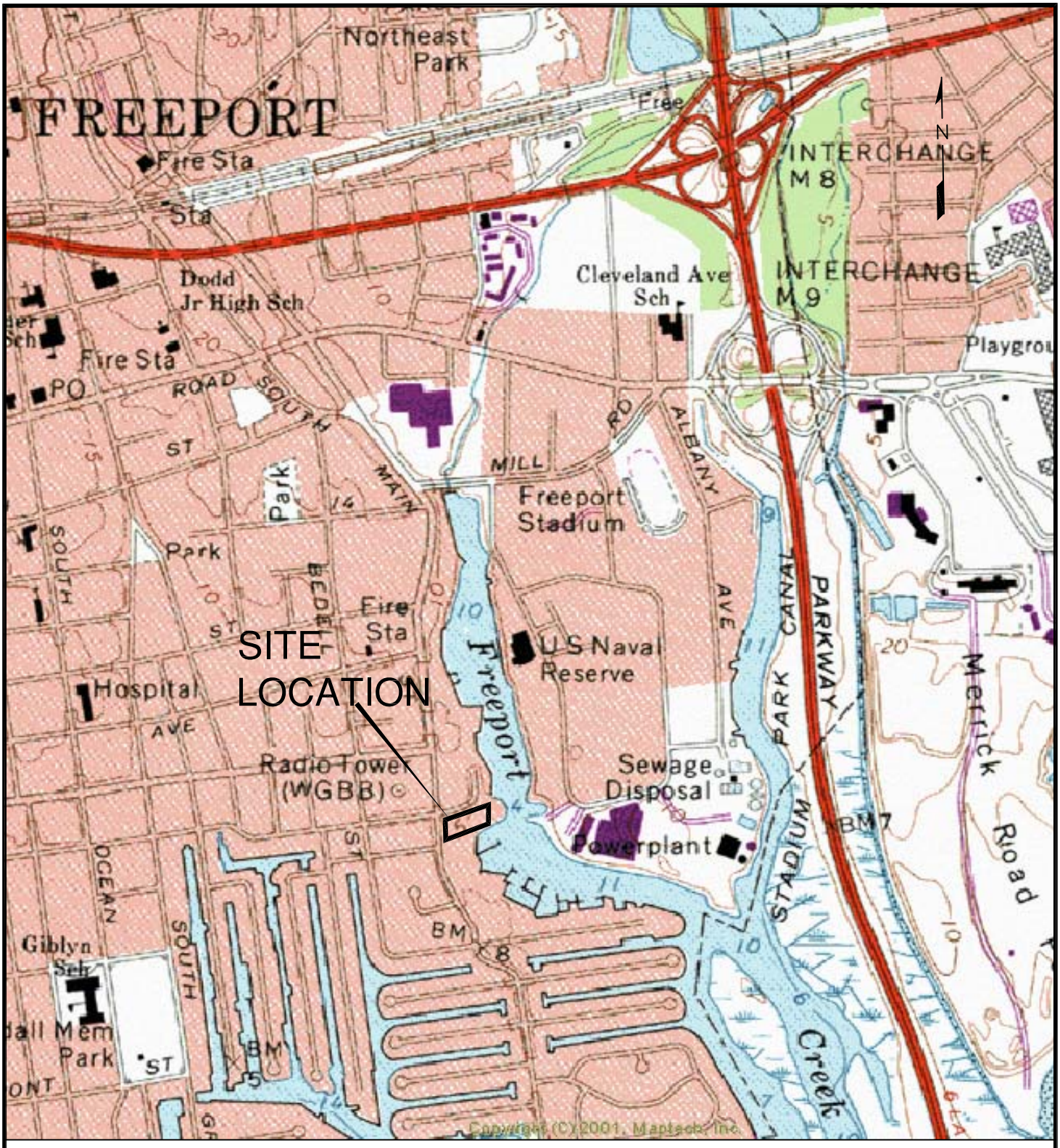
Subsurface Soil	Constituent	SCG	Units
Volatile Organic Compounds (VOCs)	Tetrachloroethene (PCE)	1.4	ppm
	Trichloroethene (TCE)	0.7	ppm
	1,2-Dichloroethene (DCE)	0.3	ppm
	Vinyl Chloride	0.2	ppm
	Benzene	0.06	ppm
	Toluene	1.5	ppm
	Ethylbenzene	5.5	ppm
	Xylene	1.2	ppm
	Methyl Tertiary-Butyl Ether (MTBE)	0.12	ppm
	Napthalene	13	ppm
	Chlorobenzene	17	ppm
Inorganics (Metals)			
	Chromium	50	ppm
	Copper	25	ppm
	Nickel	13	ppm
	Zinc	20	ppm
Groundwater	**Constituent**	**SCG**	**Units**
Volatile Organic Compounds (VOCs)	Tetrachloroethene (PCE)	5	ppb
	Trichloroethene (TCE)	5	ppb
	1,2-Dichloroethene (DCE)	5	ppb
	Vinyl Chloride	2	ppb
	Methyl Tertiary-Butyl Ether (MTBE)	10	ppb
Inorganics (Metals)			
	Chromium	50	ppb
	Copper	200	ppb
	Nickel	100	ppb
	Zinc	2,000	ppb

Table 1 (cont.)
Metal Etching Standards, Criteria, and Guidance

Surface Water	Constituent	SCG	Units
Volatile Organic Compounds (VOCs)	Ethylbenzene	4,500	ppb
	Xylene	1,900	ppb
Inorganics (Metals)			
	Copper	3,400	ppb
Sediment	**Constituent**	**SCG**	**Units**
Inorganics (Metals)	Chromium	81	ppm
	Nickel	20.9	ppm
	Zinc	150	ppm

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
No Action	-0-	-0-	-0-
Alternative 2: Surface Cover, Soil Vapor Extraction, and Monitored Natural Attenuation	$250,000	$1,900,000	$2,200,000
Alternative 3: Hot Spot Excavation to Water Table, Surface Cover, Sediment Removal, and Groundwater Monitored Attenuation	$1,500,000	$680,000	$2,200,000
Alternative 4: Hot Spot Excavation to 14 feet bgs, Backfill with ZVI, Limited Sediment Removal, and Groundwater Monitored Attenuation	$4,100,000	$670,000	$4,800,000
Alternative 5: Hot Spot Excavation to 14 feet bgs, SVE System, ZVI Wall, and Limited Sediment Removal	$7,300,000	1,100,000	$8,400,000
Alternative 6: Excavation, ZVI Wall, and Limited Sediment Removal	$26,000,000	200,000	26,000,000



0 1000 2000

GRAPHIC SCALE IN FEET

SOURCE: USGS QUADRANGLE MAP, FREEPORT, NY, 1979

TITLE

SITE LOCATION MAP
METAL ETCHING
FREEPORT, NEW YORK

PREPARED FOR

NYSDEC

Environmental Resources Management

ERM

DRAWN	JOB NO.	FILE NAME	SCALE	FIGURE
MFM	0011475	0011475.004a	GRAPHIC	1
			DATE 12/06/04	

MAP DERIVED FROM
TOPOGRAPHIC MAP OF
DESCRIBED PROPERTY
AND
LOT NOS. 24 & 25
MAP OF
SUNSHINE PARK
SITUATED AT
FREEPORT
TOWN OF HEMPSTEAD
NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1528
FILED: JUNE 4, 1921

GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

N

0 60' 120'

GRAPHIC SCALE

LEGEND

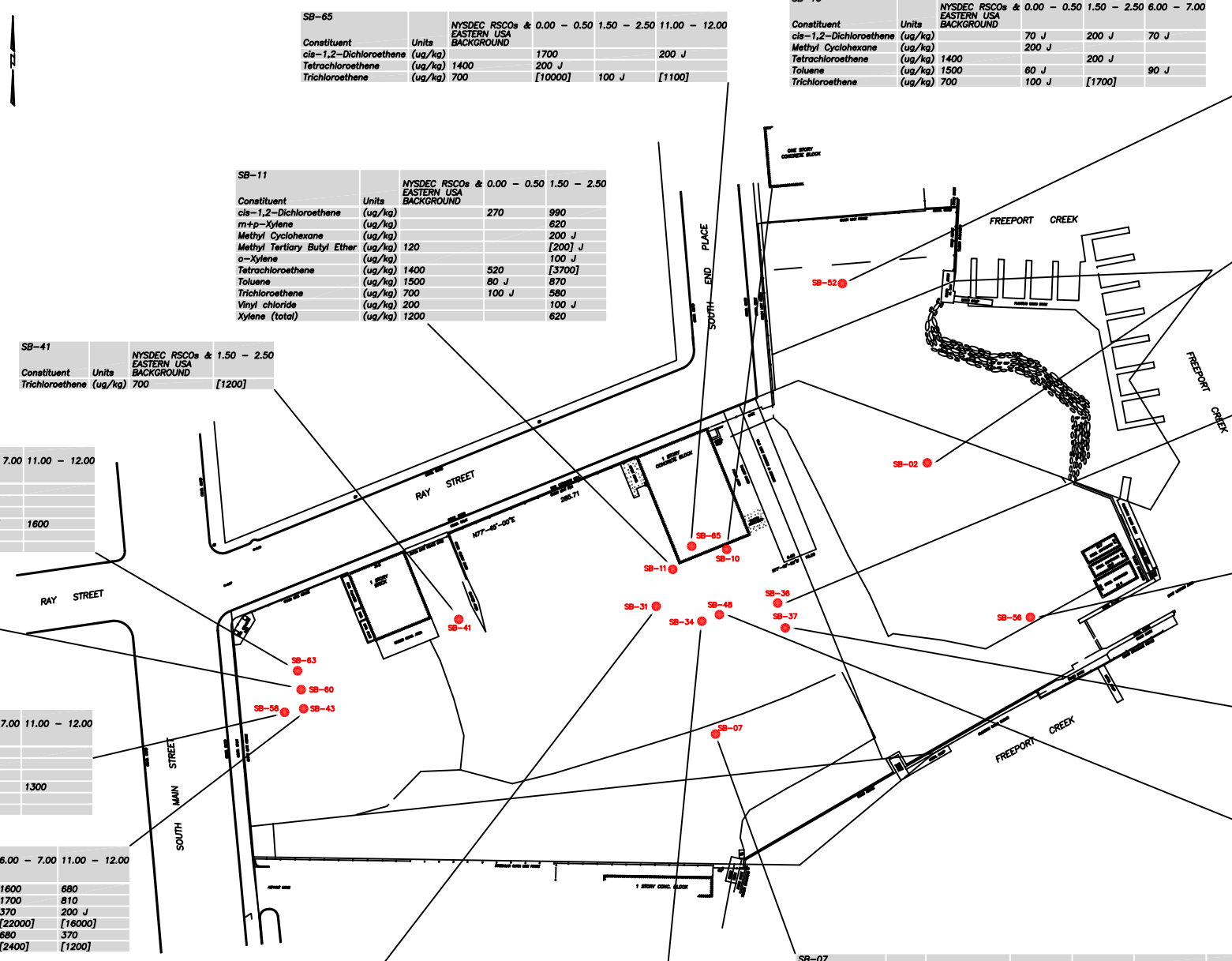
- SB-64 — SOIL BORING
- P09 — PIEZOMETER
- MW-03D — MONITORING WELL
- SG-01 — SOIL GAS POINT
- VP-01 — VERTICAL PROFILE
- SED-08 — SEDIMENT SAMPLE
- SW-08 — SURFACE WATER SAMPLE
- MANHOLE
- STUDY AREA
- SITE
- STORM SEWER DRAIN

TITLE
SITE AND STUDY AREA BOUNDARIES AND SAMPLE LOCATIONS METAL ETCHING SITE FREEPORT, NEW YORK

PREPARED FOR
NYSDEC

ERM — Environmental Resources Management

DRAWN:	JOB NO.:	FILE NAME:	SCALE	FIGURE
MFM/EMF	0011475	0011475-01-022	GRAPHIC	2
			DATE 10/30/06	



SB-65

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	0.00 – 0.50	1.50 – 2.50	11.00 – 12.00
cis-1,2-Dichloroethene	(ug/kg)		1700		200 J
Tetrachloroethene	(ug/kg)	1400	200 J		
Trichloroethene	(ug/kg)	700	[10000]	100 J	[1100]

SB-10

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	0.00 – 0.50	1.50 – 2.50	6.00 – 7.00
cis-1,2-Dichloroethene	(ug/kg)		70 J	200 J	70 J
Methyl Cyclohexane	(ug/kg)		200 J		
Tetrachloroethene	(ug/kg)	1400		200 J	
Toluene	(ug/kg)	1500	60 J		90 J
Trichloroethene	(ug/kg)	700	100 J	[1700]	

SB-52

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	6.00 – 7.00	11.00 – 12.00
Ethylbenzene	(ug/kg)	5500	5200	1500
m+p-Xylene	(ug/kg)		3000	1400
Methyl Cyclohexane	(ug/kg)		42000	21000
Naphthalene	(ug/kg)	13000	6700	2800
o-Xylene	(ug/kg)		1000	290
Toluene	(ug/kg)	1500	360	80 J
Xylene (total)	(ug/kg)	1200	[4000]	[1700]

SB-11

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	0.00 – 0.50	1.50 – 2.50
cis-1,2-Dichloroethene	(ug/kg)		270	990
m+p-Xylene	(ug/kg)			620
Methyl Cyclohexane	(ug/kg)			200 J
Methyl Tertiary Butyl Ether	(ug/kg)	120		[200] J
o-Xylene	(ug/kg)			100 J
Tetrachloroethene	(ug/kg)	1400	520	[3700]
Toluene	(ug/kg)	1500	80 J	870
Trichloroethene	(ug/kg)	700	100 J	580
Vinyl chloride	(ug/kg)	200		100 J
Xylene (total)	(ug/kg)	1200		620

SB-02

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	0.00 – 0.50	1.50 – 2.50	6.00 – 7.00	11.00 – 12.00
Ethylbenzene	(ug/kg)	5500		1600	200 J	
m+p-Xylene	(ug/kg)			2000	60 J	
Methyl Cyclohexane	(ug/kg)		1400	54000 J	42000 J	590
Naphthalene	(ug/kg)	13000		1200	3800	350
Xylene (total)	(ug/kg)	1200		[2000]	60 J	

SB-41

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	1.50 – 2.50
Trichloroethene	(ug/kg)	700	[1200]

SB-36

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	0.00 – 0.50	1.50 – 2.50	6.00 – 7.00	11.00 – 12.00
cis-1,2-Dichloroethene	(ug/kg)		470	200 J	300	
Methyl Cyclohexane	(ug/kg)		27000	750	420	250
Tetrachloroethene	(ug/kg)	1400	80 J		100 J	
Toluene	(ug/kg)	1500	[2800]			
Trichloroethene	(ug/kg)	700	560		[1000]	

SB-63

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	0.00 – 0.50	1.50 – 2.50	6.00 – 7.00	11.00 – 12.00
Ethylbenzene	(ug/kg)	5500			1600	
m+p-Xylene	(ug/kg)				2600	
Methyl Cyclohexane	(ug/kg)				970	
Naphthalene	(ug/kg)	13000	200 J	80 J	[19000]	1600
o-Xylene	(ug/kg)				480	
Xylene (total)	(ug/kg)	1200			[3100]	

SB-56

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	4.00 – 8.00	10.00 – 14.00	20.00 – 24.00
1,4-Dichlorobenzene	(ug/kg)	8500	4800	200 J	
Chlorobenzene	(ug/kg)	1700	[3700]	90 J	
Ethylbenzene	(ug/kg)	5500	[14000]	280	
m+p-Xylene	(ug/kg)		15000	320	
Methyl Cyclohexane	(ug/kg)		34000	950	
Naphthalene	(ug/kg)	13000	11000	1200	60 J
o-Xylene	(ug/kg)		470		
Toluene	(ug/kg)	1500	270		
Xylene (total)	(ug/kg)	1200	[15000]	320	

SB-60

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	6.00 – 7.00	11.00 – 12.00
Ethylbenzene	(ug/kg)	5500	3600	80 J
m+p-Xylene	(ug/kg)		9100	200 J
Methyl Cyclohexane	(ug/kg)		1300	
Naphthalene	(ug/kg)	13000	[25000]	4500
o-Xylene	(ug/kg)		1400	
Xylene (total)	(ug/kg)	1200	[11000]	200 J

SB-37

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	0.00 – 0.50	1.50 – 2.50	6.00 – 7.00	11.00 – 12.00
cis-1,2-Dichloroethene	(ug/kg)		12000	300 J	100 J	100 J
Methyl Cyclohexane	(ug/kg)		200 J	200 J	100 J	100 J
Tetrachloroethene	(ug/kg)	1400	[4300]	200 J	100 J	100 J
Trichloroethene	(ug/kg)	700	[2700]	80 J		70 J
Vinyl chloride	(ug/kg)	200	[1800]			

SB-58

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	6.00 – 7.00	11.00 – 12.00
Ethylbenzene	(ug/kg)	5500	420	
m+p-Xylene	(ug/kg)		2000	
Methyl Cyclohexane	(ug/kg)		100 J	
Naphthalene	(ug/kg)	13000	10000	1300
o-Xylene	(ug/kg)		2000	
Xylene (total)	(ug/kg)	1200	[4000]	

SB-43

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	6.00 – 7.00	11.00 – 12.00
Ethylbenzene	(ug/kg)	5500	1600	680
m+p-Xylene	(ug/kg)		1700	810
Methyl Cyclohexane	(ug/kg)		370	200 J
Naphthalene	(ug/kg)	13000	[22000]	[16000]
o-Xylene	(ug/kg)		680	370
Xylene (total)	(ug/kg)	1200	[2400]	[1200]

SB-48

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	11.00 – 12.00	0.00 – 0.50	1.50 – 2.50	6.00 – 7.00
cis-1,2-Dichloroethene	(ug/kg)		60 J			70 J
m+p-Xylene	(ug/kg)					80 J
Methyl Cyclohexane	(ug/kg)		1100	200 J	1000	740
Methyl Tertiary Butyl Ether	(ug/kg)	120	[450]		60 J	
Naphthalene	(ug/kg)	13000	100 J		200 J	640
Tetrachloroethene	(ug/kg)	1400				200 J
Toluene	(ug/kg)	1500				60 J
Trichloroethene	(ug/kg)	700	200 J		80 J	[730]
Xylene (total)	(ug/kg)	1200				80 J

SB-31

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	0.00 – 0.50	1.50 – 2.50	6.00 – 7.00	11.00 – 12.00
Methyl Cyclohexane	(ug/kg)				100 J	
Methyl Tertiary Butyl Ether	(ug/kg)	120			[280]	70 J
Tetrachloroethene	(ug/kg)	1400	710			60 J
Toluene	(ug/kg)	1500		60 J		70 J

SB-07

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	0.00 – 0.50	6.00 – 7.00	11.00 – 12.00	1.50 – 2.50
Benzene	(ug/kg)	60		[480]		[1400]
Ethylbenzene	(ug/kg)	5500		70 J		200 J
m+p-Xylene	(ug/kg)		80 J	370		1000
Methyl Cyclohexane	(ug/kg)		1700			170000 J
Naphthalene	(ug/kg)	13000	200 J	2600	310	8300
o-Xylene	(ug/kg)			100 J		100 J
Toluene	(ug/kg)	1500		350		1100
Xylene (total)	(ug/kg)	1200	80 J	370		1000

SB-34

Constituent	Units	NYSDEC RSCOs & EASTERN USA BACKGROUND	0.00 – 0.50	6.00 – 7.00	11.00 – 12.00	7.00 – 8.00
Ethylbenzene	(ug/kg)	5500		200 J		200 J
m+p-Xylene	(ug/kg)			410		470
Methyl Cyclohexane	(ug/kg)		17000	170000	4200	350000
Methyl Tertiary Butyl Ether	(ug/kg)	120	[370]	[1500]		
Naphthalene	(ug/kg)	13000	370	1300		680
Toluene	(ug/kg)	1500	100 J	[35000]	200 J	[78000]
Xylene (total)	(ug/kg)	1200		410		470

MAP DERIVED FROM
TOPOGRAPHIC MAP OF DESCRIBED PROPERTY AND LOT NOS. 24 & 25 MAP OF SUNSHINE PARK SITUATED AT FREEPORT TOWN OF HEMPSTEAD NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1328
FILED: JUNE 4, 1921
GUARANTEED ONLY TO: NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

0 30' 60'
GRAPHIC SCALE

LEGEND

SB-63 ● SOIL BORING LOCATION WITH VOLATILE ORGANIC COMPOUND CONCENTRATIONS ABOVE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM (TAGM) #4046 RECOMMENDED SOIL CLEANUP OBJECTIVE (RSCO)

[ ] DETECTED SOIL CONCENTRATION IS ABOVE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM (TAGM) #4046 RECOMMENDED SOIL CLEANUP OBJECTIVE (RSCO)

J ESTIMATED VALUE

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

NYSDEC

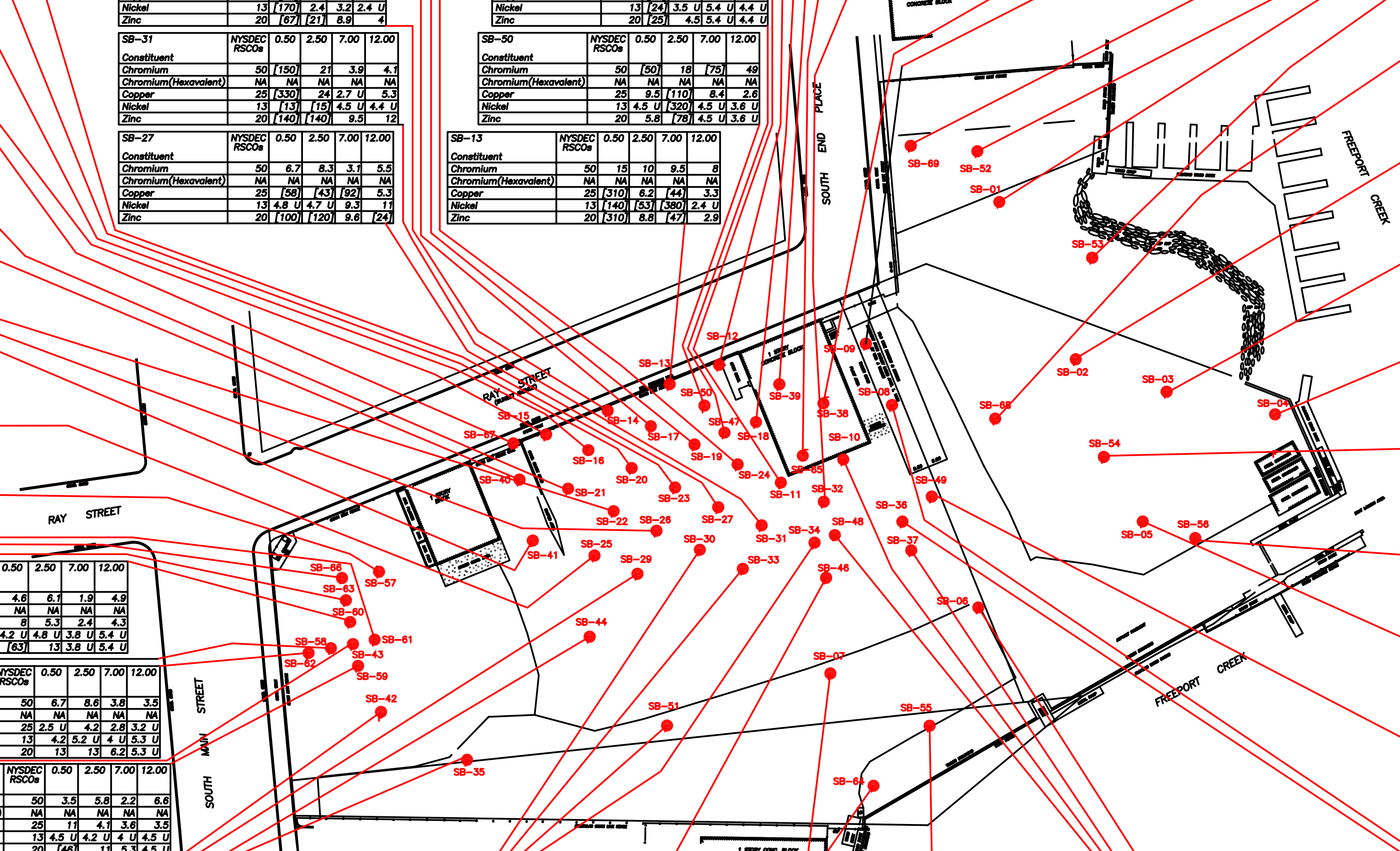
ERM Environmental Resources Management

CHECKED		DATE	
DESIGN ENGINEER			
PROJECT ENGINEER			
PROJECT MANAGER	MFM		
APPROVED			
APPROVED			

VOC DETECTIONS IN SOIL ABOVE SCGs METAL ETCHING SITE NO. 1-30-110 FREEPORT, NEW YORK

DRAWN	MFM/EMF	DATE	10/24/06
REVISED DATE			
SCALE	GRAPHIC	JOB NO.	0011475.1
FILE NAME	0011475-01-033		

DRAWING NO. 3 REV. NO.
SHEET OF



SB-23 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	3.9	[52]	[1500]	[120]
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	4	4.3	[130]	10
Nickel	13	4.5 U	4.5 U	[33]	4.4 U
Zinc	20	7.3	4.5 U	[40]	4.4 U

SB-24 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00	16.00	20.00	24.00	33.00
Chromium	50	29	29	[190]	[140]	43	35	[58]	38
Chromium(Hexavalent)	NA	NA	NA	6.52	NA	NA	NA	NA	NA
Copper	25	2.8 U	2.7 U	[25]	13	7.4	7.1	5.1	[25]
Nickel	13	4.6 U	4.5 U	4.1 U	5.1 U	5.2 U	<4.7 U	<4.9 U	[19]
Zinc	20	4.6 U	4.5 U	4.7	5.1 U	5.2 U	<4.7 U	<4.9 U	[51]

SB-18 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	[120]	3.3	33	23
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[30]	2.8 U	[37]	6.6
Nickel	13	[46]	4.6 U	[16]	3.7 U
Zinc	20	[81]	6.4	[77]	4.9

SB-39 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	3.5	10	3.1	2 U
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	5.6	20	2.8 U	2.9 U
Nickel	13	4.8 U	7.6	4.6 U	4.9 U
Zinc	20	8.2	[41]	19	4.9 U

SB-69 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	6.7	3	2.8	3.5
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	9.7	3.6	3.5	4.1
Nickel	13	4.5	2.2 U	2.3 U	2.2 U
Zinc	20	[23]	4.8	4.5	3.2

SB-20 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	39	4.7	23	[98]
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	16	3.6	4.3	6.9
Nickel	13	8.5	7.3	5.3 U	12
Zinc	20	18	6.8	6.6	5.1

SB-19 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	5.7	2.9	[51]	[85]
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	5	3.9	12	14
Nickel	13	5.2 U	4.5 U	4.4 U	6.2
Zinc	20	8	5.4	7.4	12

SB-12 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	[220]	[640]	[500]	28
Chromium(Hexavalent)	NA	88.9	NA	218	NA
Copper	25	3.2	2.8	2.7	4.1
Nickel	13	4.2	3.6	8.1	[25]
Zinc	20	3.6	4.1	3.7	3.6

SB-65 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	3.9	9.9	2.5	6
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	3.6	[65]	2	20
Nickel	13	2.2 U	11	2 U	3.8
Zinc	20	6.2	[29]	3.1	[20]

SB-38 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	9.5	3.7	1.7	1.8
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	4.9	7.1	2.5 U	2.5
Nickel	13	4.2 U	5.2 U	4.2 U	3.8 U
Zinc	20	6	[33]	4.2 U	3.8 U

SB-52 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	[100]	34	7	7
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[100]	[180]	5.3	[45]
Nickel	13	6.2	[21]	3.7 U	4.1 U
Zinc	20	[48]	[1200]	[350]	[150]

SB-16 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00	16.00	20.00	37.00
Chromium	50	[120]	[1100]	[180]	[80]	48	37	2
Chromium(Hexavalent)	NA	4.26 U	19.4	5.94	NA	NA	NA	NA
Copper	25	[40]	[49]	13	3	5.2	7	<2.6 U
Nickel	13	2.3 U	2.2 U	5	4.3	4.5 U	<3.9 U	<4.4 U
Zinc	20	4.9	2.2	7.3	2.9	4.5 U	6.4	<4.4 U

SB-17 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00	0.50
Chromium	50	[470]	[160]	17	20	
Chromium(Hexavalent)	NA	NA	NA	NA	NA	4.58 U
Copper	25	16	12	5.1	5.8	
Nickel	13	4.5 U	5.2 U	4.6 U	3.7 U	
Zinc	20	4.5 U	5.2 U	4.6 U	3.7 U	

SB-11 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	6.9	36	5.2	2.8
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[100]	[130]	6.3	2.9
Nickel	13	[440]	[1300]	9.6	4.2 U
Zinc	20	[180]	[290]	7.3	4.2 U

SB-32 Constituent	NYSDEC RSCOs	7.00	12.00
Chromium	50	4.3	2.1
Chromium(Hexavalent)	NA	NA	NA
Copper	25	6.6	2.9 U
Nickel	13	11	4.8 U
Zinc	20	8.4	4.8 U

SB-09 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	10	2.5	2.3	2.1
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	18	2.8 U	3.4	3.3
Nickel	13	6	4.7 U	4.7 U	9.9
Zinc	20	[37]	[27]	[33]	[31]

SB-01 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	14	13	14	3.4
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[530]	[5700]	[220]	15
Nickel	13	9	9.3	6.9	5 U
Zinc	20	[140]	[790]	[170]	5 U

SB-67 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	[310]	[68]	10	[76]
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[890]	[31]	10	13
Nickel	13	[280]	8.4	5.5	4.1
Zinc	20	[160]	7.1	14	9.1

SB-15 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	9.7	4.7	38	36
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[110]	9.5	3.5	2.7
Nickel	13	[13]	2.8	2.2	2.2 U
Zinc	20	[58]	[44]	3.9	3

SB-14 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	13	4.4	9.1	15
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[64]	4.6	3.1	3.3
Nickel	13	[170]	2.4	3.2	2.4 U
Zinc	20	[67]	[21]	8.9	4

SB-47 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	31	2.5	[57]	22
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[55]	3.5	7.6	7.9
Nickel	13	[24]	3.5 U	5.4 U	4.4 U
Zinc	20	[25]	4.5	5.4 U	4.4 U

SB-53 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	27	18	6.1	6.6
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[85]	[66]	12	5
Nickel	13	[15]	[14]	4.7 U	4.9 U
Zinc	20	[130]	[95]	[26]	13

SB-40 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	5.6	35	36	25
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	20	9.6	3.8	5.3
Nickel	13	5.5	10	5.2	4.7 U
Zinc	20	[81]	[26]	4.8 U	5.1

SB-21 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	4.3	[170]	[59]	[73]
Chromium(Hexavalent)	NA	NA	NA	7.21	NA
Copper	25	5.6	[110]	7.5	3.4
Nickel	13	5 U	9.8	8.7	5
Zinc	20	6.8	[32]	7.6	4.8 U

SB-31 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	[150]	21	3.9	4.1
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[330]	24	2.7 U	5.3
Nickel	13	[13]	[15]	4.5 U	4.4 U
Zinc	20	[140]	[140]	9.5	12

SB-50 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	[50]	18	[75]	49
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	9.5	[110]	8.4	2.6
Nickel	13	4.5 U	[320]	4.5 U	3.6 U
Zinc	20	5.8	[78]	4.5 U	3.6 U

SB-68 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	42	7.3	3.4	5.5
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[540]	[35]	[160]	24
Nickel	13	10	4.4	2.2 U	3
Zinc	20	[200]	[110]	[31]	[160]

SB-27 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	6.7	8.3	3.1	5.5
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[58]	[43]	[92]	5.3
Nickel	13	4.8 U	4.7 U	9.3	11
Zinc	20	[100]	[120]	9.6	[24]

SB-13 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	15	10	9.5	8
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[310]	6.2	[44]	3.3
Nickel	13	[140]	[53]	[380]	2.4 U
Zinc	20	[310]	8.8	[47]	2.9

SB-02 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	7	[1200]	13	9.5
Chromium(Hexavalent)	NA	NA	24.3	NA	NA
Copper	25	[30]	[1600]	[93]	[44]
Nickel	13	9.1	[19]	[24]	7.8
Zinc	20	[110]	[1200]	[130]	[42]

SB-26 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	9	12	[82]	[120]
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[210]	[310]	7.5	9.6
Nickel	13	11	[13]	4.4 U	4.5 U
Zinc	20	[640]	[810]	4.5	4.9

SB-22 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	4	3.5	36	2.4
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	3	4.1	10	3
Nickel	13	4.7 U	4.7 U	4.8	4.2 U
Zinc	20	6.7	9.3	4.5 U	9.8

SB-03 Constituent	NYSDEC RSCOs	7.00	0.50	2.50	12.00
Chromium	50	22	[57]	13	15
Chromium(Hexavalent)	NA	NA	4.56 U	NA	NA
Copper	25	[640]	[2000]	[180]	11
Nickel	13	[20]	[71]	[13]	5.2 U
Zinc	20	[360]	[1600]	[240]	13

SB-41 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	6.4	6.9	3	3.3
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[31]	[29]	6.9	3.6
Nickel	13	[220]	9.8	5.7	3.8 U
Zinc	20	[46]	[320]	13	6

SB-25 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	43	11	5.3	3
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[960]	[290]	6.9	12
Nickel	13	[240]	[32]	[13]	5 U
Zinc	20	[3600]	[910]	[24]	7.9

SB-04 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	14	5.7	22	22
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[39]	[40]	[100]	10
Nickel	13	5 U	5 U	[15]	9.9
Zinc	20	[22]	[20]	[160]	[31]

SB-57 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	8.5	7.3	2.5	7.9
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	14	5.3	4	5.5
Nickel	13	4.7 U	4.3	4.9 U	5 U
Zinc	20	[34]	11	4.9 U	12

SB-54 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	3.9	9.9	24	14
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	16	15	[170]	4.4
Nickel	13	5.1 U	9.9	[15]	4.7
Zinc	20	14	[94]	[260]	17

SB-61 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	5.1	8.4	3.2	2.7
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	14	4.9	3.1 U	2.9 U
Nickel	13	4.8 U	5.4	5.2 U	4.8 U
Zinc	20	[69]	14	5.2 U	4.8 U

SB-60 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	4.6	6.1	1.9	4.9
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	8	5.3	2.4	4.3
Nickel	13	4.2 U	4.8 U	3.8 U	5.4 U
Zinc	20	[63]	13	3.8 U	5.4 U

SB-56 Constituent	NYSDEC RSCOs	8.00	14.00	24.00	38.00
Chromium	50	14	2.2 U	31	5.9
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[57]	3.3 U	[69]	3.5
Nickel	13	[16]	5.6 U	5 U	4.3
Zinc	20	[150]	5.6 U	5 U	13

SB-66 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	13	6.4	1.8	6.6
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[26]	6.4	2.5	3.2
Nickel	13	6.4	4.3	2.7	2.3 U
Zinc	20	[110]	11	6.5	10

SB-62 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	6.7	8.6	3.8	3.5
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	2.5 U	4.2	2.8	3.2 U
Nickel	13	4.2 U	5.2 U	4 U	5.3 U
Zinc	20	13	13	6.2	5.3 U

SB-05 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	30	11	8.8	1.9
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[87]	[69]	9.6	2.9
Nickel	13	9.3	7.7	5 U	4.2 U
Zinc	20	[70]	[87]	[34]	4.2 U

SB-63 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	34	5.8	2.6	2.8
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[68]	6.3	2.9	3
Nickel	13	[18]	3.1	2.4 U	2.2 U
Zinc	20	[210]	[24]	2.7	2.5

SB-59 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	3.5	5.8	2.2	6.6
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	11	4.1	3.6	3.5
Nickel	13	4.5 U	4.2 U	4 U	4.5 U
Zinc	20	[46]	11	5.3	4.5 U

SB-49 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	14	9.5	16	11
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[32]	17	[25]	[37]
Nickel	13	7	4.9	9.8	5.5
Zinc	20	[73]	[160]	[84]	[54]

MAP DERIVED FROM TOPOGRAPHIC MAP OF DESCRIBED PROPERTY AND LOT NOS. 24 & 25 MAP OF SUNSHINE PARK SITUATED AT FREEPORT TOWN OF HEMPSTEAD NASSAU COUNTY, NEW YORK NASSAU COUNTY MAP NO. 179 NASSAU COUNTY CASE NO. 1528 FILED: JUNE 4, 1921
GUARANTEED ONLY TO: NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

0 30' 60'
GRAPHIC SCALE

SB-58 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	15	7.4	4.9	2.1 U
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	21	6.3	4.7	3.1 U
Nickel	13	4.2 U	5.2 U	3.6 U	5.2 U
Zinc	20	[70]	13	6	5.2 U

SB-29 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	4.6	5.4	2.2 U	4.9
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	9.6	8.7	3.3 U	6.8
Nickel	13	5.4 U	5.1 U	5.6 U	5 U
Zinc	20	[22]	[37]	13	[67]

SB-30 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	12	13	2.4	1.7
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[31]	[48]	2.7 U	2.1 U
Nickel	13	11	6.1	4.5 U	3.5
Zinc	20	[62]	[49]	4.5 U	4.6

SB-46 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	44	6.9	20	5.8
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[140]	15	[130]	5.3
Nickel	13	[18]	4.9 U	6.1	4.5 U
Zinc	20	[100]	[23]	[52]	5.6

SB-55 Constituent	NYSDEC RSCOs	8.00	14.00	24.00	34.00
Chromium	50	12	13	32	19
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	21	[140]	7.7	7.9
Nickel	13	5 U	4.7	4.2 U	4.7 U
Zinc	20	[59]	[87]	4.2 U	4.7 U

SB-06 Constituent	NYSDEC RSCOs	2.50	0.50	7.00	12.00
Chromium	50	7.1	35	3.6	9
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[90]	[31]	9.1	2.7 U
Nickel	13	9.4	6	4.7 U	4.5 U
Zinc	20	[130]	[83]	[50]	4.5 U

SB-08 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	18	12	3.1	3.4
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[81]	13	3.1 U	2.7
Nickel	13	[34]	6.7	5.2 U	4.5 U
Zinc	20	[110]	[46]	5.2 U	4.5 U

SB-43 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	4	8.6	2.9	5.9
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	8.9	3.8	3.4	2.9
Nickel	13	4.3 U	5.6	3.9 U	4.8 U
Zinc	20	[36]	17	5	8.8

SB-44 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	27	6	2	3.1
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[240]	14	3.5	4.1
Nickel	13	11	4.6	4.2 U	5.4 U
Zinc	20	[81]	[39]	18	5.4 U

SB-33 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	4.4	10	3.4	2.7
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[25]	5.4	2.9 U	3
Nickel	13	4.5 U	6.5	4.8 U	4.5 U
Zinc	20	15	15	9	4.5 U

SB-07 Constituent	NYSDEC RSCOs	0.50	7.00	12.00	2.50	0.50
Chromium	50	[740]	[690]	3.9	[320]	
Chromium(Hexavalent)	NA	NA	9.93	NA	13.6	4.39 U
Copper	25	[260]	[84]	2.4 U	[130]	
Nickel	13	[37]	[240]	4 U	[45]	
Zinc	20	[280]	[99]	4 U	[180]	

SB-48 Constituent	NYSDEC RSCOs	12.00	0.50	2.50	7.00
Chromium	50	8.1	26	5.3	24
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	5.3	[180]	[43]	[150]
Nickel	13	6.2	[99]	[21]	[49]
Zinc	20	10	[240]	[26]	[85]

SB-37 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	[74]	8.5	3.6	7.7
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[3600]	[110]	22	[83]
Nickel	13	[23]	[20]	4.6 U	5 U
Zinc	20	[470]	[79]	[24]	[130]

SB-36 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	23	6	12	3.1
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[65]	9.6	[64]	2.2 U
Nickel	13	[20]	4.9 U	9.9	3.7 U
Zinc	20	[420]	[32]	[140]	3.7 U

SB-42 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	1.8 U	3.9	2.3	2 U
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	6.2	10	2.9	2.9 U
Nickel	13	4.5 U	5.3 U	4.8 U	4.9 U
Zinc	20	7.6	[28]	5.6	4.9 U

SB-35 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	4.6	9.8	2.9	3.7
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	13	[35]	3.6	3.1
Nickel	13	5 U	4.8 U	4.9 U	4.7 U
Zinc	20	[32]	[55]	13	4.7 U

SB-51 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	15	18	29	3.4
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[35]	[47]	[1300]	12
Nickel	13	10	5.8	7.5	5 U
Zinc	20	[170]	[38]	[69]	7.3

SB-34 Constituent	NYSDEC RSCOs	0.50	7.00	12.00	0.50	8.00
Chromium	50	[230]	14	2.7		44
Chromium(Hexavalent)	NA	NA	NA	NA	7.09	NA
Copper	25	[290]	[28]	3.3		[51]
Nickel	13	[48]	4.7 U	5.4		[16]
Zinc	20	[140]	17	[35]		[27]

SB-10 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	[390]	[2200]	16	3.2
Chromium(Hexavalent)	NA	19.2	14.3	NA	NA
Copper	25	[500]	[370]	15	21
Nickel	13	[40]	[13]	[50]	4.7 U
Zinc	20	[150]	[69]	[500]	[20]

SB-64 Constituent	NYSDEC RSCOs	0.50	2.50	7.00	12.00
Chromium	50	13	44	16	0.92 U
Chromium(Hexavalent)	NA	NA	NA	NA	NA
Copper	25	[1300]	[77]	[44]	4
Nickel	13	[17]	[28]	9.4	2.3 U
Zinc	20	[600]	[250]	[57]	2.3 U

LEGEND

SB-57 ● SOIL BORING LOCATION
CONCENTRATIONS OF CONSTITUENTS ARE SHOWN IN MILLIGRAM PER KILOGRAM (mg/kg)

[ ] DETECTED SOIL CONCENTRATION IS ABOVE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM RECOMMENDED SOIL CLEANUP OBJECTIVE (RSCO)

U NOT DETECTED AT INDICATED DETECTION LIMIT

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

NYSDEC

ERM Environmental Resources Management

CHECKED		DATE
DESIGN ENGINEER		
PROJECT ENGINEER		
PROJECT MANAGER		
APPROVED		
APPROVED		

METALS DETECTIONS IN SOIL ABOVE SCGs
METAL ETCHING SITE NO. 1-30-110
FREEPORT, NEW YORK

DRAWN	DATE	REVISED DATE	DRAWING NO.
MFM/EMF	10/24/06		4
SCALE	JOB NO.	FILE NAME	SHEET OF
GRAPHIC	0011475.2	0011475-00-040	

REV. NO.

MAP DERIVED FROM
TOPOGRAPHIC MAP OF
DESCRIBED PROPERTY
AND
LOT NOS. 24 & 25
MAP OF
SUNSHINE PARK
SITUATED AT
FREEPORT
TOWN OF HEMPSTEAD
NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1528
FILED: JUNE 4, 1921

GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

APPROXIMATE
GROUNDWATER
FLOW DIRECTION

Concentrations (ug/l)

- Above – 2101
- 2101
- 2000
- 1900
- 1800
- 1700
- 1600
- 1450
- 1350
- 1250
- 1150
- 1050
- 950
- 850
- 750
- 650
- 550
- 400
- 300
- 200
- 100
- 5 (NYSDEC TOGS CLASS GA GROUNDWATER STANDARD)
- Below – 5

LEGEND

SB06 ● Soil Boring Location
└ Concentration of PCE in groundwater in ppb

0 60' 120'
GRAPHIC SCALE

TITLE
TETRACHLORETHENE (PCE) CONCENTRATIONS
WATER TABLE
GROUNDWATER SAMPLES

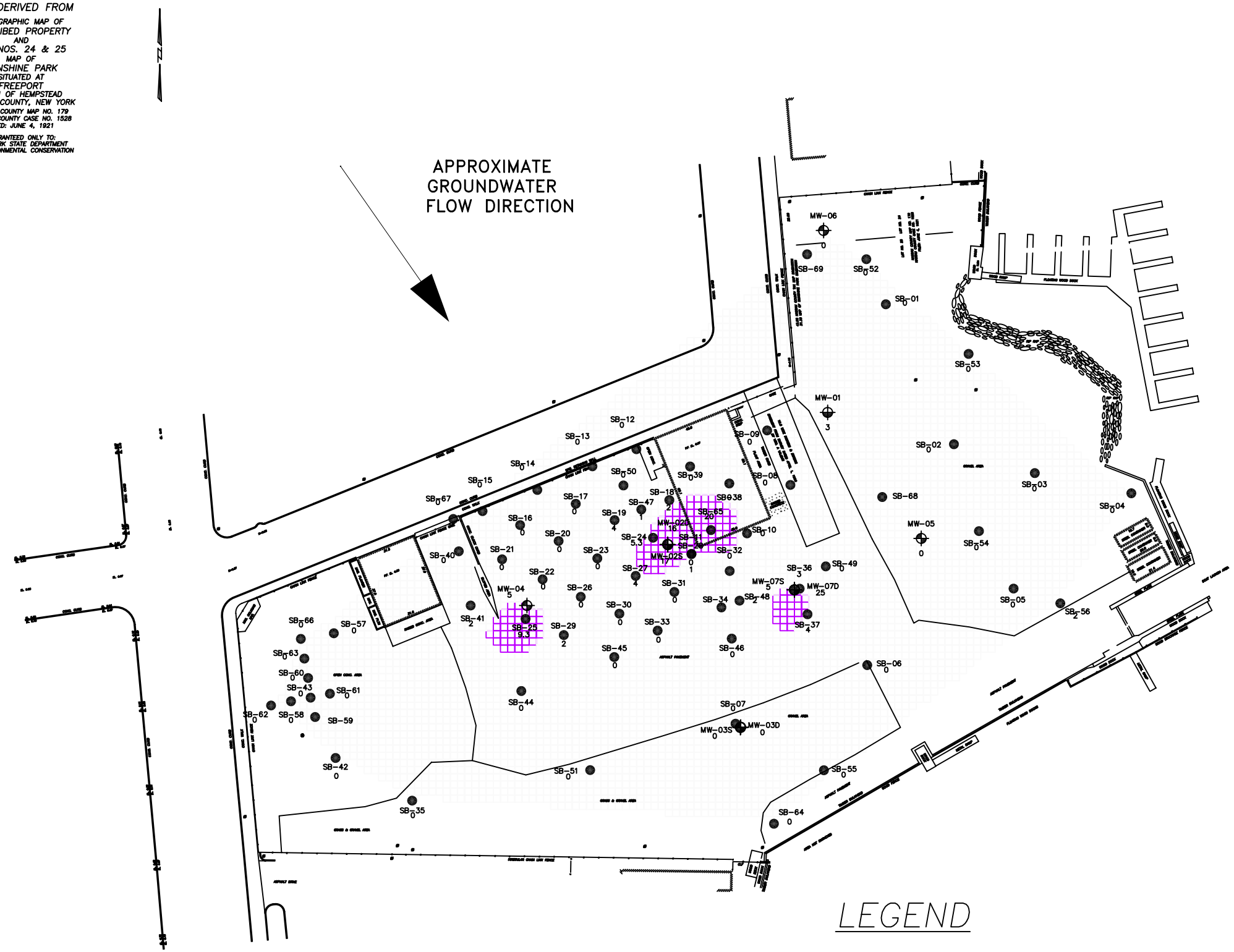
PROJECT:
METAL ETCHING, INC.

Environmental Resources Management
ERM

DRAWN:	JOB NO.:	FILE NAME:	SCALE	FIGURE
MFM/EMF	0011475	0011475-00-043	GRAPHIC	5
			DATE 11/1/06	

MAP DERIVED FROM
TOPOGRAPHIC MAP OF
DESCRIBED PROPERTY
AND
LOT NOS. 24 & 25
MAP OF
SUNSHINE PARK
SITUATED AT
FREEPORT
TOWN OF HEMPSTEAD
NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1528
FILED: JUNE 4, 1921

GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION



Concentration (ug/l)

- Above – 2101
- 2101
- 2000
- 1900
- 1800
- 1700
- 1600
- 1450
- 1350
- 1260
- 1150
- 1050
- 950
- 850
- 750
- 650
- 550
- 400
- 300
- 200
- 100
- 5 (NYSDEC TOGS CLASS GA GROUNDWATER STANDARD)
- Below – 5

LEGEND

SB-06 ● Soil Boring Location

Concentration of TCE in groundwater in pbb

0 60' 120'

GRAPHIC SCALE

TITLE

TRICHLOROETHENE (TCE) CONCENTRATIONS WATER TABLE GROUNDWATER SAMPLES

PROJECT:

METAL ETCHING, INC.

Environmental Resources Management
ERM

DRAWN:	JOB NO.:	FILE NAME:	SCALE	FIGURE
MFM/EMF	0011475	0011475-00-044	GRAPHIC	6

DATE 11/1/06

MAP DERIVED FROM
TOPOGRAPHIC MAP OF
DESCRIBED PROPERTY
AND
LOT NOS. 24 & 25
MAP OF
SUNSHINE PARK
SITUATED AT
FREEPORT
TOWN OF HEMPSTEAD
NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1528
FILED: JUNE 4, 1921

GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

APPROXIMATE
GROUNDWATER
FLOW DIRECTION

Concentration (ug/l)

- Above – 2101
- 2101
- 2000
- 1900
- 1800
- 1700
- 1600
- 1450
- 1350
- 1250
- 1150
- 1050
- 950
- 850
- 750
- 650
- 550
- 400
- 300
- 200
- 100
- 5 (NYSDEC TOGS CLASS GA GROUNDWATER STANDARD)
- Below – 5

LEGEND

SB 0.06 ● Soil Boring Location

Concentration of CIS–1,2–Dichloroethene in groundwater in ppb

0 60' 120'

GRAPHIC SCALE

TITLE

CIS–1,2–DICHLOROETHENE CONCENTRATIONS WATER TABLE GROUNDWATER SAMPLES

PROJECT:

METAL ETCHING, INC.

Environmental Resources Management
ERM

SCALE	FIGURE
GRAPHIC	7

DRAWN:	JOB NO.:	FILE NAME:	DATE
MFM/EMF	0011475	0011475–00–045	11/1/06

MAP DERIVED FROM
TOPOGRAPHIC MAP OF
DESCRIBED PROPERTY
AND
LOT NOS. 24 & 25
MAP OF
SUNSHINE PARK
SITUATED AT
FREEPORT
TOWN OF HEMPSTEAD
NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1528
FILED: JUNE 4, 1921

GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

APPROXIMATE
GROUNDWATER
FLOW DIRECTION

Concentration (ug/l)

- Above – 2101
- 2101
- 2000
- 1900
- 1800
- 1700
- 1600
- 1450
- 1350
- 1250
- 1150
- 1050
- 950
- 850
- 750
- 650
- 550
- 400
- 300
- 200
- 100
- 2 (NYSDEC TOGS CLASS GA GROUNDWATER STANDARD)
- Below – 2

LEGEND

SB-06 ● Soil Boring Location
Concentration of VC in groundwater in ppb

0 60' 120'
GRAPHIC SCALE

TITLE
VINYL CHLORIDE (VC) CONCENTRATIONS
WATER TABLE
GROUNDWATER SAMPLES

PROJECT:
METAL ETCHING, INC.

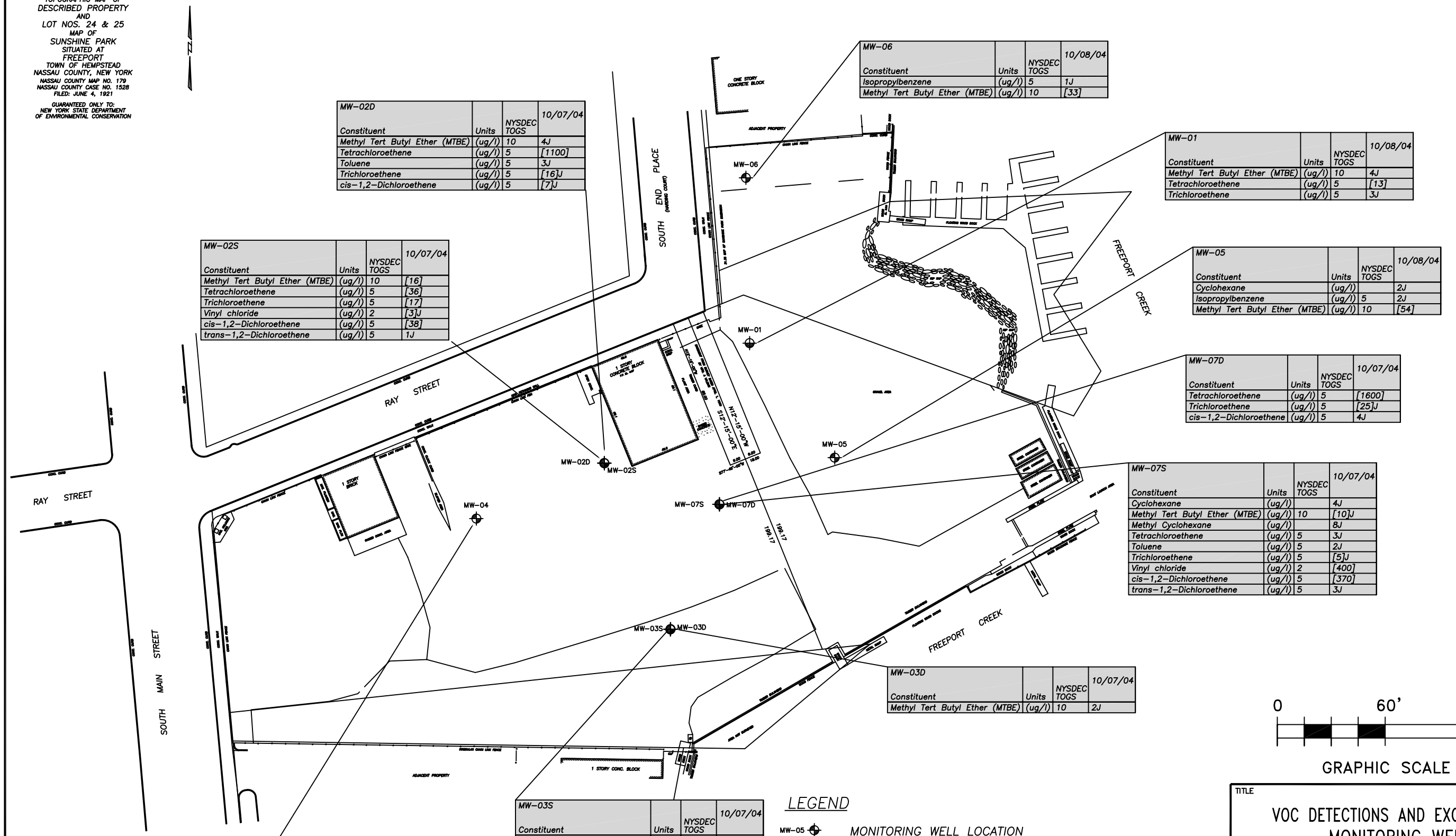
Environmental Resources Management
ERM

DRAWN:	JOB NO.:	FILE NAME:	SCALE	FIGURE
MFM/EMF	0011475	0011475-00-046	GRAPHIC	8
			DATE 11/1/06	

MAP DERIVED FROM

TOPOGRAPHIC MAP OF DESCRIBED PROPERTY AND LOT NOS. 24 & 25 MAP OF SUNSHINE PARK SITUATED AT FREEPORT TOWN OF HEMPSTEAD NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1528
FILED: JUNE 4, 1921

GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION



MW-02D Constituent	Units	NYSDEC TOGS	10/07/04
Methyl Tert Butyl Ether (MTBE)	(ug/l)	10	4J
Tetrachloroethene	(ug/l)	5	[1100]
Toluene	(ug/l)	5	3J
Trichloroethene	(ug/l)	5	[16]J
cis-1,2-Dichloroethene	(ug/l)	5	[7]J

MW-06 Constituent	Units	NYSDEC TOGS	10/08/04
Isopropylbenzene	(ug/l)	5	1J
Methyl Tert Butyl Ether (MTBE)	(ug/l)	10	[33]

MW-01 Constituent	Units	NYSDEC TOGS	10/08/04
Methyl Tert Butyl Ether (MTBE)	(ug/l)	10	4J
Tetrachloroethene	(ug/l)	5	[13]
Trichloroethene	(ug/l)	5	3J

MW-02S Constituent	Units	NYSDEC TOGS	10/07/04
Methyl Tert Butyl Ether (MTBE)	(ug/l)	10	[16]
Tetrachloroethene	(ug/l)	5	[36]
Trichloroethene	(ug/l)	5	[17]
Vinyl chloride	(ug/l)	2	[3]J
cis-1,2-Dichloroethene	(ug/l)	5	[38]
trans-1,2-Dichloroethene	(ug/l)	5	1J

MW-05 Constituent	Units	NYSDEC TOGS	10/08/04
Cyclohexane	(ug/l)		2J
Isopropylbenzene	(ug/l)	5	2J
Methyl Tert Butyl Ether (MTBE)	(ug/l)	10	[54]

MW-07D Constituent	Units	NYSDEC TOGS	10/07/04
Tetrachloroethene	(ug/l)	5	[1600]
Trichloroethene	(ug/l)	5	[25]J
cis-1,2-Dichloroethene	(ug/l)	5	4J

MW-07S Constituent	Units	NYSDEC TOGS	10/07/04
Cyclohexane	(ug/l)		4J
Methyl Tert Butyl Ether (MTBE)	(ug/l)	10	[10]J
Methyl Cyclohexane	(ug/l)		8J
Tetrachloroethene	(ug/l)	5	3J
Toluene	(ug/l)	5	2J
Trichloroethene	(ug/l)	5	[5]J
Vinyl chloride	(ug/l)	2	[400]
cis-1,2-Dichloroethene	(ug/l)	5	[370]
trans-1,2-Dichloroethene	(ug/l)	5	3J

MW-03D Constituent	Units	NYSDEC TOGS	10/07/04
Methyl Tert Butyl Ether (MTBE)	(ug/l)	10	2J

MW-04 Constituent	Units	NYSDEC TOGS	10/08/04
Methyl Tert Butyl Ether (MTBE)	(ug/l)	10	[140]
Tetrachloroethene	(ug/l)	5	3J
Trichloroethene	(ug/l)	5	[5]J
cis-1,2-Dichloroethene	(ug/l)	5	1J

MW-03S Constituent	Units	NYSDEC TOGS	10/07/04
Benzene	(ug/l)	1	[6]J
Chlorobenzene	(ug/l)	5	1J
Cyclohexane	(ug/l)		1J
Methyl Tert Butyl Ether (MTBE)	(ug/l)	10	[130]
Methyl Cyclohexane	(ug/l)		2J
Vinyl chloride	(ug/l)	2	[29]
cis-1,2-Dichloroethene	(ug/l)	5	[32]

LEGEND

MW-05 — MONITORING WELL LOCATION

[ ] — DETECTED GROUNDWATER CONCENTRATION IS ABOVE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL AND OPERATIONAL GUIDANCE SERIES 111 (TOGS) CLASS GA GROUNDWATER STANDARD

J — ESTIMATED VALUE

0 60' 120'

GRAPHIC SCALE

TITLE

VOC DETECTIONS AND EXCEEDENCES MONITORING WELL GROUNDWATER SAMPLES

PROJECT:

METAL ETCHING, INC

Environmental Resources Management
ERM

DRAWN:	JOB NO.:	FILE NAME:	SCALE	FIGURE
MFM/EMF	0011475	0011475-00-041	GRAPHIC	9
			DATE 10/23/06	

MAP DERIVED FROM
TOPOGRAPHIC MAP OF
DESCRIBED PROPERTY
AND
LOT NOS. 24 & 25
MAP OF
SUNSHINE PARK
SITUATED AT
FREEPORT
TOWN OF HEMPSTEAD
NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1528
FILED: JUNE 4, 1921

GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

N

APPROXIMATE
GROUNDWATER
FLOW DIRECTION

Concentrations (ug/l)

- Above – 2101
- 2101
- 2000
- 1900
- 1800
- 1700
- 1600
- 1450
- 1350
- 1250
- 1150
- 1050
- 950
- 850
- 750
- 650
- 550
- 400
- 300
- 200
- 100
- 10
- Below – 10 (NYSDEC TOGS CLASS GA GROUNDWATER STANDARD)

LEGEND

SB-55 77 ● Soil Boring Location
Concentration of MTBE in groundwater in ppb

0 60' 120'
GRAPHIC SCALE

TITLE
METHYL TERTIARY BUTYL ETHER (MTBE)
WATER TABLE
GROUNDWATER SAMPLES

PROJECT:
METAL ETCHING, INC.

ERM Environmental Resources Management

DRAWN:	JOB NO.:	FILE NAME:	SCALE	DATE	FIGURE
MFM	0011475	Fig 4-14	GRAPHIC	11/1/06	10

MAP DERIVED FROM
TOPOGRAPHIC MAP OF
DESCRIBED PROPERTY
AND
LOT NOS. 24 & 25
MAP OF
SUNSHINE PARK
SITUATED AT
FREEPORT
TOWN OF HEMPSTEAD
NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1528
FILED: JUNE 4, 1921

GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

0 60' 120'

GRAPHIC SCALE

MANHOLE TO BE CLEANED
(COMMON ACTION C2)

SECTION OF STORM SEWER
DRAIN TO BE CLEANED
(COMMON ACTION C2)

STORM SEWER
DRAIN OUTFALL

ONE STORY
CONCRETE BLOCK

ADJOINING PROPERTY

FREEPORT CREEK

SOUTH END PLACE

RAY STREET

SOUTH MAIN STREET

STORY CONCRETE BLOCK

1 STORY CONC. BLOCK

MH-01

SD-01

MW-01

MW-02D

MW-03S

MW-04

MW-05

MW-07S
MW-07D

MW-08S
MW-08D

MW-09S
MW-09D

SED-01

SED-02

SED-03

SED-04

SED-05

SED-06

SED-07

SED-08

LEGEND

- ASPHALT & CONCRETE *
- ASPHALT *
- CONCRETE *
- GRAVEL *
- INSTALL ASPHALT OR BALLAST COVER OVER CURRENTLY EXPOSED SOILS *
- GRAVEL, SOIL & WEEDS *
- SUB-SLAB DEPRESSURIZATIN BENEATH SITE BUILDINGS (COMMON ACTION C1)

- STUDY AREA
- SITE
- STORM SEWER DRAIN
- AREA OF IMPACTED SEDIMENT TO BE MONITORED THROUGH MONITORED NATURAL RECOVERY (MNR) (MAY CHANGE BASED ON PRE-DESIGN STUDIES)
- SED-08 SEDIMENT SAMPLE
- MW-08S / MW-08D MONITORING WELLS TO BE INSTALLED, TO BE MONITORED FOR 30 YEARS FOR MONITORED NATURAL ATTENUATION (MNA)
- MW-07S / MW-07D EXISTING MONITORING WELLS TO BE MONITORED FOR 30 YEARS FOR MONITORED NATURAL ATTENUATION (MNA)
- POTENTIAL UST TO BE REMOVED (COMMON ACTION C3)
- PIPING FOR SOIL VAPOR EXTRACTION SYSTEM

NOTE:

* TO BE MAINTAINED THROUGH SITE MANAGEMENT PLAN AS PART OF ENVIROMENTAL EASEMENT (COMMON ACTION C4)

TITLE

ALTERNATIVE 2:
SOIL COVER, GROUNDWATER MNA, SVE, AND SEDIMENT MNR
METAL ETCHING SITE
FREEPORT, NEW YORK

PREPARED FOR

NYSDEC

Environmental Resources Management
ERM

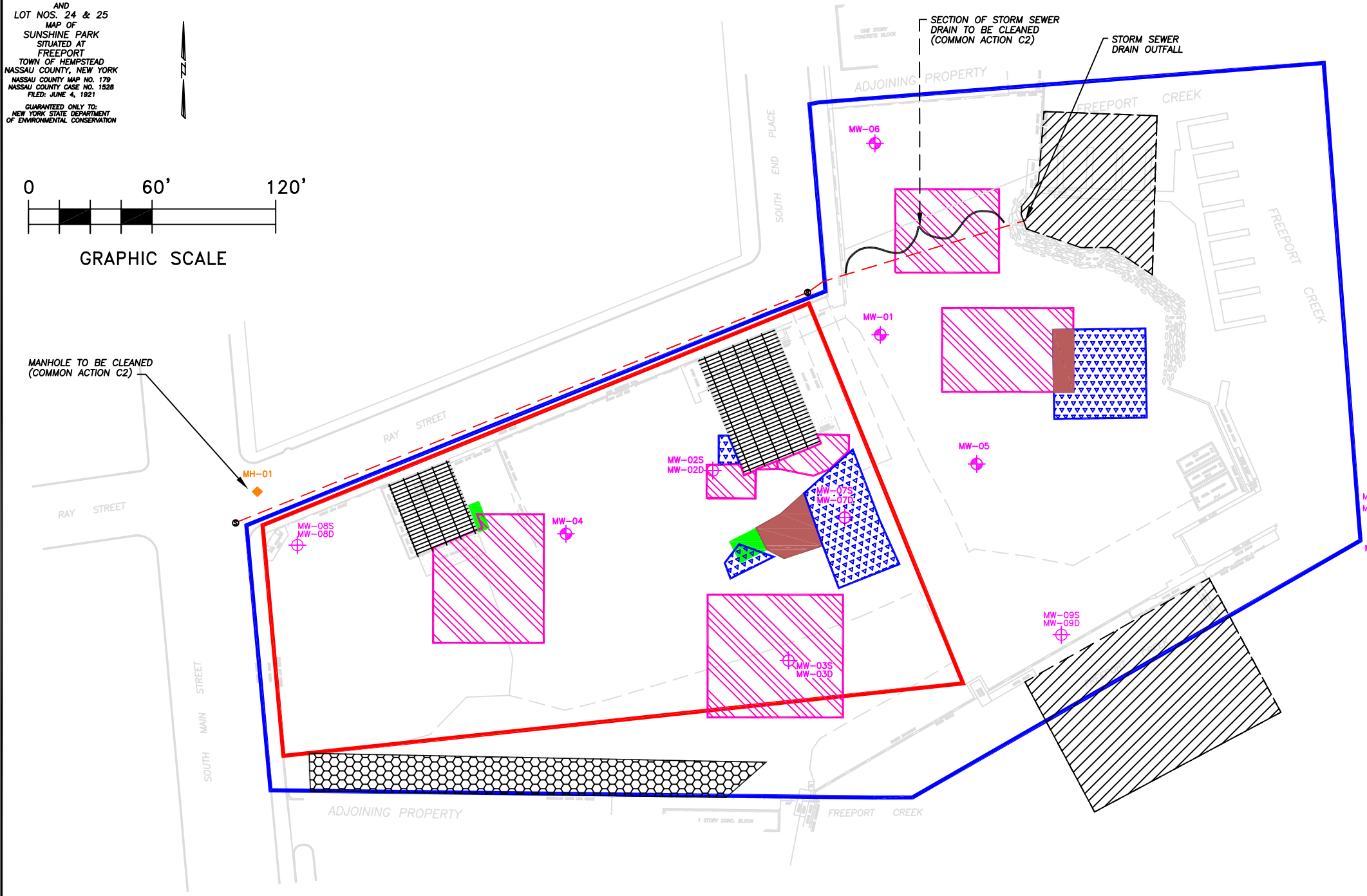
DRAWN:	JOB NO.:	FILE NAME:	SCALE	DATE	FIGURE
MFM/EMF	0011475	0011475-01-038	GRAPHIC	11/1/06	11

MAP DERIVED FROM
TOPOGRAPHIC MAP OF DESCRIBED PROPERTY AND LOT NOS. 24 & 25 MAP OF SUNSHINE PARK SITUATED AT FREEPORT TOWN OF HEMPSTEAD NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1528
FILED: JUNE 4, 1921
GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

N

0 60' 120'

GRAPHIC SCALE



LEGEND

- STUDY AREA
- SITE
- STORM SEWER DRAIN
- AREA OF SEDIMENT REMOVAL (MAY CHANGE BASED ON PRE-DESIGN STUDIES)
- MW-08S / MW-08D — MONITORING WELLS TO BE INSTALLED, TO BE MONITORED FOR 30 YEARS FOR MONITORED NATURAL ATTENUATION (MNA)
- MW-05 — EXISTING MONITORING WELLS TO BE MONITORED FOR 30 YEARS FOR MNA
- POTENTIAL UST TO BE REMOVED (COMMON ACTION C3)
- SUB-SLAB DEPRESSURIZATION BENEATH SITE BUILDINGS (COMMON ACTION C1)
- HOT SPOT EXCAVATION 0 TO 1 FEET BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 4 FEET BELOW GRADE
- HOT SPOT EXCAVATION 1 TO 4 FEET BELOW GRADE
- INSTALL ASPHALT OR BALLAST COVER OVER CURRENTLY EXPOSED SOILS TO BE MAINTAINED THROUGH SITE MANAGEMENT PLAN AS PART OF ENVIRONMENTAL EASEMENT[1]

NOTE:

1. REFER TO FIGURE 2-1 FOR SURFACE COVERS TO BE MAINTAINED THROUGH SITE MANAGEMENT PLAN AS PART OF ENVIRONMENTAL EASEMENT (COMMON ACTION C4)

TITLE
ALTERNATIVE 3:
HOT SPOT SOIL EXCAVATION TO THE WATER TABLE AND SURFACE COVER, GROUNDWATER MNA AND SEDIMENT REMOVAL
METAL ETCHING SITE
FREEPORT, NEW YORK

PREPARED FOR
NYSDEC

ERM Environmental Resources Management

SCALE	FIGURE
GRAPHIC	12

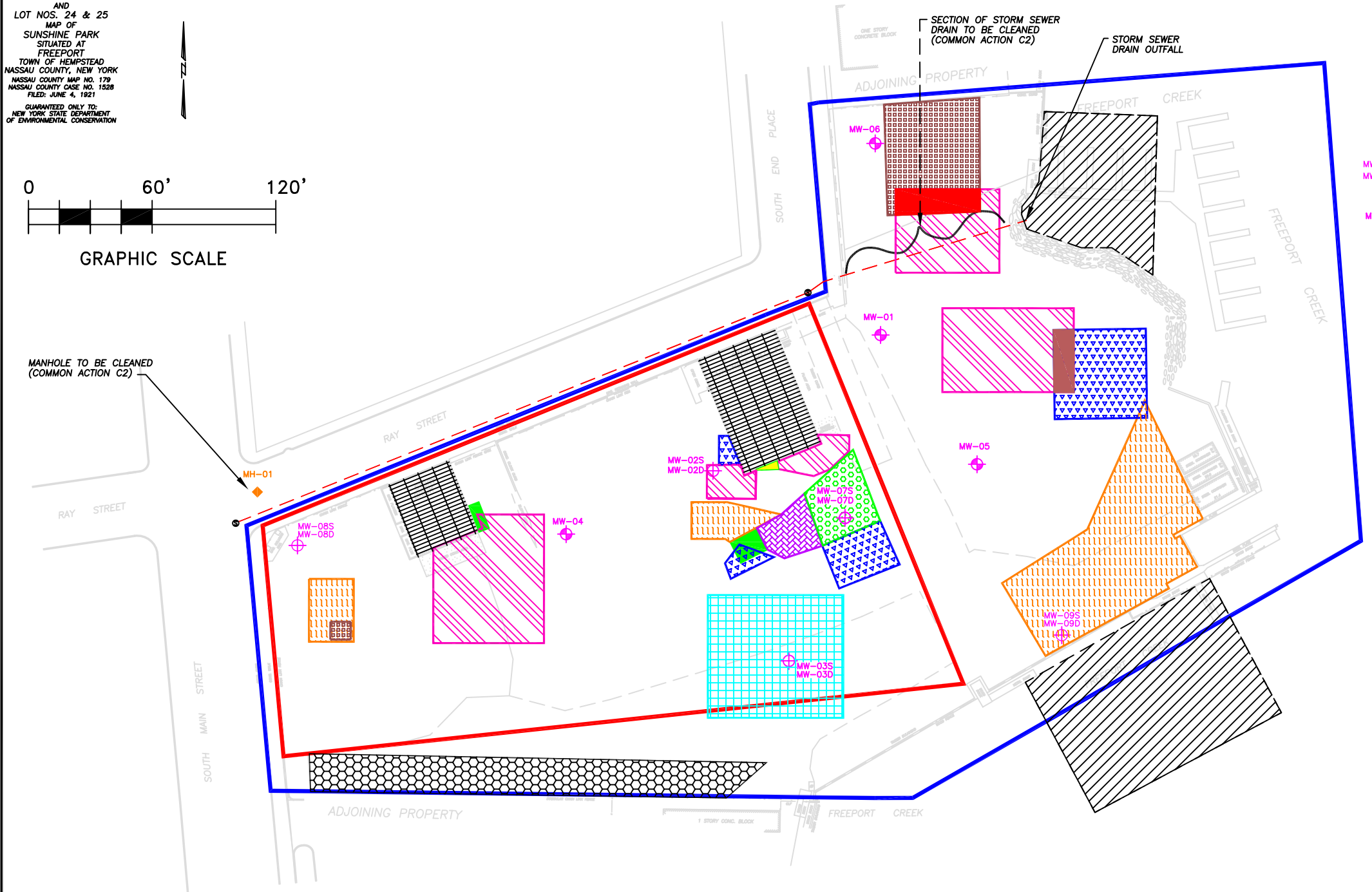
DRAWN:	JOB NO.:	FILE NAME:	DATE
MFM/EMF	0011475	0011475-01-056	11/6/06

MAP DERIVED FROM
TOPOGRAPHIC MAP OF DESCRIBED PROPERTY AND LOT NOS. 24 & 25 MAP OF SUNSHINE PARK SITUATED AT FREEPORT TOWN OF HEMPSTEAD NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1528
FILED: JUNE 4, 1921
GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

N

0 60' 120'

GRAPHIC SCALE



LEGEND

- STUDY AREA
- SITE
- STORM SEWER DRAIN
- AREA OF SEDIMENT REMOVAL (MAY CHANGE BASED ON PRE-DESIGN STUDIES)
- MW-08S / MW-08D — MONITORING WELLS TO BE INSTALLED, TO BE MONITORED FOR 30 YEARS FOR MONITORED NATURAL ATTENUATION (MNA)
- MW-05 — EXISTING MONITORING WELLS TO BE MONITORED FOR 30 YEARS FOR MNA
- POTENTIAL UST TO BE REMOVED (COMMON ACTION C3)
- SUB-SLAB DEPRESSURIZATION BENEATH SITE BUILDINGS (COMMON ACTION C1)
- HOT SPOT EXCAVATION 0 TO 1 FEET BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 4 FEET BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 14 FEET BELOW GRADE
- HOT SPOT EXCAVATION 1 TO 4 FEET BELOW GRADE
- HOT SPOT EXCAVATION 1 TO 9 FEET[1] BELOW GRADE
- HOT SPOT EXCAVATION 4 TO 9 FEET[1] BELOW GRADE
- HOT SPOT EXCAVATION 4 TO 14 FEET[1] BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 1 FEET BELOW GRADE AND 4 TO 9 FEET[1] BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 1 FEET BELOW GRADE AND 4 TO 9 FEET[1] BELOW GRADE
- HOT SPOT EXCAVATION 1 to 14 FEET[1] BELOW GRADE
- INSTALL ASPHALT OR BALLAST COVER OVER CURRENTLY EXPOSED SOILS TO BE MAINTAINED THROUGH SITE MANAGEMENT PLAN AS PART OF ENVIRONMENTAL EASEMENT[2]

NOTE:

1. HOT SPOT EXCAVATION INTERVALS DEEPER THAN 4 FEET BELOW GRADE ARE TO BE BACKFILLED WITH CLEAN FILL AND ZERO VALENT IRON MIXTURE.
2. REFER TO FIGURE 2-1 FOR SURFACE COVERS TO BE MAINTAINED THROUGH SITE MANAGEMENT PLAN AS PART OF ENVIRONMENTAL EASEMENT (COMMON ACTION C4)

TITLE
ALTERNATIVE 4:
HOT SPOT SOIL EXCAVATION, SURFACE COVER
GROUNDWATER MNA AND SEDIMENT REMOVAL
METAL ETCHING SITE
FREEPORT, NEW YORK

PREPARED FOR
NYSDEC

Environmental Resources Management
ERM

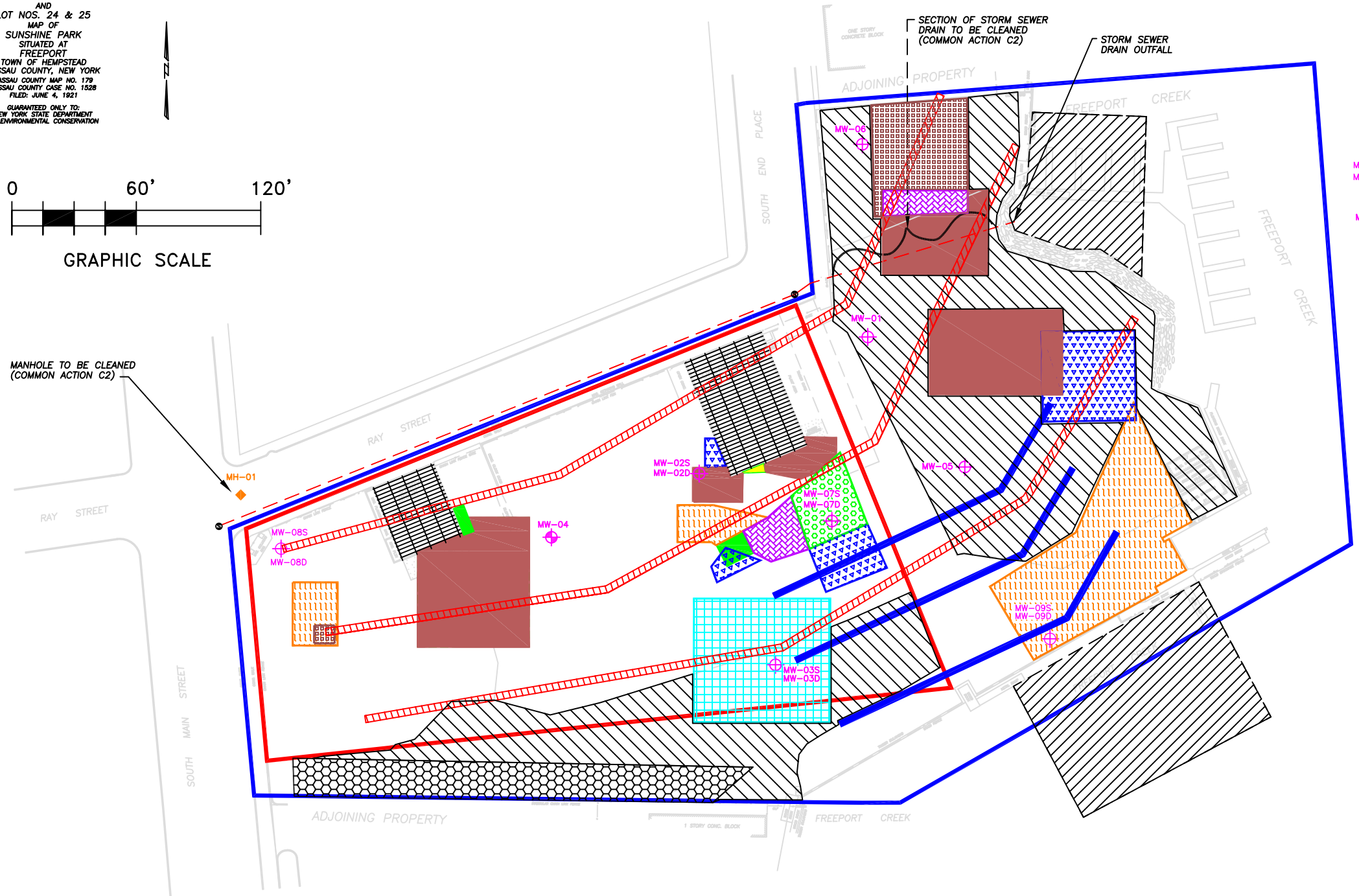
DRAWN:	JOB NO.:	FILE NAME:	SCALE	DATE	FIGURE
MFM/EMF	0011475	0011475-01-039	GRAPHIC	11/1/06	13

MAP DERIVED FROM
TOPOGRAPHIC MAP OF
DESCRIBED PROPERTY
AND
LOT NOS. 24 & 25
MAP OF
SUNSHINE PARK
SITUATED AT
FREEPORT
TOWN OF HEMPSTEAD
NASSAU COUNTY, NEW YORK
NASSAU COUNTY MAP NO. 179
NASSAU COUNTY CASE NO. 1528
FILED: JUNE 4, 1921

GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

0 60' 120'

GRAPHIC SCALE



LEGEND

- STUDY AREA
- SITE
- STORM SEWER DRAIN
- AREA OF SEDIMENT REMOVAL (MAY CHANGE BASED ON PRE-DESIGN STUDIES)
- MW-08S / MW-08D — MONITORING WELLS TO BE INSTALLED, TO BE MONITORED FOR 30 YEARS FOR MONITORED NATURAL ATTENUATION (MNA)
- MW-05 — EXISTING MONITORING WELLS TO BE MONITORED FOR 30 YEARS FOR MNA
- POTENTIAL UST TO BE REMOVED (COMMON ACTION C3)
- SUB-SLAB DEPRESSURIZATION BENEATH SITE BUILDINGS (COMMON ACTION C1)
- HOT SPOT EXCAVATION 0 TO 1 FEET BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 4 FEET BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 14 FEET BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 9 FEET BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 6 INCHES AND 4 TO 9 FEET BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 6 INCHES AND 4 TO 14 FEET BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 1 FEET BELOW GRADE AND 4 TO 9 FEET BELOW GRADE
- HOT SPOT EXCAVATION 0 TO 1 FEET BELOW GRADE AND 4 TO 9 FEET BELOW GRADE
- REMOVAL OF UNCAPPED SOILS 0 TO 6 INCHES BELOW GRADE
- INSTALL ASPHALT OR BALLAST COVER OVER CURRENTLY EXPOSED SOILS TO BE MAINTAINED THROUGH SITE MANAGEMENT PLAN AS PART OF ENVIRONMENTAL EASEMENT[1]
- PIPING FOR SOIL VAPOR EXTRACTION SYSTEM
- ZERO VALENT IRON WALL

NOTE:

1. REFER TO FIGURE 2-1 FOR SURFACE COVERS TO BE MAINTAINED THROUGH SITE MANAGEMENT PLAN AS PART OF ENVIRONMENTAL EASEMENT (COMMON ACTION C4)

TITLE
ALTERNATIVE 5:
HOT SPOT SOIL EXCAVATION AND SURFACE COVER, REMOVAL OF UNCAPPED SOIL, ZVI WALL, SVE, AND SEDIMENT REMOVAL
METAL ETCHING SITE
FREEPORT, NEW YORK

PREPARED FOR
NYSDEC

Environmental Resources Management
ERM

DRAWN:	JOB NO.:	FILE NAME:	SCALE	FIGURE
MFM/EMF	0011475	0011475-01-053	GRAPHIC	14
			DATE 11/1/06	

MAP DERIVED FROM

TOPOGRAPHIC MAP OF
DESCRIBED PROPERTY
AND
LOT NOS. 24 & 25
MAP OF
SUNSHINE PARK
SITUATED AT
FREEPORT
TOWN OF HEMPSTEAD
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NASSAU COUNTY MAP NO. 179
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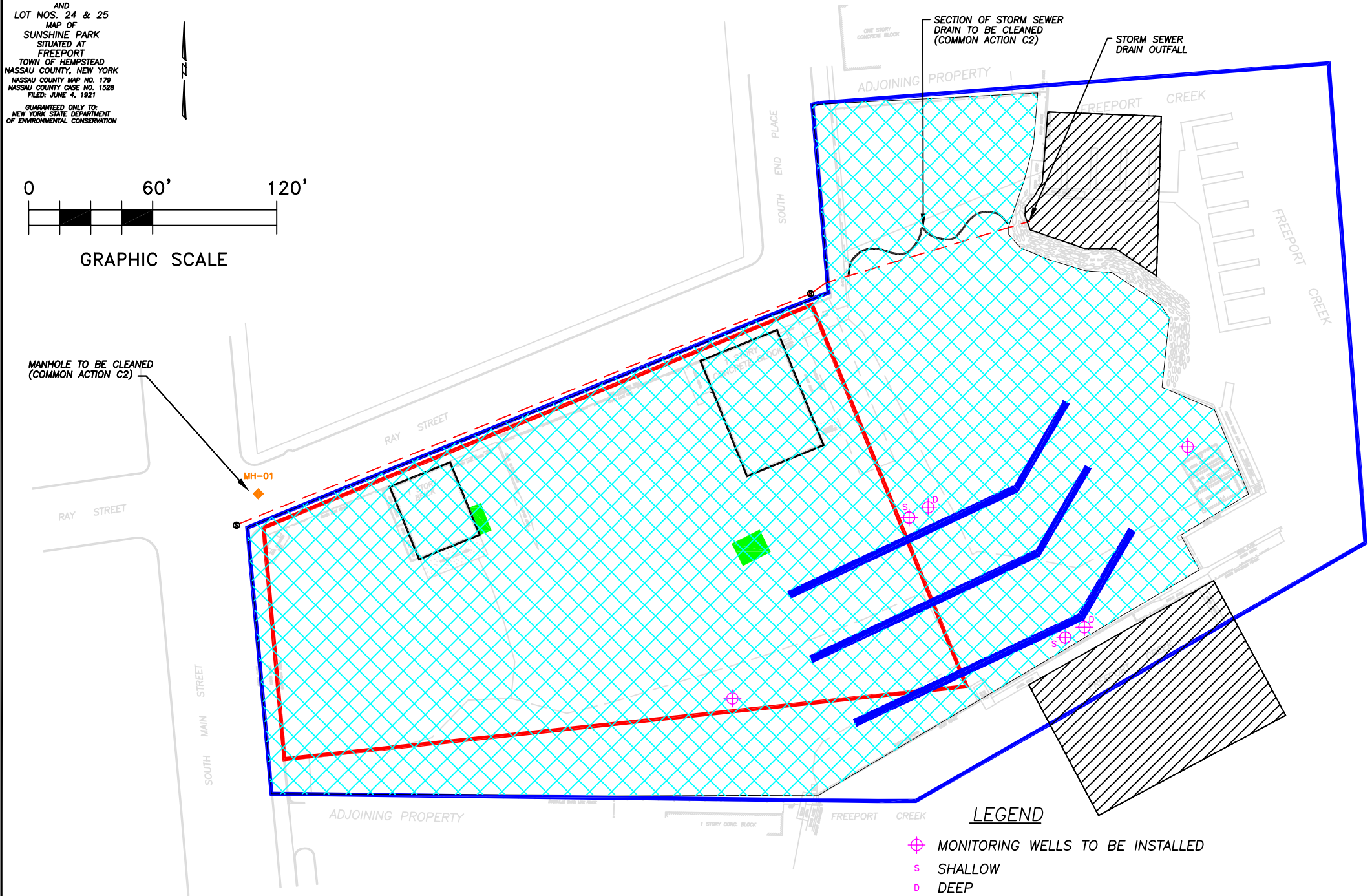
FILED: JUNE 4, 1921

GUARANTEED ONLY TO:
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

0 60' 120'

GRAPHIC SCALE



LEGEND

- MONITORING WELLS TO BE INSTALLED
- S SHALLOW
- D DEEP
- STUDY AREA
- SITE
- STORM SEWER DRAIN
- AREA OF SEDIMENT REMOVAL (MAY CHANGE BASED ON PRE-DESIGN STUDIES)
- POTENTIAL UST TO BE REMOVED (COMMON ACTION C3)
- EXCAVATION OF SOILS EXCEEDING VOC AND METALS SCGs TO 14' BELOW GRADE
- BUILDING TO BE DEMOLISHED PRIOR TO SOIL EXCAVATION
- ZERO VALENT IRON WALL

NOTE:

1. THE NEED FOR SUB-SLAB DEPRESSURIZATION (COMMON ACTION C1) FOR NEW BUILDINGS CONSTRUCTED POST-REMEDIATION WOULD BE EVALUATED THROUGH SOIL GAS SAMPING FOLLOWING REMEDIAL ACTION IMPLEMENTATION.

2. ENVIRONMENTAL EASEMENT (COMMON ACTION C4) WOULD BE IMPLEMENTED TO RESTRICT GROUNDWATER USE.

TITLE

ALTERNATIVE 6:
FULL SCALE SOIL EXCAVATION, ZVI WALL AND SEDIMENT REMOVAL
METAL ETCHING SITE
FREEPORT, NEW YORK

PREPARED FOR

NYSDEC

Environmental Resources Management
ERM

SCALE	FIGURE
GRAPHIC	15

DRAWN:	JOB NO.:	FILE NAME:	DATE
MFM/EMF	0011475	0011475-01-054	11/1/06