Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

34 Freeman's Bridge Road Site

Town of Glenville
Schenectady County, New York
Site Number 447028

March 2004

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor*   ERIN M. CROTTY, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

34 Freeman's Bridge Road
Inactive Hazardous Waste Disposal Site
Town of Glenville, Schenectady County, New York
Site No. 447028

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the 34 Freeman's Bridge Road site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the 34 Freeman's Bridge Road inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and/or the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the 34 Freeman's Bridge Road site and the criteria identified for evaluation of alternatives, the NYSDEC has selected excavation and on-site thermal treatment of site wastes and soils. The components of the remedy are as follows:

- Excavation, on-site low temperature thermal treatment, and on-site stabilization of approximately 71,000 tons of contaminated soils, waste, and debris.

- Collection and treatment of contaminated non-aqueous phase liquids (NAPLs) and groundwater from the main contaminated area.

- Site restoration using treated and stabilized soils as backfill.

- Institutional controls and restrictions on the use of the property and future use of groundwater.

- Monitoring of remaining groundwater contamination area to confirm success of source area remedy.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

___________________________________	___________________________________
Date	Dale A. Desnoyers, Director Division of Environmental Remediation

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RECORD OF DECISION

34 Freeman's Bridge Road Site

Town of Glenville, Schenectady County, New York
Site No. 447028
March 2004

SECTION 1: SUMMARY AND PURPOSE OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the 34 Freeman's Bridge Road Site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, surface and subsurface disposal of liquid and oily chemical wastes, drummed wastes, and landfilling of construction and demolition debris have resulted in the disposal of hazardous wastes, including polychlorinated biphenyls, volatile and semi-volatile organic compounds, polycyclic aromatic hydrocarbons, and metals. These wastes have contaminated the surface soils, subsurface soils, and groundwater at the site, and have resulted in:

- a significant threat to human health associated with potential exposure to contaminated surface soil, subsurface soil, and groundwater.

To eliminate or mitigate these threats, the NYSDEC has selected the following remedy:

- Excavation, on-site low temperature thermal treatment, and on-site stabilization of approximately 71,000 tons of contaminated soils, waste, and debris.

- Collection and treatment of contaminated non-aqueous phase liquids (NAPLs) and groundwater from the main contaminated area.

- Site restoration using treated and stabilized soils as backfill.

- Institutional controls and restrictions on the use of the property and future use of groundwater.

- Monitoring of remaining groundwater contamination area to confirm success of source area remedy.

The selected 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.

SECTION 2: <u>SITE LOCATION AND DESCRIPTION</u>

The 34 Freeman's Bridge Road site is an 13-acre property located in a residential and commercial area on Freeman's Bridge Road in the Village of Scotia, Town of Glenville, New York. The site is currently owned by Lyon's Ventures, Inc. and is operated as a commercial used office furniture supply business.

The site is bound by Maple Avenue and residential and commercial properties to the north, Freeman's Bridge Road and residential and commercial properties on the west, and railroad and power line rights-of way and an asphalt emulsion business to the south and east. Warner Creek (also known as Kromme Creek), a tributary to the Mohawk River, drains a portion of the site. The Mohawk River approaches within 350 feet of the site at its closest point. The nearest residential dwelling is located approximately 450 feet from the site. Figures 1 and 1a show the site and its surroundings.

The site is generally flat and covered with grass and small bushes and trees. A building and associated parking areas, used for the furniture business, is located in the extreme southwest corner of the property. Beginning in the late 1970's and continuing through the 1980's, the rear of the property was covered with approximately eight feet of soil and construction and demolition debris from various sources. Approximately 13 acres of formerly low-lying areas of the Lyons property and several adjacent properties has been filled.

SECTION 3: <u>SITE HISTORY</u>

3.1: <u>Operational/Disposal History</u>

The site was formerly occupied by Kitchton Cooperage Company from the late 1940's until 1972. The cooperage accepted containers, including 55-gallon drums, with residual liquids and solids from local industries. The drums were cleaned, repainted, recycled, and resold. Wastes from the operation were reportedly disposed onto the ground surface and into pits, lagoons, and ditches to the rear of the cooperage building. Drums and other waste materials were also stored in various places about the property. These activities have been confirmed through aerial photographic analysis and information from local residents. The cooperage activities appear to be the primary contributor to site contamination.

The current owner took over the property in 1978 and has accepted various additional wastes, including drums of hazardous waste and large quantities of construction and demolition wastes from local construction projects. These materials have contributed additional contamination to site soils and groundwater. The thick layer of contaminated soil and construction and demolition debris now comprises the main source area at the site. Figure 2 shows the thickness of fill at the site.

3.2: <u>Remedial History</u>

In 1984, the NYSDEC listed the site as a Class 2 site, site I.D. Number 447016, in the Registry of Inactive Hazardous Waste Disposal Sites in New York State. 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.

The site was listed due to the presence of drummed wastes behind the building. The owner was directed to remove the drums and the site was delisted on the premise that this had been accomplished. In 1989, drums were again discovered behind the site building. These may have been the same drums previously discovered in 1984. The NYSDEC Region 4 office performed a drum removal. Approximately 80, 55-gallon drums were removed. The owner was assessed a fine for improper storage of hazardous wastes.

In 1996, the site came under consideration for commercial development. Touhey Associates, acting as a volunteer, and its consultant sampled the property to determine the extent of any contamination. A number of test pits were dug and soil samples taken. PCBs were detected in subsurface soils in many locations at concentrations in excess of 100 parts per million (ppm). The volunteer activities, and the commercial development, were subsequently dropped.

An Immediate Investigation Work Assignment investigation was performed by contractors of the NYSDEC in June 1996. Additional test pits were dug and several groundwater monitoring wells installed. PCBs were detected in surface soils at several locations at concentrations up to 33 ppm. Subsurface soils were also found to be contaminated with PCBs in concentrations up to 980 ppm. Groundwater was found to contain levels of PCBs, dichloroethene, benzene, toluene, ethylbenzene, xylenes, and several semi-volatile organic compounds at concentrations in excess of NYS standards. At least one monitoring well encountered a non-aqueous phase liquid. Based on these results, the site was placed back on the Registry in December 1996 as a Class 2 site, site I.D. number 447028.
Additionally in 1996, the New York Sate Department of Health sampled four residential wells in the area. None of the samples indicated site-related contamination.

SECTION 4: <u>ENFORCEMENT STATUS</u>

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

The PRPs for the site, documented to date, include: the current site owner/operator, Lyon's Ventures, Inc., and the former operator and disposer of the majority of the waste, Kitchton Cooperage Company. Kitchton has long been out of business and is not considered a viable entity.

The PRP (Lyon's Ventures, Inc.) declined to implement the RI/FS at the site when requested by the NYSDEC in 1998. The site was subsequently referred to the Division of Environmental Remediation for the performance of an RI/FS under the State Superfund program.

After the remedy is selected, the PRP will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRP, the NYSDEC will evaluate the site for further action under the State Superfund. 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.

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 in two separate phases between January 2000 and November 2001. The field activities and findings of the investigation are described in the RI report. Figure 3 shows the location of samples taken during the investigation.

The following activities were conducted during the RI:

- Research of historical information, including aerial photograph interpretation;
- Geophysical survey to investigate the fill and determine areas to explore with test pits and test trenches;
- Excavation of 35 test pits and test trenches to investigate conditions in the fill and sample soils and wastes;
- Collection of 147 soil samples from test pitting operations;
- Installation of 25 soil borings using direct push technology;
- Installation of 24 soil borings and 24 new monitoring wells (in addition to the 7 already existing), with the collection of 65 samples for chemical analysis of soils and groundwater, as well as physical testing to determine properties of soil and hydrogeologic conditions;
- Installation of three large diameter (18-36") culvert wells to evaluate NAPL properties and assess potential remedial alternatives;
- Sampling of 31 new and existing monitoring wells;
- Collection of groundwater samples from 26 locations, including a sample from an interior building sump;
- A survey of public and private water supply wells in the area around the site, and collection of water samples from three residential wells;
- Collection of surface water samples at 6 locations;
- Collection of 12 aquatic sediment samples at 6 locations;

To determine whether the soils, groundwater, surface water, and sediments 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 NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

- Site-specific soil cleanup goals were developed by the NYSDEC in consultation with the NYSDOH. These include:

  Total Carcinogenic SVOCs in soil - 10 ppm
  Total SVOCs in soil - 500 ppm
  Total VOCs in soil - 10 ppm
  Total PCBs in surface soil - 1 ppm
  Total PCBs in subsurface soil - 10 ppm
  Lead in soil - 1200 ppm
  Total Chromium in soil - 50 ppm
  Mercury in soil - 2 ppm

- Sediment SCGs are based on the NYSDEC "Technical Guidance for Screening Contaminated Sediments."

- Background surface and subsurface soil samples were taken from two locations. These locations were upgradient and across a stream from the site, and were deemed to be representative of fill conditions typical for the area and unaffected by historic or current site operations. The samples were analyzed for PCBs, metals, and volatile and semi-volatile organic compounds. The results of the analysis were compared to data from the RI (Table 1) to determine appropriate site remediation goals.

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 below. More complete information can be found in the RI report.

5.1.1: Site Geology and Hydrogeology

The site is located in the valley and flood plain of the Mohawk River. At its closest point, the river approaches within 350 feet. The Mohawk River is a Class A water body in the vicinity of the site, i.e., the waters' best use is as a source of drinking water.

Warner Creek, a tributary of the Mohawk River, forms the northwest boundary of the site. The creek is an approximately 2-1/2 mile long drainageway that originates in a wetland just northeast of the Scotia-Glenville Industrial Park. The drainage basin for the creek includes the highly developed Route 50 corridor and the western half of the Schenectady County Airport. As it leaves the site area, the stream passes through a culvert penetrating the railroad embankment on the eastern edge of the site. The stream passes through a NYSDEC regulated wetland (S-112) before discharging to the Mohawk River, approximately 2,000 feet downstream from the site. The creek is classified as a C(TS) stream, meaning its best use is supporting fisheries and non-contact human activities. Figures 1 and 1a show the site and its surroundings.

The site is relatively level and most areas range in elevation from 224 to 228 above sea level. Surface drainage on the eastern and northeastern sides of the site is to the east toward the railroad embankment, then north to Warner Creek. Runoff from the northern portion of the site flows northwest directly to the creek. The southern part of the site drains south and west toward Freeman's Bridge Road. Historic topographic maps indicate a former tributary that flowed through the site area, originating near the current parking area and following a straight course to Warner Creek near the railroad culvert. This drainage pathway has since been significantly altered by the site fill, but it may still control the flow and migration of groundwater and NAPL in the subsurface.

The remedial investigation identified five stratigraphic units at the site. In order of increasing depth, they are:

- Fill
- Floodplain Alluvium
- Deep Sand
- Glacial Till and other Deposits
- Bedrock

Fill is the surficial unit and most significantly impacted hydrogeologic unit of the site. Most of the fill consists of construction and demolition debris, including brick, asphalt, concrete, and wood. In some areas, domestic wastes and pieces of drums and containers were observed. The heterogeneous nature of the fill creates potential contaminant pathways within the fill. Fill underlies essentially the entire site property and several adjacent properties to the north and west. The fill thickness ranges from 1.5 feet to 11 feet. (Figure 2 shows the location and thickness of the fill.) The fill represents the major zone of contamination, both in soils and groundwater.

The floodplain alluvium is a natural silt and clay deposit underlying the fill. It appears to provide a relatively low permeability layer that retards the vertical migration of groundwater and NAPLs. For this reason, it has significant importance relative to the migration of contaminants that may have been released at the existing or former ground surface. A prominent feature of the alluvium is the former drainage tributary/pathway to Warner Creek that existed prior to the filling of the site property. This drainage swale, shown on Figures 5 and 6, controlled the thickness of fill and may represent a preferred pathway for contaminant migration.

The floodplain alluvium is underlain by a thick layer of sand. This layer represents a significant water bearing zone that is used locally for public and private drinking water supply. This layer is noted near the surface of the ground on the eastern side of the site (at MW-18) and at depths greater than 16 feet to the west at MW-13.

The glacial till and bedrock layers represent deep confining layers beneath the site. The till is composed of silt and clay and was encountered in borings at depths ranging from 23 to 56 feet below the ground surface. The bedrock is shale and was found at depths ranging from 15 feet at MW-17 on the east to greater than 70 feet at MW-23D on the west. The till and bedrock units are not significant water bearing zones.

The 34 Freeman's Bridge Road site is located near the eastern edge of the Schenectady Aquifer, a highly productive sole-source aquifer. The part of the aquifer in the site area is not used for public water supply and is classified as a general aquifer recharge area. Groundwater impacts from the site are not expected to affect public or any other known drinking water supplies.

There are two principal zones of groundwater flow at the site, the shallow zone and the deep zone. The shallow zone consists of the saturated fill and upper portions of the floodplain alluvium. The deep zone is comprised of the deep sand unit. The floodplain alluvium, where present, acts as a barrier between the two zones.

Groundwater flow is somewhat complex and seasonally variable. The shallow zone groundwater occurs under unconfined water table conditions. Depth of water ranges from 4 to 13 feet below ground surface. Groundwater in drier months of the year flows radially outward from a groundwater mound located beneath the gravel parking area to the rear of the building. To the north of the site, flow is generally eastward toward the Mohawk River. In wetter times of the year, flow is generally eastward onto the southern part of the site and northeastward in the northern portions of the site. Flow directions for the shallow zone are shown on Figure 5.

The deep aquifer zone is comprised of groundwater in the deep sand unit underlying the fill and floodplain deposits. Groundwater in the sand occurs under confined artesian conditions beneath the low permeability floodplain alluvium in most areas of the site. Groundwater flow in the deep zone in drier months is quite low, but generally in a northeasterly direction. Higher flow gradients are noted in the wetter months and groundwater flows onto the site from the east and west margins and flows offsite in a northeasterly direction. Figure 6 shows the deep zone groundwater flow.

5.1.2: <u>Nature of Contamination</u>

As described in the RI report, many soil, groundwater, surface water, and sediment samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and inorganics (metals).

The VOCs of concern are primarily petroleum hydrocarbons, such as benzene, toluene, and xylene and some chlorinated compounds such as trichloroethene and 1,2-dichloroethene.

The primary SVOCs of concern arepolycyclic aromatic hydrocarbons (PAHs) such as benzo(a)anthracene, benzo(b)phenanthrene, and benzo(a)pyrene. Some phenolics, phthalates, naphthalenes, and chlorobenzenes are also present. PAHs are commonly associated with coal, ash, heavy petroleum oils and products of incomplete combustion.

The PCBs of concern are Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260. PCBs are a group of 209 different synthetic organic chemicals that were used in industry due to their resistance to heat and electrical insulating properties. Polychlorinated biphenyls were blended in different combinations (called Aroclors) according to their desired properties. PCBs show a strong affinity to organic material and are often bound up in soil layers. They are not readily dissolved in water and thus, are not generally found in groundwater or surface water unless associated with fine-grained particulate matter suspended in these media. In the environment, PCBs are relatively persistent, and are degraded only under certain highly favorable conditions. PCB distribution at 34 Freeman's Bridge Road is associated with the distribution of NAPL and also generally occurs in the same areas where the soil is contaminated with SVOCs and PAHs.

The primary metals of concern at the site are lead and chromium. These metals have the widest distribution and occur at the highest concentrations relative to background levels and the cleanup goals.

5.1.3: <u>Extent of Contamination</u>

This section describes the findings of the investigation for all environmental media that were investigated.

Chemical concentrations are reported in parts per billion (ppb) for water and parts per million (ppm) for waste, soil, and sediment. For comparison purposes, where applicable, SCGs are provided for each medium.

Table 1 summarizes the degree of contamination for the contaminants of concern in waste (NAPL), surface and subsurface soils, shallow and deep groundwater, sediment, and surface water and compares the data with the SCGs for the site.

Refer to Figures 1 and 1a for the Site Location and Site Surroundings and Features. Figure 2 shows the thickness of fill covering the site. Figure 3 gives the location of all samples taken during the Remedial Investigation. Figures 4 through 13 present detail on the extent of contamination by media and contaminants of concern.

The results of the Remedial Investigation indicate that the fill (the surface soil plus the subsurface soil) and the upper surface of the underlying alluvial materials are contaminated with volatile organic compounds, semi-volatiles, PCBs, and metals in concentrations in excess of New York State standards, criteria, and guidelines.

Significant soil contamination, including NAPL, is present in three principal areas of the site: 1) the vicinity of the existing building and parking area; 2) to the north and east of the parking area; and, 3) several isolated areas beyond the parking area associated with buried drums and debris. The distribution of soil contamination is consistent with the reported and inferred patterns of past releases and disposal, including:

- spillage and routine disposal of liquids to the former ground surface and into pits and lagoons near the building and parking area, particularly along a former drainage ditch at the southeast side of the building;
- migration of contaminants along former ditches and drainage pathways away from the point of disposal;
- burial of low-lying areas, including pits and lagoons by construction and demolition debris and other waste material;
- entrainment of waste materials such as liquids in the fill; and
- burial of waste drums and containers, subject to potential corrosion and leakage, in the fill.

Shallow groundwater, within the fill and above the underlying alluvial materials, is contaminated with site-related contaminants. The contamination is generally associated with the soil contamination source areas, though some groundwater exceedances are observed at the northeast end of the site. The deeper groundwater, within or below the alluvium, is not significantly contaminated.

Surface and subsurface soil contamination does extend beyond the Lyons property lines, particularly in the subsurface to the north of the parking area. Contamination on adjacent properties is closely associated with the observed limits of fill on those properties. Soil and groundwater within the Niagara-Mohawk Power Corporation right-of-way along the south side of the site does not appear to be impacted by site-related contamination.

The following are the media which were investigated and a summary of the findings of the investigation

Waste Materials (NAPL)

Non-aqueous phase liquids have been observed in several locations at the site. Both light NAPLs (LNAPL) that float on the water table and dense NAPLs (DNAPL) have been found. LNAPLs tend to be hydraulically controlled and may concentrate in areas similar to the shallow groundwater mound observed in the parking area. LNAPLs were observed in well MW-2, MW-4, MW-6, MW-7, and MW-8 and in the large diameter culvert wells CW-1, CW-2, and CW-3. Except for MW-4, all these wells are located near the building in the shallow groundwater mound in parking area. NAPL was also observed in several test pits including TP-21, TP-26, and TP-35.

DNAPL migration and occurrence tends to be stratigraphically controlled and DNAPLs may accumulate in topographic depressions in the subsurface. Locations MW-2, MW-5, MW-6, GB-22, TP-21, TP-26, TP-35, CW-2, and CW-3 all are located within interpreted depressions in the surface of the underlying alluvium surface in the area behind the building. All of these locations encountered NAPL.

Chemical analysis of three NAPL samples indicate high concentrations of volatiles, semi-volatiles, and PCBs. Several different Aroclors of PCBs were detected (1242, 1248, 1254, and 1260), with individual PCB concentrations ranging up to 1,500 ppm; well above the 50 ppm concentration that would classify the material as hazardous waste. Volatile organic analysis indicated significant concentrations of several compounds including benzene (1.2 ppm maximum at MW-6), toluene (280 ppm maximum at MW-8), xylenes (1,600 ppm maximum at MW-8), trichloroethene (28 ppm maximum at MW-8), and tetrachloroethene (48 ppm maximum at MW-8).

Table 1 provides a summary of analytical results for NAPL. Figure 3 shows the locations of samples. Figure 4 shows the extent of NAPL observed in the subsurface.

Surface Soil (0-2 feet)

For remedial costing purposes and for the purpose of discussing the extent of contamination, surface soil has been defined as extending from the ground surface to a depth of two feet. For risk assessment and human exposure evaluation purposes, contaminants in the upper two inches of soil were considered. Surface soil in most areas of the site is non-native fill material covered by pavement, gravel, or vegetation. In some areas, it is covered by recently deposited debris.

Volatile organic contamination of surface soils is not of primary concern. Only one location (test Pit TP-35) of the 14 sampled for volatiles exceeded the remedial goal of 10 ppm for total volatiles. Several compounds, primarily benzene, toluene, and xylene, exceeded their individual cleanup goals at the same location.

Semi-volatile organic contamination was widespread across the site, though at moderately low total concentration levels relative to the remedial goals. None of the 19 locations sampled exceeded the 500 ppm total SVOCs cleanup goal. However, a number of locations did have specific compounds in concentrations that exceeded specific cleanup levels. The maximum concentration of SVOCs was noted in TP-35, near the former drainage ditch behind the building. Total carcinogenic SVOCs were detected at two locations in excess of the 10 ppm cleanup goal: TP-35 at 32.2 ppm and TP-18 at 38.6 ppm.

PCBs are the primary contaminants of concern for surface soil at the site. PCBs were detected at concentrations exceeding the one ppm total PCB cleanup goal at 17 of 18 locations. Three samples exceeded the 50 ppm regulatory limit for the definition of hazardous waste. The maximum concentration detected was 1,100 ppm at TP-35 behind the on-site building.

Metals were detected above SCGs in a number of locations. Comparison to background concentrations of fill material from the area and comparison to published values for background concentrations indicate chromium and lead to be of concern in surface soils. Chromium was found at levels from 10.4 to 962 ppm at 17 of 19 locations. The established cleanup goal is 50 ppm. Lead was detected at levels ranging from 895 to 5,140 ppm, in excess of the cleanup goal of 1,200 ppm.

Table 1 provides a summary of analytical results for Surface Soil. Figure 3 shows the locations of samples. Figures 9 through 13 show the extent of SVOCs, PCBS, and metals in the surface soil.

Subsurface Soil (>2 feet)

For remedial costing purposes and for the purpose of discussing extent of contamination, subsurface soil has been defined as all soils found at depths greater than two feet below the ground surface. Subsurface soil in most areas of the site is non-native fill material covered by pavement, gravel, or vegetation. The fill may be construction and demolition debris, soil and rock, or mixed wastes including portions of drums and containers.

Generally, the subsurface soil is the most contaminated medium at the site.

Five locations of the 43 sampled exceeded the remedial goal of 10 ppm total for volatile organic contamination. These were: MW-8 (5,542 ppm at 4-6 feet), MW-9 (15 ppm at 4-6 feet), TP-7 (135 ppm at 6-8 feet), TP-26 (1,450 ppm at 2-4 feet), and TP-35 (366 ppm at 2-4 feet). The predominant contaminants were petroleum hydrocarbons (benzene, toluene, and xylene). Most of these locations were within the area of observed NAPL and the results are consistent with visual observations of gross contamination in these areas.

Semi-volatile compounds were detected in numerous locations at the site. Five of the 45 locations had concentrations that exceed the 500 ppm remedial goal for total SVOCs. A maximum concentration of 4,918 ppm was noted at MW-10. As with the volatiles, all the high areas are associated with the area of NAPL observations and visual indications of contamination in the sample. The highest concentrations typically occur within the 4-6 feet depth interval near the building and parking area.

PCBs are prevalent in elevated concentrations at numerous locations in the subsurface. Of the 44 locations sampled, 16 exceed the 10 ppm remedial goal for total PCBs in subsurface soil. The highest concentrations were found in TP-14 (1,860 ppm at 2-4 feet) and TP-26 (1,160 at 2-4 feet). Again, the highest concentrations were generally found behind the building and under the parking area in areas of observed NAPL.

Metals were found in elevated concentrations in several locations. The primary metals of concern in the subsurface are chromium, lead, and mercury. Chromium was detected in 43 of 44 locations with a maximum value at location TP-35 (1,130 ppm at 4-6 feet). Lead was found in 9 of 44 locations with a maximum value at TP-35 (6,410 ppm at 4-6 feet). Mercury was found at one location that exceeded the remedial goal of 2 ppm (TP-1, 116 ppm at 4-6 feet).

Table 1 provides a summary of analytical results for Subsurface Soil. Figure 3 shows the locations of samples. Figures 9 through 13 show the extent of contamination in the subsurface soil.

Surface Water

Samples of surface water were taken at six locations in Warner Creek. A single volatile organic compound, tetrachloroethene (PCE), was detected in three locations (SW-1 at 6 ppb, SW-2 at 18 ppb, and SW-3 at 16 ppb). SW-1 is located upstream of the site near where the stream passes under Freeman’s Bridge Road, suggesting an upstream source of the contaminant. No SVOCs or PCBs were detected in surface water. Metals in SW-1 and SW-2 were all below standards. The only exceedance for metals was in sample SW-3 which contained iron at 364 ppm, slightly above the SCG.

Sediments

Sediment samples were taken in Warner Creek at 6 locations at two depths (0-6 inches and 6-12 inches) per location. Samples were taken upstream and downstream of the site and along the site boundary with the creek. Generally, it appears that site-related impacts to the sediment in Warner Creek, if any, are minor. While some contaminants were detected at concentrations in excess of sediment screening criteria, impacts are likely related to upstream or off-site sources, or are related to the generally poor quality of the terrestrial and aquatic habitat.

Tetrachloroethene (1.5 ppm at SW-2) and vinyl chloride (0.7 ppm at SW-2) were the only volatiles detected in sediments at concentrations above the sediment criteria. While tetrachloroethene was detected on the main site property, the presence of this contaminant in surface water samples upstream and adjacent to the site may better explain the presence of this contaminant in the sediment.

Semi-volatiles were detected at levels slightly above sediment screening criteria in both upstream and downstream samples.

PCBs (Aroclor-1248 at 0.067 ppm) were detected in one sample, SED-2, downstream of the site. Elevated levels of several metals were detected in locations SED-2 and SED-3. These metals include copper, iron, manganese, mercury, and zinc. The concentrations detected were generally higher than the Lower Effects Level (LEL) which indicates sediments are contaminated to a moderate level. However, none of the contaminants exceeded the Severe Effects Level (SEL) and the contaminants are not the same as those considered to be of concern at the site disposal areas. It is likely that the source of the contaminants is off-site or upstream and reflects the general poor quality of the aquatic habitat.

Table 1 provides a summary of analytical results for Sediment. Figure 3 shows the location of sediment samples taken in Warner Creek.

Groundwater

The shallow groundwater zone is significantly contaminated in areas associated with the extent of NAPL and surface and subsurface soil contamination in and around the gravel parking area and the site building.

Volatile organics were detected in a number of wells, however, exceedances of SCGs are limited mainly to MW-8 (the most highly contaminated soil and NAPL area) and sporadic hits in wells MW-5, 10, 14, and 15. Contaminants are petroleum hydrocarbons such as benzene (120 ppb maximum at MW-8), toluene (2,400 ppb maximum at MW-8), and xylene (3,500 ppb at MW-8) and chlorinated compounds such as 1,2-dichloroethene (1,400 ppb maximum at MW-8).

Semi-volatile organic contaminants also were detected primarily in areas associated with the parking area. MW-8, again, was the most contaminated well, containing 34,410 ppb of total SVOCs. Only four other wells had exceedances of SVOCs: MW-19 (total SVOCs of 164 ppb), MW-13 (37 ppb total SVOCs), MW-20 (33 ppb total SVOCs), and MW-10 (1 ppb total SVOCs).

PCBs were detected in concentrations that exceed groundwater standards at six of the 16 locations sampled in the shallow zone. The distribution of the PCBs in the shallow zone groundwater is consistent with other data. The maximum concentrations noted are in the MW-8 area, which measured 46 ppb total PCBs. Other wells with high values of PCBs were: MW-10 (1.6 ppb total PCBs), MW- 13 (6.3 ppb total PCBs), MW-14 (4.7 ppb total PCBs), MW-16 (0.44 ppb total PCBs), and MW-20 (21.8 ppb total PCBs). These wells are all located within the buried swale/former tributary noted in the underlying floodplain alluvium, suggesting this feature plays an important role in contaminant distribution and migration. These wells are also located in the areas of greatest NAPL contamination.

Metals were found in several wells in concentrations in excess of SCGs. The greatest frequency of exceedances were for chromium and lead, which are primary metals of concern in the surface and subsurface soils. The highest values were found in MW-1, a potentially upgradient location adjacent to Freeman's Bridge Road.

Table 1 provides a summary of analytical results for Shallow Groundwater. Figure 7 presents the shallow groundwater contamination data and well locations in detail.

The deep groundwater is significantly less contaminated than the shallow zone. The low permeability of the overlying floodplain alluvium appears to retard the flow and migration of contamination down from the fill into the lower units.

Volatile organic contaminants, were detected in several wells monitoring the deep zone. MW-9, located immediately downgradient of the highly contaminated MW-8 area, is the most contaminated well in the deep zone. The primary contaminant of concern in the deep zone is 1,2-dichloroethene. This compound was found in wells MW-9 (52 ppb), MW-24 (20 ppb), MW-16D (14 ppb), and at an upgradient well, MW-19D (53 ppb). This contaminant is the only VOC found in any significant concentration outside the principal contamination source area.

Only one well in the deep zone, MW-9, contained SVOCs at concentrations that exceed SCGs. The majority of SVOCs detected are phenolic compounds such as 2,4-dimethyphenol found at 250 ppb in MW-9.

In the deep zone, only MW-9 contained PCBs (41 ppb total PCBs) at concentrations above SCGs. Likewise, metals impacts to the deep zone are also considerably less than that noted for the shallow zone. Only MW-9 encountered elevated levels of metals, principally chromium at 84.7 ppb and lead at 238 ppb.

Four nearby residential wells were sampled by the New York State Department of Health in 1996. Three residential wells were sampled again in 2002. All of the wells were located near the site on the other side of Freeman's Bridge Road. None of the samples detected site-related contamination. There are no known residential wells located downgradient of the site source areas.

Table 1 provides a summary of analytical results for Deep Groundwater. Figure 8 presents the shallow groundwater contamination data and well locations in detail.

Air

No ambient air samples were collected at the site for analysis. However, real-time monitoring of the air during intrusive investigations was performed. No significant levels of volatile organics or particulates were encountered. Indoor air surveys, including sub-floor soil gas, of the site building are proposed as part of the remedy discussed later in this document.

5.2: <u>Interim Remedial Measures</u>

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.

There were no formal IRMs performed at this site during the RI/FS. However, wastes and test pit spoils generated during the investigation activities were stockpiled and subsequently removed. Approximately 125 tons of contaminated soils were removed and disposed off-site. Additionally, six partially crushed, 55-gallon drums of a paint-like material discovered in the test pit program and 22, 55-gallon drums of well development and decontamination water were sent off-site for disposal.

5.3: <u>Summary of Human Exposure Pathways</u>:

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 Sections 2 and 8 and Appendix L 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.

Environmental data collected at the site were used to develop a Qualitative Human Health Exposure Assessment. Environmental samples were grouped into five media:

- groundwater
- surface soil

- subsurface soil
- surface water
- sediment

Contaminants of potential concern include volatile organics, semi-volatile organics, PCBs, and metals.

Shallow groundwater beneath the site contains detectable concentrations of contaminants of potential concern. Much of the shallow groundwater discharges directly to Warner Creek at the eastern end of the site. Public water provides drinking water to the site and the surrounding community. There are a few private wells in the area that provide water for consumption. Several of these nearest the site have been sampled and found to be free of site-related contaminants. The site is in the eastern periphery of the Schenectady Aquifer, a sole source of potable water for several municipalities. However, given the distance to the wellfields and the current groundwater flow direction, site groundwater does not pose a threat to this public supply of groundwater. Therefore, the groundwater pathway is considered to be an incomplete exposure pathway for current use conditions. Future construction and utility workers may be exposed to contaminated groundwater through direct contact and inhalation of vapors.

A portion of the site contains free-phase product (NAPL) on groundwater. Although no current exposures are occurring, the presence of NAPL may pose a threat to future construction and excavation workers due to direct contact and inhalation of vapors. Additionally, the NAPL may affect indoor air quality of on-site buildings due to migration of vapors.

Surface soil samples indicate the presence of semi-volatiles, PCBs, and metals of concern. Current on-site workers and site trespassers (nearby residents) may be exposed on a limited basis due to incidental ingestion and dermal contact with site soils. Potential future receptors may include residents and construction and utility workers.

Subsurface soil samples revealed the presence of semi-volatiles, volatiles, PCBs, and metals of concern. Given the depth below the ground surface, it is unlikely that any current exposures to contaminants of concern are occurring. Potential future exposures may occur to construction and utility workers.

Surface water and sediment in Warner Creek were found to contain volatile organics, semi-volatiles, and metals. Potential receptors may include nearby residents using the creek for recreational purposes. However, due to the low perceived use of the creek (due to its unappealing nature and limited physical access), it is expected that any exposures to contaminants in sediment and surface water would be extremely limited.

Although no ambient air samples were collected at the site for analysis, real-time monitoring of the air during intrusive investigations was performed. No significant levels of volatile organics or particulates were encountered. Therefore, the ambient air pathway is not expected to present a threat of human exposure. Future construction workers may be exposed to particulates and volatile organics in ambient air during soil excavation activities

5.4: Summary of Environmental Impacts

This section summarizes the evaluation of 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 in Appendix M, presents a detailed discussion of site habitats and the potential impacts from the site to fish and wildlife receptor

In general, based on environmental sampling and site reconnaissance, the potential for the site to impact fish and wildlife and their associated habitats is minimal.

Significant environmental resources and habitats identified nearby include:

- Mohawk River (NYSDEC Class A water body)
- Warner Creek (Kromme Kill) (NYSDEC Class C(TS) water body)
- NYSDEC regulated wetland S-112
- Federal wetland (Warner Creek wetland)

The project site is extremely disturbed. Construction and demolition debris, including metal, concrete, asphalt, wood, brick, and appliance parts, are visible in many parts of the site. Even in areas that are predominantly covered in vegetation, debris is evident. In the southwest corner of the site, there is a commercial facility and a parking area. Outside of the building and parking areas, small trees, shrubs, and grasses cover the remaining land. Plant species found on site are those typically found in disturbed locations. No rare or endangered species of plants or animals were identified within one-half mile of the site.

Aquatic habitat centers on Warner Creek. Within the site area, the stream is severely degraded by activities unrelated to hazardous waste disposal. The southern bank of the stream often marks the extent of fill on the site. The northern bank is composed of lawn or shrub/forested habitat, and commercial property. Refuse and debris line the creek on both banks. Although the stream is classified as supporting trout propagation, field observations indicate the stream is seasonally stagnant, warm, and turbid and probably not suitable for trout at this location. Water quality is low due to the degraded upstream riparian corridor and runoff. The stream exits the site area through a culvert under the railroad embankment.

The terrestrial and aquatic habitat offers poor to marginal habitat for wildlife. The majority of the site is vegetated, however construction debris does not offer a sound basis for ecosystem development. The unnatural south bank of Warner Creek does not provide a suitable substrate for riparian vegetation and wildlife. In general, the stream has evidence of channel alteration, little or no floodplain, lack of a natural riparian zone, and poor water appearance.

Off-site, there is more suitable wildlife habitat within one-half mile of the site. The forested terrestrial and aquatic habitat downstream offers a more natural habitat for wildlife.

Although elevated concentrations of chemical compounds have been detected in surface and subsurface soils and wastes, the potential for wildlife exposure is limited. The site is relatively small, disturbed, and debris-littered. Contaminants in site media are primarily concentrated in the vicinity of the site building and parking area. Risks to wildlife through direct exposure is minimal due to the low habitat quality and limited extent of contaminated surface soil.

Contaminant concentrations detected in surface water and sediment were generally very low. As noted in Section 5.1.3. of this PRAP, the contamination found is more reflective of the overall poor quality of the habitat, rather than significant impacts from site-related activities.

Site contamination has significantly impacted the groundwater resource in the shallow zone. However, due to low flow gradients, migration of contaminants from the shallow zone to the surface water is slow. Eventually, some discharge of groundwater from the northeast portions of the site into wetland habitats is expected, but concentrations of contaminants in that area, at some distance from the source areas, are low. The deep zone of groundwater is markedly less contaminated.

The 34 Freeman's Bridge Road site is located near the eastern edge of the Schenectady Aquifer, a highly productive sole-source aquifer. The part of the aquifer in the site area is not used for public water supply and is classified as a general aquifer recharge area. Groundwater impacts from the site are not expected to affect public or any other known drinking water supplies.

SECTION 6: <u>SUMMARY OF THE REMEDIATION GOALS</u>

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. 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 polychlorinated biphenyls, volatile and semi-volatile organic compounds, and metals in wastes, contaminated surface soil, subsurface soil, soil vapor, groundwater, and non-aqueous phase liquids;

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

- the release or migration of contaminants from site soils and wastes into groundwater, surface water, and ambient air.

Further, the remediation goals for the site include:

- attaining to the extent practicable, ambient groundwater and surface water quality standards and applicable cleanup criteria and guidelines for soil.

- eliminating, to the extent practicable, the potential for contaminated groundwater, which does not meet NYSDOH Part 5 Drinking Water Quality Standards, to be used as a drinking water supply.

As soils and waste materials are the primary contaminated media at the site, site-specific and contaminant-specific cleanup goals were established. These goals were used to determine the areal extent and volumes of impacted soils, excavation and treatment volumes, and costs associated with the remediation. For the purpose of this evaluation, surface soil is defined as soils found from the surface to two feet below ground level. Subsurface soil is defined as soils found at depths greater than two feet. The specific goals are listed below:

Total Carcinogenic SVOCs in soil - 10 ppm
Total SVOCs in soil - 500 ppm
Total VOCs in soil - 10 ppm
Total PCBs in surface soil - 1 ppm
Total PCBs in subsurface soil - 10 ppm
Lead in soil - 1200 ppm
Total Chromium in soil - 50 ppm
Mercury in soil - 2 ppm

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 34 Freeman's Bridge Road Site were identified, screened and evaluated in the FS report which is available at the document repositories identified in Section 1.

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

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated wastes, soil and groundwater at the site. The alternatives and costs are further summarized in Tables 2 and 3.

Alternative 1: No Action

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

Present Worth: *$0*
Capital Cost: *$0*
Annual OM&M:
(Years 1-5): *$0*
(Years 5-30): *$0*

Alternative 1 is presented in the Feasibility Study as a true "no-action" alternative, in that no groundwater and surface water monitoring is proposed. The only protective activities envisioned are deed and land use restrictions (institutional controls or environmental easements) to be placed on the property. No cost estimates were developed for the restrictions as implementation and certification would be the responsibility of the property owner. This alternative was developed to provide a rigorous comparison to Alternative 2, Monitored Natural Attenuation, which is an aggressive monitoring and evaluation program.

Alternative 2: Monitored natural attenuation of groundwater and long-term institutional controls on site and groundwater usage.

Present Worth: *$2,140,000*
Capital Cost: *$104,000*
Annual OM&M:
(Years 1-5): *$132,500*
(Years 5-30): *$132,500*

Monitored natural attenuation relies on the reduction of the volume and toxicity of contaminants over time by naturally occurring processes in soil and groundwater. Extensive site modeling and monitoring would be performed as part of the alternative to demonstrate that contaminants do not represent a significant risk and that degradation is occurring. Monitoring would continue until contaminated groundwater concentrations attain groundwater standards. Institutional controls on the use of the land and groundwater would be imposed. Design and implementation of the remedy would be accomplished within one year of remedy selection.

Alternative 3: Containment with slurry wall and geomembrane, pumping within containment cell to maintain inward hydraulic gradient, treatment of NAPL and groundwater with on-site treatment plant, consolidation of contaminated soils within containment cell, long-term institutional controls on site and groundwater usage.

Present Worth: *$5,266,000*
Capital Cost: *$2,690,000*
Annual OM&M:
(Years 1-5): *$167,000*

(Years 5-30): *$167,000*

This alternative would involve the consolidation of soils (approximately 5,418 tons) containing high levels of metals from outlying areas of the site into the main source area of approximately 4 acres. The main source area would be isolated from the environment with a subsurface cut-off wall and a multi-layer, impermeable capping system (see insert). Extraction wells would maintain an inward gradient to prevent escape of contaminated groundwater and NAPL. A treatment system would be constructed to treat water prior to surface discharge. This alternative would require indefinite long-term operation, maintenance, and monitoring of the treatment system, containment structures, and remaining contaminated groundwater. The containment cell and groundwater would require institutional controls to limit future reuse. Design would take approximately one year and implementation of the alternative would be complete approximately three years from selection of remedy. As hazardous waste would remain on-site, the time to meet remediation goals is estimated to be greater than 30 years

Alternative 4: Excavation and removal of contaminated soils, groundwater, and NAPLs, on-site thermal treatment, stabilization of treated soils, backfill of excavation with treated soils, site restoration, groundwater monitoring, short-term institutional controls on groundwater usage

Present Worth: *$12,320,000*
Capital Cost: *$12,027,000*
Annual OM&M:
(Years 1-5): *$60,500*
(Years 5-30): *$0*

This alternative would involve the excavation and on-site thermal treatment of all soil and waste materials (approximately 71,743 tons) that exceed the soil cleanup goals. The treated material would be used as clean backfill to restore the site grades. As metals are not amenable to thermal treatment, some soils (approximately 21,238 tons) containing high concentrations of metals would be chemically and physically stabilized prior to being used as backfill. This material would be placed in a designated area of the site for management and monitoring. The site building would potentially be removed to allow access to underlying contaminated material, if present. The remaining small groundwater plume would be monitored and allowed to naturally attenuate. As all of the contaminated materials would be treated or stabilized, institutional controls on the future commercial or light industrial use of the site would be minimal; some controls on the use of site groundwater would be required until concentrations reach groundwater standards. Design of the remedy would take approximately one year and implementation of the alternative would be complete approximately three years from selection of remedy. It is estimated that the remediation goals would be met within 5 years of implementation of the remedy.

Multi-layer Impermeable Cap

Alternative 3 includes a cap with an impermeable subsurface barrier to prevent precipitation from entering the fill and groundwater and waste from migrating out of the site.

This cap would be designed to meet the requirements for landfill capping (6NYCRR Part 360) and PCB disposal facilities (TSCA Part 761). However, because fill at the site doesn't generate methane, the gas venting requirements of a Part 360 cap would be waived. The components of the cap, from bottom to top would be:

- Bedding layer of sand or geotextile to protect the barrier from underlying debris
- Impermeable layer of geomembrane or compacted clay
- Barrier protection layer of 18" of soil
- Layer (6") of vegetated topsoil or asphalt

The underlying fill and/or bedding layer would be properly sloped to promote drainage along the overlying barrier layer and away from the site. Additional drainage layers or structures may be necessary to convey water collected above the barrier to the discharge point.

Alternative 5: Excavation and removal of contaminated soils and NAPLs, off-site disposal and treatment of contaminated media, backfill of excavation with clean soils, site restoration, groundwater monitoring, short-term institutional controls on groundwater usage.

Present Worth: $14,918,000

Capital Cost: $14,625,000
Annual OM&M:
(Years 1-5): $60,500
(Years 5-30): $0

This alternative would involve the excavation, transport, and off-site disposal and treatment of all soils and wastes that exceed the cleanup goals. Clean backfill would be brought in to restore the site grades. The site building would potentially be removed to allow access to underlying contaminated material, if present. The remaining small groundwater plume would be monitored. As all of the contaminated materials would be removed, institutional controls on the future use of the site would be minimal; controls on the use of site groundwater would be required until concentrations reach groundwater standards. Design of the remedy would take approximately one year and implementation of the alternative would be complete approximately three years from selection of remedy. It is estimated that the remediation goals would be met within 5 years of implementation of the remedy.

Excavation Alternatives

Several of the alternatives under consideration involve varying degrees of excavation and/or removal of contaminated fill at the site. The following elements are common to the alternatives involving excavation:

Depending upon the results of pre-design investigations, buildings and other structures located in areas targeted for excavation would be demolished and their foundations would be removed. Asbestos and lead abatement would be conducted as necessary prior to demolition.

Excavation cells would be created by driving sheet piles around the perimeter of the targeted area. Additional pre-design investigation may be necessary in certain areas to delineate the targeted area. As excavation proceeds, the cells would be de-watered by pumping groundwater and NAPL with submersible pumps. Pumped groundwater and NAPL would be treated/filtered to remove fine soil particles, along with suspended and dissolved contaminants, and free product separated, with subsequent off-site disposal of the filtered solids and free product. The treated water would be discharged to the ground in compliance with the State Pollution Discharge Elimination System (SPDES).

The excavated material would be de-watered and mixed with materials on-site as necessary to either comply with transportation requirements as a solid material or to adjust water content or handling characteristics to facilitate thermal treatment. The material would be stockpiled on-site and tested to determine whether it should be disposed/treated as hazardous or non-hazardous waste. Material to go off-site would then be transported by truck or rail for disposal in a permitted off-site landfill which meets all state and

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 State. 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 NYSDEC 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-Effectiveness. Capital costs and 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 3 at the end of this PRAP.

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 have been evaluated. The responsiveness summary (Appendix C) presents the public comments received and the manner in which the NYSDEC addressed the concerns raised.

In general, the public comments received were supportive of a comprehensive remedy at the site which would involve permanent destruction or removal of the wastes and maximize future use of the property. Several comments were received pertaining to a preference for off-site removal of the waste over the proposed thermal treatment and on-site backfilling of the treated soils. Most of the concerns were over operational issues, such as noise and truck traffic. Several comments related to the impact on potential re-development of the use of stabilized metals-contaminated soils as site backfill.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix D) and the discussion presented below, the NYSDEC has selected Alternative 4 - Excavation and On-site Thermal Treatment and Stabilization as the remedy for this site. The elements of this remedy are described at the end of this section. Table 4 provides additional detail on the costs and activities associated with Alternative 4. Figure 14 provides a plan view of the selected remedy.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS.

Alternative 4 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It would achieve the remediation goals for the site by treating or destroying the wastes and soils that create the most significant threat to public health. It would essentially eliminate the source of contamination to groundwater, and would create the conditions needed to restore groundwater quality to the extent practicable. Alternative 4 also treats or destroys nearly all wastes and contaminated media on the site, with the exception of a small area of contaminated groundwater. The range of possible future uses of the property is thus enhanced. Alternatives 3 and 5 would also comply with the threshold selection criteria but to a lesser degree or with other mitigating factors.

Alternative 1 and 2 (the No Action and Monitored Natural Attenuation alternatives) do not include actions to contain, remove, or treat contaminants that pose a current or potential threat to human health and the environment. While Alternative 2 would monitor the groundwater plume and soil concentrations and would provide some measure of reduction of the potential for direct contact through the installation of fencing and deed restrictions, this alternative would not fully meet the remedial objectives. The alternative would not reduce the migration of site contaminants. Thus, these two alternatives fail to meet the threshold criteria.

Because Alternatives 3, 4, and 5 satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Implementation of Alternatives 3 (containment and consolidation), 4 (removal and on-site treatment) and 5 (removal and off-site disposal) all pose similar short-term impacts which can be mitigated through engineering controls. Construction impacts would include increased traffic, and potential vapors, dusts, and noise generation. Alternative 3 has the least associated short-term impacts from soil excavation due to the smaller volume of material to be excavated and consolidated with the main source area. Vehicular traffic and its associated problems would be high due to the need to construct the cover and containment system. On-site excavation and thermal processing in Alternative 4 slightly increases the potential for exposure to contaminated site media ; however, most activity would stay on the property, minimizing potential affects to the community. Alternative 5 poses the highest short-term risk due to the need to transport large quantities of hazardous materials via vehicles and public highways. The potential for accidental release is high and vehicular traffic in the community would be at a maximum.

Monitoring and Maintenance

Alternatives that include excavation of contaminated soil or long-term management by capping or containment would require monitoring, both during the construction phase and in the long term.

Construction-Phase Monitoring

Monitoring during soil excavation would be necessary to protect the health of site workers and the surrounding community. A Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) would be developed during the remedial design phase. These plans would specify the monitoring procedures, action levels, and contingency measures that are required to protect public health. Generally, air monitoring for PCBs would include both laboratory analysis for volatile emissions and real-time measurement of dust levels. A sample CAMP is attached as Appendix B of this PRAP.

Post-Construction Monitoring and Maintenance

Long-term monitoring and maintenance would be required for alternatives that involve containment or capping of contaminated soil.

Water quality and water elevation monitoring would be performed inside the containment area to ensure that the impermeable cap, slurry wall, and sealed sheet piles are properly functioning, and that excessive groundwater does

Achieving long-term effectiveness at the site is best accomplished by complete removal of the contaminated wastes and soils (Alternatives 4 and 5). Alternative 4 is favorable because it would result in the excavation, treatment, and stabilization of all wastes and contaminated soils that exist in concentrations above cleanup goals, including those in the shallow groundwater table. Alternative 5 would likewise remove site wastes. Alternative 3 would be effective in the long-term, however, significant monitoring and maintenance would be required to keep the containment system in peak performance shape. While containment is an effective and accepted remedy, it is likely that modification or enhancement of the containment system would be required to meet future regulatory needs.

Low-Temperature Thermal Desorption

Alternative 4 calls for the on-site thermal treatment of excavated soils. Thermal desorption is a proven technology suitable to treat volatile and semi-volatile organics, pesticides, and PCBs.

Soils and sediments are excavated, screened to remove large objects and debris, and processed through a mobile low-temperature thermal desorption, direct-fired unit located on the site. Typical operating temperatures are around 1,000 degrees Fahrenheit. Gases and desorbed organics are captured, filtered, condensed, and treated by carbon. The treated soil is analyzed to confirm removal of contaminants to levels below the established treatment standards. This material would be used to backfill excavated areas.

The thermal treatment unit would be required to meet stringent air emission requirements determined by the NYSDEC, as well as adhere to the Community Air

Alternatives 3, 4, and 5 all would require monitoring of the remaining small area of groundwater contamination. As wastes would be left in place in Alternative 3, the monitoring period would be indefinite. Short-term monitoring, on the order of five years, based on groundwater flow rates, would be required for Alternatives 4 and 5.

Alternative 4 is favorable in that it is readily implementable. Numerous providers of portable thermal treatment systems are available and the materials to complete this alternative are readily available. Alternative 5 relies on the availability of permitted and operating hazardous waste disposal facilities to accept the waste from the site.
Thermal treatment under Alternative 4 would permanently reduce the volume, toxicity, and mobility of a significant portion of the wastes present at the site. Permanent remedies are preferred under the site remedy selection process. Stabilization of the metals wastes remaining after thermal treatment would reduce the toxicity and mobility, but not significantly reduce the volume. Alternative 5 removes, to an equal degree, wastes from the site, the remedy is thus considered permanent, relative to the site. Much of the waste will be disposed in a permitted landfill somewhere else, requiring monitoring and maintenance there for an indefinite period. Alternative 3 is a containment remedy, thus no reduction in volume or toxicity will occur. Some reduction in mobility will occur due to containment, but this reduction is dependent upon the long-term maintenance of the containment system.

The cost of the three primary alternatives varies significantly. Although containment (Alternative 3) is less expensive than removal (Alternatives 4 and 5), it is not a permanent remedy. Alternative 4 is the least costly of the treatment/removal remedies. Activities associated with soil and waste excavation, and backfilling of the site are similar for the alternatives. The differences in the capital costs arise from the per unit cost for treatment and stabilization under Alternative 4 compared to the per unit cost for transportation, treatment and disposal under Alternative 5. The wastes also would require additional handling, screening, and separation under Alternative 5 to accommodate the needs of the various off-site disposal facilities. Designing the remedy, mobilizing the equipment, preparing the site, and construction management are substantial costs associated with each of these remedies.

The estimated present worth cost to implement the selected remedy is $12,320,000. The capital cost to construct the remedy is estimated to be $12,027,000 and the estimated average annual operation, maintenance, and monitoring costs for 5 years is $60,500.

The elements of the selected remedy are as follows:

1. A remedial design program to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. This will include an engineering evaluation of the site building to determine its structural stability and the need to remove the structure as part of the remediation. An indoor air quality study, including sub-slab soil gas, will also be conducted. Additional soil and waste material samples may be taken to further define treatment quantities and aid in the final design of the remedy. While the proposed remedy calls for stabilization and on-site placement of metals-containing soils, an evaluation will be made during the design phase to further define the quantities and concentrations of metals expected to remain in the soil after thermal treatment. Off-site disposal options for that material may then be considered, depending on cost and technical feasibility.

2. Site preparation including access roads, fencing, and miscellaneous field installations.

3. Excavation, preparation, and thermal treatment of approximately 71,743 tons of contaminated wastes, soils, and debris. A mobile low temperature thermal desorption unit will be placed on the site to treat the materials. Testing of the treated material will be conducted to ensure materials meet all treatment standards and cleanup goals. Upon completion of the treatment, the mobile thermal unit will be removed from the site. A portion of the material (approximately 21,238 tons) containing high concentrations of metals will be chemically stabilized and consolidated after thermal treatment.

4. Groundwater and NAPL collection and treatment. Wells and trenches will be employed to collect and treat contaminated liquids from the main source area prior to and during excavation activities.

5. The site will be restored by grading, placement of topsoil, and seeding of excavated and/or filled areas. All treated and stabilized materials will be used as backfill to restore site grades. The stabilized soils will be placed in a designated area to facilitate management and monitoring. While the remedy intends to treat or stabilize all soils, surface and subsurface, that exceed cleanup goals, a site management plan, similar to the example included as Appendix A, will be implemented. This plan will guide future use of the site soils and property.

6. An institutional control, such as an environmental easement, will be imposed, in such form as the NYSDEC may approve, that will prevent the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Schenectady County Department of Health. Due to the continued presence of volatile organic compounds in groundwater for some period of time after remediation, the potential for vapor intrusion to indoor air must be evaluated prior to any new construction

on the site. Additionally, depending on the level of post-remedial soil contamination, it may be necessary to impose controls on the property which may limit the use of the property to commercial and/or industrial purposes. The property owner will complete and submit to the NYSDEC an annual certification, until the NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal will contain a certification that the institutional controls put in place, pursuant to the Record of Decision, are still in place, have not been altered, and are still effective.

7. A notification will be sent to the county clerk for filing, to notify future owners of the residual groundwater contaminants remaining on the site.

8. Since the remedy results in untreated groundwater remaining at the site, a monitoring program will be instituted. This program will allow the effectiveness of the soil and waste removal to be monitored and will be a component of the operation, maintenance, and monitoring for the site. The small area of contaminated groundwater remaining outside the main contaminant source area to be excavated will be monitored and allowed to attenuate naturally. With the source of the groundwater contamination removed, it is anticipated the groundwater plume will reach SCGs within five years.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the 34 Freeman's Bridge site environmental restoration process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- Repositories for documents pertaining to the site were established.

- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established. Fact sheets and/or complete copies of the PRAP were mailed to the contact list.

- A public meeting was held on February 11, 2004 to present information and receive comments on the PRAP.

- A responsiveness summary (Appendix C) was prepared to address the comments received during the public comment period for the PRAP.

TABLE 1
Nature and Extent of Contamination
Remedial Investigation - January 2000 to November 2001

WASTE (NAPL)	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	benzene	ND to 1.2	n/a	-
	chlorobenzene	ND to 13	n/a	-
	ethylbenzene	5.5 to 290	n/a	-
	toluene	1.7 to 280	n/a	-
	xylene	14 to 1,600	n/a	-
	trichloroethene	ND to 28	n/a	-
	tetrachloroethene	ND to 48	n/a	-
Semivolatile Organic Compounds (SVOCs)	bis (2- ethylyhexyl) phthalate	87 to 380	n/a	-
	di-n-butylphthalate	ND to 370	n/a	-
PCBs/Pesticides	Aroclor -1242	ND to 1,400	50	1 of 3 samples
	Aroclor - 1248	ND to 610	50	2 of 3
	Aroclor - 1254	ND to 1,500	50	1 of 3
	Aroclor - 1260	ND to 570	50	1 of 3
Inorganic Compounds	lead	102 to 285	n/a	-
	chromium	29 to 105	n/a	-

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	methylene chloride	ND to 0.34	0.1	2 of 14 locations
	1,2-dichloroethene	ND to 0.56	0.3	1 of 14

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
	trichloroethene	ND to 1.3	0.7	1 of 14
	benzene	ND to 3.8	0.06	1 of 14
	toluene	ND to 88	1.5	1 of 14
	xylenes	ND to 300	1.2	1 of 14
	chlorobenzene	ND to 38	1.7	1 of 14
	ethylbenzene	ND to 88	5.5	1 of 14
	tetrachloroethene	ND to 7.4	1.4	1 of 14
	TOTAL VOCs	**ND to 533**	**10**	**1 of 14 locations**
Semivolatile Organic Compounds (SVOCs)	benzo(a)anthracene	ND to 6.8	0.224	8 of 19 locations
	benzo(b)fluoranthene	ND to 4.8	0.224	8 of 19
	benzo(k)fluoranthene	ND to 7.1	0.224	8 of 19
	benzo(a)pyrene	ND to 6.3	0.061	10 of 19
	dibenzo(ah)anthracene	ND to 1.9	0.014	9 of 19
	chrysene	ND to 7.1	0.4	7 of 19
	1,3-dichlorobenzene	ND to 4.9	1.6	1 of 19
	1,4-dichlorobenzene	ND to 11.0	8.5	1 of 19
	1,2,4-trichlorobenzene	ND to 9.6	3.4	1 of 19
	4-methylphenol	ND to 2.9	0.9	1 of 19
	2-methyphenol	ND to 0.35	0.1	1 of 19
	naphthalene	ND to 28	13.0	1 of 19
	indeno(1,2,3-cd)pyrene	ND to 4.6	3.2	1 of 19
	TOTAL SVOCs	**ND to 149**	**500**	**0 of 19**
	TOTAL Carc. SVOCs	**ND to 38.6**	**10**	**2 of 19**
PCBs	**TOTAL PCBs**	**ND to 1,100**	**1**	**17 of 18 locations**
Inorganic	arsenic	10.2 to14.1	7.5/SB	2 of 19 locations

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Compounds *ranges for exceedances only	barium	361 to 618	300	4 of 19
	beryllium	0.31 to 0.60	0.16	19 of 19
	cadmium	1.5 to 5.3	10.0	5 of 19
	chromium	10.4 to 962	50	17 of 19
	copper	27.6 to 701	25	14 of 19
	lead	895 to 5140	1200	3 of 19
	nickel	15.3 to 29	13	12 of 19
	zinc	46.7 to 1,710	20	19 of 19

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic	methylene chloride	ND to 5.3	0.1	1 of 43 locations
Compounds (VOCs)	1,2-dichloroethene	ND to 29	0.3	1 of 43
	trichloroethene	ND to 230	0.7	1 of 43
	benzene	ND to 14	0.06	3 of 43
	toluene	ND to 670	1.5	4 of 43
	xylenes	ND to 3,700	1.2	6 of 43
	chlorobenzene	ND to 23	1.7	3 of 43
	ethylbenzene	ND to 560	5.5	4 of 43
	tetrachloroethene	ND to 250	1.4	3 of 43
	chloroform	ND to 58	0.3	1 of 43
	1,2-dichloroethane	ND to 2	0.1	1 of 43
	TOTAL VOCs	**ND to 5,542**	**10**	**5 of 43 locations**
Semivolatile Organic	benzo(a)anthracene	ND to 310	0.224	21 of 45 locations
Compounds (SVOCs)	benzo(b)fluoranthene	ND to 300	0.224	22 of 45

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Semivolatile Organic Compounds (SVOCs)	benzo(k)fluoranthene	ND to 210	0.224	23 of 45
	benzo(a)pyrene	ND to 270	0.061	26 of 45
	dibenzo(ah)anthracene	ND to 64	.014	22 of 45
	chrysene	ND to 230	0.4	18 of 45
	1,3-dichlorobenzene	ND to 6.2	1.6	1 of 45
	1,4-dichlorobenzene	ND to 22	8.5	1 of 45
	1,2,4-trichlorobenzene	ND to 130	3.4	2 of 45
	4-methylphenol	ND to 46	0.9	5 of 45
	2-methyphenol	ND to 35	0.1	6 of 45
	naphthalene	ND to 150	13	5 of 45
	2-methylnaphthalene	ND to 77	36.4	2 of 45
	indeno(1,2,3-cd)pyrene	ND to 150	3.2	8 of 45
	hexachlorobenzene	ND to 1.7	0.41	2 of 45
	phenanthrene	ND to 833	50	4 of 45
	fluoranthene	ND to 840	50	4 of 45
	pyrene	ND to 550	50	4 of 45
	2,4-dimethylphenol	ND to 300	0.1	11 of 45
	phenol	ND to 19	0.03	8 of 45
	dibenzofuran	ND to 150	6.2	6 of 45
	TOTAL SVOCs	**ND to 4,918**	**500**	**5 of 45 locations**
	TOTAL Carc. SVOCS	**ND to 412**	**10**	**18 of 45 locations**
PCBs	**TOTAL PCBs**	**ND to 1,860**	**10**	**16 of 44 locations**
Inorganic Compounds	arsenic	7.7 to 51	7.5/SB	13 of 44 locations
	barium	329 to 1,460	300	8 of 44
	beryllium	0.2 to 1.4	0.16	44 of 44

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
	cadmium	1.1 to 25.7	10.0	9 of 44
	chromium	69.8 to 1,130	50	8 of 44
	copper	25.4 to 420	25	24 of 44
	lead	2,140 to 6,410	1200	5 of 44
	nickel	13.3 to 51.3	13	36 of 44
	zinc	32.7 to 1,740	20	44 of 44
	mercury	53.5 to 116	2	2 of 44

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic	tetrachlorethene	1.5	0.8	1 of 6 locations
	vinyl chloride	0.7	0.07	1 of 6
Semivolatile Organic Compounds (SVOCs)	phenanthrene	ND to 240	120	1 of 6 locations
	benzo(a)anthracene	ND to 120	12	1 of 6
	chrysene	ND to 130	1.3	1 of 6
	benzo(b)fluoranthene	ND to 110	1.3	1 of 6
	benzo(k)fluoranthene	ND to 79	1.3	1 of 6
	benzo(a)pyrene	ND to 90	1.3	1 of 6
	indeno(1,2,3-cd)pyrene	ND to 63	1.3	1 of 6
PCB/Pesticides	4,4"-DDE	0.44	0.01	1 of 6 locations
	Aroclor-1248	.067	0.0008	1 of 6
Inorganic Compounds	copper	7 to 41	LEL[c] - 16	2 of 3 locations
			SEL[c] - 110	0 of 3 locations
	iron	10,200 to 29,900	LEL - 20,000	2 of 3
			SEL - 4%	0 of 3
	manganese	270 to 1,020	LEL - 460	2 of 3
			SEL - 1,100	0 of 3

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
	mercury	ND to 0.28	LEL - 0.15	1 of 3
			SEL - 2.0	0 of 3
	zinc	39.6 to 202	LEL - 120	2 of 3
			SEL - 820	0 of 3

GROUNDWATER Shallow Zone	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic	vinyl chloride	ND to 69	2	2 of 13 locations
Compounds (VOCs)	methylene chloride	ND to 110	5	1 of 13
	acetone	ND to 290	50	2 of 13
	chloroform	ND to 200	7	1 of 13
Volatile Organic	trichloroethene	ND to 96	5	1 of 13
Compounds (VOCs)	benzene	ND to 120	1	4 of 13
	tetrachloroethene	ND to 82	5	1 of 13
	toluene	ND to 2,400	5	1 of 13
	chlorobenzene	ND to 26	5	3 of 13
	ethylbenzene	ND to 570	5	2 of 13
	xylene	ND to 3,500	5	1 of 13
	1,2-dichloroethene	ND to 1,400	5	2 of 13
	chloromethane	ND to 20	5	1 of 13
Semivolatile Organic	benzo(b)fluoranthene	ND to 11	0.002	3 of 13 locations
Compounds (SVOCs)	benzo(k)fluoranthene	ND to 10	0.002	4 of 13
	benzo(a)anthracene	ND to 15	0.002	3 of 13
	chrysene	ND to 15	0.002	3 of 13
	benzo(a)pyrene	ND to 10	0.002	3 of 13

GROUNDWATER Shallow Zone	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
	indeno(1,2,3-cd)pyrene	ND to 7	0.002	3 of 13
	phenol	ND to 3	1	1 of 13
	naphthalene	ND to 210	10	3 of 13
	acenaphthene	ND to 26	20	1 of 13
	phenanthrene	ND to 54	50	1 of 13
	2-methyphenol	ND to 1,900	1	1 of 13
	4-methylphenol	ND to 9,200	1	1 of 13
	2,4-dimethylphenol	ND to 20,000	1	2 of 13
PCB/Pesticides	alpha-BHC	ND to 0.18	0.01	2 of 13 locations
	beta-BHC	ND to 1.8	0.04	2 of 13
	4,4"-DDE	ND to 0.77	0.2	1 of 13
	gamma-chlordane	ND to 0.12	0.05	1 of 13
PCB/Pesticides	Aroclor-1242	ND to 3	0.09	1 of 13
	Aroclor-1248	ND to 16	0.09	1 of 13
	Aroclor-1254	ND to 32	0.09	4 of 13
	Aroclor-1260	ND to 14	0.09	3 of 13
Inorganic	antimony	3.1 to 26.4	3	8 of 13 locations
Compounds	arsenic	25.8 to 142	25	4 of 13
*ranges for exceedances only	barium	1,890 to 3,130	1000	2 of 13
	beryllium	3.4 to 41.9	4	4 of 13
	cadmium	5.5 to 23.9	5	3 of 13
	chromium	58 to 1,010	50	5 of 13
	copper	247 to 1,770	200	3 of 13
	lead	28.7 to 2,470	25	12 of 13
	mercury	1.4 to 3.2	0.7	2 of 13

GROUNDWATER Shallow Zone	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
	nickel	206 to 2,260	100	3 of 13
	thallium	5.5 to 911	0.5	11 of 13
	zinc	2,380 to 5,120	2000	2 of 13

GROUNDWATER Deep Zone	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic	vinyl chloride	ND to 69	2	3 of 13 locations
Compounds (VOCs)	methylene chloride	ND to 110	5	1 of 13
	acetone	ND to 290	50	2 of 13
	chloroform	ND to 200	7	1 of 13
	trichloroethene	ND to 96	5	1 of 13
	benzene	ND to 120	1	3 of 13
	tertrachloroethene	ND to 82	5	1 of 13
Volatile Organic	toluene	ND to 2,400	5	2 of 13
Compounds (VOCs)	chlorobenzene	ND to 66	5	2 of 13
	ethylbenzene	ND to 570	5	3 of 13
	xylene	ND to 3,500	5	2 of 13
	1,2-dichloroethene	ND to 1,400	5	4 of 13
	1,2-dichlorobenzene	ND to 4	3	1 of 13
	1,3-dichlorobenzene	ND to 4	3	1 of 13
	1,4-dichlorobenzene	ND to 7	3	1 of 13
Semivolatile Organic	phenol	ND to 3,100	1	2 of 13 locations
Compounds (SVOCs)	2-methylphenol	ND to 1,900	1	2 of 13
	4-methyphenol	ND to 9,200	1	2 of 13
	2,4-dimethylphenol	ND to 20,000	1	2 of 13
	2,4-dichlorophenol	ND to 4	0.3	1 of 13

GROUNDWATER Deep Zone	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
	2,4,5-trichlorophenol	ND to 4	1	1 of 13
	naphthalene	ND to 210	10	2 of 13
	bis(2-ethylhexyl)phthalate	ND to 69	5	1 of 13
	benzo(k)fluoranthene	ND to 1	0.002	1 of 13
PCB/Pesticides	beta-BHC	ND to 1.8	0.04	1 of 13 locations
	4,4'-DDE	ND to 0.77	0.2	2 of 13
	Aroclor-1242	ND to 38	0.09	2 of 13
	Aroclor-1254	ND to 32	0.09	1 of 13
	Aroclor-1260	ND to 14	0.09	2 of 13
Inorganic	antimony	3.1 to 12.2	3	6 of 13 locations
Compounds	arsenic	25.8 to 64.9	25	4 of 13
	beryllium	6.4	3	1 of 13
***ranges for exceedances only**	cadmium	5.5	5	1 of 13
	chromium	58 to 145	50	4 of 13
Inorganic	copper	247	200	1 of 13
Compounds	lead	43.1 to 1,030	25	5 of 13
	nickel	206	100	1 of 13
	thallium	9.2 to 103	0.5	5 of 13

SURFACE WATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic	tetrachloroethene	ND to 18	0.7	2 of 5 locations
Inorganic Compounds	iron	ND to 364	300	1 of 5 locations

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;

ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m^3 = micrograms per cubic meter

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

[c] LEL = Lowest Effects Level and SEL = Severe Effects Level. A sediment is considered to be contaminated of these criteria is exceeded. If both criteria are exceeded, the sediment is severely impacted. If only the LE exceeded, the impact is considered to be moderate.

SB = site background levels determined from sampling

ND = Not Detected

Table 2 - Summary of Alternatives
34 Freeman's Bridge Road

Alternative 1: No Action

- No Action response action must be considered in the detailed analysis of alternatives to provide a base which other alternatives can be evaluated.
- No actions would be taken to reduce the potential impacts associated with Site contaminants.

Alternative 2: Monitored Natural Attenuation

- Reduction of the volume and toxicity of contaminants over time by naturally occurring processes in so groundwater.
- Site modeling and monitoring are performed to demonstrate that contaminants do not represent signifi and that degradation is occurring.
- Institutional controls such as restrictions on groundwater use without treatment through deed restrictic prohibition of new well construction.

Alternative 3: On-Site Containment (with Consolidation)

Install barrier wall around main source area
Install low permeability final cover system over main source area
Remove and consolidate isolated areas into main containment area
Install pumping wells inside containment cell to maintain inward gradient
Construct long-term treatment facility for groundwater and NAPL
Discharge of treated water to surface water
Long-term monitoring
Institutional controls such as land use restrictions and future groundwater use restrictions

Alternative 4: Excavation and On-Site Thermal Treatment and Stabilization [Selected Remedy]

Install trenches/wells to remove NAPL and groundwater from main source area
Construct temporary water treatment system to handle liquids
Excavate contaminated soil and debris
Perform on-site low temperature thermal treatment and stabilization on contaminated soil
Backfill and restore property with treated soil, topsoil, and vegetation
Monitoring to confirm no further potential impacts
Institutional controls such as future groundwater use restrictions

Alternative 5: Removal and Off-Site Disposal

Install trenches/wells to remove NAPL and groundwater from main source area
Construct temporary water treatment system to handle liquids
Excavate and remove contaminated soil and debris for off-site disposal or treatment
Backfill with clean, imported soils
Monitoring to confirm no further potential impacts
Institutional controls such as future groundwater use restrictions

Table 3

Comparison of Alternative Costs

34 Freeman's Bridge Road Site

Components	Alternative 1 No Action	Alternative 2 Monitored Natural Attenuation	Alternative 3 Containment (with Consolidation)	Alternative 4 Excavation and On-Site Treatment and Stabilization	Alternative 5 Removal and Off-Site Disposal

Removal Volume	0	0	5,418 tons	71,743 tons	71,743 tons
Capping Area	0	0	4 acres	0	0
Capital Costs	$0	$74,000	$1,933,000	$9,543,000	$11,704,000
Engineering & Contingency (20% each) [1]	$0	$30,000	$757,000	$2,484,000 [2]	$2,921,000 [2]
Total Capital Costs	$0	$104,000	$2,690,000	$12,027,000	$14,625,000
Total Annual O&M Costs	$0	$132,500	$167,000	$60,500	$60,500
Present Worth O&M Costs [3]	$0	$2,036,000	$2,576,000		
Present Worth O&M Costs [4]				$262,000	$262,000
Total Present Worth Costs	**$0**	**$2,140,000**	**$5,266,000**	**$12,320,000**	**$14,918,000**

Notes: [1] Engineering costs are estimated at 20% of capital costs. Contingency costs are also estimated at 20% of capital costs.
[2] Engineering costs are 20% of capital costs not including disposal costs
[3] Present worth costs are based on 30 years of O&M and a 5% discount rate.
[4] Includes five years of monitoring and closeout costs.

Table 4

Alternative 4 Details

Table 4 page 2

APPENDIX A

Institutional Controls And Site Management Plan Example

Appendix A: Example of Institutional Controls for 34 Freeman's Bridge Road Site.

The owner of the site will submit to the NYSDEC for review and approval a legal instrument (e.g., environmental easement), to run with the land, that will in perpetuity notify any potential purchasers of the property of the contamination present at the property and of the engineering and institutional controls necessary to protect public health and the environment. At a minimum, the language of the instrument will include provisions that:

- Require that any institutional and engineering controls specified in the Record of Decision shall continue in full force and effect and shall be maintained unless the owner first obtains permission from the NYSDEC to discontinue such controls,

- Require annual certification that the institutional and engineering controls put in place pursuant to the Record of Decision are still in place, have not been altered, and are still effective,

- Identify the presence and location of any area containing residual contamination ,

- Prohibit the extraction of water from beneath the surface of the property other than for remedial purposes without specific approval from the NYSDEC and the appropriate county Department of Health,

- Notify future land owners, that under the authority of the New York State Department of Environmental Conservation, an existing hazardous waste remedial program is ongoing to address the on-site and off-site contamination in soils, sediments, surface water and groundwater.

- Provide that the environmental easement shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the owner and its successors and assigns consent to enforcement by the NYSDEC of these prohibitions and restrictions, and agree not to contest the authority of the NYSDEC to seek enforcement.

- Prohibit the excavation of soils at the facility or removal of soil from the facility unless undertaken in accordance with a NYSDEC-approved Site Management Plan submitted to the NYSDEC by the proponent that describes procedures for soil excavation and removal of soils from the facility and that are designed to protect human health and the environment. At a minimum, such a plan shall include:

    - a provision for prior notification and approval of NYSDEC and NYSDOH for any intrusive activities that could result in exposure to subsurface soils.

    - protocols and procedures for sampling soils to determine the concentration of contaminants.

    - a description of the health and safety requirements and general procedures to be followed during the excavation of soils. The plan shall be designed to minimize the possibility that personnel at the facility and the surrounding community will be injured or exposed to site contaminants during excavation of such soils.

- should soil be disposed off-site, a hazardous waste determination to verify whether deposition into a secure hazardous waste landfill or a solid waste landfill is necessary.

- a provision for submittal of a construction completion report to the NYSDEC for all activities conducted pursuant to the Site Management Plan.

The owner may implement the Site Management Plan at any time after NYSDEC approval.

This instrument will be recorded and filed with the Schenectady County Clerk, and proof of recording and filing will be submitted to the NYSDEC within thirty days of the Department's approval of the language of the instrument.

APPENDIX B

Community Air Monitoring Plan
Example

Appendix B: Community Air Monitoring Plan (CAMP) Example

NYSDOH Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH. Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

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

VOC Monitoring, Response Levels, and Actions

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

• If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

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

• If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

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

• If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.

• If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

PCB Monitoring, Response Levels, and Actions

PCB air samples will be collected to determine if off-site emissions of volatilized PCBs from contaminated soils poses a threat to the surrounding community.

1. The scope of the sampling will include collection of three ambient air samples: one collected as a representative background sample (preferably upwind), one collected at the downwind perimeter of the work zone, and three near community occupied structures or recreational areas (preferably downwind from the work site). Ideal sample collection points for the latter three samples would be between the work site and the structures and recreational areas. The samples will be taken at the following intervals:

- Twice, prior to the initiation of the soil removal activities;
- Daily, during the first five days of soil removal activities;
- Weekly, during the remainder of the soil removal activities.

Sampling frequency may increase if results equal or exceed the action levels described in the PCB Emission Response Plan.

The samples shall be collected and analyzed for PCBs using NYS DOH Method 311-1. A field blank will be sent to the NYSDEC/NYSDOH-approved laboratory for analysis with each sample shipment. The samples will be delivered to the lab on the same day of collection. PCB samples will be analyzed and results will be made available within 24-hours following delivery. Documentation of the sample results will be provided to the on-site coordinator (OSC) and the State for immediate review.

PCBs Emission Response Plan

A threshold value of 100 nanograms per cubic meter (ng/m3) will be used for the site to minimize the potential for community exposures. Activities must be examined and engineering controls must be considered to mitigate off-site emissions if total PCB concentrations at the exclusion zone perimeter exceed 100 ng/m3 above previous background samples taken in the area. Activities will be temporarily terminated and modifications must be employed to reduce off-site emissions if a sample collected near the community contains total PCB concentrations that equal or exceed 100 ng/m3. If a sample result exceeds the threshold value, additional sampling will be necessary to determine if the modifications employed have successfully reduced emissions.

APPENDIX C

Responsiveness Summary

RESPONSIVENESS SUMMARY

34 Freeman's Bridge Road Site
Town of Glenville, Schenectady County, New York
Site No. 447028

The Proposed Remedial Action Plan (PRAP) for the 34 Freeman's Bridge Road site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on January 30, 2004. The PRAP outlined the remedial measures proposed for the contaminated waste, soil, and groundwater at the 34 Freeman's Bridge Road site.

Public Participation Activities

The PRAP was prepared by the New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH) and announced via a Fact Sheet (Attachment 1) sent to the site mailing list, articles in the local newspapers, and selected mailings of the complete PRAP to local officials and interested parties. The mailing list includes local citizens, businesses, local, state and federal governmental agencies, media, and environmental organizations. A public meeting was held at the Town of Glenville Municipal Center (Town Hall) on February 11, 2004. The meeting included presentations by NYSDEC and NYSDOH officials on the results of the Remedial Investigation and Feasibility Study and discussions of the proposed remedy. The meetings provided an opportunity for the public to ask questions, discuss their concerns, and provide comment on the proposed plan. Approximately 30 people attended the meeting. The public comment period ended on February 28, 2004. Written and verbal comments will become part of the Administrative Record for this site. Written comments were also received from the following parties during the course of the public comment period:

- Letter and e-mail dated February 12, 2004 from Neil Turner, President, Citizens Advocating Responsible Development, Inc., Scotia, NY;

- Letter dated February 25, 2004, from Henri T. Plant, Conservation Chair, Mohawk Valley Hiking Club, Scotia, NY;

- Letter and fax dated February 27, 2003, from Jason M. Pelton, Schenectady Co. Ground Water Management Planner, Schenectady Co. Intermunicipal Watershed Rules and Regulations Board;

- E-mails dated February 13 and February 23, 2004, from Peter Keegan, a Town of Glenville resident;

- Letter dated February 28, 2004, from Clarence Mosher, Supervisor, Town of Glenville and the Glenville Environmental Conservation Commission.

Comments and Responses

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the NYSDEC's responses:

Where the same or similar issues were raised either in writing or verbally during the public meetings or phone calls, they have been grouped together and are addressed once. The remaining issues were addressed individually. The issues raised have been grouped into the following categories: (I) Remedy Selection Issues (thermal treatment/waste removal/lead); (II) Construction Issues (excavation, dewatering, noise, traffic); (III) Extent of Contamination/Investigation Issues; (IV) Health Issues; (V) Site Restoration and Redevelopment; and, (VI) Other Issues.

(I) <u>REMEDY SELECTION ISSUES (thermal treatment/waste removal/lead)</u>

COMMENT 1: Will the NYSDEC consider Alternative 5 (excavation and off-site disposal) should disposal fees decline relative to the estimates used in the current cost comparison?

RESPONSE 1: The NYSDEC will seek to refine all disposal and remedial costs during the design phase, particularly as we progress through the pre-design investigation and confirm the waste volume numbers. Costs for off-site disposal of wastes will be investigated again during the design process to allow further evaluation of that option.

COMMENT 2: Is it feasible to consider a hybrid of Alternatives 4 and 5? That is, the excavation and thermal treatment of appropriate soil and off-site disposal of only the metals contaminated soil (approximately 21,238 tons).

RESPONSE 2: The Record of Decision (ROD) does currently consider and discuss the possibility of sending the metals-contaminated soils to an off-site facility for disposal (see Section 8, number 1 of the PRAP and ROD). This may turn out to be a cost-effective and technologically effective way to dispose of the soils, particularly since the volume estimates in the ROD (the 21,238 tons) are conservative and represent a worst-case scenario. The areas containing high metals will be excavated separately and carefully and the treated materials staged after thermal treatment to allow their discrete sampling. Once the concentrations of contaminants and the total volumes of metals-contaminated soils are determined, a decision will be made as to their ultimate disposition.

COMMENT 3: Were any remedial alternatives considered that address ground water contamination in the deep zone or will the preferred alternative treat this ground water also?

RESPONSE 3: As the deeper regional aquifer is not significantly contaminated, no specific remedial activities are planned for that groundwater at the site. The pre-excavation phase (NAPL and groundwater removal) of the construction will remove as much of the significantly contaminated shallow groundwater as possible. The excavation of the soils will then remove the contaminated soil, the only potential source of shallow or deep groundwater contamination in the future. As the ROD notes, a small area of low level groundwater contamination outside of the excavation area will remain and require monitoring after the excavation and treatment phase is complete. Monitoring will be performed in the shallow and deep zones.

COMMENT 4: What is soil stabilization? What will be the impact of leaving metals contaminated soils behind after the remediation?

Other concerns include...: Lead concentrations of 1200 ppm will be excavated and replaced at the site.

RESPONSE 4: Soil stabilization is a broad term referring to the physical and chemical treatment of soils to make them less susceptible to leaching from water, reduce dissolution of soil contaminants into groundwater, or reduce the potential for contact with soil contaminants to potential receptors. It is an accepted and proven technology to treat metals-contaminated materials. Commonly, this is done by addition of chemicals such as cement or polymers to the soil to change the physical and chemical characteristics of the soil. It should be noted that were the metals-contaminated soils be sent to an off-site disposal facility, a significant portion of those soils would also be stabilized prior to being disposed in that facility.

The plan currently calls for the stabilization of site soils that exceed the cleanup goals for metals after going through the thermal treatment process. These soils would be used as backfill at the site. Stabilization will significantly reduce any impact the soils and metals would have on the environment, particularly groundwater. While concentrations of lead, for example, in excess of 1200 ppm, would remain, they would be unavailable physically and chemically to pose a threat. It is not anticipated that the stabilized soils would pose any engineering obstacle to future development or construction. They will be paced in a designated area of the backfilled zone and will be at depth (at the bottom of the excavation). The site and soils management plan would guide development of the site. The ultimate use of the property, envisioned as commercial and light industrial, would not be greatly affected by the presence of stabilized soils.

As noted in RESPONSE 2:, if the volume of metals contaminated soils remaining after thermal treatment is low, the NYSDEC will consider off-site disposal of the material, if cost effective, rather than soil stabilization.

COMMENT 5: The primary issue of concern is the proposed excavation and thermal treatment of soil containing hazardous concentrations of metals, specifically lead. The concern is with concentrations of lead in soil of approximately 1200 parts per million (ppm), a hazardous concentration. Thermal treatment of soil does absolutely nothing to remediate or destroy metals. Thermally treated soils containing concentrations of lead at 1200 ppm will be reintroduced into the environment at this site. This area is most likely within the 100-year floodplain of the Mohawk River. Soils containing lead at hazardous concentrations could potentially be exposed to flooding, re-suspended in floodwaters, and transported off-site.

RESPONSE 5: The cleanup goal for lead (1200 ppm) used in the ROD is a health-based cleanup goal. The determination of whether metals are a hazardous waste or not is done by an analytical test to determine the metals propensity to be dissolved (or leached) into groundwater. Lead concentrations of 1200 ppm are unlikely to fail any leaching tests for hazardous waste determination.
Thermal treatment will do little to remediate lead and other metals levels in the site soils, since the technology is designed primarily for organic contaminants. There will be some minor losses of metals to volatilization during the thermal process. As noted in RESPONSE 2, the areas containing high metals will be excavated separately and carefully and the treated materials staged after thermal treatment to allow their discrete sampling and handling. Stabilization of those soils will significantly reduce any impact on the environment, particularly groundwater. While concentrations of lead, for example, in excess of 1200 ppm would remain, they would be unavailable to pose a threat.

Given the history of the area, the topography, and the drainage infrastructure that exists around the site, it is unlikely that flooding on the magnitude necessary to fully scour the site and cause the stabilized fill to be transported off-site could occur. If there is such a threat from flooding, it is also likely that any future development of the site would also be precluded.

COMMENT 6: The cost estimate of $12 MM [million] for the proposed remedial strategy versus a cost of $14 MM [million] for excavation and off-site disposal makes no sense. The cost differential of $2 MM [million] does not adequately justify the proposed strategy versus off-site disposal of hazardous wastes.

RESPONSE 6: The cost difference between Alternative 4 and 5 is estimated to be $2,598,000. Alternative 5 is thus nearly 21% higher in cost. This is a significant cost increase, given that both remedies are equally protective of the public health and environment and provide extensive and permanent remedies. For the two remedies, there are no perceived significant differences in the future activities that would be allowed at the site once remediation is complete.

It should be noted that the primary criteria for choosing remedies at sites is protectiveness of public health and the environment. Cost is only a balancing factor if all other criteria are equivalent. Alternative 3, at $5,266,000, is also protective of the public health and environment, is technically feasible, and has limited short-term impacts compared to the Alternative 4 and 5. Alternative 3 is not a permanent remedy, however, and would require monitoring and maintenance indefinitely. Future use of portions of the property would be severely limited, compared to the possible range of uses after implementation of Alternative 4 or 5. Because of this, serious consideration was given to the two excavation remedies, even though future use of the property is not a criterion formally used in remedy selection. Future use and development potential are considerations only when they are consistent with the other selection criteria, such as protectiveness of the public health and environment, and are cost effective.

COMMENT 7: Several general comments related to a preference for Alternative 5 over Alternative 4 were received. Most were concerned over the presence of lead in stabilized soils.

Alternative 5 (excavation, removal, and off-site disposal of contaminated soils) [is the] the preferred alternative for this site. This remedial option is more appropriate for the site and will significantly benefit any future use of the property. Excavation and off-site disposal of contaminated media will also eliminate any threat of residual chemical compounds from being scoured and transported off-site during flood conditions.

Alternative 5 may not be the least-cost approach compared to Alternative 4, but the long-term benefit of a non-metals contaminated site providing for a safer and more attractive development location, as well as the reduced community impact during remediation and the reduced monitoring requirements all make this the most desirable approach.

Alternative 5 should be the choice for the safest and wisest choice even though it is more costly. Alternative 5 will:

- Rid the contaminated area of the volatile organics and heavy metals for now and into the future (it does not seem to be prudent to remove only the volatiles but return the heavy metals as part of the backfill as proposed in Alternative 4. The back filled heavy metals would pose future risks from leaching and probable disrupt development activities down the time line.)
- Provide more employment and business for local trucking and sand and gravel companies rather than outside contractors.
- Reduce the disruptive time in the local area.

Alternative 5 is attractive since it essentially removes the contamination from the site and places less restrictions on future property reuse.

RESPONSE 7: Responses 2, 4, and 5 specifically discuss the impact of lead and other metals-containing soils that will remain on the site in a stabilized state. Stabilization will reduce potential public health exposure as it will fix the metals in the soil and the matrix of the stabilized material, thus making it unavailable for direct contact and ingestion. The stabilization process also reduces the leaching potential of the metals, thus future groundwater impact from metals is mitigated. The stabilized soils, while a to-be-considered factor in any engineering work at the site, should not pose a construction problem. As noted in RESPONSE 2, the NYSDEC will investigate possible off-site disposal options for the metals, depending upon the volume and concentrations of metals remaining after thermal treatment.

The cost differences between Alternative 4 and 5 is discussed in RESPONSE 6. The difference is considerable given finite State resources and the technical considerations of the remedy selection criteria. Both remedies are protective of public health and the environment, provide extensive removal and/or control of site wastes, and provide essentially equal potential for future use and development.

The issue of employment and business opportunity is addressed in RESPONSE 13 later in this summary. Flooding is addressed in RESPONSE 5. Redevelopment issues are discussed in (V) Restoration and Redevelopment.

(II) <u>CONSTRUCTION ISSUES (Excavation, dewatering, noise, dust, traffic)</u>

COMMENT 8: Other concerns include...: Reintroduction of "cleaned material" into contaminated groundwater.

Will clean soil/fill be put back into contaminated groundwater?

RESPONSE 8: Clean and treated soil will not be placed back into contaminated groundwater. The proposed remedy calls for removal of contaminated groundwater and NAPL prior to excavation. This would be accomplished by the creation of discrete excavation cells, as discussed in the Excavation Alternatives box on page 21 of the ROD. Once dewatered, the soils would be excavated down to the bottom of the fill and top of alluvium and then thermally treated. The treated soils would then be placed back into the dewatered excavation. The only contaminated groundwater that will remain is that outside of the excavated area, downgradient of the main contaminated soil area.

COMMENT 9: Can the NYSDEC provide information on the effectiveness of Alternative 4? Specifically, on the effectiveness of excavating, thermally treating, and returning soil to an excavation containing contaminated groundwater.

RESPONSE 9: Thermal treatment is a technologically proven and extremely effective remedial technology. The technology has been used at a number of inactive hazardous waste disposal sites in New York and throughout the country. The U.S. Environmental Protection Agency currently lists 43 thermal treatment projects underway or planned in the U.S. Another 19 projects using thermal treatment as a remedial component are proposed or under consideration. In NYS, several projects have been recently completed including the Saratoga State Tree Nursery (pesticides), the Glens Falls Dragstrip (PCBs), American Valve (chlorinated solvents), and the GCL Tie & Treating site (creosote) in Sydney, NY. The GCL site is also managed by Martin Brand, the NYSDEC project manager for 34 Freeman's Bridge Road. Approximately 195,000 tons of contaminated soil were successfully treated and the material used as clean backfill.

As noted in RESPONSE 8 above, the clean (treated) soils will not be re-introduced into contaminated groundwater.

COMMENT 10: Other concerns include...: Particulate material introduced into the atmosphere during operations at the site.

Will DOH do particulate monitoring during construction?

RESPONSE 10: Air quality will be monitored rigorously during all aspects of the remediation, including excavation, thermal treatment, and backfilling. As shown in the example Community Air Monitoring Plan (CAMP) in Appendix B of the ROD, the effort will be extensive and mandatory. Generally, the contractor chosen for the remedial construction will perform the monitoring, under the supervision and review of the NYSDEC and the NYSDOH.

COMMENT 11: Many people were concerned about the noise levels created by the mobile thermal unit. How loud will the unit be? What will be its operating hours? Eight hours a day, 24 hours a day?

There is concern over the thermal desorption equipment operation. Using the DEC figures of 71,000 tons of soil, 20 tons per hour of desorption capability, and assuming 24/7 continuous operation this amounts to about six months of operation - probably longer as the process will not attain that level of operation continuously. This round-the-clock operation with its attendant equipment and truck noise, as well as potential light pollution, for a lengthy period of time is highly undesirable. It is recognized that additional trucking activity will be required for Alternative 5, but the hours of operation should have less impact and the trucking routes will no doubt be away from the more sensitive residential and commercial areas. With a nearby rail facility, strong consideration should be given to fill removal and replacement by rail. We also wonder if barging the soil could be a viable approach.

RESPONSE 11: The thermal treatment unit will produce mechanical noise during its operation. Anecdotally, this noise has been described as being similar to that of a slow moving train. The NYSDEC has performed noise surveys at other sites using thermal treatment equipment. The most recent survey was done at the American Valve site in Coxsackie, NY, where the thermal unit was located adjacent to railroad tracks in a similar setting to Freeman's Bridge Road. The average decibel level associated with routine operation of a rotary kiln, the most likely type of low temperature thermal desorber to be used here, was approximately 70 decibels, measured at 75 feet from the unit. Passing freight trains were measured at approximately 73 decibels. General site noise (combination of the thermal unit and other equipment noises) averaged about 80 decibels. This is below the 85 decibel limit for working without hearing protection. Generally, the noise generated by these units was not objectionable to the average listener.

The excavation, processing, and staging of soils will be accomplished during the course of an average construction work day, during daylight hours. It is likely that the thermal unit, once tested and calibrated, will operate on a continuous basis (24 hours a day). This is necessary to maintain a proper operating temperature to achieve the desired removal of organic contaminants. It is not likely the unit will be operated continuously for many months at a time. There will be periodic shutdowns for maintenance, calibration, testing, etc. Of the total volume of site waste (the 71,000 tons) some percentage will not require treatment, such as the large demolition debris pieces, thus the total volume to be treated may be somewhat less than the current estimate. The remedial design and the work plans submitted by the thermal and excavation contractors will detail the exact operational activities to take place at the site. This will include efforts to minimize where possible the impacts of the treatment operation.

Given the commercial nature of the surrounding area and the proposed location of the unit at some distance away from Freeman's Bridge Road and adjacent to the existing railroad tracks, the potential short-term noise and light impacts of the unit operation are deemed to be acceptable, given the benefits of the final outcome. As noted in RESPONSE 9 above, the NYSDEC and USEPA recently completed the thermal treatment of approximately 195,000 tons of soils at the GCL Tie & Treating site in Sydney, NY. The

surrounding community is remarkably similar to that of Freeman's Bridge Road. The project was completed without incident and with minimal disruption to the community.
The amount of truck traffic to remove 71,000 tons of soil and subsequently bring in an equivalent amount of clean fill would be considerable. A reasonable estimate would be approximately 5,000 individual trips with large 20-yard capacity dump trailers, twice that if standard dump trucks were used. The likely route would include Freeman's Bridge Road and/or Route 50 to the nearest interstate highway. The impacts from noise, congestion, and the potential for accidents for this scenario are very high. Rail would be a viable option, but that method requires an active railroad siding for loading and off-loading. Construction of such a siding would be very expensive and time consuming. Use of an existing nearby siding would still require the level of trucking described earlier. Barging of the soil and fill might be a viable option, but again would require movement of the materials to the river.

There are unavoidable short-term impacts associated with both of the excavation remedies. However, they are deemed to be acceptable when compared to the alternative of leaving the waste untreated and contained on-site, with its attendant long-term maintenance requirements and the necessary restrictions on the use of the property.

COMMENT 12: Much of the sifting, sorting and removal of soil and C&D debris required on-site for the desorption approach would be eliminated [in Alternative 5], as the spoil could be removed, classified and disposed of off-site. This would reduce the impact on the surrounding area from noise and particulate drift of contaminated soil, and reduce exposure of on-site workers to contaminants.

RESPONSE 12: The excavation and materials handling and preparation activities for Alternative 4 (on-site treatment and backfilling) are almost identical to that required for Alternative 5 (off-site disposal and backfilling with clean fill). The fill materials will have to be sorted, screened and staged on-site to prepare them for processing through the thermal treatment unit. Likewise, the fill materials would have to be prepared on-site prior to their being transported to an off-site disposal facility. This is due to the permitting and transportation requirements that exist for different classes of contaminants and hazardous wastes. No one facility can handle equally all the waste classes present in the site fill. The construction and demolition debris has to be segregated and sent to a C&D facility, the high concentrations of PCBs would need to be sent to another facility permitted to handle such waste, and the metals waste must be stabilized prior to disposal, and so on. All of these activities have been factored into the costs associated with the off-site option in order to comply with disposal regulations and achieve the lowest cost possible. Otherwise, the disposal facility would charge for the highest, most restrictive item in the waste stream (such as PCBs) and the cost for off-site disposal would be considerably higher than the current $14.9 million. Thus, very little difference exists in the potential short-term impacts associated with the on-site activities for each remedy.

COMMENT 13: From a local economy standpoint the employment of local truckers and workers is more desirable than bringing in specialized equipment and workers from outside the area.

RESPONSE 13: It is difficult to ascertain the extent of local involvement in construction projects of this kind. Procurement of contractors, subcontractors, and vendors is carefully controlled by NYSDEC fiscal policies and NYS finance laws and regulations. Much of the remedial work is highly specialized and requires experienced and trained personnel and firms. For example, workers on-site must be trained and certified annually to work on hazardous waste sites. That said, there should be ample opportunity for local economic involvement in many areas of site activities such as fencing, security, trucking, and fill materials and supplies, regardless of the remedy selected.

(III) <u>EXTENT of CONTAMINATION/INVESTIGATION ISSUES</u>

COMMENT 14: Were sediment samples collected from the Mohawk River, particularly from possible deltaic sediments at the confluence of the Kromme Kill?

RESPONSE 14: No. Surface water and sediment samples were collected from the Kromme Kill (Warner Creek) and from the wetlands to the east of the site and the railroad tracks. The lack of significant site related contamination in the downstream samples did not indicate the need to sample further downstream to the Mohawk River.

COMMENT 15: The report indicates that the sand unit is under confined artesian conditions. During the investigation, was the confining unit (floodplain alluvium) found to be laterally contiguous beneath the site?

RESPONSE 15: The alluvium was generally found throughout the site, particularly under the main contaminated area. This is important as the alluvium provides a measure of protection to the lower sand aquifer. The alluvium is thin or absent in the southwest portion of the site, in the area of the high voltage power lines. Fortunately, no contamination was noted in that area.

COMMENT 16: The PRAP indicates that light non-aqueous phase liquids (LNAPL) and dense non-aqueous phase liquids (DNAPL) were observed in several on-site monitoring wells, but does not provide information on the NAPL thickness.

RESPONSE 16: NAPLs were observed in many areas of the site, in different forms. Some appear as sheens on the top of groundwater, some as stained and wet soils, and in other areas, as significant thicknesses of liquid in monitoring wells. Discussions of NAPL thickness and other observations are located in pertinent sections of the Remedial Investigation report. Thicknesses of four inches and more were reported in several wells (MW-2, 4, 6, 7, and 8) and measurable thicknesses of NAPL were reported in the CW series of wells located near the on-site building.

COMMENT 17: Mercury was detected at a concentration that exceeded the maximum contaminant level (MCL) at one location along the north-margin of the site. During the RI, was additional sampling performed to determine the extent of mercury contamination?

RESPONSE 17: Mercury was detected at concentrations above 2 ppm in a test pit (TP-01) on the northeast portion of the site near the Kromme Kill. The mercury appears to be associated with electrical lighting materials (possible mercury vapor lights) that were part of commercial building materials disposed at that location. Mercury was part of the analysis program throughout the site. Only the one location was found with levels above the cleanup goal. This location is slated for excavation under the proposed remedial plan.

COMMENT 18: According to the PRAP text, trichloroethene (TCE) was detected in three separate surface water samples collected from the Kromme Kill (Warner Creek) at concentrations that exceed the MCL. The inset tables included in Figure 7 however, report that tetracholoroethene (PCE) was the contaminant detected in the three surface water samples. Regardless of the chlorinated solvent detected in the Kromme Kill, was a possible source for the solvent identified? Were additional surface water samples collected upstream from the SW-1 sampling location adjacent to the east-side of Freeman's Bridge Road?

RESPONSE 18: Tetrachlorethene was the volatile organic contaminant detected in surface water samples at the site. As the contaminant was detected in upstream samples as well as downstream samples and was not found in levels of concern on the site, it is not considered a contaminant of concern for remedial purposes. A possible source has not been identified. Additional surface water samples upstream of SW-1 were not taken during the investigation. The NYSDEC is considering an investigation to determine the source of the tetrachloroethene.

COMMENT 19: Please clarify the construction of monitoring well MW-08. The footnotes on Figures 7 and 8 indicates that the MW-08 screened interval intercepts both the shallowand the deep ground water systems. The groundwater elevation data suggests that a downward hydraulic gradient exists at the site. The well construction along with the downward hydraulic gradient may result in the transport of highly contaminated ground water and possible non-aqueous phase liquids from the shallow zone to the less contaminated deep zone.

RESPONSE 19: MW-08 was installed during the first phase of RI activities in August 2000. The well was approximately 11.5 feet deep. The well boring penetrated approximately 4 feet of fill, 7.5 feet of floodplain alluvium material, and just penetrated the top of the underlying sand. A well screen was installed from 3 feet below ground surface to 11 feet below ground. MW-08 is one of the most highly contaminated wells found in-site. It is also situated in the most highly contaminated soil area. A downward hydraulic gradient does exist in the area. After analysis and the detection of contaminants, and the observation of NAPL in the well, the well was abandoned (plugged and sealed) due to concerns over the potential for providing a conduit for contaminant migration down through the alluvium and into the lower sand aquifer. Several other older wells, from previous investigations were also abandoned after sampling. There is no indication that NAPLs have entered the deeper groundwater from the shallow zone.

COMMENT 20: Was the geophysical survey conducted during the RI extensive?

RESPONSE 20: A geophysical survey was performed at the site in an attempt to define the fill limits, delineate contamination, and detect any buried drums or waste. The survey included terrain conductivity measurements and metal detection measurements. Anomalous areas and reading were subsequently checked with test pits or soil borings.

COMMENT 21: Delineation of the contamination to the north was not explained well during the presentation. What is the extent of contamination to the north? How did we determine the edge of the fill? How was the boundary of the NAPL/plume area determined? Did the fill material push the waste out of the ponds/original disposal area?

RESPONSE 21: Contamination in soils at the site is essentially confined to the fill materials disposed on the Lyon's property and portions of adjacent properties on the north edge of the Lyon's property. The demarcation of the fill boundary to the north is dramatic and visually obvious. Geophysical surveys taken at the site during the RI also confirmed the location of the fill. Samples taken from test pits and soil borings on the northern edge of the site confirm that the contamination is limited to the fill area. While the RI was extensive, additional investigation is proposed to be performed during the design phase of this project to further refine the extent of contamination and the areas and volumes of waste to be excavated, treated and/or disposed.

Groundwater contamination and NAPL extent were determined by analysis of water samples from numerous groundwater monitoring wells and borings. Additional direct observation of NAPL in test pits, wells, and borings, allowed NYSDEC's consultant to map the extent of NAPL as shown in Figure 4 of the ROD.

It appears that fill material was used to fill in waste ponds and lagoons and other low areas, including trenches, on the site. Some displacement of waste materials from these areas may have occurred, but this is not certain. The fill material and the top of the original ground surface is now the most significantly contaminated media at the site.

COMMENT 22: Were the drums found in 1984 and removed in 1989 related to the contamination found in 1996?

RESPONSE 22: No. The drums found in 1984 were located along the rear of the property and were of more recent vintage, compared to the activities at the former cooperage. The contamination found in 1996, and in the later Remedial Investigation, appears primarily related to disposal activities during the time of the operation of the cooperage.

COMMENT 23: Did you find drums with material in them?

RESPONSE 23: Yes, several full and intact drums containing material were discovered during the investigation. Some of them appeared to contain paint-like materials. These drums were removed at the conclusion of the investigation (see RESPONSE 35). Most of the drum-related materials found were parts and pieces of old 55-gallon drums.

COMMENT 24: What is the stratigraphy at the site?

RESPONSE 24: The RI identified five separate units at the site. In order of increasing depth, they are:

- fill

- floodplain alluvium
- deep sand
- glacial till
- bedrock

The fill is the most impacted unit on the site and contains most of the soil volume and shallow groundwater to be remediated. The thickness ranges from 1.5 to 11 feet. The floodplain alluvium is a natural silt and clay deposit and represents the original ground surface prior to filling of the site.

COMMENT 25: What is meant when you say that the deep/regional groundwater is not significantly affected?

RESPONSE 25: The most significantly contaminated media at the site is the subsurface soil and fill in the vicinity of the site building. Shallow groundwater (generally within 10 feet of the ground surface) found primarily within the fill is highly contaminated. Monitoring wells placed in the deeper sand aquifer at the site (the aquifer of concern for regional drinking water) did not detect significant site-related contamination. Several of the deep wells did have detections of low levels of volatile organic contaminants, particularly 1,2-dichloroethene. This contaminant was also found off-site in an updgradient location as well. One well located on the property (MW-8), drilled into the very top of the sand, did have high concentrations of contaminants. However, the well also draws water from the shallow aquifer and it is likely that the contamination is related to the fill and shallow groundwater. That well has since been abandoned and sealed as a precautionary measure.

COMMENT 26: Did you find evidence of the trenches that extended from the cooperage building out back to the creek?

RESPONSE 26: Some evidence of trenches was found during the investigation. A number of the test pits were placed in areas of suspected trenches, as determined from aerial photo interpretation. One particular test pit did intercept a known trench and significant contamination was confirmed. In general, the site contamination is concentrated along the former drainage pathway/tributary to Warner Creek that existed at the rear of the building prior to filling of the property.

COMMENT 27: All the concrete from the old Freeman's Bridge went into the site, some very large pieces.

RESPONSE 27: Much of the fill at the site is comprised of construction and demolition debris. We have had other reports that significant quantities came from the new and old Freeman's Bridge(s).

COMMENT 28: Were we aware that NYSDOT did some drainage work along Freeman's Bridge Road in front of the site and that oil was used to displace water from under the road?

RESPONSE 28: No, NYSDEC was unaware of this event. The pre-design investigation to be performed will be looking at the area around the site building, adjacent to the road, among other areas. The investigation could be modified to determine the existence of any oil in that area.

(IV) HEALTH ISSUES

COMMENT 29: The PRAP indicates that several domestic water supply wells located near the site were sampled and that no site contaminants were detected. Please provide the residential well sampling locations. Was any long-term groundwater level monitoring performed as part of the remedial investigation to determine if cyclic pumping from the residential wells influences water levels beneath the 34 Freeman's Bridge Road site?

In that [public] meeting you mentioned that water safety tests had been conducted at 6 locations to make sure it was safe to drink, if I am not mistaken. I would like to know the addresses where those tests were conducted and the names of the owners of those properties.

RESPONSE 29: Water samples were taken by the New York State Department of Health from several residential wells in the area in 1996 and 2002. Four wells in total were identified as being close to the site and available for testing; three were sampled in 1996 and all four in 2002. The water samples were analyzed for volatile organic compounds, ketones, petroleum products, and polychlorinated biphenyls (PCBs). No site-related contaminants were detected in any of the samples taken on both dates (the results were compared to NYS drinking water and groundwater standards). The wells were sampled by the NYSDOH as a conservative measure to evaluate the possible health impacts of the site. The results indicate the water in those wells was not contaminated from site-related contaminants.

Two properties on Maple Avenue (#8 and #10) were tested and two on Sunnyside Avenue (#213 and #219). The owners were all notified in writing of the results of the testing. All of these properties are located hydrologically upgradient of the site (or sidegradient for the Maple Avenue wells) and were not expected to be affected by the site contaminants. The sampling results confirm this. We have not identified any private wells directly downgradient (east-northeast) of the site.

While several rounds of samples and groundwater levels have been taken at the site, no long-term monitoring for the purposes of determining the effects of the homeowner wells on the site has been completed. Given the distance from the site and the depths and usage of the wells, it is unlikely that the residential wells could significantly impact the site groundwater.

COMMENT 30: Is 1200 ppm of lead a high number? What is the source of the lead? How was the cleanup goal of 1200 ppm determined?

RESPONSE 30: The cleanup goal for lead, at 1200 ppm, was established in consultation with the NYSDOH. Soil concentrations at or below 1200 ppm would be acceptable for unrestricted commercial or light industrial use. This concentration would be acceptable for residential use if appropriate soil cover, such as vegetation, were used and maintained. For unrestricted residential use, the cleanup goal used by NYSDEC and USEPA is generally 400 ppm of lead in surface soils.
The exact source of the lead in site soils is unknown. However, the highest lead levels in soils detected at the site have been observed to be associated with waste paint.

COMMENT 31: What is the threat if nothing is done?

RESPONSE 31: The Human Heath Risk Assessment performed during the RI indicates that current threats posed by the site are primarily through direct contact and ingestion of wastes or inhalation of vapors by site workers, or future construction workers or excavators. However, no current exposures are occurring. The shallow groundwater is contaminated but there are no known users of the groundwater downgradient of the site. Soils are contaminated but there is good vegetative cover over most of the site so the potential for exposure is low. Fortunately, there is no significant off-site contamination in groundwater, surface water, or sediment.

(V) <u>SITE RESTORATION and REDEVELOPMENT</u>

COMMENT32: The removal and replacement of contaminated earth with clean fill will result in a clean layer of fill up to ten feet, rather than having metals-contaminated reprocessed fill with a clean two foot top layer on it. From a standpoint of usage where foundation and other development excavation work take place, this is a much more desirable outcome from a health and safety and recontamination standpoint, and worth additional cost. The increased utility of the site with resulting increased value of the property, benefitting the surrounding region, should more than offset the added cost.

Why will the site topography be brought back to the fill/current level? The wetlands could be restored. Why not restore the property to its original contours? This would save the state money by not having to bring clean fill back in. Why should the taxpayers pay to make the site “shovel ready” for a developer?

RESPONSE 32: The conceptual excavation plan, treatment plan, and subsequent restoration plans, and the associated costs, were developed with the intent of restoring the site to its current topographic level and condition. This was thought to be technically feasible, timely in terms of implementation, and provided the best balance of public health and environmental protectiveness and potential re-use of the land for activities amenable to the surrounding neighborhood. Given the current environmental and land use conditions along Freeman’s Bridge Road, it did not seem practical to attempt to restore the site to some pre-release wetland or native state.

Restoration of fill levels was also included in order to properly compare costs and technologies between the two removal remedies (Alt. 4 and 5). Thermal treatment results in a ready supply of clean fill that must be managed (i.e., used for backfill). Off-site removal requires the importation of clean fill, at some added cost. Equivalent restoration goals between the two remedies allowed a rigorous comparison of costs, implementability, and potential short-term impacts.

From a future usage and engineering standpoint, the treated soil and stabilized soils should provide no more impediment to future commercial and light industrial construction than would clean imported fill. The metals-containing soils will be chemically and physically fixed through the stabilization process and placed at depth in the excavation. The upper layer of soil, in either scenario, will be clean soil and pose no threat of exposure to any receptor.

COMMENT 33: What would prohibit future residential development?

RESPONSE 33: The potential for future residential development will be determined by the concentrations and types of contaminants that remain at the site after remediation. The thermal treatment will destroy the organics in the soils. A portion of the shallow groundwater plume outside the excavation area will remain and require monitoring. Thus, groundwater use for drinking water at the site will be controlled for some time until concentrations of groundwater contaminants reach acceptable levels. Due to the continued presence of volatile organics in groundwater, the potential for vapor intrusion to indoor air will have to be evaluated for any new construction. Stabilized soils containing metals may remain at the site after remediation. These soils will be placed in a designated area, at depth. The soils component of the site management plan would guide use of that portion of the site.

The site remedial plan was developed with the current and most likely use of the land in mind. This is commercial and light industrial. Given the current mixed commercial and industrial use of the surrounding properties (commercial stores, body shops, asphalt tank farms, etc.), the presence of high voltage power lines across a large portion of the site, and the proximity of the railroad tracks, future residential development of the property seems unlikely.

(VI) <u>OTHER ISSUES</u>

COMMENT 34: How long will the remediation take?

RESPONSE 34: The remedial design and remedial action process will take approximately three years to complete. The Record of Decision will be issued at the end of March 2004. The PRP will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRP, a legal referral to spend NYS State Superfund money will be obtained and a consultant for design services will be procured. The design will take approximately one year. It is anticipated that the remedial activities will start in 2005. Construction activities are planned for two field seasons, with all activities anticipated to be complete by 2007.

COMMENT 35: Were there any Interim Remedial Measures (IRMs) conducted?

There is no active remediation at the site at the present time, even though light non-aqueous phase liquid (LNAPL) material is present on groundwater at the site.

RESPONSE 35: No active remediation is ongoing at the site. No significant remedial measures were performed during the investigation phase. However, materials generated during the investigation test pit and drilling programs were removed. Approximately 125 tons of contaminated soils were disposed at off-site facilities. Several 55-gallon drums of suspected paint waste and 22, 55-gallon drums of well development and decontamination water were also removed.

COMMENT 36: Are there adequate suppliers of thermal desorption systems to get a good pool of bidders?

RESPONSE 36: At present, there are a number of thermal vendors operating in the United States that would be qualified to perform this work. It is assumed that adequate, qualified bidders will be available when this project is offered to bid at the conclusion of the design process.

COMMENT 37: There was a meeting for this site in 1996 at the beginning of the process. Why has it taken so long to get to this point?

RESPONSE 37: The 1996 meeting was to inform the public of the results of the preliminary investigation (referred to as the Immediate Investigation Work Assignment in the PRAP) performed in 1996. That investigation caused the site to be re-listed on the NYS Registry of Inactive Hazardous Waste Disposal Sites as a Class 2 site. A legal search was done to determine if the previous owners could be found and made to pay for any investigation and cleanup costs. That search was unsuccessful and the site was referred to the State Superfund for action in 1999. The RI and Feasibility Study (FS) was initiated in 1999 and fieldwork was performed through 2002. The culmination of that process is the current Record of Decision.

The actual time needed to complete studies on a site is a function of the site's complexity, funding availability, and the site's relative priority, in terms of public health and environmental impacts, relative to other sites.

COMMENT 38: Are there adequate state funds to accomplish the work? Will it happen?

RESPONSE 38: Funds are available for remediation of sites under the State Superfund program. However, the decision to proceed with the selected remedy at this site will be made after the completion of the design and prior to bidding. At that time, a determination of the availability of funds will be made.

Upon selection of remedy through this PRAP and ROD process, another attempt will be made to get the responsible parties (the current site owner and the past owners) to fund the required work. State monies can be expended only after it is determined that the responsible parties cannot or will not perform the work.

COMMENT 39: How many other sites are in the state process ahead of this one? How many sites need funding? Is this site a high priority?

RESPONSE 39: It is not known exactly how many sites are currently being considered for funding; there are quite a few state-wide. The decision to spend State money on a site is affected by several factors, including availability of funds and the relative threat posed by the site compared to other sites. The NYSDEC does have a priority ranking system that is used in the decision making process. This site ranks quite high in that system.

COMMENT 40: What mechanisms are in place to enforce and track the institutional controls that will be put in place? Who will be responsible for enforcement and monitoring of the institutional controls?

RESPONSE 40: In general, the site owner and/or the parties responsible for the waste disposal bear most of the responsibility for the institutional controls. For example, the owner will have to certify annually to the NYSDEC that all the engineering and institutional controls required for the site are still in place and functioning effectively. There is some measure of diligence required by the state, municipalities, and local health departments as the institutional controls (such as easements and groundwater restrictions) will be reviewed and ultimately controlled by those entities.

APPENDIX D

Administrative Record

Administrative Record

34 Freeman's Bridge Road
Site No. 447028

Proposed Remedial Action Plan (PRAP) for the 34 Freeman's Bridge Road site, dated January 2004, prepared by the NYSDEC.

Preliminary Investigation by Touhey Associates:

Preliminary Investigation report 1996, Environmental Design Partnership for Touhey & Associates

Immediate Investigation Work Assignment (IIWA):

IIWA report 1996, Superfund Standby Program Work Assignment D002478, prepared by Parsons Engineering Science, Inc.

Remedial Investigation (RI) Report:

Remedial Investigation, 34 Freeman's Bridge Road Site, Site 4-47-028, Superfund Standby Program Work Assignment D003821-17, Volumes 1 and II, prepared by EarthTech Northeast, Inc., January 2004

Feasibility Study (FS) Report:

Feasibility Study, 34 Freeman's Bridge Road Site, Site 4-47-028, Superfund Standby Program Work Assignment D003821-17, One volume, prepared by EarthTech Northeast, Inc., January 2004

Residential Well Sampling:

NYSDOH 1996 and 2002

Interim Remedial Measures (IRMs)

Correspondence and Contract Information, Earth Tech Northeast, Inc., as part of Superfund Standby Program Work Assignment D003821-17

Referral Memorandum from Division of Environmental Enforcement to DER, dated 1998, for Remedial Investigation.

Fact Sheet: Proposed Remedial Action Plan (PRAP) and public participation process for the 34 Freeman's Bridge Road site, dated January 30, 2004.

Correspondence/comments related to remedy selection:

Letter and e-mail dated February 12, 2004 from Neil Turner, President, Citizens Advocating Responsible Development, Inc., Scotia, NY;

Letter dated February 25, 2004, from Henri T. Plant, Conservation Chair, Mohawk Valley Hiking Club, Scotia, NY;

Letter and fax dated February 27, 2003, from Jason M. Pelton, Schenectady Co. Ground Water Management Planner, Schenectady Co. Intermunicipal Watershed Rules and Regulations Board;

E-mails dated February 13 and February 23, 2004, from Peter Keegan, a Town of Glenville resident; and,

Letter dated March 2, 2004, from Clarence Mosher, Supervisor, Town of Glenville.

Table 4
Remedial Action Alternative 4 (Excavation and Onsite Treatment)
34 Freeman's Bridge Road-Feasibility Study

ITEM	QUANTITY	UNIT COST	TOTAL	*REF #
Site Preparation				
Temporary Access Roads - The temporary access road will be 20 ft wide and will be placed through the center of the site to access all areas that require excavation. The road will be constructed from 3" of subbase and 6" of gravel. The road will be systematically removed as the excavation and removal actions advance. The access road is estimated to be 600 lf in length.	600.00 lf	$ 30.11	$ 18,066	4-1
Temporary Fencing - 5 ft high boundary fence with that will enclose the site during construction.	2,150.00 lf	$ 9.17	$ 19,726	4-2
Overhead Electrical Distribution - The overhead electrical system will supply the treatment facility. Assume 1000 amp service. Assume approximately 200 ft to facility.	200.00 lf	$ 167.29	$ 33,457	4-3
Miscellaneous Field Installation - These costs include office trailers, and a paved area for the treatment system.	1.00 ls	$ 120,299.00	$ 120,299	4-4
Structural and Environmental Review of Onsite Building - This is a program to review the current status of the onsite building.	1.00 ls	$ 25,747.00	$ 25,747	3-4
Demo Building - Assume a masonry building with 10% of the debris requiring hazardous waste disposal. Disposal facility is assumed to be approximately 200 miles from site. [CONTINGENCY ITEM BASED ON RESULTS OF EVALUATION]	1.00 ls	$ 120,913.00	$ 120,913	4-5
	d to nearest $1,000)		**$ 338,000**	
Groundwater and NAPL Removal and Treatment				
Free Product Removal - Estimate for cost of one oil recovery pump and skimmer unit. Water from the excavation will be pumped to a frac tank before entering the oil water separator. Accumulated oil will recovered with a skimmer from the top of the water in frac tank and pumped to the temporary 550 gallon steel oil storage tank.	1.00 ls	$ 5,371.00	$ 5,371	4-6
Oil/Water Separator - This technology includes an oil/water separator to handle 150 gpm. The water will be pumped from the excavation area and will pass through the oil water separator. Also included in this item is two water treatment trailers to process 25 gpm for 24 hours per day during excavation activities.	1.00 ls	$ 153,949.00	$ 153,949	4-7
Water Storage Tanks - It is assumed that 4 - 20,000 gallon Frac Tanks will be used for this item. The cost is estimated based upon 4 frac tanks for 12 months at a rate of $35 per day and a setup and breakdown fee.	4.00 ea	$ 18,442.25	$ 73,769	4-8
Carbon Adsorption (Liquid) - Ground water collected during excavation activities will be treated and then sent through the carbon adsorption system to be polished.	1.00 ea	$ 57,887.00	$ 57,887	4-9
Off-site Transportation and Disposal of NAPL - this includes the costs for the disposal of collected NAPL during excavation activities. The liquid is considered to be hazardous waste with a hazardous waste disposal fee of $1.60 per gallon. Additional costs for transportation and loading at $1 per gallon are included in the unit price.	32,000.00 gal	$ 2.60	$ 83,200	4-10
Operation and Maintenance Startup Costs - This cost is associated with work required to set up the operation and maintenance program.	1.00 ls	$ 96,523.90	$ 96,524	3-16
Operation and Maintenance - This is the cost for operation and maintenance for the treatment system during construction activities. The treatment system includes the oil water separator, GAC, and oil skimmer. O&M calculates the amount of GAC to be consumed and the electrical requirements for the water treatment system. The cost for the thermal treatment plant and stabilization plant are estimated under the respective technologies. These costs also covers the sampling of the treated water prior to discharging the water to the onsite stream. The water will be tested once a week for SVOC, VOC, PCB and Metals.	1.00 ls		$ 402,677	4-11
	d to nearest $1,000)		**$ 873,000**	
Soil Removal and Treatment				
Excavation and Backfill - The costs for this item covers the excavation of 51245 yds (or 71,743 tns at 1.4 tns per yard) of impacted material and spreading and compacting the treated material after is has been stabilized and is ready to be backfilled. It also covers the cost of dewatering during the excavation activities. It is assumed that 100% of the material that is excavated and treated onsite will be utilized as clean backfill. In addition this item includes costs for screening and washing the excavated material. It is assumed that the process plant operates at 50 tons per hour due to the large amount of foreign debris expected in the soil	71,743.00 tn	$ 23.87	$ 1,712,316	4-12
Onsite Low Temp Thermal Desorption - This item is a cost estimate for using a low temp thermal desorption system to treat the VOC, SVOC, and VOCs in the impacted soil. The cost may be slightly high, this is due to the fact that there is a large percentage of material that is below the water table and will therefore have a high moisture content.	71,743.00 tn	$ 78.65	$ 5,642,695	4-13
Ex-situ Solidification/Stabilization - Ex-Situ solidification/stabilization will be used to stabilize the soil due to metals contamination. Approximately 21,238 tons (15,170 yds at 1.4 tns/yd) of material will require stabilization. Upon stabilization and solidification the soil can be backfilled into the excavated areas.	21,238.00 tn	$ 44.28	$ 940,461	4-14
	d to nearest $1,000)		**$ 8,295,000**	
Site Restoration				
Clean Up and Landscaping - This cost is to seed the entire site and pickup after all construction activities are completed. It is assumed that 7 acres will be seeded.	1.00 ls	$ 17,364.00	$ 17,364	4-15
	d to nearest $1,000)		**$ 17,000**	
Monitoring Well Installation				
Ground Water Monitoring Well - The costs associated with this item are for replacing 6 monitoring wells destroyed during excavation.	6.00 ea	$ 3,359.17	$ 20,155	4-16
	ITEM subtotal (rounded to nearest $1,000)		**$ 20,000**	

Subtotal Capital Costs	**$**	**9,543,000.00**
Engineering (20% construction costs less treatment or disposal costs rounded to nearest $1,000)	$	575,000.00
Contingency (20% construction costs rounded to nearest $1,000)	$	1,909,000.00
Total Capital Costs	$	12,027,000.00

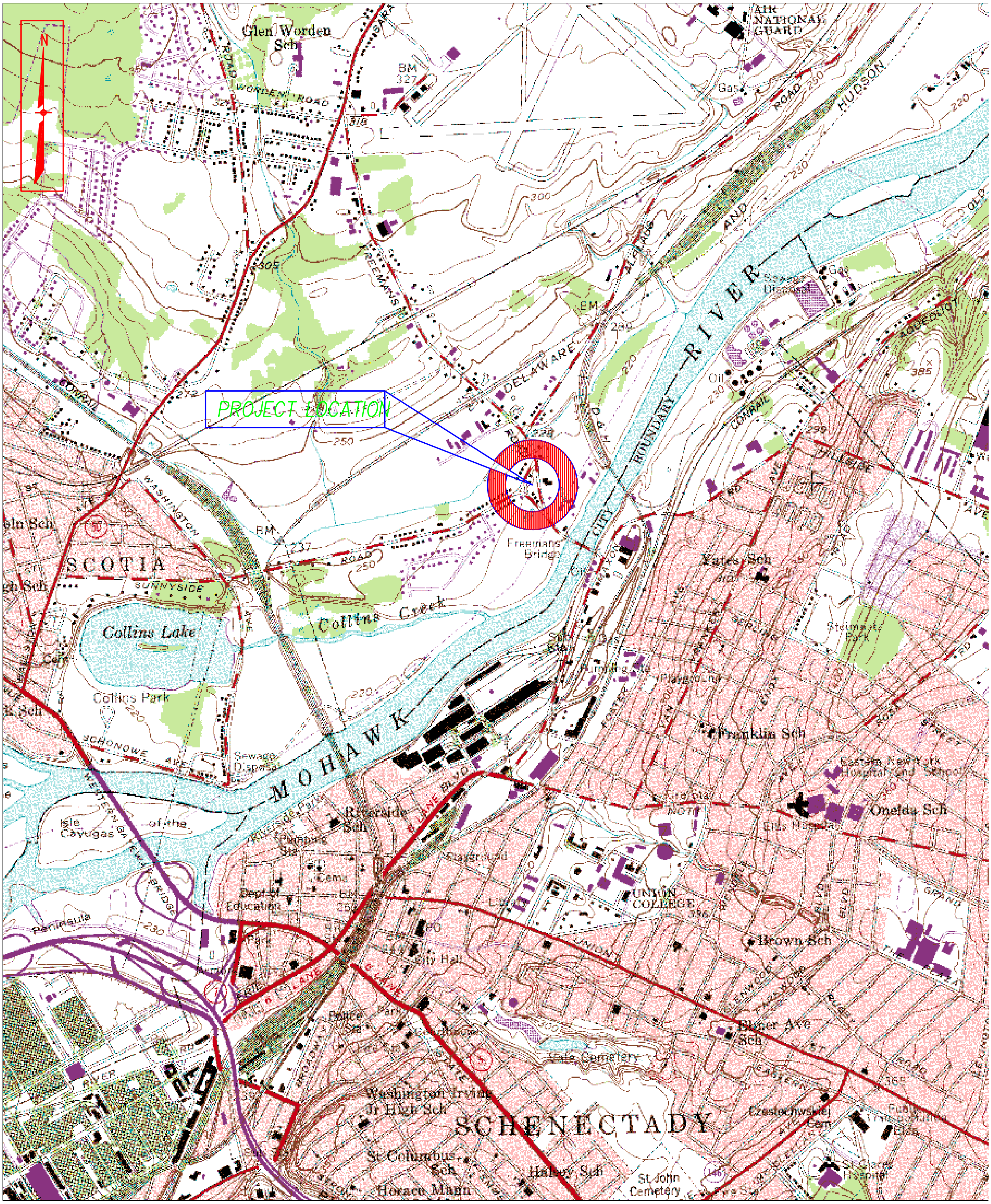
ANNUAL O&M COSTS (Long-term)		
Annual Operation and Maintenance	$	0.00
Annual Long-Term Monitoring (quarterly sampling and monitoring)	$	59,111.00
Five Year Review	$	1,500.00
Total Annual O&M Costs	$	60,611.00
Present Worth O&M Costs (5% discount Rate/5 yrs)	$	262,400.00

OTHER COSTS (short-term O&M and Closeout)		
Site Closeout	$	30,647.00
Total Other Costs	$	30,647.00

PRESENT WORTH OF COSTS		
Total Capital Costs	$	12,027,000.00
Total Present Worth O&M Costs	$	262,400.00
Total Other Costs	$	30,647.00
TOTAL PRESENT WORTH	$	12,320,047.00

COST TO IMPLEMENT REMEDIAL ACTION ALTERNATIVE 4 **$ 12,320,000**

* REF # refers to line item in cost estimating software output located in appendix B-3



MAP REFERENCE:
U.S.G.S. 7.5 MINUTE SERIES, SCHENECTADY

0' 2000' 4000'

SCALE

February 2000

38925

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

Figure 1
SITE LOCATION MAP
New York State Department of Environmental Conservation
Freeman's Bridge Road Site
Scotia, New York

FILE NAME: \38925\cadd\RI_PRAP_Sept2003\site-location-map.dwg IMAGE: \38925\cadd\image\schenectady-quad.dwg

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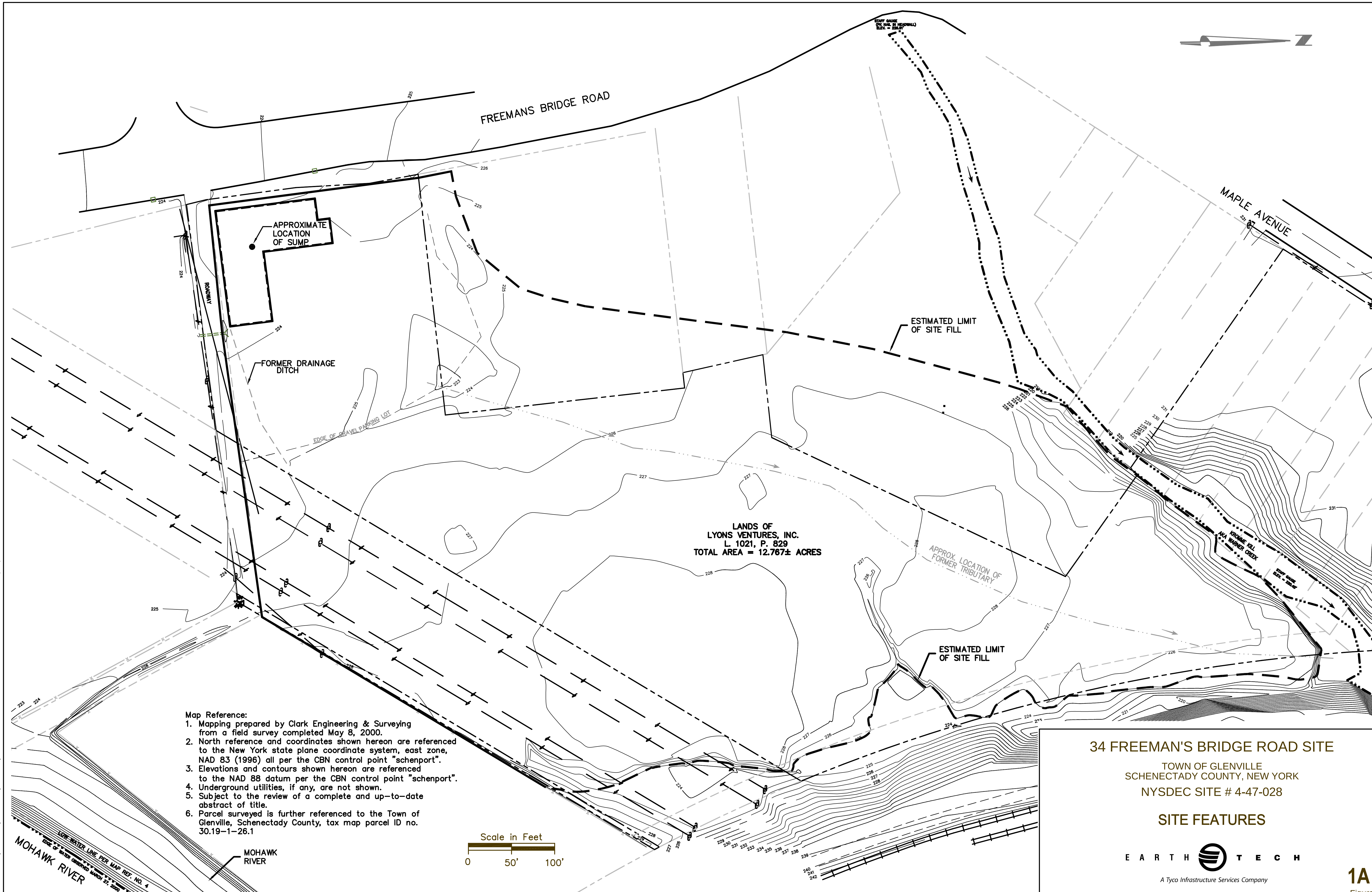


Map Reference:
1. Mapping prepared by Clark Engineering & Surveying from a field survey completed May 8, 2000.
2. North reference and coordinates shown hereon are referenced to the New York state plane coordinate system, east zone, NAD 83 (1996) all per the CBN control point "schenport".
3. Elevations and contours shown hereon are referenced to the NAD 88 datum per the CBN control point "schenport".
4. Underground utilities, if any, are not shown.
5. Subject to the review of a complete and up-to-date abstract of title.
6. Parcel surveyed is further referenced to the Town of Glenville, Schenectady County, tax map parcel ID no. 30.19-1-26.1

34 FREEMAN'S BRIDGE ROAD SITE

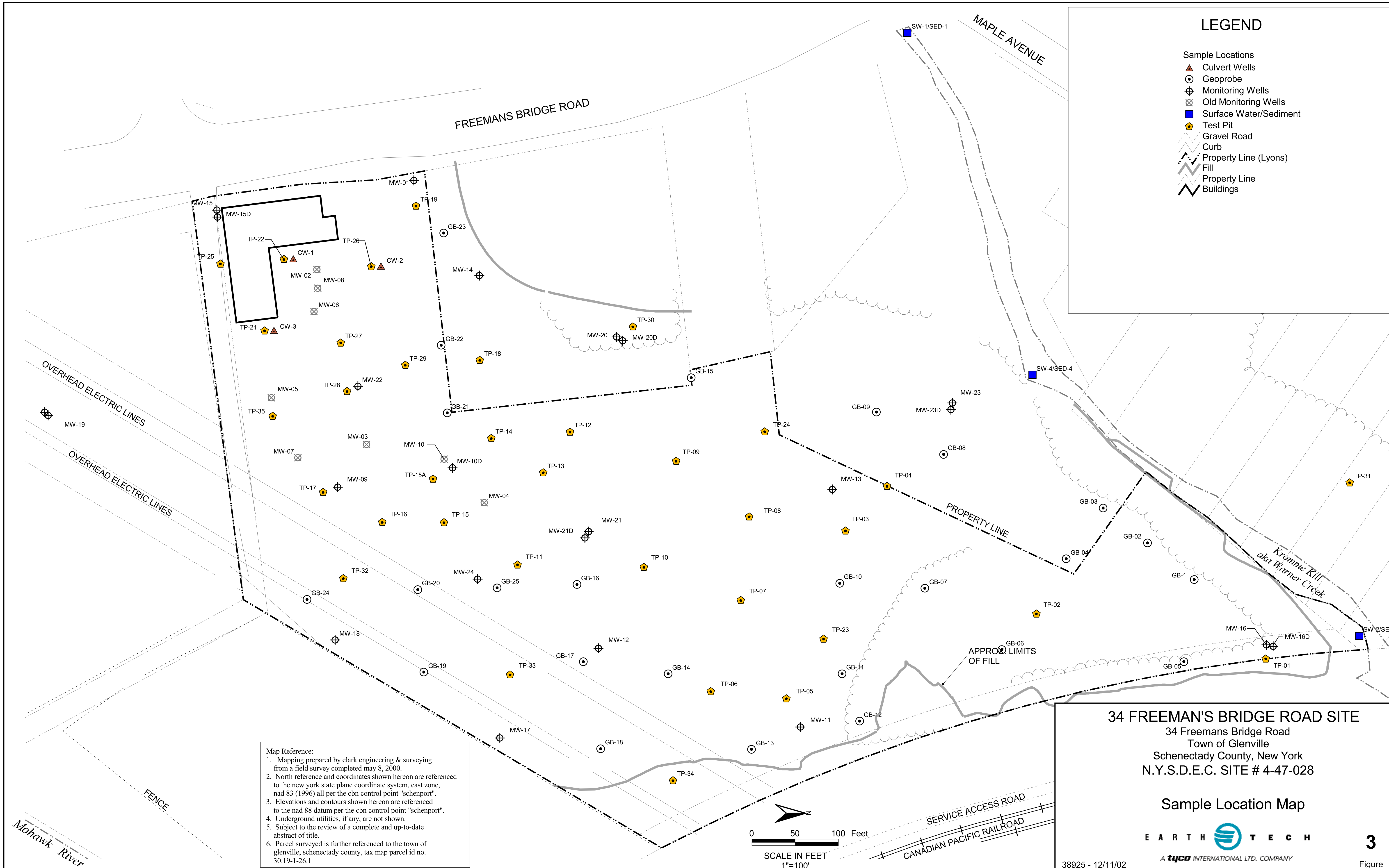
TOWN OF GLENVILLE
SCHENECTADY COUNTY, NEW YORK
NYSDEC SITE # 4-47-028

SITE FEATURES

EARTH TECH
A Tyco Infrastructure Services Company

1A
Figure

CAD FILE NAME: L;\WORK\38925\CADD\Figures2003\PRAP2003\PRAP2_FILL-THICK-ISO.DWG
XREF: L;\WORK\38925\CADD\38925-Base4PRAP.DWG PLOT DATE: 10/7/03


LEGEND
Sample Locations
Culvert Wells
Geoprobe
Monitoring Wells
Old Monitoring Wells
Surface Water/Sediment
Test Pit
Gravel Road
Curb
Property Line (Lyons)
Fill
Property Line
Buildings
FREEMANS BRIDGE ROAD
MAPLE AVENUE
OVERHEAD ELECTRIC LINES
OVERHEAD ELECTRIC LINES
PROPERTY LINE
Kromme Kill
aka Warner Creek
APPROX. LIMITS
OF FILL
FENCE
Mohawk River
SERVICE ACCESS ROAD
CANADIAN PACIFIC RAILROAD
SW-1/SED-1
SW-4/SED-4
SW-2/SED
MW-01
MW-15
MW-15D
TP-19
GB-23
TP-22
TP-26
CW-1
CW-2
TP-25
MW-02
MW-08
MW-14
MW-06
TP-21
CW-3
TP-30
TP-27
GB-22
MW-20
MW-20D
TP-18
TP-29
GB-15
MW-22
TP-28
MW-05
GB-21
MW-23
GB-09
MW-23D
TP-35
MW-19
TP-24
TP-14
TP-12
MW-03
MW-10
GB-08
MW-07
TP-09
MW-10D
TP-13
TP-15A
MW-13
TP-04
MW-09
TP-17
TP-31
MW-04
GB-03
TP-08
TP-16
TP-15
MW-21
TP-03
MW-21D
GB-02
GB-04
TP-11
TP-10
MW-24
GB-1
TP-32
GB-20
GB-25
GB-16
GB-10
GB-07
GB-24
TP-07
TP-02
MW-16
MW-16D
MW-18
TP-23
GB-06
MW-12
GB-17
GB-19
TP-33
GB-14
GB-11
GB-05
TP-01
TP-06
TP-05
MW-11
GB-12
MW-17
GB-18
GB-13
TP-34
Map Reference:
1. Mapping prepared by clark engineering & surveying from a field survey completed may 8, 2000.
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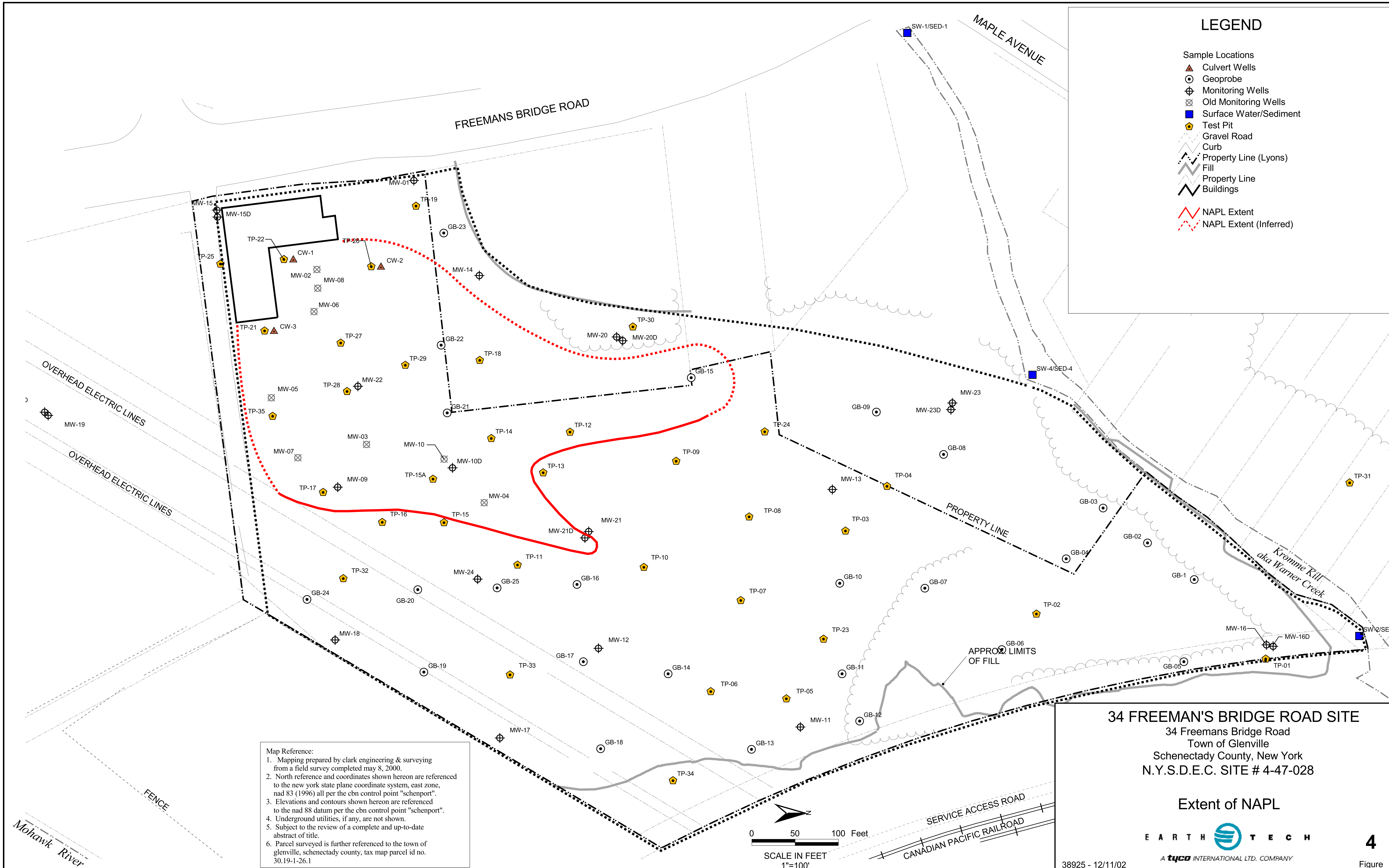
3. Elevations and contours shown hereon are referenced to the nad 88 datum per the cbn control point "schenport".
4. Underground utilities, if any, are not shown.
5. Subject to the review of a complete and up-to-date abstract of title.
6. Parcel surveyed is further referenced to the town of glenville, schenectady county, tax map parcel id no. 30.19-1-26.1
N
0 50 100 Feet
SCALE IN FEET
1"=100'
34 FREEMAN'S BRIDGE ROAD SITE
34 Freemans Bridge Road
Town of Glenville
Schenectady County, New York
N.Y.S.D.E.C. SITE # 4-47-028
Sample Location Map
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
38925 - 12/11/02
3
Figure



LEGEND
Sample Locations
Culvert Wells
Geoprobe
Monitoring Wells
Old Monitoring Wells
Surface Water/Sediment
Test Pit
Gravel Road
Curb
Property Line (Lyons)
Fill
Property Line
Buildings
NAPL Extent
NAPL Extent (Inferred)
FREEMANS BRIDGE ROAD
MAPLE AVENUE
OVERHEAD ELECTRIC LINES
OVERHEAD ELECTRIC LINES
PROPERTY LINE
Kromme Kill
aka Warner Creek
APPROX. LIMITS
OF FILL
FENCE
Mohawk River
SERVICE ACCESS ROAD
CANADIAN PACIFIC RAILROAD
SW-1/SED-1
SW-4/SED-4
SW-2/SED
MW-01
MW-15
MW-15D
TP-19
GB-23
TP-22
TP-20
CW-1
CW-2
TP-25
MW-02
MW-08
MW-06
MW-14
TP-21
CW-3
TP-27
GB-22
TP-30
MW-20
MW-20D
TP-29
TP-18
TP-28
MW-22
GB-15
MW-05
TP-35
GB-21
MW-19
MW-03
TP-14
TP-12
TP-24
GB-09
MW-23
MW-23D
MW-07
MW-10
MW-10D
TP-09
GB-08
TP-13
TP-15A
TP-17
MW-09
MW-04
TP-04
MW-13
TP-16
TP-15
MW-21
MW-21D
TP-08
TP-03
GB-03
TP-31
GB-02
GB-04
TP-32
TP-11
TP-10
GB-24
MW-24
GB-25
GB-16
GB-10
GB-07
GB-1
GB-20
TP-07
TP-02
MW-18
MW-12
TP-23
GB-06
MW-16
MW-16D
GB-19
GB-17
TP-33
GB-14
GB-11
GB-05
TP-01
TP-06
TP-05
GB-12
MW-17
MW-11
GB-18
GB-13
TP-34
Map Reference:
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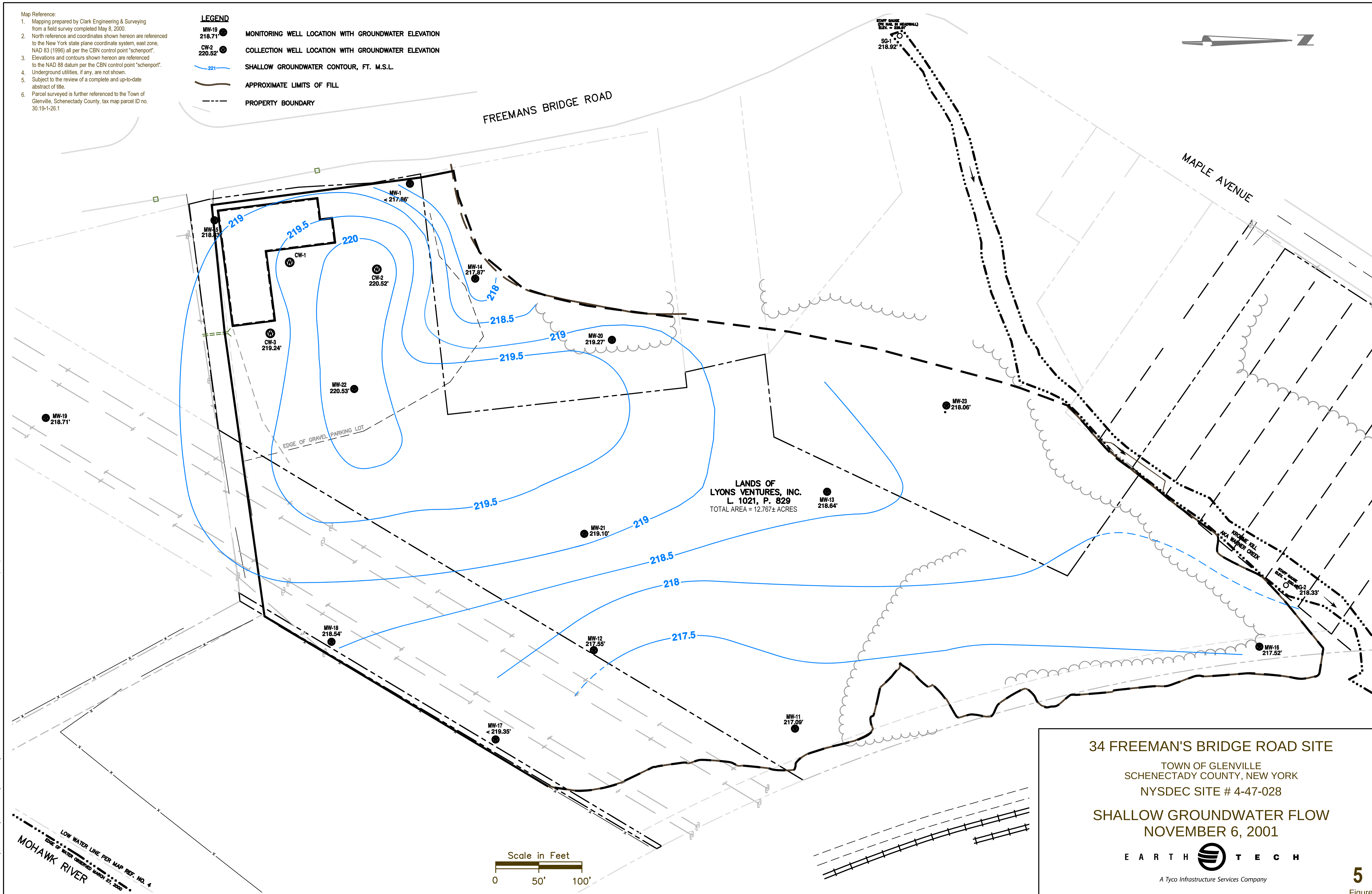
N
0 50 100 Feet
SCALE IN FEET
1"=100'
34 FREEMAN'S BRIDGE ROAD SITE
34 Freemans Bridge Road
Town of Glenville
Schenectady County, New York
N.Y.S.D.E.C. SITE # 4-47-028
Extent of NAPL
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
38925 - 12/11/02
4
Figure

CAD FILE NAME: L;\WORK\38925\CADD\Figures2003\PRAP_2003\PRAP5_GW-SHALLOW-11-06-01.DWG
XREF: L;\WORK\38925\CADD\38925-Base4PRAP.DWG PLOT DATE: 10/7/03



34 FREEMAN'S BRIDGE ROAD SITE

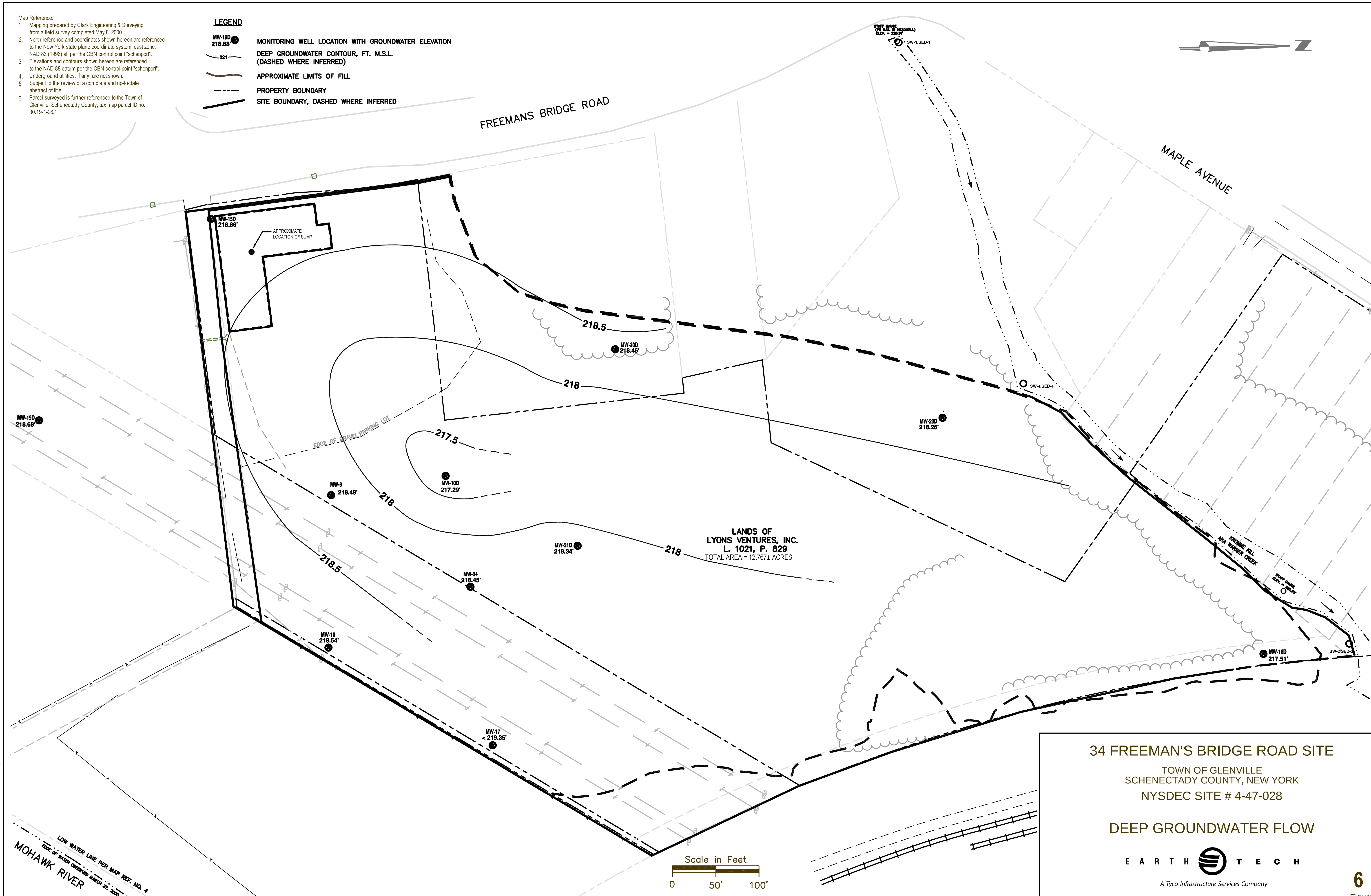
TOWN OF GLENVILLE
SCHENECTADY COUNTY, NEW YORK
NYSDEC SITE # 4-47-028

SHALLOW GROUNDWATER FLOW
NOVEMBER 6, 2001

EARTH TECH
A Tyco Infrastructure Services Company

Figure 5

CAD FILE NAME: L;\WORK\38925\CADD\Figures2003\PRAP_2003\PRAP6_GW-DEEP-11-06-01.DWG
XREF: L;\WORK\38925\CADD\38925-Base4PRAP.DWG PLOT DATE: 10/7/03



34 FREEMAN'S BRIDGE ROAD SITE

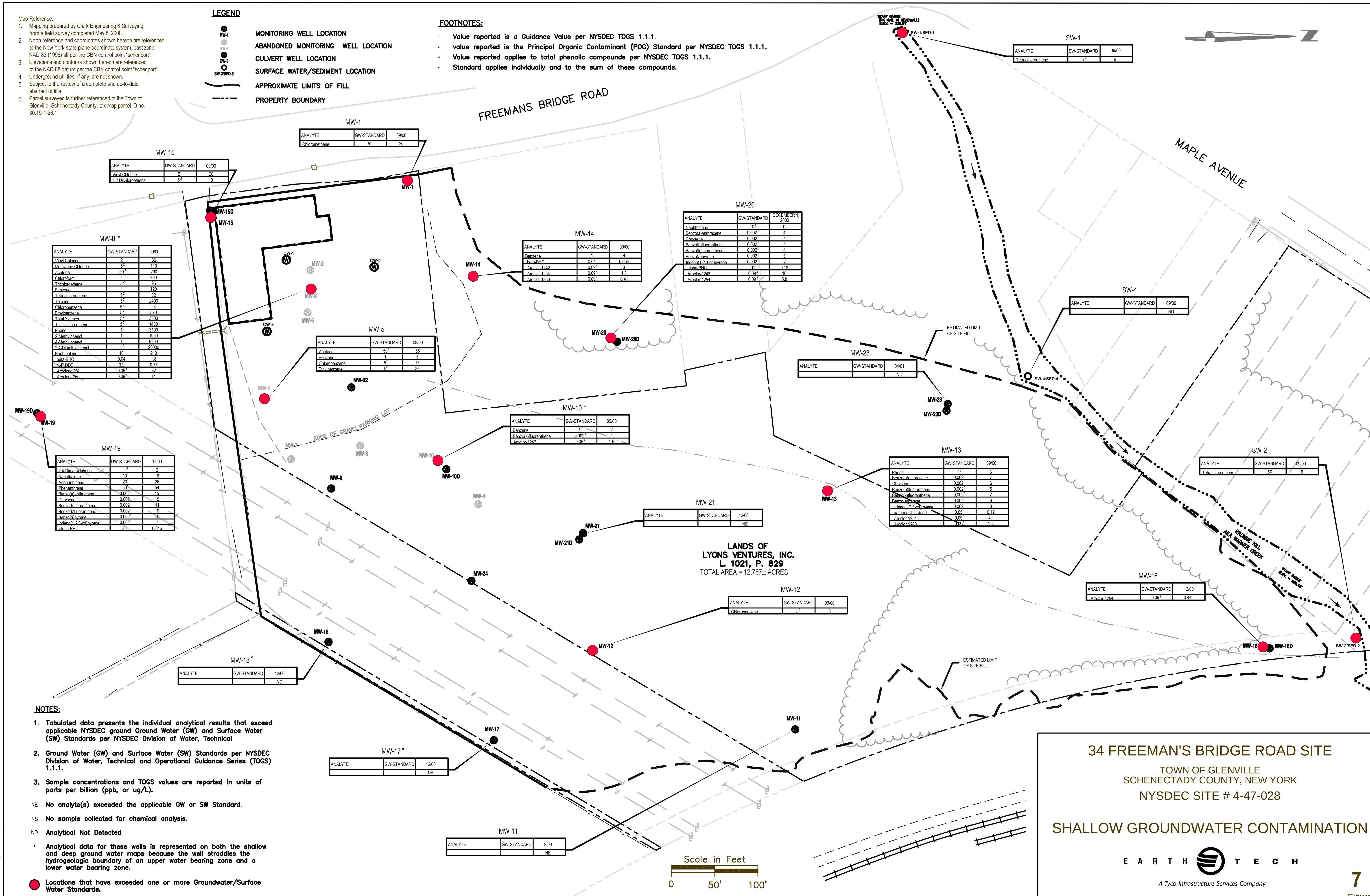
TOWN OF GLENVILLE
SCHENECTADY COUNTY, NEW YORK
NYSDEC SITE # 4-47-028

DEEP GROUNDWATER FLOW

EARTH TECH
A Tyco Infrastructure Services Company

Figure 6

CAD FILE NAME: L;\WORK\38925\CADD\Figures2003\PRAP_2003\PRAP7_GWSHALLOW-ORGANIC.DWG
XREF: L;\WORK\38925\CADD\38925-Base4PRAP.DWG PLOT DATE: 10/7/03



Map Reference:
1. Mapping prepared by Clark Engineering & Surveying from a field survey completed May 8, 2000.
2. North reference and coordinates shown hereon are referenced to the New York state plane coordinate system, east zone, NAD 83 (1996) all per the CBN control point "schenport".
3. Elevations and contours shown hereon are referenced to the NAD 88 datum per the CBN control point "schenport".
4. Underground utilities, if any, are not shown.
5. Subject to the review of a complete and up-to-date abstract of title.
6. Parcel surveyed is further referenced to the Town of Glenville, Schenectady County, tax map parcel ID no. 30.19-1-26.1

LEGEND

- MW-1 — MONITORING WELL LOCATION
- MW-6 — ABANDONED MONITORING WELL LOCATION
- CW-3 — CULVERT WELL LOCATION
- SW-3/SED-3 — SURFACE WATER/SEDIMENT LOCATION
- APPROXIMATE LIMITS OF FILL
- PROPERTY BOUNDARY

FOOTNOTES:

1 Value reported is a Guidance Value per NYSDEC TOGS 1.1.1.
2 value reported is the Principal Organic Contaminant (POC) Standard per NYSDEC TOGS 1.1.1.
3 Value reported applies to total phenolic compounds per NYSDEC TOGS 1.1.1.
4 Standard applies individually and to the sum of these compounds.

MW-1

ANALYTE	GW-STANDARD	09/00
Chloromethane	5[2]	20

MW-15

ANALYTE	GW-STANDARD	09/00
Vinyl Chloride	2	20
1,2 Dichloroethene	5[2]	10

MW-8 *

ANALYTE	GW-STANDARD	09/00
Vinyl Chloride	2	69
Methylene Chloride	5[2]	110
Acetone	50[1]	290
Chloroform	7	200
Trichloroethene	5[2]	96
Benzene	1	120
Tetrachloroethene	5[2]	82
Toluene	5[2]	2400
Chlorobenzene	5[2]	26
Ethylbenzene	5[2]	570
Total Xylenes	5[2]	3500
1,2 Dichloroethene	5[2]	1400
Phenol	1[3]	3100
2-Methylphenol	1[3]	1900
4-Methylphenol	1[3]	9200
2,4-Dimethylphenol	1[3]	20000
Naphthalene	10[1]	210
beta-BHC	0.04	1.8
4,4"-DDE	0.2	0.77
Aroclor-1254	0.09[4]	32
Aroclor-1260	0.09[4]	14

MW-14

ANALYTE	GW-STANDARD	09/00
Benzene	1	4
beta-BHC	0.04	0.054
Aroclor-1242	0.09[4]	3
Aroclor-1254	0.09[4]	1.3
Aroclor-1260	0.09[4]	0.41

MW-20

ANALYTE	GW-STANDARD	DECEMBER 1, 2000
Naphthalene	10[1]	12
Benzo(a)anthracene	0.002[1]	4
Chrysene	0.002[1]	4
Benzo(b)fluoranthene	0.002[1]	4
Benzo(k)fluoranthene	0.002[1]	4
Benzo(a)pyrene	0.002[1]	3
Indeno(1,2,3-cd)pyrene	0.002[1]	2
alpha-BHC	.01	0.18
Aroclor-1248	0.09[4]	16
Aroclor-1254	0.09[4]	5.8

SW-1

ANALYTE	SW-STANDARD	09/00
Tetrachloroethene	5[2]	6

SW-4

ANALYTE	GW-STANDARD	09/00
		ND

MW-5

ANALYTE	GW-STANDARD	09/00
Acetone	50[1]	56
Benzene	1	5
Chlorobenzene	5[2]	17
Ethylbenzene	5[2]	30

MW-23

ANALYTE	GW-STANDARD	04/01
		ND

MW-19

ANALYTE	GW-STANDARD	12/00
2,4-Dimethylphenol	1[3]	2
Naphthalene	10[1]	16
Acenaphthene	20[1]	26
Phenanthrene	50[1]	54
Benzo(a)anthracene	0.002[1]	15
Chrysene	0.002[1]	15
Benzo(b)fluoranthene	0.002[1]	11
Benzo(k)fluoranthene	0.002[1]	10
Benzo(a)pyrene	0.002[1]	10
Indeno(1,2,3-cd)pyrene	0.002[1]	7
alpha-BHC	.01	0.046

MW-10 *

ANALYTE	GW-STANDARD	09/00
Benzene	1[1]	2
Benzo(k)fluoranthene	0.002[1]	1
Aroclor-1242	0.09[4]	1.6

MW-13

ANALYTE	GW-STANDARD	09/00
Phenol	1[3]	3
Benzo(a)anthracene	0.002[1]	7
Chrysene	0.002[1]	6
Benzo(b)fluoranthene	0.002[1]	5
Benzo(k)fluoranthene	0.002[1]	7
Benzo(a)pyrene	0.002[1]	6
Indeno(1,2,3-cd)pyrene	0.002[1]	3
gamma-Chlordane[5]	0.05	0.12
Aroclor-1254	0.09[4]	4.1
Aroclor-1260	0.09[4]	2.2

SW-2

ANALYTE	SW-STANDARD	09/00
Tetrachloroethene	5[2]	18

MW-21

ANALYTE	GW-STANDARD	12/00
		NE

MW-16

ANALYTE	GW-STANDARD	12/00
Aroclor-1254	0.09[4]	0.44

MW-12

ANALYTE	GW-STANDARD	09/00
Chlorobenzene	5[2]	8

MW-18 *

ANALYTE	GW-STANDARD	12/00
		ND

MW-17 *

ANALYTE	GW-STANDARD	12/00
		NE

MW-11

ANALYTE	GW-STANDARD	9/00
		NE

NOTES:

1. Tabulated data presents the individual analytical results that exceed applicable NYSDEC ground Ground Water (GW) and Surface Water (SW) Standards per NYSDEC Division of Water, Technical
2. Ground Water (GW) and Surface Water (SW) Standards per NYSDEC Division of Water, Technical and Operational Guidance Series (TOGS) 1.1.1.
3. Sample concentrations and TOGS values are reported in units of parts per billion (ppb, or ug/L).

NE No analyte(s) exceeded the applicable GW or SW Standard.

NS No sample collected for chemical analysis.

ND Analytical Not Detected

* Analytical data for these wells is represented on both the shallow and deep ground water maps because the well straddles the hydrogeologic boundary of an upper water bearing zone and a lower water bearing zone.

● Locations that have exceeded one or more Groundwater/Surface Water Standards.

34 FREEMAN'S BRIDGE ROAD SITE

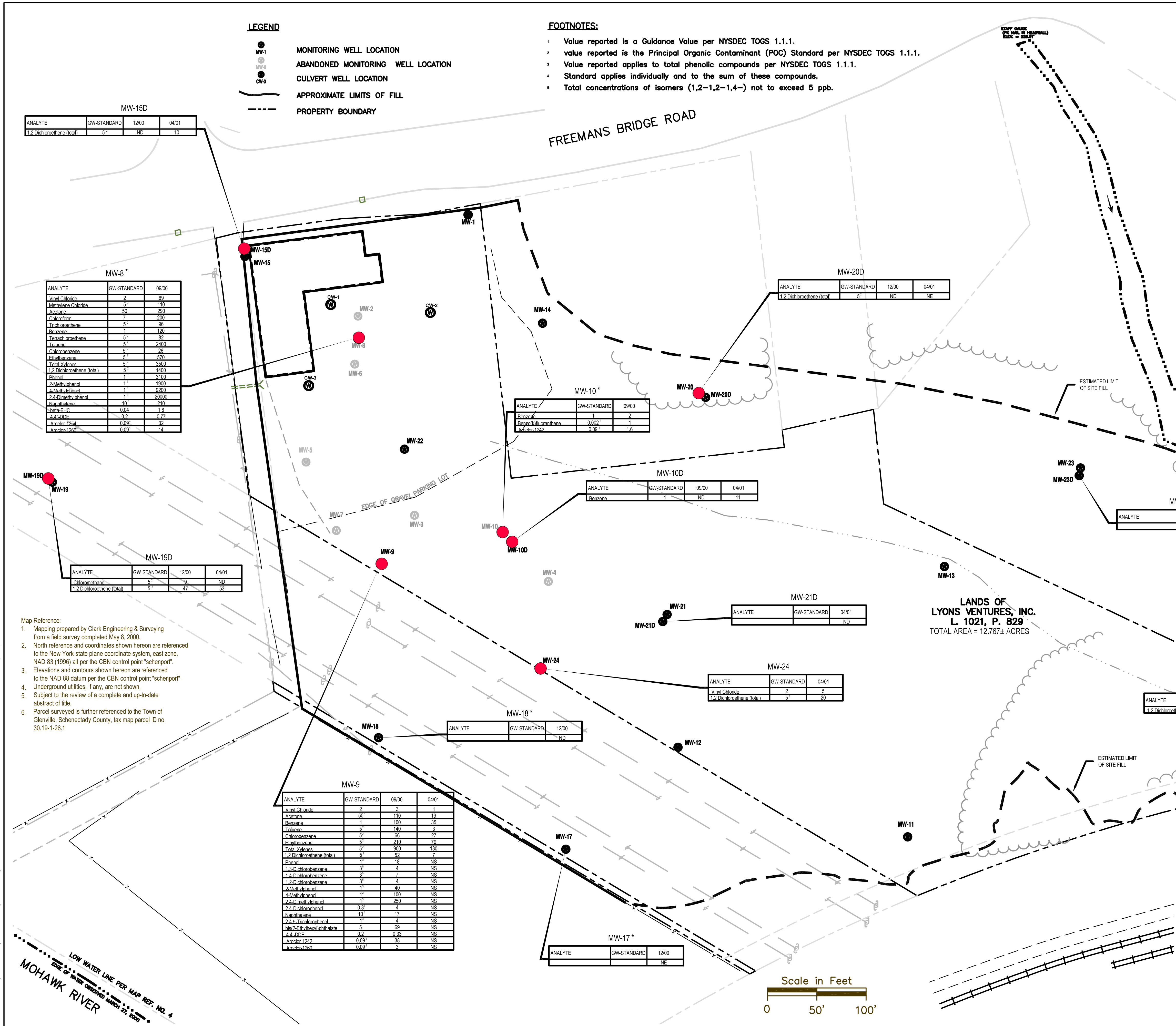
TOWN OF GLENVILLE
SCHENECTADY COUNTY, NEW YORK
NYSDEC SITE # 4-47-028

SHALLOW GROUNDWATER CONTAMINATION

EARTH TECH
A Tyco Infrastructure Services Company

7
Figure

CAD FILE NAME: L;\WORK\38925\CADD\Figures2003\PRAP_2003\PRAP8_GW-DEEP-ORGANIC.DWG
XREF: L;\WORK\38925\CADD\38925-Base4PRAP.DWG PLOT DATE: 10/7/03



LEGEND

- MONITORING WELL LOCATION
- ABANDONED MONITORING WELL LOCATION
- CULVERT WELL LOCATION
- APPROXIMATE LIMITS OF FILL
- PROPERTY BOUNDARY

FOOTNOTES:

1. Value reported is a Guidance Value per NYSDEC TOGS 1.1.1.
2. value reported is the Principal Organic Contaminant (POC) Standard per NYSDEC TOGS 1.1.1.
3. Value reported applies to total phenolic compounds per NYSDEC TOGS 1.1.1.
4. Standard applies individually and to the sum of these compounds.
5. Total concentrations of isomers (1,2–1,2–1,4–) not to exceed 5 ppb.

NOTES:

1. Tabulated data presents the individual analytical results that exceed applicable NYSDEC ground Ground Water (GW) and Surface Water (SW) Standards per NYSDEC Division of Water, Technical
2. Ground Water (GW) and Surface Water (SW) Standards per NYSDEC Division of Water, Technical and Operational Guidance Series (TOGS) 1.1.1.
3. Sample concentrations and TOGS values are reported in units of parts per billion (ppb, or ug/L).

NE No analyte(s) exceeded the applicable GW or SW Standard.

NS No sample collected for chemical analysis.

ND Analytical Not Detected

* Analytical data for these wells is represented on both the shallow and deep ground water maps because the well straddles the hydrogeologic boundary of an upper water bearing zone and a lower water bearing zone.

● Locations that have exceeded one or more Groundwater/Surface Water Standards.

MW-15D

ANALYTE	GW-STANDARD	12/00	04/01
1,2 Dichloroethene (total)	5[2]	ND	10

MW-8*

ANALYTE	GW-STANDARD	09/00
Vinyl Chloride	2	69
Methylene Chloride	5[2]	110
Acetone	50	290
Chloroform	7	200
Trichloroethene	5[2]	96
Benzene	1	120
Tetrachloroethene	5[2]	82
Toluene	5[2]	2400
Chlorobenzene	5[2]	26
Ethylbenzene	5[2]	570
Total Xylenes	5[2]	3500
1,2 Dichloroethene (total)	5[2]	1400
Phenol	1[3]	3100
2-Methylphenol	1[3]	1900
4-Methylphenol	1[3]	9200
2,4-Dimethylphenol	1[3]	20000
Naphthalene	10[1]	210
beta-BHC	0.04	1.8
4,4"-DDE	0.2	0.77
Aroclor-1254	0.09[4]	32
Aroclor-1260	0.09[4]	14

MW-20D

ANALYTE	GW-STANDARD	12/00	04/01
1,2 Dichloroethene (total)	5[2]	ND	NE

MW-10*

ANALYTE	GW-STANDARD	09/00
Benzene	1	2
Benzo(k)fluoranthene	0.002	1
Aroclor-1242	0.09	1.6

MW-10D

ANALYTE	GW-STANDARD	09/00	04/01
Benzene	1	ND	11

MW-23D

ANALYTE	GW-STANDARD	12/00
		ND

MW-19D

ANALYTE	GW-STANDARD	12/00	04/01
Chloromethane	5[2]	9	ND
1,2 Dichloroethene (total)	5[2]	47	53

MW-21D

ANALYTE	GW-STANDARD	04/01
		ND

MW-24

ANALYTE	GW-STANDARD	04/01
Vinyl Chloride	2	5
1,2 Dichloroethene (total)	5[2]	20

MW-16D

ANALYTE	GW-STANDARD	12/00	04/01
1,2 Dichloroethene (total)	5	14	12

MW-18*

ANALYTE	GW-STANDARD	12/00
		ND

MW-9

ANALYTE	GW-STANDARD	09/00	04/01
Vinyl Chloride	2	3	1
Acetone	50[1]	110	19
Benzene	1	100	35
Toluene	5[2]	140	3
Chlorobenzene	5[2]	66	27
Ethylbenzene	5[2]	210	79
Total Xylenes	5[2]	900	130
1,2 Dichloroethene (total)	5[2]	52	7
Phenol	1[3]	18	NS
1,3-Dichlorobenzene	3[5]	4	NS
1,4-Dichlorobenzene	3[5]	7	NS
1,2-Dichlorobenzene	3[5]	4	NS
2-Methylphenol	1[3]	40	NS
4-Methylphenol	1[3]	100	NS
2,4-Dimethylphenol	1[3]	250	NS
2,4-Dichlorophenol	0.3[3]	4	NS
Naphthalene	10[1]	17	NS
2,4,5-Trichlorophenol	1[3]	4	NS
bis(2-Ethylhexyl)phthalate	5	69	NS
4,4'-DDE	0.2	0.33	NS
Aroclor-1242	0.09[4]	38	NS
Aroclor-1260	0.09[4]	3	NS

MW-17*

ANALYTE	GW-STANDARD	12/00
		NE

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3. Elevations and contours shown hereon are referenced to the NAD 88 datum per the CBN control point "schenport".
4. Underground utilities, if any, are not shown.
5. Subject to the review of a complete and up-to-date abstract of title.
6. Parcel surveyed is further referenced to the Town of Glenville, Schenectady County, tax map parcel ID no. 30.19-1-26.1

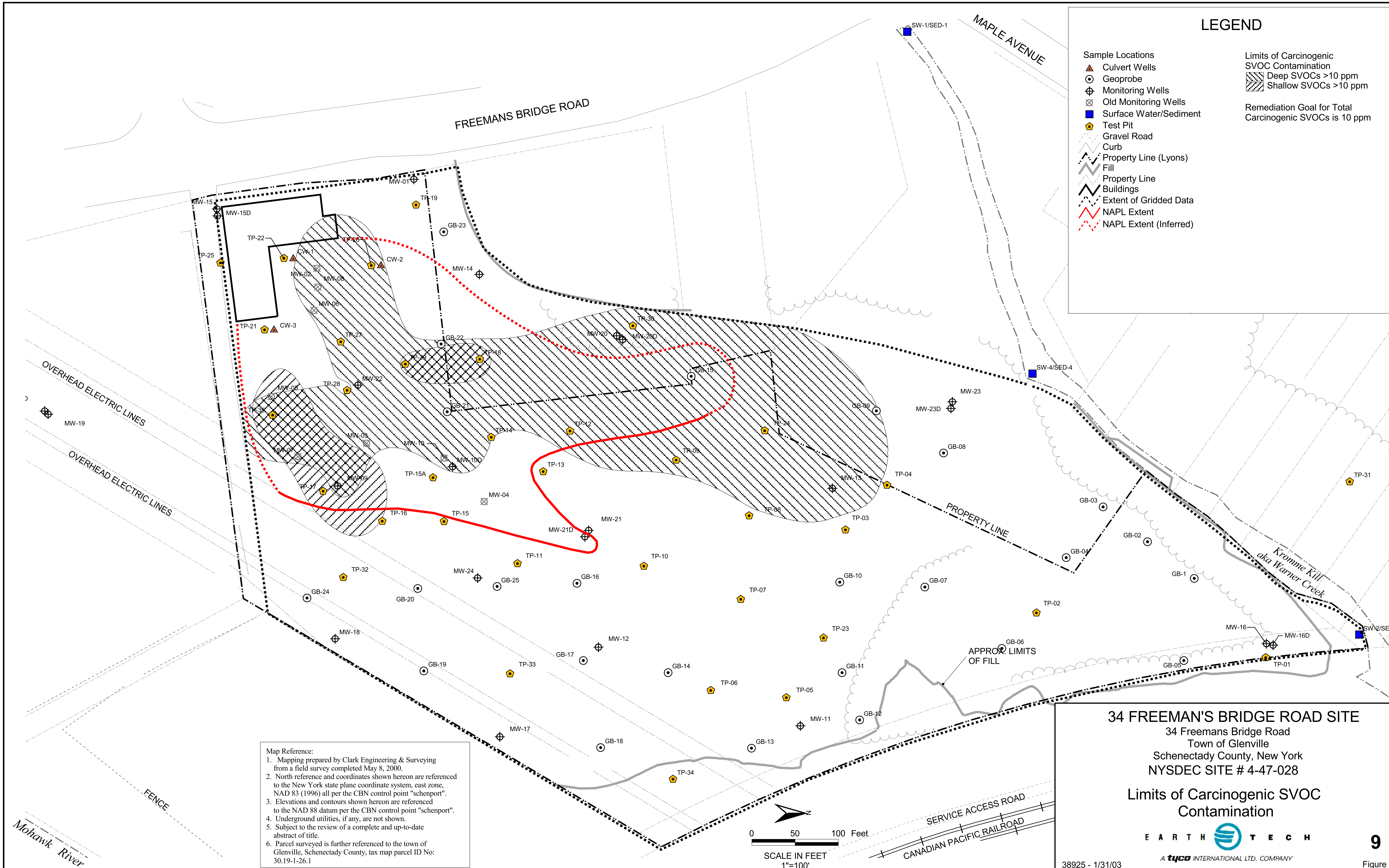
34 FREEMAN'S BRIDGE ROAD SITE

TOWN OF GLENVILLE
SCHENECTADY COUNTY, NEW YORK
NYSDEC SITE # 4-47-028

DEEP GROUNDWATER CONTAMINATION

EARTH TECH
A Tyco Infrastructure Services Company

Figure 8



Map Reference:
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3. Elevations and contours shown hereon are referenced to the NAD 88 datum per the CBN control point "schenport".
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6. Parcel surveyed is further referenced to the town of Glenville, Schenectady County, tax map parcel ID No: 30.19-1-26.1

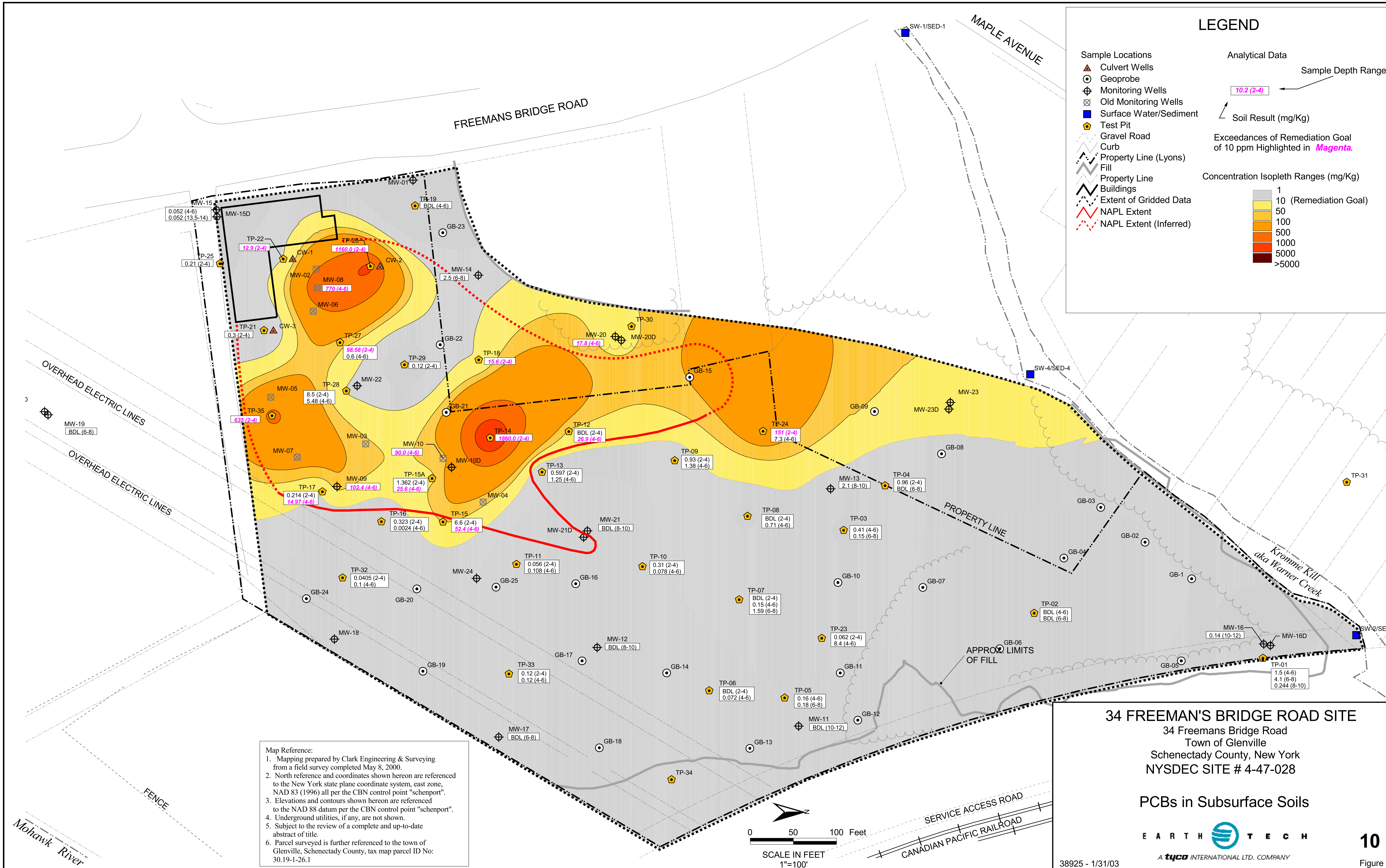
34 FREEMAN'S BRIDGE ROAD SITE
34 Freemans Bridge Road
Town of Glenville
Schenectady County, New York
NYSDEC SITE # 4-47-028

Limits of Carcinogenic SVOC Contamination

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

38925 - 1/31/03

9
Figure



LEGEND
Sample Locations
Culvert Wells
Geoprobe
Monitoring Wells
Old Monitoring Wells
Surface Water/Sediment
Test Pit
Gravel Road
Curb
Property Line (Lyons)
Fill
Property Line
Buildings
Extent of Gridded Data
NAPL Extent
NAPL Extent (Inferred)
Analytical Data
Sample Depth Range
10.2 (2-4)
Soil Result (mg/Kg)
Exceedances of Remediation Goal of 10 ppm Highlighted in Magenta.
Concentration Isopleth Ranges (mg/Kg)
1
10 (Remediation Goal)
50
100
500
1000
5000
>5000
FREEMANS BRIDGE ROAD
MAPLE AVENUE
OVERHEAD ELECTRIC LINES
OVERHEAD ELECTRIC LINES
PROPERTY LINE
Kromme Kill aka Warner Creek
APPROX. LIMITS OF FILL
SERVICE ACCESS ROAD
CANADIAN PACIFIC RAILROAD
FENCE
Mohawk River
SW-1/SED-1
SW-4/SED-4
SW-2/SED
MW-15 0.052 (4-6) 0.052 (13.5-14)
MW-15D
MW-01
TP-19 BDL (4-6)
GB-23
TP-22 12.9 (2-4)
CW-1
TP-26 1160.0 (2-4)
CW-2
TP-25 0.21 (2-4)
MW-02
MW-08 770 (4-6)
MW-14 2.5 (6-8)
MW-06
TP-21 0.3 (2-4)
CW-3
TP-27 98.58 (2-4) 0.6 (4-6)
GB-22
TP-30
MW-20 17.8 (4-6)
MW-20D
TP-29 0.12 (2-4)
TP-18 15.6 (2-4)
GB-15
TP-28
MW-22
MW-05 8.5 (2-4) 5.48 (4-6)
TP-35 635 (2-4)
GB-21
TP-14 1860.0 (2-4)
TP-12 BDL (2-4) 26.9 (4-6)
TP-24 151 (2-4) 7.3 (4-6)
GB-09
MW-23
MW-23D
MW-19 BDL (6-8)
MW-07
MW-03
MW-10 90.0 (4-6)
MW-10D
TP-13 0.597 (2-4) 1.25 (4-6)
TP-09 0.93 (2-4) 1.38 (4-6)
GB-08
TP-15A 1.362 (2-4) 25.6 (4-6)
MW-09 102.4 (4-6)
TP-17 0.214 (2-4) 14.97 (4-6)
MW-04
MW-13 2.1 (8-10)
TP-04 0.96 (2-4) BDL (6-8)
TP-31
GB-03
TP-16 0.323 (2-4) 0.0024 (4-6)
TP-15 6.6 (2-4) 52.4 (4-6)
MW-21 BDL (8-10)
MW-21D
TP-08 BDL (2-4) 0.71 (4-6)
TP-03 0.41 (4-6) 0.15 (6-8)
GB-02
GB-04
TP-11 0.056 (2-4) 0.108 (4-6)
TP-10 0.31 (2-4) 0.078 (4-6)
TP-32 0.0405 (2-4) 0.1 (4-6)
MW-24
GB-25
GB-16
GB-10
GB-07
GB-1
GB-24
GB-20
TP-07 BDL (2-4) 0.15 (4-6) 1.59 (6-8)
TP-02 BDL (4-6) BDL (6-8)
MW-18
MW-12 BDL (8-10)
TP-23 0.062 (2-4) 8.4 (4-6)
GB-06
MW-16 0.14 (10-12)
MW-16D
GB-17
GB-19
TP-33 0.12 (2-4) 0.12 (4-6)
GB-14
GB-11
GB-05
TP-01 1.5 (4-6) 4.1 (6-8) 0.244 (8-10)
TP-06 BDL (2-4) 0.072 (4-6)
TP-05 0.16 (4-6) 0.18 (6-8)
GB-12
MW-11 BDL (10-12)
MW-17 BDL (6-8)
GB-18
GB-13
TP-34
Map Reference:
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N
0 50 100 Feet
SCALE IN FEET 1"=100'
34 FREEMAN'S BRIDGE ROAD SITE
34 Freemans Bridge Road
Town of Glenville
Schenectady County, New York
NYSDEC SITE # 4-47-028
PCBs in Subsurface Soils
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
38925 - 1/31/03
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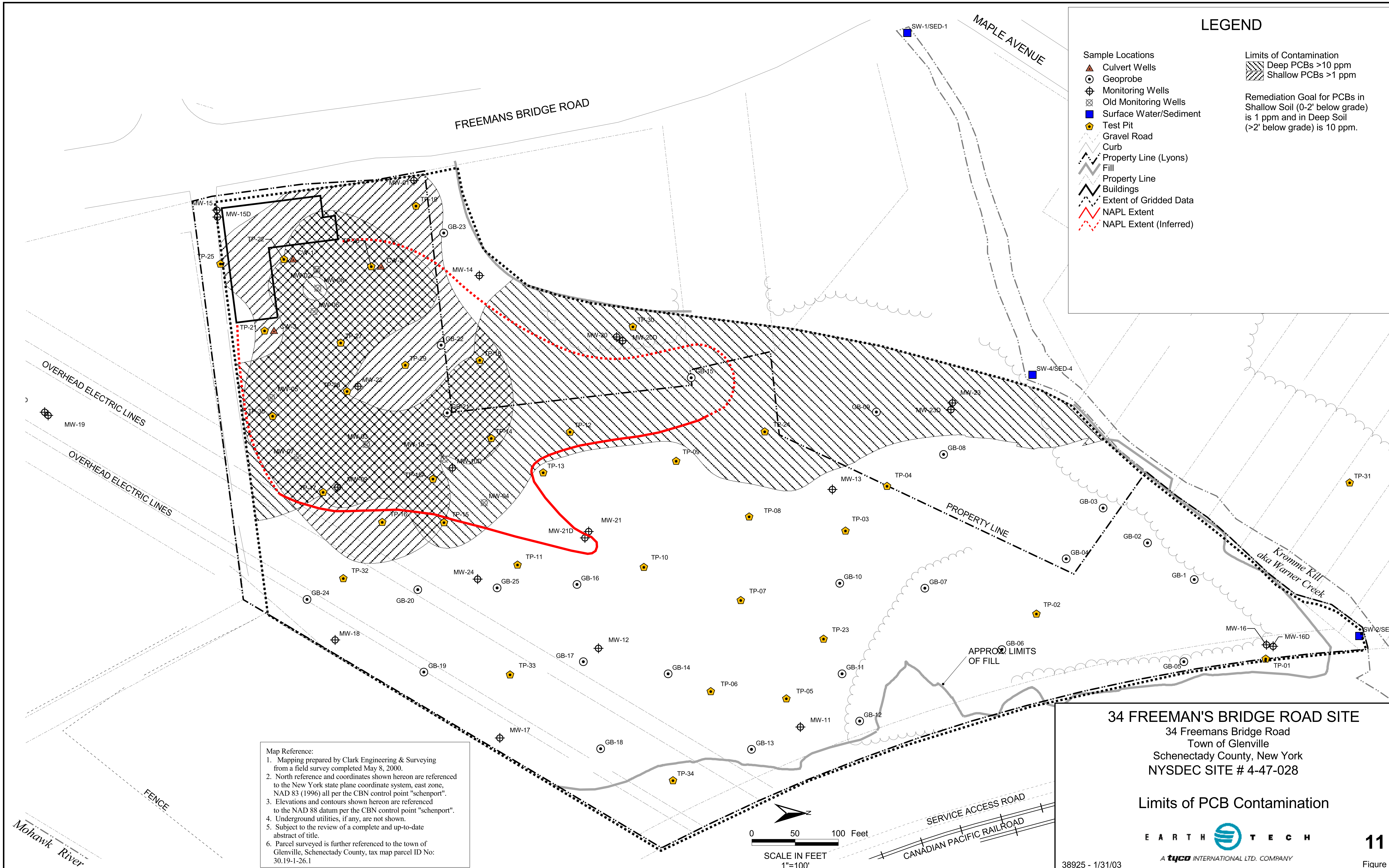
Figure



LEGEND
Sample Locations
Culvert Wells
Geoprobe
Monitoring Wells
Old Monitoring Wells
Surface Water/Sediment
Test Pit
Gravel Road
Curb
Property Line (Lyons)
Fill
Property Line
Buildings
Extent of Gridded Data
NAPL Extent
NAPL Extent (Inferred)
Limits of Contamination
Deep PCBs >10 ppm
Shallow PCBs >1 ppm
Remediation Goal for PCBs in Shallow Soil (0-2' below grade) is 1 ppm and in Deep Soil (>2' below grade) is 10 ppm.
FREEMANS BRIDGE ROAD
MAPLE AVENUE
OVERHEAD ELECTRIC LINES
OVERHEAD ELECTRIC LINES
PROPERTY LINE
APPROX. LIMITS OF FILL
Kromme Kill aka Warner Creek
SERVICE ACCESS ROAD
CANADIAN PACIFIC RAILROAD
FENCE
Mohawk River
SW-1/SED-1
SW-4/SED-4
MW-15
MW-15D
MW-01
TP-19
GB-23
TP-25
TP-22
MW-14
TP-21
GB-22
TP-29
MW-22
TP-30
MW-20
MW-20D
GB-15
MW-19
MW-23
MW-23D
GB-09
GB-21
TP-12
TP-24
GB-08
TP-09
TP-13
MW-13
TP-04
TP-08
TP-03
GB-03
MW-21
MW-21D
TP-16
TP-15
TP-31
GB-02
GB-04
TP-32
TP-11
MW-24
GB-25
GB-16
TP-10
GB-10
GB-07
GB-1
GB-24
GB-20
TP-07
TP-02
MW-18
MW-12
TP-23
MW-16
MW-16D
GB-06
GB-17
GB-19
TP-33
GB-14
GB-11
GB-05
TP-01
TP-06
TP-05
MW-17
GB-12
MW-11
GB-18
GB-13
TP-34
0 50 100 Feet
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1"=100'
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34 FREEMAN'S BRIDGE ROAD SITE
34 Freemans Bridge Road
Town of Glenville
Schenectady County, New York
NYSDEC SITE # 4-47-028
Limits of PCB Contamination
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
38925 - 1/31/03
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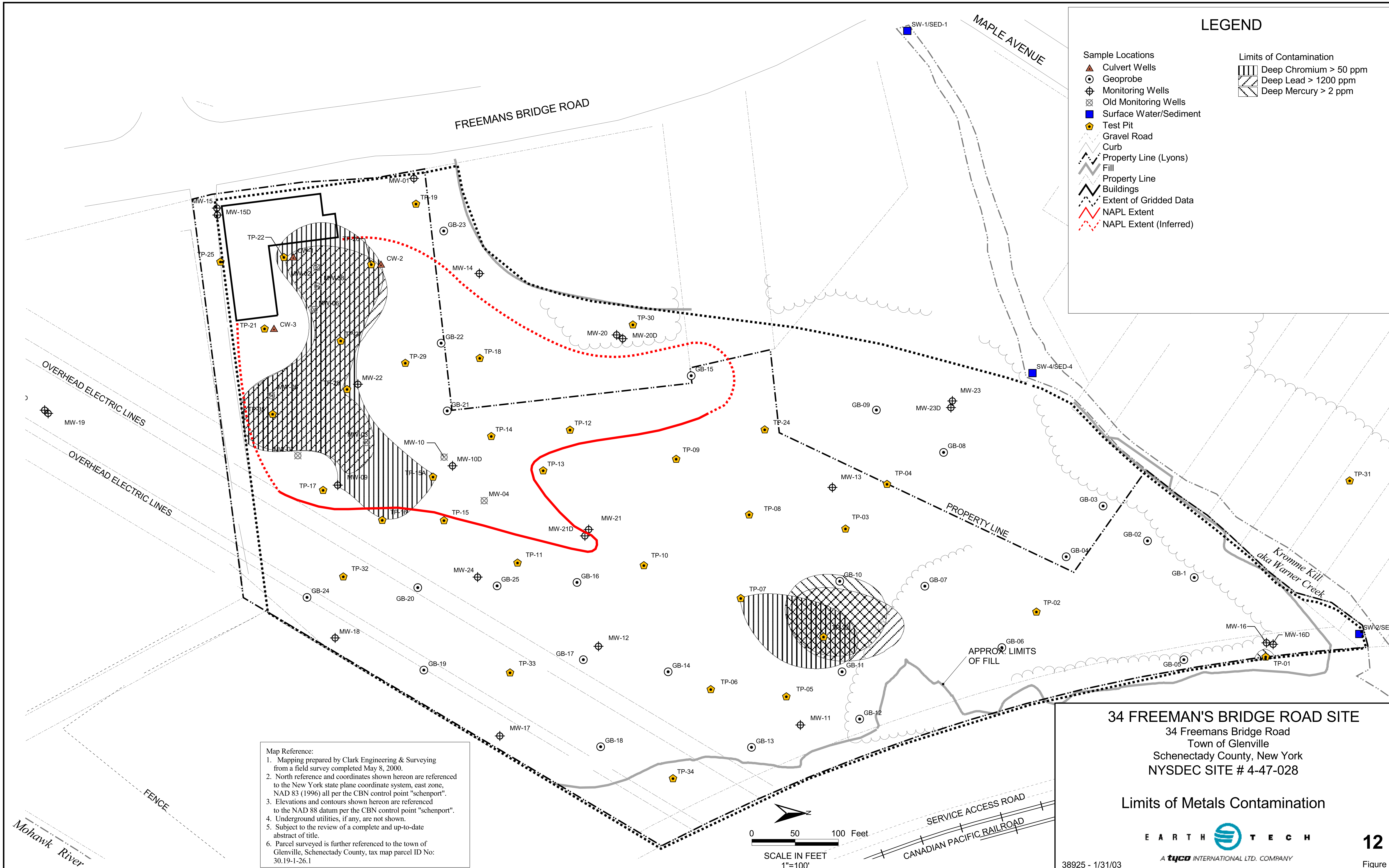
Figure


LEGEND
Sample Locations
Culvert Wells
Geoprobe
Monitoring Wells
Old Monitoring Wells
Surface Water/Sediment
Test Pit
Gravel Road
Curb
Property Line (Lyons)
Fill
Property Line
Buildings
Extent of Gridded Data
NAPL Extent
NAPL Extent (Inferred)
Limits of Contamination
Deep Chromium > 50 ppm
Deep Lead > 1200 ppm
Deep Mercury > 2 ppm
FREEMANS BRIDGE ROAD
MAPLE AVENUE
OVERHEAD ELECTRIC LINES
OVERHEAD ELECTRIC LINES
PROPERTY LINE
FENCE
Mohawk River
Kromme Kill aka Warner Creek
APPROX. LIMITS OF FILL
SERVICE ACCESS ROAD
CANADIAN PACIFIC RAILROAD
SW-1/SED-1
SW-4/SED-4
SW-2/SED
MW-01
MW-15
MW-15D
MW-14
MW-19
MW-20
MW-20D
MW-22
MW-10
MW-10D
MW-04
MW-21
MW-21D
MW-23
MW-23D
MW-13
MW-24
MW-18
MW-12
MW-17
MW-11
MW-16
MW-16D
CW-2
CW-3
TP-01
TP-02
TP-03
TP-04
TP-05
TP-06
TP-07
TP-08
TP-09
TP-10
TP-11
TP-12
TP-13
TP-14
TP-15
TP-17
TP-18
TP-19
TP-21
TP-22
TP-24
TP-25
TP-29
TP-30
TP-31
TP-32
TP-33
TP-34
GB-1
GB-02
GB-03
GB-04
GB-05
GB-06
GB-07
GB-08
GB-09
GB-10
GB-11
GB-12
GB-13
GB-14
GB-15
GB-16
GB-17
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GB-21
GB-22
GB-23
GB-24
GB-25
0 50 100 Feet
SCALE IN FEET
1"=100'
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34 FREEMAN'S BRIDGE ROAD SITE
34 Freemans Bridge Road
Town of Glenville
Schenectady County, New York
NYSDEC SITE # 4-47-028
Limits of Metals Contamination
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
38925 - 1/31/03
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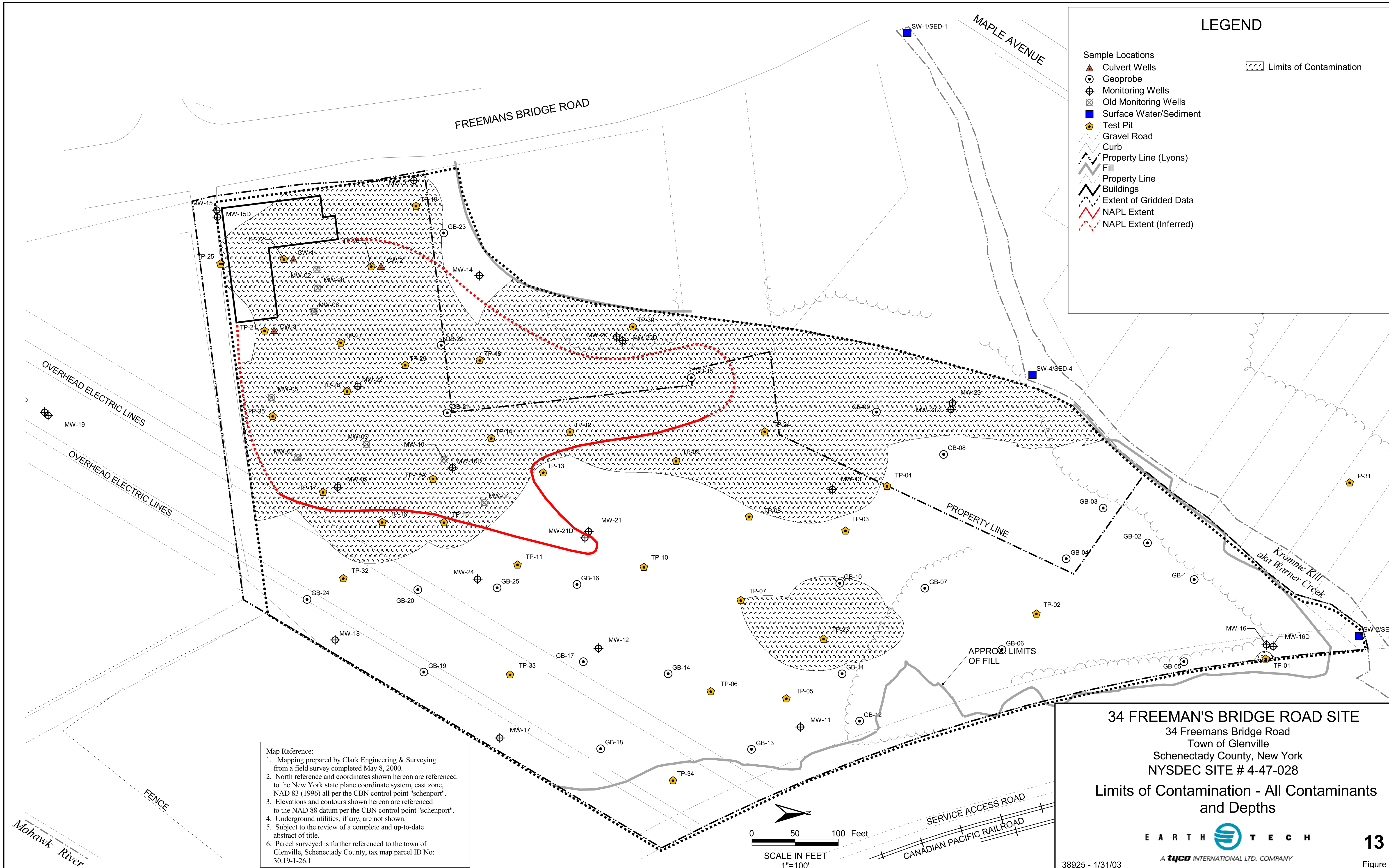
Figure



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34 FREEMAN'S BRIDGE ROAD SITE

34 Freemans Bridge Road
Town of Glenville
Schenectady County, New York
NYSDEC SITE # 4-47-028

Limits of Contamination - All Contaminants and Depths

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

38925 - 1/31/03

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Figure

34 FREEMAN'S BRIDGE ROAD SITE
Town of Glenville
Schenectady County, New York
NYSDEC SITE # 4-47-028

ALTERNATIVE #4

REMOVAL AND ON-SITE TREATMENT

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

38925_PRAP.apr - 10/6/03

14
Figure