FINAL SITE INVESTIGATION/REMEDIAL ALTERNATIVES REPORT

FRANCZYK PARK
(NYSDEC SITE NO. B00174-9)
564 BABCOCK STREET
CITY OF BUFFALO
ERIE COUNTY, NEW YORK

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1.0 INTRODUCTION

1.1 Purpose

The City of Buffalo (the City) entered into a State Assistance Contract with the New York State Department of Environmental Conservation (NYSDEC) to complete a Site Investigation/Remedial Alternatives Report (SI/RAR) at Franczyk Park located at 564 Babcock Street in the City of Buffalo, Erie County, New York (project site). The location of the project site is shown on Figure 1 and the layout of the project site is shown on Figure 2. The SI was completed pursuant to the Environmental Restoration, or Brownfield, Program, component of Title 5 of the Clean Water/Clean Air Bond Act of 1996, which is administered by the NYSDEC. The purpose of the SI/RAR program described herein was to characterize the nature and extent of contamination occurring on, and emanating from, the project site, and to develop and evaluate remedial alternatives, as appropriate.

TVGA has prepared this report on behalf of City of Buffalo to provide a detailed description of the SI/RAR program implemented at the Franczyk Park site. In addition to summarizing and documenting the methods used to investigate the project site, this Site Investigation/Remedial Alternatives Report describes the physical characteristics of the site; defines the nature and extent of contamination encountered; assesses the contamination with respect to fate, transport and exposure; and identifies appropriate remedial action objectives (RAOs). The screening and detailed analysis of remedial alternatives, and the identification of the most suitable remedy available to satisfy the RAOs are also discussed in this report.

1.2 Site Background

1.2.1 Site Description

Franczyk Park is a public park composed of two adjoining parcels totaling approximately 16.5 acres. Baseball diamonds, a soccer field, tennis and basketball courts, and an asphalt parking area occupy portions of the project site. A manicured lawn covers the remainder of the project site. Although wooden bollards are located along the western, eastern, and southern property lines, the spacing is wide enough to accommodate automobiles, which are frequently parked on the lawn of the park. The project site is generally rectangular in shape and is bordered by Fleming Street to the southwest, Lewis Street to the northwest and Babcock Street to the southeast. A community center and an auto salvage yard bound the project site to the northeast.

The City of Buffalo purchased the parcels that contain the project site in 1984. The location and configuration of the tax parcels containing the project site are depicted on a tax map excerpt included as Figure 3. The City of Buffalo Assessor assigned section block and lot numbers (SBL) 112.17-1-10 and 112.17-1-11 to the two parcels that comprise the project site. The project site is located in an area that is zoned for industrial use. Land use in the vicinity of the site is characterized as a mixture of commercial,

industrial, and residential. Residential properties are located on the south side of Fleming Street and on the west side of Lewis Street.

1.2.2 Site History

The project site was first developed as an agricultural fertilizer manufacturing facility and these manufacturing operations lasted almost a century. The project site was undeveloped prior to the mid-1870s or early 1880s, at which point the Buffalo Fertilizing Chemical Works (L.L. Crocker) was constructed at the site. The facility underwent a number of name changes during its tenure, including Crocker Chemical Works in 1894, the Crocker Fertilizing and Chemical Company in 1900 and the American Agricultural Chemical Company (AACC) in 1902. In the late 1930s, AACC sold the southeast corner of the project site to the Economy Reduction Corporation (rendering and soap manufacturers). The Continental Oil Company purchased AACC in 1965 and delegated control of the project site to its subsidiary, Agrico Chemical Company (Agrico), who sold the project site in 1974 to Frit Industries Inc. (Frit), also an agricultural fertilizer manufacturer. In 1975, Frit sold the northwest corner of the project site to Thaddeus Joseph Dulski Community Center Inc. and, in 1976, sold the remainder of the project site to the Industrial Refining Corporation. The Industrial Refining Corporation sold the project site to Car Salvage World in 1977. When Car Salvage World went bankrupt in 1981, the Brondy Real Estate Co. acquired the project site and later sold it to the City of Buffalo in 1984. The City constructed a public park at the project site in 1987.

Development at the project site included an industrial complex and associated railroad spurs, and the complex consisted of production, storage, and office buildings. Structures at the project site included:

- A transformer house along the eastern property line
- An open coal bin along the southern property line
- A baghouse along the southern property line
- A machine shop in the northwest portion of the project site, which included an oil storage house
- A sulfuric acid chamber building in the southwest corner of the project site
- Vessels were used to store the raw materials required for the manufacturing of fertilizer, including:
    - A large above ground storage tank (AST) to store sulfuric acid in the southeast corner of the project site
    - Gas tanks in the northwest and southeast portions of the site
    - A number of underground storage tanks throughout the project site for the storage of petroleum products

The majority of the buildings associated with agricultural fertilizer manufacturing operations were demolished in 1976.

The City of Buffalo performed an environmental investigation at the project site in 1985, as described in Section 1.2.3. This investigation identified soil/fill material that was present on-site prior to acquisition of the project site by the City, with elevated concentrations of metals and a thickness of two to ten feet. The source(s) of the soil/fill material present at the site prior to 1984 is not known. The soil/fill material may be related to former on-site manufacturing and/or demolition activities, or may have been brought in from off-site sources. Based on the findings of the 1985 investigation, the City placed a cover layer consisting of off-site fill material and topsoil across the project site prior to development of the public park. The off-site fill cover material reportedly originated from the Pilot Field and NFTA Bus Terminal construction projects.

1.2.3 Previous Environmental Investigations

The project site has been the subject of multiple environmental assessments and investigations. Appendix A summarizes the documents that describe these activities, as well as other site information. The environmental data generated in 1985, prior to the construction of the public park, indicates that several surface soil/fill samples contained concentrations of metals, including arsenic and lead, and semivolatile organic compounds (SVOCs) above current regulatory guidance levels and background concentrations. Arsenic and lead concentrations were found to be as high as 64.1 parts per million (ppm) and 17,800 ppm, respectively, in the surface soil/fill samples. In addition, subsurface soil/fill samples contained SVOCs, metals (primarily lead and arsenic), and one pesticide at concentrations above the regulatory guidance levels and background concentrations. The maximum concentration of lead detected in subsurface soil/fill samples was one order of magnitude less than that encountered in the surface soil/fill. In addition, SVOCs were detected at concentrations above the current water quality standards in multiple groundwater samples collected at the project site in 1985.

Based on the findings of the 1985 investigation, the City of Buffalo placed off-site fill and topsoil across the entire project site to prevent exposure to the contamination in the soil/fill that was present at the site when the City acquired the property.. Correspondence obtained from City records indicates that fill material from the NFTA Bus Garage and Pilot Field sites was utilized as cover material on the Franczyk Park property prior to development of the site as a public park. Laboratory analytical results for the material from Pilot Field and the NFTA Bus Garage are summarized in Appendix A.

In 1989 and 1990, groundwater monitoring was conducted to investigate potential impacts of the documented soil contamination on groundwater quality. As shown in Appendix A, the results of this groundwater quality monitoring indicated the presence of metals, including arsenic and lead, in groundwater at the site at concentrations above water quality standards. SVOCs were not detected in the groundwater samples collected at that time.

The analysis of samples collected in 1990 from a groundwater seep located near the southwest corner of the project site indicated the presence of pesticides, herbicides, and

metals, including arsenic and lead, at concentrations exceeding the water quality standards. However, the turbidity of the samples was reportedly high and may have biased the results. Although polychlorinated biphenyls (PCBs) were also reportedly detected in one of the groundwater seep samples, the detection of PCBs is likely the result of sediment within the sample based on the fact that a groundwater sample collected in the immediate vicinity of the groundwater seep did not contain PCBs. Additionally, no PCBs were detected in a subsequent sample collected from the same location or in the surface soils surrounding the seep.

In 1998, groundwater seeps were reported in the southeast and southwest corners of the project site. Aqueous samples were collected from both seep areas for chemical analysis on several occasions. The results indicated the presence of numerous inorganic parameters, including arsenic and lead, at concentrations exceeding the water quality standards. Volatile organic compounds (VOCs), SVOCs, and pesticides were also sporadically detected in the samples but were generally present at concentrations below the water quality standards. Surface soil samples were also collected in the vicinity of the two seep locations for chemical analysis in 1998. Although SVOCs were detected in the surface soil samples from both areas, only the sample collected from the southeastern seep area contained concentrations in excess of the regulatory guidance values. The concentrations of arsenic detected in surface soil samples collected from both seep locations also exceeded the regulatory guidance levels, with arsenic concentrations as high as 8,280 ppm in one sample collected from the southeastern seep area. Subsurface soil/fill samples collected from test borings drilled in both seep areas also contained metals at concentrations above the regulatory guidance levels.

In order to delineate the extent of the elevated arsenic levels detected in these surface soil samples, additional surface soil samples were collected on a 100-foot grid system established across the entire project site. This resulted in the collection and analysis of 101 grab samples for arsenic. Of these samples, only two contained arsenic concentrations above the site-specific background concentration of 10 ppm, which was developed in consultation with the NYSDEC and NYSDOH based upon the analysis of one off-site background sample. Both of the samples with high concentrations of arsenic were collected within or adjacent to the groundwater seep areas where elevated arsenic levels had previously been detected.

In 2001, 28 additional surface soil samples were collected from the northern portion of the project site. The analytical results indicated that the lead concentration under the western swing set (1,360 ppm) exceeded the regulatory guidance value. However, it is uncertain whether the sample was collected from the topsoil or the underlying soil/fill material that may have been exposed through erosion resulting from the use of the swings.

To mitigate the groundwater seeps, the City of Buffalo installed an interceptor trench drain system to collect groundwater in the vicinity of the seeps and convey the water to the sanitary sewer system. Prior to constructing the trench drains, subsurface soil/fill

samples were collected along the trench alignments for disposal profiling purposes. The results identified some soil/fill material within the work areas as characteristic hazardous waste based upon leachable lead levels. Additional surface soil samples were also collected within the groundwater seep areas. The chemical analysis of these composite surface soil samples did not indicate any hazardous levels of lead or other parameters.

The analysis of post-excavation subsurface soil/fill samples collected from the groundwater interceptor trench along Lewis Street prior to backfilling indicated that lead concentrations ranged from 27.9 ppm to 5,220 ppm and arsenic concentrations ranged from 5.32 ppm to 206 ppm. In addition, the post-excavation results from samples collected from the interceptor trench along Fleming Street revealed lead concentrations ranging from 1,300 ppm to 15,800 ppm and arsenic concentrations ranging from 361 ppm to 9,790 ppm. Furthermore, the analysis of soil/fill removed from the trenches revealed arsenic levels as high as 22,400 ppm and lead levels as high as 26,600 ppm.

Although a number of investigations were previously performed at the site, as discussed above, the data generated during these investigations was not sufficient to determine the magnitude and extent of the contamination within the soil/fill, nor was it sufficient to determine the degree to which groundwater has been impacted, if at all.

1.2.4 Areas Of Potential Environmental Concern

Based upon a review of historical information, the results of previous investigations of the project site, interviews, and site reconnaissance, the following areas of potential environmental concern were identified for the project site:

- Documented SVOC and metals (viz., lead, arsenic, cadmium, chromium and mercury) contamination in soil/fill and groundwater throughout the project site.
- The potential presence of a 550-gallon abandoned underground storage tank (UST) in the southeast corner of the project site.
- Potential contamination resulting from historical operations of a fertilizer manufacturing facility, which included the storage and use of acids and other chemicals. These operations may have involved subsurface disposal of waste chemicals.
- Potential petroleum, metals, and PCB contamination in connection with the project site's former use as a scrap/salvage yard where automobiles and possibly transformers were accepted/processed.
- Possible subsurface petroleum contamination in connection with former USTs.
- The on-site disposal of demolition debris throughout the subsurface of the project site.

- The project site consists of a public park with no on-site buildings; therefore, it is not anticipated that asbestos-containing materials (ACMs) exist above grade. However, because buildings occupied the project site from before 1900 to the late 1970's, it is possible for ACMs to exist in subsurface soil/fill as well as any remaining building components or buried building debris.

2.0 METHODS OF INVESTIGATION

The scope of the Site Investigation program was generally consistent with that outlined in the NYSDEC-approved July 2003 Draft SI/RA Report Work Plan (Work Plan), the subsequent September 9, 2003 comment response letter which served to finalize the Work Plan and the four Extra Work Authorizations submitted in October 2003 through February 2004. Modifications made to the Work Plan during the completion of the SI were approved by NYSDEC and the City and are discussed within this report.

The purpose of the Site Investigation program was to determine the nature and extent of contamination associated with the areas of environmental concern discussed in Section 1.2.4. To accomplish these goals, the following tasks were completed during the field investigation:

- Site Survey
- Geophysical Survey
- Test Pit Excavation
- Surface Soil Sampling
- Subsurface Soil/Fill Sampling
- Background Soil Sampling
- Soil Probe Advancement
- Test Boring Advancement
- Monitoring Well Installation
- Groundwater Sampling

The following section describes these field tasks in detail.

2.1 Field Investigation

The following subsections describe the scope of field activities associated with the site characterization program. This scope reflects minor deviations and/or additions from the initial scope, as some minor modifications were necessary to account for information obtained during the field investigation or were performed at the request of the NYSDEC. The methods employed during the execution of the field tasks were detailed in the Field Sampling Plan (FSP), while the procedures implemented to ensure the quality of the resulting field and laboratory data were in accordance with the Quality Assurance/Quality Control (QA/QC) Plan. Table 1 summarizes the number of samples collected during the investigative tasks, including QA/QC samples, and the corresponding analytical methods. Figures 4 through 6 show the sampling locations.

2.1.1 Site Survey

TVGA Consultants performed a site survey to develop a topographic base map and to locate the horizontal and vertical positions (where appropriate) of sample locations and relevant site features. A New York State licensed land surveyor established coordinates

relative to the Buffalo City Datum based on a benchmark that consists of the northeast bolt on a fire hydrant located on the southwest corner of Fleming and Clemo Streets.

2.1.2 Geophysical Survey

A near-surface geophysical survey was performed on November 12, 2003 in four separate areas of the project site to determine if USTs and/or other metallic anomalies exist in the subsurface. The four areas of the project site were selected based on historical investigation results, interviews with local residents, and the soil probe investigation, which indicated the potential for subsurface metallic anomalies in these locations. Figure 7 shows the geophysical survey locations, and the geophysical survey report is included in Appendix B.

A subcontractor to TVGA Consultants, Geomatrix Consultants, employed a GEONICS EM61 High Sensitivity Metal Detector and solid-state data logger during the geophysical survey. The survey utilized a ten-foot by ten-foot grid spacing for the western-most survey area and a three-foot by three-foot grid spacing for the three remaining areas.

2.1.3 Test Pit Excavations

Eleven test pits were excavated on December 10, 2003 in the locations with the most significant magnetic anomalies recorded during the geophysical survey to determine the nature of these anomalies. These areas are shown in Figure 7.

A subcontractor to TVGA Consultants, SLC Environmental Services (SLC), provided and operated a backhoe for the excavation of the test pits. Excavated material was segregated into cover soil and soil/fill material and stockpiled on plastic sheeting. Visual characterization was performed and the soil was screened for total organic vapors (TOVs) using a photoionization detector (PID). Logs that detail the observations made during the test pit activities are included in Appendix C.

After the magnetic anomaly and/or native soil was encountered within each test pit, the fill material was first placed back in the excavation, and then the cover material was placed on top of the fill material. No sampling was conducted as a part of the test pit program.

2.1.4 Background Soil Samples

Five background surface soil samples (BG-01 through BG-05) were collected on November 25, 2003 from five separate off-site locations to define local baseline conditions. Two of the background samples were collected from the backyards of private residences and three were collected from properties owned by the Precious Blood Roman Catholic Church. The samples were collected from zero to six inches below ground surface. The background samples were analyzed for Target Compound List (TCL) SVOCs and Target Analyte List (TAL) metals plus cyanide.

2.1.5 Surface Soil Sampling

Ten surface soil samples (SS-01 through SS-10) were collected on November 12, 2003, and four surface soil samples (SS-11 through SS-14) were collected on March 6, 2004 to evaluate the degree of contamination in the surface soil, if any. The surface soil sampling locations are shown on Figure 4. These surface soil samples were collected utilizing the procedures outlined in Section 12.1 of the FSP.

The collection of surface soil samples SS-01 through SS-10 focused on areas where the topsoil and cover material appeared to have been eroded due to high pedestrian traffic. Reconnaissance of the project site indicated the presence of nine such areas, including the three swing set areas, the toddler play area, areas behind the backstops of each of the three baseball diamonds, an area near the northern bleachers associated with the center baseball diamond, and an area near the community center on the northwestern corner of the site. Two surface soil samples were collected from the western swing set area, and one sample was collected from each of the remaining areas for a total of ten grab samples. These samples were analyzed for TAL metals and total cyanide

The surface soil samples SS-11 through SS-14 were collected at the project site from the grassed area between the sidewalk and Lewis Street. These samples were analyzed for total lead and total arsenic.

2.1.6 Soil Probes

2.1.6.1 Initial Sampling

A total of 54 soil probes were drilled on November 3 through 6, 2003 to characterize surficial geology across the site; define the areal extent and thickness of fill material; and identify areas of subsurface contamination. The soil probes were drilled at the locations shown on Figure 5 using direct-push soil sampling equipment to collect continuous samples. The depths of the soil probes ranged from 2.5 to 12.8 feet below grade. A subcontractor to TVGA Consultants, SLC, provided and operated the direct-push drilling rig.

Upon retrieval, each soil sample was field screened with a PID for TOVs and a representative sample was placed in a clean driller's jar. Soil samples from each split-spoon or probe were initially screened with a PID upon retrieval by separating the soil column with a decontaminated stainless steel spoon and placing the PID probe tip near the void. This was recorded as a "direct" TOV reading. In addition, the PID tip was placed into the air headspace above the soil to obtain a "headspace" TOV measurement after the headspace in the driller's jar was allowed to reach equilibrium. The direct and headspace TOV measurements, as well as soil descriptions, were recorded on Soil Probe Logs, which are included in Appendix C.

The subsurface soil/fill samples were submitted to a laboratory subcontracted to TVGA Consultants for chemical analysis. Section 2.2 describes the process by which samples were selected for analysis and the methods by which the selected samples were analyzed.

2.1.6.2 Additional Sampling

As a result of elevated concentrations of lead, arsenic, and mercury in some of the samples collected during the initial subsurface soil/fill sampling event, additional soil probes were advanced on March 6, 2004 to facilitate the collection of soil samples to further characterize these areas.

Eight additional soil samples were collected for Toxicity Characteristic Leaching Procedure (TCLP) lead analysis to determine if lead is present at concentrations that constitute a characteristic hazardous waste. Four of these samples were collected from the following locations with the highest total lead concentrations detected during the initial sampling by advancing soil probes immediately adjacent to the original location. The total lead concentrations in the original samples are shown in parentheses.

- SP-4: 1.5 to 4 feet (6350 mg/kg)
- SP-5: 2 to 3.5 feet (4220 mg/kg)
- SP-28: 1.2 to 3.5 feet (4240 mg/kg)
- SP-34: 3 to 5 feet (4920 mg/kg)

In addition, two samples were collected in the vicinity of each of the interceptor trenches, which included samples from SP-55 and SP-56 adjacent to the Fleming Street trench and SP-57 and SP-58 adjacent to the Lewis Street trench. Figure 5 shows the soil probe locations. These samples were collected because elevated lead concentrations were detected in these areas during previous investigations and construction of the trenches.

Seven additional soil samples were collected for TCLP arsenic analysis to determine if arsenic is present at concentrations that constitute a characteristic hazardous waste. Three of these samples were collected from the following locations with the highest total arsenic concentrations detected during the initial sampling by advancing soil probes immediately adjacent to the original location. The corresponding total arsenic concentrations are shown in parentheses.

- SP-2: 11 to 12 feet (421 mg/kg)
- SP-23: 1 to 3.5 feet (756 mg/kg)
- SP-39: 0.3 to 5.5 feet (928 mg/kg)

Similar to the samples collected for lead analysis, two samples were also collected in the vicinity of each of the interceptor trenches for arsenic analysis.

These samples were collected from SP-55 and SP-56 adjacent to the Fleming Street trench and SP-57 and SP-59 adjacent to the Lewis Street trench.

The concentration of mercury in the sample collected from grade to 3.5 feet below grade in soil probe SP-10 was 12.9 mg/kg. To confirm this result, determine the specific depth at which the elevated mercury concentration occurred, and characterize the soil in the vicinity of the sample, the following seven soil samples were collected for analysis of total mercury:

- Three samples were collected from approximately the same location as the sample collected from SP-10:
  - One sample was collected from zero to two inches below grade.
  - One sample was collected from two inches to two feet below grade.
  - One sample was collected from two to 3.5 feet below grade.
- One sample was collected approximately 10 feet from the SP-10 location in each of the four cardinal directions. These samples were collected from the cover material from depths of generally zero to two feet below grade.

The soil sample collected from SP-56 exhibited visual and olfactory evidence of petroleum (potentially fuel oil) contamination; however, both direct and headspace screening of the soil with a PID produced TOV levels below one ppm. Based on the visual and olfactory observations, an additional sample was collected and submitted for chemical analysis for the TCL SVOCs.

After the final depth of each soil probe was reached and sampling was completed, excess soil was placed back into the probe hole from which it originated and a minimum of the top six inches of each probe hole was backfilled with bentonite powder.

2.1.7 Test Borings and Monitoring Well Installation

Six test borings were drilled on November 17 through 19, 2003 to characterize the subsurface soil and facilitate the installation of groundwater monitoring wells in the soil/fill. In addition, two test borings were drilled solely for the installation of monitoring wells. Test boring and monitoring well locations were selected based upon the project objectives, ease of access, freedom from obstructions, and safety considerations (appropriate set backs from overhead wires and buried services). The project objectives included the characterization of areas of potential environmental concern identified during the project scoping as well as during soil probe investigation. The groundwater monitoring wells were installed to determine the groundwater flow direction, hydraulic gradient, and hydraulic conductivity of the upper-most water-bearing zone, as well as

characterize the groundwater quality at the project site. The locations of the test borings and the monitoring wells are shown on Figures 5 and 6, respectively.

Because the soil/fill material in test borings TB-4 and TB-6 was not saturated, the monitoring wells proposed for these locations were moved to the locations of soil probes SP-48 and SP-21, respectively. Because soil logs had previously been prepared for the soil probe borings, no boring logs were created for these two locations.

In addition, one microwell (Micro-01) was installed in the southwestern portion of the site to characterize the groundwater in this area with relatively high concentrations of metals in the soil. The microwell was drilled and installed using direct-push drilling techniques in the area of soil probes SP-4 and SP-5 on March 6, 2004. The location of Micro-01 is shown on Figure 6.

The drilling, split-spoon sampling, and monitoring well installation procedures were completed in accordance with the Work Plan. The microwell was constructed in accordance with the specifications in Extra Work Authorization No. 4. The test borings were advanced though overburden soils/fill to either native material or refusal (presumed to be bedrock) using hollow-stem augers. The depths of the monitoring wells ranged from eight to 16 feet below grade. Soil samples from the test borings were submitted to the analytical laboratory. Section 2.2 describes the process by which samples were selected for analysis and the methods by which the selected samples were analyzed.

Each of the monitoring wells and the microwell was screened in the uppermost water-bearing zone in the soil/fill. Table 2 summarizes the Well Construction Details and Appendix C includes the Monitoring Well Installation Reports. Following the monitoring well installation, each newly installed monitoring well was developed, with a dedicated bailer, until the discharged water was relatively sediment free and/or the indicator parameters (pH, temperature, and conductivity) had stabilized. The microwell was developed using a peristaltic pump and dedicated tubing. Well Development Logs are included in Appendix C.

2.1.8 Groundwater Sampling

Prior to the initiation of groundwater sampling, groundwater levels were measured to determine the groundwater flow direction and gradient using an electronic water level indicator. None of the wells contained non-aqueous phase liquid (NAPL).

The six monitoring wells were sampled on November 21, 2003 to obtain representative groundwater samples for analysis of TCL VOCs, SVOCs, and pesticides and TAL metals plus cyanide. A second round of groundwater sampling was performed on March 8, 2004 and included the six existing monitoring wells and the new microwell, the samples from which were analyzed for six metals (antimony, arsenic, beryllium, lead, nickel, and selenium). These metals were selected because they were detected in one or more wells sampled on November 21, 2003 at concentrations above the applicable standards.

Groundwater sampling consisted of the evacuation of a minimum of three well volumes from each of the wells using a peristaltic pump and dedicated tubing. Groundwater sampling was performed as soon as practicable after purging had been completed and the wells had recovered sufficiently to sample. The groundwater was pumped directly from the well using the peristaltic pump and dedicated tubing into pre-cleaned bottles provided by the laboratory. All wells contained sufficient volume for the required laboratory analytical testing. Monitoring Well Purging and Sampling Logs are included in Appendix C.

2.1.9 In-Situ Hydraulic Conductivity Testing

In-situ hydraulic conductivity tests were completed on November 25, 2003 to determine the permeability of the soil/fill material in which the wells are screened. Four of the monitoring wells (MW-01, MW-03, MW-04, and MW-05) were tested via the introduction and/or withdrawal of a slug of water. Water levels were measured in each of the wells prior to and after the introduction or withdrawal or the slug using a pressure transducer and data logger. The slug test results were analyzed using methods of Hvorslev (1951). The slug test results are summarized in Table 4 and the raw data is included in Appendix D.

2.1.10 Investigation-Derived Waste

Excess soil from the soil probing activities was placed back down the probe holes; therefore, no waste soil was generated during the soil probe activities. Decontamination fluids and excess auger cuttings generated from the test boring activities were placed into 55-gallon drums, which were stored in a fenced area for off-site disposal by the City of Buffalo. All development water and purge water, with the exception of that generated from MW-01, was collected and discharged to the groundwater interceptor trenches located along the western side and southeastern corner of the site. The development water and purge water generated from MW-01 was placed into a 55-gallon drum based on visual and olfactory evidence of contamination.

2.2 Sample Analysis/Validation

2.2.1 Laboratory Analysis

All chemical analyses were performed by Severn Trent Laboratories, Inc. (STL), which is accredited under the New York State Environmental Laboratory Approval Program (ELAP) Contract Laboratory Program (CLP). All samples were analyzed using the applicable methods prescribed by the NYSDEC Analytical Services Protocol (ASP), June 2000. Category B deliverables were generated for these samples. The target analytes and corresponding analytical methods used for the project are identified and summarized in Table 1.

2.2.1.1 Quality Assurance/Quality Control Samples

In addition to field samples, Quality Assurance/Quality Control Samples were collected to evaluate the effectiveness of the QA/QC procedures implemented during the field and laboratory activities associated with the project. These QA/QC samples were collected and analyzed in accordance with the July 2003 QA/QC Plan developed for the project. As reflected by Table 1, QA/QC samples included matrix spike (MS), matrix spike duplicate (MSD) and matrix duplicate (MD) samples, trip blanks, blind field duplicates and equipment blank samples.

2.2.1.2 Selection of Subsurface Soil Samples for Analysis

During the initial part of the investigation, a total of 110 subsurface soil/fill samples were collected from 54 soil probes advanced across the site, and 29 subsurface soil/fill samples were collected from the eight test borings completed across the site. Of these 139 samples, 45 soil/fill samples were submitted for chemical analysis for TCL SVOCs. Thirty-five of these samples were also analyzed for lead and arsenic. The remaining ten samples were analyzed for TCL VOCs, pesticides, and PCBs and TAL metals plus cyanide. Additionally, ten samples were analyzed for asbestos using Polarized Light Microscopy (PLM). To facilitate the sample management and selection process, the subsurface soil investigation was divided into three phases:

- Phase 1 included the soil probes located on the western half of the site (SP-01 through SP-27)
- Phase 2 included the soil probes located on the eastern half of the site (SP-28 through SP-54), and
- Phase 3 included all of the test borings (TB-01 through TB-08).

The phasing of this program was intended to allow the selection of samples for chemical analysis at the end of each phase and the extraction of the samples within the required holding times. Following the completion of each phase of drilling, each discrete soil or soil/fill unit identified in the logs was assigned a unique unit identifier, including topsoil, CM (cover material), subsurface soil/fill units B through K, and native material. After the soil sampling in each phase was completed, Table 3 was prepared to summarize the distribution of these units throughout the borings.

The total number of subsurface samples to be analyzed was divided between the three phases to distribute those samples spatially throughout the site. The majority of the samples were equally distributed between Phases 1 and 2, and the remainder was allotted to Phase 3. The following procedure was used to select the samples for analysis after the completion of Phases 1 and 2:

- One sample was selected from each of the predominant subsurface units for analysis of TCL VOCs, SVOCs, pesticides and PCBs and TAL metals plus cyanide based on the number of times each was encountered, as summarized in Table 3. These units included the cover material, soil/fill units B and C, and native material;
- One sample was selected from each of the ten soil/fill units for analysis of TCL SVOCs and lead and arsenic;
- When a discrete soil/fill unit was encountered at multiple probe/boring locations, multiple samples of this unit were selected for analysis of TCL SVOCs and lead and arsenic. These samples were collected in addition to the one sample collected per the preceding bullet. The locations of these samples were selected to provide horizontal and/or vertical coverage of the soil/fill unit. This selection process also considered variations observed in the composition of the unit as well as visual and olfactory indications of contamination.
- The areal extent of each soil/fill unit, as well as the number of units requiring characterization, was considered in the determination of the number of samples selected for each discrete soil/fill unit.

2.2.2 Data Validation

A NYSDEC-approved independent data validator performed the validation of the laboratory data in accordance with the *NYSDEC Guidance for the Development of Data Usability Summary Reports* (DUSR). The data package was first reviewed for completeness and compliance relative to the criteria specified in the aforementioned NYSDEC document. The validator then conducted a detailed comparison of the reported data with the raw data submitted as part of the supporting documentation package, and applied protocol-defined procedures for the identification and quantitation of the individual analytes to determine the validity of the data. The DUSR includes a narrative summary discussing all quality issues and their impact on the reported results and presents copies of laboratory case narratives. The DUSR is included in Appendix E.

3.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

3.1 Physical Setting

The project site is located in the Ontario Basin of the Erie-Ontario Lowland Physiographic Province. This Province is generally characterized by low topographic relief as a result of erosion and deposition of sediments adjacent to Lakes Erie and Ontario. A USGS 7.5 Minute Topographic Map is included as Figure 1. The topography of the project site is generally flat with an approximate elevation of 600 feet above mean sea level.

The *Soil Survey of Erie County* indicates that the project site is located in an area of Urban Land (Ud), which is defined as a miscellaneous area in which 80 percent or more of the soil surface is covered by asphalt, concrete, buildings, or other impervious structures. The *Surficial Geologic Map of New York, Niagara Sheet* depicts the project site as being underlain by lacustrine silt and clay deposits consisting of laminated silt and clay. The *Geologic Map of New York, Niagara Section* depicts the uppermost bedrock formation beneath the project site as consisting of middle Devonian Period shales and limestones that are approximately 150 feet thick.

A review of historical atlases indicated that the Little Buffalo Creek once flowed through the western portion of the project site in a north-northwesterly direction to an eventual discharge into the Buffalo River that in turn discharges to Lake Erie. This creek appeared in the 1872 and 1884 historical atlases reviewed for the project site but was not present in the 1894 historical atlas.

The majority of the storm water on the project site is conveyed either by overland flow off the project site or by a series of drainage swales located in the southern portions of the project site. The project site is graded such that storm water flows from the interior portions of the project site toward the property lines where it enters into catch basins along the road shoulders. West of the eastern-most baseball diamond is a vegetated storm water drainage swale, which conveys storm water to the southwest toward Fleming Street. South of this ball diamond is another drainage swale that conveys storm water to the southeast to Fleming Street. A series of drainage swales surrounding the basketball and tennis courts convey storm water to a storm sewer system on Babcock and Fleming Streets. Storm water collected northeast of the courts flows to the east towards Babcock Street. Storm water collected on the southeast and the west side of the courts flows to the south and southwest, respectively, to Fleming Street. Storm water on the asphalt paved parking area flows into two catch basins located on the east and west sides of the parking area.

3.2 Geology

Historical information and the results of the site investigation indicate that soil/fill overlies the native soil across the entire site. The overburden stratigraphy can be divided into four significant units, which are described in descending order.

- Topsoil
- Cover Material
- Soil/Fill
- Native Material

These materials are discussed below. Table 5 summarizes the thicknesses and elevations of these units, and Figures 10 through 12 show cross-sections through the project site. It should be noted that the existing cover system has been defined to include both topsoil and cover material.

3.2.1 Topsoil

A thin layer of topsoil that ranges in thickness from less than one inch to 1.5 feet was typically present as the uppermost overburden layer. The topsoil is generally a brown silty soil with varying amounts of organic material. Topsoil was encountered at 48 of the 66 subsurface probe and boring locations. This unit constitutes a portion of the cover system.

3.2.2 Cover Material

The cover material was the most frequently encountered layer of soil material on the project site, and was typically present below the topsoil and was observed in 58 of the 66 probe and boring locations. This material was reportedly placed on the site in 1987 to cover the underlying contaminated fill. This layer of material, which varied in thickness from 0.5 feet to 6.7 feet, consisted of a red and brown silt and clay with some locations containing traces of gravel, brick and a coal-like material. The thickest deposits of the cover material were encountered in the subsurface investigation locations positioned along the northern portion of the site. This unit constitutes a portion of the cover system.

3.2.3 Soil/Fill Materials

Soil/fill materials were encountered in each of the 66 probe and boring locations and vary in thickness from 1.7 feet to 13.5 feet. The soil/fill materials were generally encountered immediately below the cover material. No visual or olfactory evidence of significant contamination was observed in the soil samples collected at the project site, and the soil screening and headspace measurements did not reveal significant VOC impacts to the soil/fill material.

There are two predominant and visibly distinct types of fill (Soil/Fill Units B and C) that were generally encountered in distinct layers. Additionally, eight other miscellaneous soil/fill layers were less frequently encountered at various locations across the project site. The following paragraphs discuss the different layers of soil/fill that were encountered on the project site in order of the number of occurrences of each soil/fill type.

- **Soil/Fill Unit B:** This soil/fill unit is one of the two predominant soil/fill layers at the project site, and was observed in 43 of the 66 probe and boring locations. This material ranges in thickness from 0.5 feet to 6.1 feet and consists of a brown to dark brown and sometimes gray sandy-silt and silty-sand with trace to some clay and varying percentages of gravel, brick, a coal-like material, glass, metal, and wood. This layer was typically observed below the cover material. However, it was occasionally observed below the other types of soil/fill encountered on the project site. This layer of soil/fill was observed across the entire project site with no apparent trends in the thickness of this soil/fill type.

- **Soil/Fill Unit C:** This soil/fill unit is one of the two predominant soil/fill layers at the project site, and was typically encountered below Soil/Fill Unit B. This soil/fill unit was observed in 30 of the 66 soil probe and test boring locations. This material ranges in thickness from one to eight feet and consists of brown and sometimes gray clayey-silt to a silty-clay with varying percentages of gravel, glass, brick, a coal-like material, sand, and wood, with some locations exhibiting iron and black staining. This layer of soil/fill was encountered throughout the project site and, like Soil/Fill Unit B, exhibited no apparent trend with respect to thickness.

- **Soil/Fill Unit D:** This unit was generally a layer of random fill, which consisted of mixtures of silt, clay, and sands of varying color, gravel, brick, coal, and wood. This soil/fill unit was observed in 14 of the 66 probe and boring locations. This layer of fill ranged in thickness from 0.5 to 5.3 feet and was encountered throughout the project site, with the most occurrences on the west side of the project site;

- **Soil/Fill Unit E:** This unit consisted of a sandy-gravel with varying percentages of silt, clay, brick, a coal like material, wood, glass, a fibrous material, a sulfur-like material and scrap metal. This soil/fill unit was observed in 13 of the 66 soil probe and test boring locations. This layer ranges in thickness from 0.5 to six feet and was encountered most frequently in western portions of the project site. This layer was typically encountered below one of the two predominant soil/fill layers.

- **Soil/Fill Unit F:** This unit consists of fine to coarse sands with varying percentages of gravel, brick, a coal-like material, and wood. This layer was encountered at five subsurface investigation points on the west side of the project site including SP-1, SP-8, SP-16, and SP-21. This layer ranges in thickness from 0.1 feet at SP-16 and SP-21 to four feet at SP-8.

- **Soil/Fill Unit G:** This unit consists of a layer red/maroon fine sand and silt with some gravel. This material was encountered at SP-7, SP-24, SP-34, SP-55 and SP-59 with the thickest occurrence (three feet) at SP-7;

- **Soil/Fill Unit H:** This unit consists of a silt layer with varying percentages of brick, a coal-like material and fine sand. This material was encountered at SP-5, SP-30, and at TB-3, with the thickest occurrence (1.8 feet) at SP-30;

- **Soil/Fill Unit I:** This unit consists of black organic material that was encountered directly above refusal in SP-35, SP-41 and SP-55;

- **Soil/Fill Unit J:** This unit consists of a white silty material less than one foot thick in SP-16; and

- **Soil/Fill Unit K:** This unit consists of clay with trace silt that was encountered in SP-5 between two layers of Soil/Fill Unit B.

3.2.4 Native Material

Native soil underlies the soil/fill material and consists of glaciolacustrine sediments and glacial tills. The uppermost native material, the glaciolacustrine sediments, primarily consists of very stiff to hard brown clayey-silts to silts and clays with gray mottling. This layer was found across the project site and was encountered at approximately one-half of the probe and boring locations. It was not encountered in the remaining locations likely because these probes and borings were terminated at shallower depths. With the exception of TB-2, where this layer was 8.8 feet thick, this layer was not fully penetrated during the subsurface investigation. However, it is possible that this material was present in TB-3 in the sampling interval from twelve to 14 feet below grade, which was not collected during boring advancement.

A layer of glacial till was observed above the bedrock in TB-2 and TB-3 and was 0.2 feet and 1.2 feet thick, respectively. This layer was composed predominantly of gray stiff to hard, non-plastic, fine-grained sandy silt, with fractured pieces of shale encountered at both locations.

3.3 Hydrogeology

Hydrogeologic conditions across the project site were investigated through the installation of six groundwater monitoring wells (MW-01 through MW-06) and one microwell (micro-01). The Monitoring Well Construction Reports, Well Development Logs, and Sampling Logs are included in Appendix C. Each of the wells was screened in the upper-most water-bearing zone in the overburden soil/fill. Groundwater in the shale bedrock was not assessed as part of this investigation because the fine-grained glacial sediments underlying the fill material at the site significantly limit the downward migration of groundwater in the overburden to the bedrock and groundwater is not used as a source of drinking water in the area. The project site and surrounding residences and businesses within the City of Buffalo are serviced by the municipal water supply system that relies upon water withdrawn from Lake Erie.

Generally, the groundwater was present in the soil/fill material but not in the fine-grained cover material. In fact, groundwater levels rose into the cover material in many of the borings after the cover material was fully penetrated. These observations indicate that the groundwater in the soil/fill is likely under confined or semi-confined conditions, with the fine-grained cover material acting as the confining layer. Because no groundwater was observed in the soil/fill material in a test boring completed in the southeastern portion of the site, near one of the interceptor trenches, it appears that the trenches act to dewater the soil/fill material that is in close proximity to the trenches.

Static water levels in the wells were measured on December 12, 2003 and March 8, 2004. Table 6 summarizes the groundwater elevation measurements. These measurements and resulting groundwater contours are shown on Figures 8 and 9. The depths to groundwater generally ranged from approximately 0.5 to five feet below grade. The groundwater contour maps indicate that groundwater flow is generally to the south and southwest. The elevations of the inverts of the two interceptor trenches are approximately five feet below the elevation of the groundwater potentiometric surface in the respective locations. Therefore, the trenches appear to intercept groundwater flow and impact the direction of groundwater flow along Lewis Street and a portion of Fleming Street. This is supported by the groundwater contour maps that show groundwater flow directions becoming perpendicular to the trenches in the immediate vicinity of these structures.

Based on an evaluation of the groundwater contour maps, the average hydraulic gradient within the upper-most water-bearing unit is approximately 9.1×10^{-3} feet per foot. The results of the in-situ hydraulic conductivity testing of the monitoring wells yielded hydraulic conductivity values ranging from 1.04×10^{-2} to 9.42×10^{-5} centimeters per second (cm/sec), with an overall geometric mean of 1.53×10^{-3} cm/sec. Table 4 summarizes the slug tests results. Assuming an average porosity of 25 percent, the average linear groundwater flow velocity across the site within the fill is approximately 0.16 feet per day.

4.0 NATURE AND EXTENT OF CONTAMINATION

Surface and subsurface soil/fill, and groundwater samples were collected for chemical analysis to determine the magnitude and extent of potential contamination occurring in these media. A summary of the samples collected including the number and type of QA/QC samples, the corresponding analytical methods, and the sample location related to the site grid system is presented in Table 1.

The following sections summarize and discuss the analytical results generated during the SI. For discussion purposes, this data is compared with the Standards Criteria and Guidance values (SCGs) applicable to each medium sampled, and include:

- Soil/Fill: NYSDEC's January 1994 Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels (TAGM HWR-94-4046)
- Groundwater: NYSDEC's June 1998 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations in the Technical and Operational Guidance Series (TOGS) 1.1.1
- Soil/Fill analyzed by TCLP: 40 CFR Part 261.24: Maximum Contaminant Levels for Toxicity Characteristic.

A series of summary tables (Tables 7 through 15) comparing the data to the applicable SCGs has been integrated into the following discussions. Table 16 includes a list a qualifiers used in Table 7 through 15. The analytical laboratory reports are included in Attachment A.

The laboratory analytical packages prepared by STL were reviewed and evaluated by an independent subcontractor, Data Validation Services, Inc. (DVS), to assess compliance with the analytical method protocols described in the NYSDEC Analytical Services Protocol (ASP). Data Usability Summary Reports (DUSRs) were prepared by DVS that compare the quality of the performance of the laboratory analyses to that described in the ASP. The DUSRs have been included in Attachment A. All analytical results summary tables discussed in this report include only the validated data.

The evaluation of the analytical results for samples collected from the project site indicate that the samples were processed in general compliance with applicable protocols, and most results are usable as reported, or usable with minor edits or qualification as estimated or edits to non-detection. The exceptions are four pesticide analytes in one sample and one pesticides analyte in another sample that are not usable due to apparent sample matrix effects. Matrix interferences were evident in the metals soil results, resulting in many qualifications of detected values as estimated. Generally the samples showed good accuracy and precision.

4.1 Background Soil

Five background soil samples were collected and analyzed for SVOCs and metals to characterize background levels in the vicinity of the project site and facilitate the evaluation of the analytical results generated from on-site sampling. Table 7 summarizes

the background soil sampling analytical results. A comparison of the results from these five samples indicates that they are generally similar. However, BG-01 and BG-02 generally displayed the highest concentrations of metals. Numerous SVOCs, primarily polycyclic aromatic hydrocarbons (PAHs), were detected in all of the background samples. Because PAHs are formed through anthropogenic combustion processes such as the burning of coal, oil and gasoline, they are generally ubiquitous in soils, especially in urban settings. The presence of PAHs in these samples is consistent with the project area's urban character.

4.2 Surface Soil

Ten surface soil samples were collected from eroded, high traffic areas to evaluate the degree of contamination in the surface materials, if any. Each of the surface samples collected from the site was analyzed for TAL metals and total cyanide, and the analytical results are summarized in Table 8. Additionally, four surface soil samples were collected from the grass area that exists between Lewis Street and the sidewalk. These samples were analyzed for total lead and arsenic. Figure 4 shows the sampling locations.

The analytical results indicate that one or more of the parameters were detected above the SCGs in each of the samples collected, with the exception of the four samples collected along Lewis Street. In seven of the samples, only aluminum, calcium, magnesium, manganese, and/or potassium were detected at concentrations above the SCGs. These metals can be found in natural, uncontaminated soils at generally similar concentrations. In addition, the toxicity of these five metals is relatively low. Therefore, the detection of these five analytes in these seven samples does not pose a concern. The concentrations of lead and arsenic in the four samples collected along Lewis Street were well below background values for the project area.

The highest concentrations of metals were detected in samples SS-01 and SS-02, which were collected under the western-most swing set. Surface soil samples SS-01 and SS-02 displayed the most exceedances with eleven and ten metals, respectively, above the SCGs, while the remainder of the samples had four or less parameters exceeding the SCGs. In addition, samples SS-01 and SS-02 contained the highest concentrations of lead and arsenic, with arsenic exceeding the SCG in both samples and lead exceeding the SCG in SS-01. Mercury was detected in SS-06, which was collected in the toddler play area, as well as in SS-01 and SS-02, at concentrations exceeding the SCGs. The presence of elevated concentrations of metals in these three samples is likely related to the erosion of the topsoil and cover material, exposing the soil/fill material present at the project site prior to the construction of the park.

4.3 Subsurface Soil/Fill

Subsurface soil/fill samples were collected from soil probes and test borings to characterize the subsurface soil/fill material. The selection of subsurface soil/fill samples for chemical analysis was based upon the rational outlined in Section 2.2.1.2. A total of

45 subsurface soil/fill samples were submitted for chemical analysis, each of which was analyzed for TCL SVOCs. Thirty-five of these samples were also analyzed for lead and arsenic, while the remaining ten samples were analyzed for TCL VOCs, pesticides and PCBs and TAL metals. For purposes of the subsequent discussions, samples submitted for VOCs, pesticides, PCBs and metals, in addition to the SVOCs, are referred to as samples submitted for the full list of analytes (full list). Additionally, ten samples were analyzed for asbestos using Polarized Light Microscopy (PLM).

Based on a review of the analytical results for the subsurface soil/fill samples collected across the project site, the discussions of these results have been divided into the three following subsections. These subsections include the samples collected from the cover material; the samples collected in the soil/fill layers (Soil/Fill Units B through J); and the samples collected from the native material. Because PCBs were not detected in the subsurface soil/fill samples and VOCs were not detected at concentrations above the SCGs, these analytes will not be discussed in the subsections below. With the exception of tetrachloroethene in SP10-D58, detected VOCs consisted of common laboratory contaminants including; acetone, 2-butanone, and methylene chloride.

4.3.1 Cover Material

A total of five samples were collected from the cover material, two of which (SP10-D03.5 and SP48-D0.31.2) were analyzed for the full list. The analytical results are summarized in Table 9. Contaminants detected in the cover material at concentrations that exceed applicable regulatory guidance values consist of PAHs and metals. Although pesticides were detected in the samples, the concentrations of these pesticides did not exceed the SCGs. Asbestos was not detected in the two samples submitted for asbestos analysis.

SVOCs were detected in each of the five samples with one or more analytes detected at concentrations above the SCGs. The maximum detected concentrations of individual SVOCs in the cover material samples were all below the average concentrations detected in the site background samples. Similar to the background samples, the SVOCs that were detected in these samples were generally PAHs. The presence and concentrations of PAHs in these samples are consistent with the project area's urban character.

Although lead and arsenic were detected in each of the five samples collected from the cover material, the concentrations did not exceed the SCGs. The two samples submitted for the full list each contained seven or more metals exceeding the guidance values. In general, the metals detected in the samples collected from the Cover Material were generally consistent site background values, with the exception of mercury. Mercury was detected in the samples collected from SP48-D0.31.2 (0.598 mg/kg) and SP10-D0.35 (12.9 mg/kg) at concentrations that exceeded the SCG (0.1 mg/kg).

Mercury concentrations in soil probe SP-48 were higher in the subsurface soil/fill than in the cover material, and the maximum concentration of mercury in samples collected from

this soil probe was 2.1 mg/kg. However, the mercury concentration in the underlying native material was below the SCG. In addition, the mercury concentrations in the cover material in SP-48 were less than the average site background concentration.

As a result of the elevated mercury detected in SP10-D0.35, three additional samples were collected from this location to determine the extent of the elevated mercury concentration. The samples were collected from zero to six inches, six inches to two feet, and two feet to 3.5 feet. The analytical results are summarized in Table 10. The results of these samples revealed that the highest mercury concentration (20.7 mg/kg) was detected in the sample collected from two feet to three and a half feet below grade. The concentrations of mercury in samples collected from zero to six inches and six inches to two feet were below the SCG. Although mercury concentrations below this interval, in the soil/fill and the native materials, decreased with depth, the sample collected from the interval immediately below 3.5 feet (3.5 to 5 feet) contained mercury at a concentration over the SCG.

Additionally, one sample was collected approximately ten feet from SP-10 in each of the four cardinal directions and was generally collected from zero to two feet below grade. With the exception of the sample collected from the north, mercury was detected in each sample at concentrations above the SCG. However, these concentrations were less than or similar to the site background concentrations. The presence of elevated mercury concentrations in the cover material in the interval two to 3.5 feet below grade in soil probe SP-10 may be related to the inadvertent mixing of this material with on-site soil/fill during placement of the cover during park construction.

4.3.2 Soil/Fill Material (Soil/Fill Units B through J)

The analytical results for the soil/fill units are presented in the following subsections. In general, the laboratory results indicated that no one particular soil/fill layer was significantly more or less contaminated than other layers present at the project site. However, two areas of the project site were determined to contain higher concentrations of metals, particularly lead and arsenic, than other portions of the project site, as described below.

4.3.2.1 Initial Sampling

A total of 34 subsurface soil/fill samples were collected from the subsurface soil/fill units in November 2003. The results are summarized in Table 11. The six samples submitted for the full list included SP10-D3.55, SP10-D58, SP48-D1.25, SP48-D56.5, TB03-D810 and TB05-D24.5. The samples were selected for analysis in accordance with the process described in Section 2.2.1.2 to characterize each of the discrete soil/fill units in both horizontal and vertical dimensions. Contaminants detected in soil/fill material at concentrations that exceed applicable SCGs include PAHs, pesticides, and metals.

SVOCs were detected in each of the subsurface soil/fill samples. Twenty-seven subsurface soil/fill samples contained up to 15 SVOCs exceeding the guidance values, while no SVOC concentrations exceeded the SCGs in the remaining seven samples. With the exception of Soil/Fill Unit F, all of the discrete soil/fill units contained SVOCs at concentrations above the SCGs. The highest concentrations of SVOCs were detected in Fill Unit E at a depth of five to six feet (SP02-D56), with concentrations of 15 SVOCs above the SCGs, and in Fill Unit B at a depth of 1.5 to four feet (SP04-D1.54), with concentrations of eleven SVOCs above the SCGs. The total concentrations of SVOCs in each of these two samples exceeded the 500,000 ppb guidance value for cumulative SVOC concentrations, with twelve and three, respectively, individual SVOCs exceeding the 50,000 ppb guideline for individual SVOCs. In addition, the samples collected from Fill Unit H at a depth of two to 3.5 feet (SP05-D23.5) and Fill Unit D at a depth of 3.5 to eight feet (SP05-D3.58) also contained individual SVOCs exceeding the 50,000 ppb guideline. Excluding SP02-D56 and SP04-D1.54, total SVOCs ranged from 61 to 338,850 ug/kg.

Similar to the background and surface soil samples, the category of SVOC detected at concentrations above the SCGs was primarily PAHs. Elevated concentrations of PAHs were detected in each of the soil/fill units sampled with the exception of Soil/Fill Unit F, from which only one sample was collected. In addition to atmospheric deposition in urban environments, PAHs are commonly associated with industrial applications involving petroleum-based products, and are found in heavy fractions of petroleum distillation, asphalt, coal tar, and creosote. Potential sources of PAHs in these samples include the former operation of rail spurs; poor housekeeping practices resulting in past releases of petroleum products and/or wastes used in connection machine shop operations; and/or past spills and/or leaks associated with the use of fuel oil.

One or more pesticides were detected in four of the six soil/fill samples analyzed for the full list. However, only dieldrin was detected at concentrations above the SCGs. Total pesticides at the four locations with detections ranged from 3.8 ppb to 173.2 ppb, while the NYSDEC guidance value for total pesticides is 10,000 ppb. The presence of dieldrin at two locations on the project site is potentially attributable to poor housekeeping practices associated with historic operations at the project site, which included the storage of pesticides.

With the exception of Fill Unit B at a depth of eight to ten feet in test boring TB-3 (TB03-D810), which contained only sodium exceeding the guidance value, seven or more metals were detected at concentrations exceeding the guidance values in the remaining five samples analyzed for the full list. Mercury was detected in four of the six samples analyzed for the full list at concentrations exceeding the SCG. Lead and arsenic were detected in each of the 34 samples collected from the subsurface soil/fill, with 25 samples exceeding the SCG for arsenic and 15 samples exceeding the SCG for lead. Concentrations of arsenic in the samples

exceeding the SCG ranged from 20.3 ppm to 928 ppm. Concentrations of lead in the samples exceeding the SCG ranged from 684 ppm to 6,350 ppm.

Arsenic concentrations exceeding SCGs were detected at depths ranging from 0.3 to 12 feet below grade and lead at depths ranging from 0.3 to 7.3 feet below grade. Additionally, lead was detected above the SCG in each of the soil/fill units sampled with the exception of Soil/Fill Units F, I and J, while arsenic was detected above the guidance value in each soil/fill unit sampled with the exception of Soil/Fill Unit F and J. However, it is important to note that only one soil/fill sample was collected from Soil/Fill Units F, I, and J.

Eight samples collected from these soil/fill units were submitted for asbestos analysis by PLM. Only one sample indicated the presence of asbestos. The sample collected from Fill Unit B at a depth of 1.3 to 5.6 feet in soil probe SP-52 (SP52-D1.35.6) indicated the presence of chrysolite, which is one of the most common types of asbestos.

4.3.2.2 Additional Sampling

In order to determine if lead and arsenic were present at levels that constitute a characteristic hazardous waste, TCLP analysis for lead and arsenic was performed on the samples with the highest total lead and arsenic concentrations, respectively. Additional samples were also collected from the vicinity of the interceptor trenches. The results are summarized in Table 12.

The results of the TCLP analysis revealed two samples (SP55-D11.3 and SP57-D0.81) with concentrations exceeding the maximum concentration of contaminants for toxicity characteristic. Both samples were collected from Fill Unit B, and the sample from SP-55 was collected from a depth of one to 1.3 feet, while the sample from SP-57 was collected from a depth of 0.8 to one feet. The concentration of leachable lead in the sample collected from SP55-D11.3 was 5.13 mg/L, which slightly exceeds the regulatory value of 5.0 mg/L. The concentration of leachable arsenic in the sample collected from SP57-D0.81 was 39.4 mg/L, which exceeds the regulatory value of 5.0 mg/L. Based on these concentrations, the soil/fill at these two locations is defined as a hazardous waste. The remaining samples did not contain concentrations of lead or arsenic exceeding the regulatory values.

The presence of elevated concentrations of metals in the soil/fill material may be attributed to the historic industrial use of the project site and the adjacent properties. Alternatively, the elevated concentrations of metals in the soil/fill may be due to the character of the soil/fill itself, which may have been brought to the site from an off-site source.

4.3.3 Native Material

A total of six soil samples were collected from the native material, two of which (SP10-D811.6 and SP48-D6.510.4) were analyzed for the full list. The analytical results are summarized in Table 11. Although SVOCs were detected in each of the subsurface soil samples collected from the native material, no SVOC concentrations were above the SCGs. Total SVOCs ranged from 37 to 571 ug/kg. The presence of SVOCs in the native material at relatively low concentrations may be due to the occurrence of SVOCs in the groundwater rather than actual contamination of the native material. Pesticides were not detected in either of the two native material samples analyzed for the full list.

Lead and arsenic were detected in each of the six samples collected from the native material; however, there were no exceedances of the guidance values for these analytes. The two samples submitted for the full list each contained seven metals exceeding the guidance values. Analytes exceeding the guidance values in the samples collected from the native material were limited to the following: aluminum, calcium, iron, magnesium, potassium and sodium. Since these metals are found in natural, uncontaminated soils at generally similar concentrations, it appears that the soil/fill material has not impacted the native material.

4.4 Groundwater

Synoptic groundwater sampling events were conducted on November 21, 2003 and March 8, 2004. The groundwater samples collected from the six newly installed monitoring wells on November 21, 2003 were analyzed for TCL VOCs, SVOCs, and pesticides, as well as TAL metals plus cyanide. The groundwater samples collected from the six wells and the new microwell on March 8, 2004 were analyzed for antimony, arsenic, barium, lead, nickel, and selenium. The groundwater analytical results are presented in Tables 13 and 14. In addition, the Buffalo Sewer Authority (BSA) collected samples from the two interceptor trenches in 2001 through 2003, and these results are summarized in Table 15.

4.4.1 Buffalo Sewer Authority Sampling

The Buffalo Sewer Authority collected water samples from the groundwater interceptor trenches between May 2001 and March 2003 for analysis of select metals. As shown on Table 15, the WQS were exceeded during only the first event, which occurred May 2001. Metals exceeding the WQS included arsenic, cadmium, chromium, copper, and lead in samples collected from both trenches as well as nickel and zinc in the sample collected from the trench along Lewis Street. The elevated concentrations of metals in the May 2001 samples are likely due to the high solids content measured in the samples, and the high solids content is most likely due to the fact that the samples were collected only two months after the installation of the interceptor trenches. The solids content and analyte concentrations were significantly reduced in subsequent sampling events.

4.4.2 November 21, 2003 Groundwater Sampling Event

Volatile organic compounds were detected in only one upgradient groundwater sample (MW-01). Five VOCs including 4-methyl-2-pentanone, acetone, benzene, toluene and trichloroethene (TCE) were detected in this sample and, with the exception of 4-methyl-2-pentanone, each was detected at a concentration exceeding the WQS. Benzene and toluene are commonly associated with petroleum products, notably gasoline. TCE is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers. These compounds were not detected in any of the samples collected from downgradient locations.

Historical records for the project site indicate that two 1,000-gallon gasoline underground storage tanks (USTs) were located in the general vicinity of MW-01 and were later removed in 1977. In addition, a 550-gallon used oil UST was located in the general vicinity of MW-01 and was removed in 1987. The presence of VOCs in the groundwater in MW-01 may be related to past spills and/or leaks associated with these tanks, or to poor housekeeping practices associated with historic operations at the project site. Additionally, the adjoining property to the northeast has been a salvage yard since the late 1960's or early 1970's. Because the groundwater flows from the salvage yard towards the project site, the presence of VOCs in the groundwater in MW-01 may be related to leaks and/or spills of petroleum products and/or solvents associated with the salvage operations on the property to the northeast of the project site.

Semivolatile organic compounds were detected in each of the groundwater samples, with the exception of the sample collected from MW-06. The samples collected from MW-01 and MW-03 contained SVOCs at levels that exceeded the guidance values. The compounds 2,4-dimethylphenol, pentachlorophenol and naphthalene were detected in the groundwater sample collected from MW-01 at concentrations exceeding the WQS. Pentachlorophenol and 2,4-dimethylphenol are both associated with the manufacture of pesticides. The presence of these compounds is potentially attributable to poor housekeeping practices associated with historic operations at the project site that included the storage of pesticides. Naphthalene is commonly associated with gasoline and diesel fuel, and three USTs were formerly located in the general vicinity of MW-01. The presence of naphthalene may potentially be related to leaks and/or spills associated with the historic use of this tank or to leaks and/or spills of petroleum products associated with the salvage operations to the northeast (upgradient) of the project site.

Bis(2-ethylhexyl)phthalate was detected in the sample collected from MW-03 at a concentration above the WQS. Bis(2-ethylhexyl)phthalate is a common laboratory contaminant.

One or more pesticides were detected in three of the six monitoring wells, and the concentrations of dieldrin in MW-02 and MW-04 and endrin in MW-01 represent the only exceedances of the WQS for pesticides in the groundwater samples. The presence of

these compounds is potentially attributable to poor housekeeping practices associated with historic operations at the project site that included the storage of pesticides.

The results of the metals analysis for the groundwater samples revealed exceedances of the WQS for five or more parameters at each of the groundwater monitoring locations. Antimony, arsenic, beryllium, lead, nickel, and selenium were detected in at least one sample at concentrations above the WQS. The presence of these metals in the groundwater samples may potentially be related to the flow of groundwater through the soil/fill and the dissolution of metals from this material, or may be related to salvage operations upgradient of the project site. The latter rationale is supported by elevated metals concentrations in upgradient locations as well as downgradient locations. The other inorganic analytes detected at concentrations above the WQS (iron, magnesium, manganese, and sodium) are commonly encountered in uncontaminated, natural environments and are associated more with the groundwater aesthetics than toxicity. It should be noted that mercury was not detected in any of the groundwater samples.

4.4.3 March 8, 2004 Groundwater Sampling Event

To confirm the results of the November 21, 2003 sampling event, additional groundwater samples were collected on March 8, 2004 and analyzed for the six metals discussed above (antimony, arsenic, beryllium, lead, nickel, and selenium). These results are summarized in Table 14 and were generally comparable to the initial sampling event. Relative to the first groundwater sampling event, exceptions to this include:

- Antimony concentrations in MW-01 and MW-04 decreased below the WQS.
- Arsenic concentrations increased in MW-01, MW-04 and MW-06 and exceeded the WQS.
- The highest arsenic concentration was detected in MW-02, an upgradient monitoring well.
- Lead was detected in Micro-01 at a concentration above the WQS.
- The concentration of selenium in MW-01 and MW-06 decreased below the WQS.

5.0 CONTAMINATION ASSESSMENT

5.1 Contaminant Fate and Transport

The probable fate and transport of contaminants detected on the project site is a function of the properties of the individual contaminants and available pathways for the contaminants to migrate. Current uses of the project site are defined as the utilization of the public park for recreational activities, and it is assumed that future uses of the project site will include those same activities. The degree to which, as well as the route by which, contaminants migrate is dependent on the physical characteristics of the site and the type and distribution of contaminants. The following sections discuss the probable fate and transport of contaminants in the different types of media at the Franczyk Park site.

5.1.1 Surface Soil

The analytical results indicate that the contaminants of concern in the surface soil consist of metals, primarily arsenic and lead. However, the only locations at which the soil at the surface contains elevated concentrations of metals are high traffic areas where the topsoil and cover material have been eroded, exposing the underlying soil/fill. It is this subsurface soil/fill that contains the elevated concentrations of contaminants. Therefore, the fate and transport of contaminants detected in these high traffic areas are discussed in the following subsection.

5.1.2 Subsurface Soil/Fill

The analytical results indicate that the contaminants of concern in the subsurface soil/fill consist of metals, primarily arsenic and lead, and PAHs. Notably, characteristic hazardous waste concentrations of lead were detected near the interceptor trench along Lewis Street and arsenic detected near the interceptor trench along Fleming Street. The extent of the soil/fill material containing characteristic hazardous waste concentrations was not determined during the Site Investigation. In addition, asbestos was detected in one sample collected at the site.

Lead and arsenic have low solubilities and are not expected to significantly affect groundwater quality or migrate substantially in the subsurface. PAHs are characterized by low solubilities and high octanol-water partition coefficients, and, therefore, have a tendency to adsorb onto soil particles and are not expected to significantly affect groundwater quality or migrate substantially in the subsurface. This is supported by the relatively low concentrations of these analytes in the groundwater at the site. Since PAHs have relatively low vapor pressures, they are expected to remain in a solid or liquid state and undergo degradation via natural attenuation. The asbestos fibers are not expected to affect groundwater quality due to the physical durability and chemical stability of the mineral.

The potential for the mechanical transport of subsurface soils contaminated with metals,

PAHs, and asbestos is via wind and water erosion, which has been reduced through the placement of the clean cover material. However, it appears that the cover material has been eroded in high traffic areas, exposing the soil/fill materials. Chemical transport of subsurface soil/fill contaminants is via surface water infiltration into the subsurface soil/fill or natural groundwater flow that may transport contaminants through the subsurface/fill. However, as discussed above, substantial subsurface contaminant migration is not expected.

5.1.3 Groundwater

Although VOCs, SVOCs, and pesticides were detected in one or more of the samples at concentrations above the WQS, these concentrations are generally low and do not pose a significant concern. The VOCs detected in the groundwater are moderately to highly mobile in the subsurface, and are expected to migrate in the dissolved phase with flowing groundwater. However, these contaminants were detected in only one upgradient monitoring well and were not detected in downgradient wells, indicating that natural attenuation mechanisms (i.e., dispersion, diffusion, and/or biodegradation) may be acting on the VOCs. In addition, it is possible that the source of VOCs detected in the upgradient location is located upgradient of the project site.

Similarly, the SVOCs detected at concentrations above the WQS in the upgradient well were not detected in the downgradient wells. These SVOCs generally exhibit relatively low mobility in the subsurface, as supported by the lack of these compounds in the downgradient locations. One SVOC was detected in a downgradient well at concentrations above the WQS, but this compound was not detected in any other groundwater sample from the site. The concentration of this SVOC was relatively low and does not pose a significant concern.

Organochlorine pesticides detected at the project site at concentrations above the WQS are characterized as having low solubilities and high affinities for organic matter and, therefore, have a tendency to adsorb onto soil particles. In addition, these pesticides will break down after a number of years. Therefore, the degree of pesticide migration off-site via groundwater flow, if any, is expected to be minimal.

The metals of concern in the groundwater at the project site consist of arsenic and lead. The other inorganic analytes detected at concentrations above the WQS are either commonly encountered in uncontaminated, natural environments and are associated more with the groundwater aesthetics than toxicity, or were detected at relatively low concentrations and do not pose a significant concern. Lead and arsenic generally have low octanol-water partition coefficients and, therefore, do not readily adsorb onto soil particles. The detection of concentrations of lead and arsenic above the WQS in downgradient locations indicates that groundwater with these concentrations is likely migrating off-site. However, the interceptor trenches collect a portion of the groundwater flowing from the project site, and other utility trenches may intercept other portions of the groundwater flow. It should be noted that the interceptor trenches were installed

downgradient of the areas with hazardous levels of lead and arsenic.

The lack of local reliance on groundwater as a source of potable water minimizes the potential for direct human exposure to groundwater contaminants. In addition, the nearest body of water to which the groundwater at the site will discharge, the Buffalo River, is more than one-half mile from the site, also limiting the potential for direct human exposure to groundwater contaminants. Thirdly, the interceptor trenches were installed to collect groundwater that otherwise would have exfiltrated from the ground surface and formed seeps along the sidewalk areas, thereby further reducing the potential for contact with groundwater. However, some groundwater does migrate from the project site along Fleming Street between the two interceptor trenches. The potential exists for direct human exposure to this groundwater in basement sumps in homes downgradient of the project site in these areas.

Groundwater seeps were observed to discharge onto the ground surface in the past, and the interceptor trenches installed in two areas of the site addressed those seeps. However, if new groundwater seeps form along the downgradient park boundary, along those portions of Fleming Street without interceptor trenches, the potential exists for direct human exposure to contaminants in the groundwater.

5.2 Evaluation of Potential Receptors

The project site is located in an area that is characterized by a mixture of residential, commercial and light industrial properties. The project site is utilized as a public park, and residences are located immediately to the south and west of Fleming and Lewis Streets, respectively.

Under current and planned future use conditions, potential human receptors for contaminated on-site soil/fill include persons using the public park for recreational activities; persons living and working in the area surrounding the project site; persons working on the project site; and persons involved in utility work on and adjacent to the project site. In addition, persons living in the vicinity of the park and those involved in recreational activities at the park could also become potential human receptors if new groundwater seeps form along the downgradient park boundary, along Fleming Street. Potential environmental receptors include wildlife utilizing the project site (e.g., rodents, birds, etc.).

The surrounding area is serviced by the municipal water supply system of the City of Buffalo, which withdraws water from an intake in Lake Erie located more than one mile from the project site. The Buffalo River is the closest surface water body, and is located more than one-half mile from the project site. Considering the lack of local reliance on groundwater as a potable water supply source, the distance to the nearest surface water body, and the presence of the interceptor trenches, the potential for exposure to on-site contamination via groundwater appears to be limited to residents living in homes with

basement sumps downgradient of the portion of the project site along Fleming Street between the two interceptor trenches.

If remedial activities are implemented at the project site, potential human receptors during construction would include site workers involved in excavation activities, and persons living in and traveling through the area surrounding the project site.

5.3 Potential Exposure Pathways

5.3.1 Surface Soil

Under the current and future use scenarios, human and environmental receptors could be exposed to heavy metals in the exposed subsurface soil/fill via inhalation of airborne particles, or the incidental ingestion of or dermal contact with the contaminated media in high traffic areas. In addition, these receptors could be exposed through incidental ingestion of, or dermal contact with, water that has pooled in the high traffic areas and is in contact with contaminated material.

If remediation of the project site is deemed necessary, human and environmental receptors at and near the project site could be exposed to the contaminants in the exposed subsurface soil/fill during excavation in connection with the remedial activities. In this case, human receptors would also include construction workers. Potential exposure routes for these receptors include inhalation of contaminated dust, and incidental ingestion of, and/or dermal contact with the contaminated soil/fill. However, the use of appropriate personal protective equipment, dust suppression techniques, and the development and implementation of a Remedial Action Work Plan would likely minimize the risk of exposure during the remedial activities.

No complete exposure pathways have been identified in connection with the post-remedial period, assuming that the contaminated subsurface soil/fill is not exposed at the ground surface.

5.3.2 Subsurface Soil/Fill

The presence of elevated concentrations of metals and SVOCs as well as asbestos in the subsurface soil/fill that has been exposed in areas where the cover system has been eroded due to high pedestrian traffic, indicates that the potential for human and environmental exposures exists. Potential exposure routes for these receptors include inhalation of contaminated dust, and incidental ingestion of, and/or dermal contact with the contaminated soil/fill. Additional erosion of the cover system in the future could expose more of the contaminated soil/fill and increase the potential for exposure.

Where the cover system remains intact, the presence of contaminants in subsurface soil/fill is not interpreted to represent an exposure risk because no complete exposure pathways were identified under the current or future use scenarios for the property. This

is a function of the subsurface disposition of the contamination and the presence of cover material overlying the majority of the contaminated subsurface soil/fill, which effectively minimize the potential for the incidental ingestion of, or dermal contact with the contaminated media. These factors also reduce the potential for the emission of particulates that could pose an exposure risk via inhalation.

If remediation of the project site is deemed necessary, human and environmental receptors at and near the project site could be exposed to the contaminants in the subsurface soil/fill during excavation in connection with the remedial activities. In this case, human receptors would also include construction workers. Potential exposure routes for these receptors include inhalation of contaminated dust, and incidental ingestion of, and/or dermal contact with the contaminated soil/fill. However, the use of appropriate personal protective equipment, dust suppression techniques, and the development and implementation of a Remedial Action Work Plan would likely minimize the risk of exposure during the remedial activities.

No complete exposure pathways have been identified in connection with the post-remedial period, assuming that the contaminated soil/fill is not exposed at the ground surface.

5.3.3 Groundwater

Groundwater in the vicinity of the project site is not utilized as a source of potable water. Therefore, no exposure via ingestion of contaminated groundwater is likely. However, it is likely that contaminants present in the groundwater enter the on-site interceptor trenches, which in turn are tied into the City sanitary sewer system. Under this scenario, there is the potential for utility workers involved with the cleaning and/or maintenance of drainage structures to be exposed to the contaminated groundwater present in these structures. Construction workers could also be exposed to the contaminated groundwater during excavation activities performed at the project site. Potential exposure routes for these receptors include incidental ingestion of, and/or dermal contact with, the groundwater. However, the use of appropriate personal protective equipment and groundwater management techniques would minimize the risk of exposure during maintenance and invasive operations.

Groundwater seeps were observed to discharge onto the ground surface in the past, and the interceptor trenches installed in two areas of the site addressed those seeps. However, if additional groundwater seeps form along the downgradient park boundary, along Fleming Street, the potential exists for direct human exposure to groundwater contaminants. Should the formation of new groundwater seeps occur, human and environmental receptors could be exposed to groundwater via incidental ingestion of, or dermal contact with, the exfiltrating groundwater. In addition, the trenches do not collect all the groundwater that leaves the project site, notably along Fleming Street between the two trenches. Therefore, the potential exists for direct human exposure to groundwater

contaminants in homes with basement sumps downgradient of this portion of the project site.

With the exception of the potential risk to utility workers, no complete exposure pathways for groundwater contamination have been identified in connection with the post-remedial period, assuming that no additional seeps form along the downgradient site boundary and that impacted groundwater is prevented from migrating beyond this boundary. These workers could be exposed to contaminants in the groundwater via incidental ingestion of or dermal contact with, groundwater within the sewer lines. However, the use of appropriate personal protective equipment would minimize the risk of exposure during maintenance operations.

6.0 IDENTIFICATION AND DEVELOPMENT OF ALTERNATIVES

6.1 Remedial Action Objectives

The following sections outline the Remedial Action Objectives (RAOs) identified for each of the contaminated media encountered on the project site. These RAOs are based upon the findings of the SI and the anticipated continued and future use of the project site as a public park.

6.1.1 Surface Soil

Contaminants of concern detected in the surface soil consisted of metals, including arsenic and lead, in areas where the cover material has been eroded due to high traffic. The RAO for this medium is to prevent the exposure of contaminated subsurface soil/fill at the ground surface.

6.1.2 Non-hazardous Subsurface Soil/Fill

Contaminants of concern in this medium consist of metals, primarily lead and arsenic, PAHs, and asbestos. The RAO for this medium is to prevent exposure of human and environmental receptors to these contaminants via dermal contact, incidental ingestion or inhalation of particulates. No significant risks to groundwater or other environmental resources were identified in connection with the contaminated soil/fill.

6.1.3 Hazardous Subsurface Soil/Fill

Contaminants of concern in this medium consist of lead and arsenic, which were encountered at characteristic hazardous waste concentrations in two locations. The RAO for this medium is to prevent exposure of human and environmental receptors to these contaminants via dermal contact, incidental ingestion or inhalation of particulates. Characteristic hazardous waste, by definition, poses a risk to groundwater resources. Therefore, the RAO for groundwater protection is to prevent the leaching of contaminants from the hazardous subsurface soil/fill into the groundwater.

6.1.4 Groundwater

Contaminants of concern in this medium consist primarily of lead and arsenic. The RAO for this medium is to prevent exposure of receptors to groundwater via dermal contact and incidental ingestion.

6.2 General Response Actions

General response actions for each of the affected media at the project site have been identified and are described in the following subsections. Although these general response actions include no action as a remedial option, the no action response does not

address the RAOs identified in the preceding section and is included for comparison purposes only. The general response actions are summarized in Table 17.

6.2.1 Non-hazardous Soil/Fill

Issues related to surface soil are limited to those places where the cover material has been eroded to expose the underlying subsurface soil/fill; therefore, response actions to address surface soil and subsurface soil/fill issues are the same and are discussed together. General response actions available to satisfy the RAO identified for non-hazardous soil/fill include:

- No action
- Institutional controls
- Augmentation to the current cover system through the use of imported soils, asphalt pavement, or landscape berms
- Excavation and off-site disposal of all on-site soil/fill

6.2.2 Hazardous Subsurface Soil/Fill

General response actions available to address the RAO for subsurface soil/fill at characteristic hazardous waste concentrations include:

- No action
- Institutional controls
- Augmentation to the current cover system through the use of imported soils, asphalt pavement, or landscape berms
- Excavation and off-site disposal of soil/fill with hazardous waste characteristics

6.2.3 Groundwater

General response actions available to satisfy the RAO identified for groundwater include:

- No action
- Institutional controls
- Annual monitoring
- Installation of additional interceptor trenches at downgradient property boundaries.

6.3 Remediation Areas and Volumes

Remediation areas and volumes have been estimated based on the results of the site investigation. Additional assumptions used to develop the remediation areas are included in Appendix F.

6.3.1 Cover System

The cover system installed by the City of Buffalo at the project site is comprised of topsoil and the cover material. The thickness of the cover system was estimated based on the results of the soil probes and borings. The thickness of the topsoil and cover material ranges from zero to 6.8 feet, with an average thickness of approximately 1.6 feet. With this average thickness over 16.5 acres (718,740 square feet), the approximate volume of the cover system is 1,150,000 cubic feet, or 42,600 cubic yards.

Although the cover system is generally composed of uncontaminated material, only a portion of the existing cover system can be stripped off and reused at the project under the removal alternative. Due to the irregular thickness of the cover system and the precision limitations of construction equipment, approximately 70 percent of the cover system is assumed to be recoverable for reuse at the site. Therefore, 29,800 cubic yards are assumed to be reusable at the project site, while the remaining 12,800 cubic yards will likely become commingled with the underlying soil/fill.

6.3.2 Soil/Fill Volume

The areal extent of soil/fill is estimated to extend to the property boundaries, encompassing approximately 16.5 acres (718,740 square feet). The thickness of the soil/fill material averages approximately seven feet (including the cover system), and the volume is estimated at 186,000 cubic yards. This total volume contains topsoil, cover material, non-hazardous soil/fill, and characteristic hazardous waste. The volumes of the latter two materials are estimated as follows:

- Characteristic Hazardous Waste – Concentrations of lead and arsenic at characteristic hazardous waste levels were detected in two portions of the site. Because these areas were not delineated during this investigation, the volume of impacted soil/fill has been estimated. It is assumed that delineation and post-excavation sampling will be conducted during the remedial planning stage of the project.

  For purposes of this evaluation, the assumed limits of the two areas with hazardous waste levels of contaminants encompass 10,000 square feet (100 feet by 100 feet) with an average depth of five feet. Therefore, it is assumed that approximately 3,700 cubic yards of soil/fill will be identified as hazardous waste.

- The volume of non-hazardous soil/fill is assumed to be equal to the total soil/fill volume minus the volume of hazardous waste and the volume of the cover system. Therefore, approximately 140,000 cubic yards of non-hazardous soil/fill are assumed to be located on the project site.

6.3.3 Interceptor Trench Measurements

The length of interceptor trench required to connect the two existing trenches is estimated to be 1,100 feet, the depth of the new trench is estimated at six feet, and the width is estimated at two feet. Approximately five additional, perpendicular trenches 60 feet in length will be required to tie the new trench into the sewer system. The resulting volume of soil/fill removed during trenching is estimated at 622 cubic yards.

6.4 Development of Alternatives

The general response actions identified in Section 6.2 have been assembled into a series of site-wide remedial action alternatives. These alternatives are summarized in Table 18 and outlined in the following subsections.

6.4.1 Alternative A – No Action

This alternative represents the "No Action Alternative". Under this alternative, the site would remain in its current state and no environmental monitoring, remedial activities, institutional or additional access controls would be implemented. This alternative does not satisfy the RAOs for the current use scenario, nor is it supportive of the continued use of the project site as a public park. It has, however, been retained for detailed analysis to provide a point of comparison for more intensive alternatives.

6.4.2 Alternative B – Cover System Construction

This alternative combines institutional controls, installation of a containment structure, and environmental monitoring. Under this alternative, a two-foot thick cover system would be placed over the entire project site. This cover system would consist of clean fill and topsoil in greenspace areas and sub-base and asphalt in athletic courts and the parking lot.

While this alternative would achieve the RAOs for surface soil and non-hazardous subsurface soil/fill, it would not satisfy the RAOs for the protection of groundwater resources from the hazardous soil/fill. In addition, it would not remove any of the contaminated media from the project site. Therefore, a soil/fill management plan would be required to address any future invasive activities at the project site. To mitigate the threat of erosion of the cover system and exposure of the underlying soil/fill, a biannual monitoring of the cover system will also be necessary.

Although the potential exposure of utility workers to contaminated groundwater within the sewer system would be mitigated through personal protective equipment and standard industry practices, residents of homes with basement sumps downgradient of those areas without interceptor trenches may be exposed to groundwater from the project site. Consequently, an annual groundwater monitoring program would be implemented to evaluate any changes to the quality of groundwater exiting the project site.

This remedial alternative includes:

- Development of a soil/fill management plan for any excavation activities to take place on the project site
- Limited excavation in the vicinity of the sidewalks and the parking lot to tie the site wide cap into these features and use of the excavated material to augment drainage patterns in central portion of the project site
- Demolition of three asphalt athletic courts and eight concrete bleacher pads with the resulting material left in place as a base for replacement courts and pads
- Removal and reuse of athletic and playground equipment
- Placement of 18 inches of clean fill in greenspace areas
- Placement of six inches of topsoil in greenspace areas
- Seeding greenspace areas
- Placement of six inches of athletic soil in three baseball infields
- Placement of 18 inches of clean sub-base in athletic courts and bleachers
- Placement of concrete in bleacher areas
- Replacement of athletic courts
- Installation of geotextile in the two playground areas
- Placement of six inches of pea gravel in playground areas
- Placement of boulder barriers around park perimeter
- Biannual monitoring of cover system with annual deed restriction monitoring
- Annual groundwater monitoring

6.4.3 Alternative C – Limited Excavation and Augmentation

This alternative combines institutional controls, installation of containment structures, limited soil removal, and environmental monitoring. Under this alternative, the most severely contaminated material (viz., hazardous waste) would be removed from the site and the existing cover system would be augmented such that the resulting cover system would be two feet thick or greater. The cover system would consist of clean fill and topsoil in greenspace areas and sub-base and asphalt in athletic courts and the parking lot. In addition, an interceptor trench would be in installed along Fleming Street.

This alternative would achieve the RAOs for the surface soil, non-hazardous subsurface soil/fill, and hazardous subsurface soil/fill. However, some contaminated, non-hazardous media would remain on the project site, thereby limiting future use of the project site. Therefore, a soil/fill management plan would be necessary to address future invasive activities at the project site.

The RAO for groundwater would be achieved by this alternative by extending the groundwater interceptor trench along the entire downgradient site boundary, thereby preventing the off-site migration of impacted groundwater. The potential for the exposure of utility workers to contaminated groundwater within the sewer system would remain, but

would be mitigated through personal protective equipment and standard industry practices.

This remedial alternative includes:

- Development of a soil/fill management plan for any excavation activities to take place on the project site
- Development and performance of a field program to delineate areal extents of the two areas that contain contaminants at hazardous concentrations
- Limited excavation in the two hazardous waste areas
- Off-site disposal of excavated, hazardous soil/fill
- Installation of an interceptor trench along Fleming Street that connects the two existing trenches
- Off-site disposal of material excavated during trench installation activities
- Demolition of three asphalt athletic courts and eight concrete bleacher pads with the resulting material left in place as a base for replacement courts and pads
- Removal and reuse of athletic and playground equipment
- Augmentation of existing cover through the placement of up to 18 inches of clean fill in greenspace areas
- Placement of six inches of topsoil in greenspace areas
- Seeding greenspace areas
- Placement of six inches of athletic soil in three baseball infields
- Placement of up to 18 inches of clean sub-base in athletic courts and bleachers
- Placement of concrete in bleacher areas
- Replacement of athletic courts
- Installation of geotextile in two playground areas
- Placement of six inches of pea gravel in playground areas
- Placement of boulder barriers around park perimeter
- Biannual monitoring of cover system with annual deed restriction monitoring
- Annual groundwater monitoring

6.4.4 Alternative D – Complete Excavation

This alternative is the most comprehensive, involving the removal and disposal of all soil/fill from the site. Following the excavation and off-site disposal of the fill, clean fill would be brought on site and graded to elevations at or above the sidewalk. This alternative is the most comprehensive, and achieves the RAOs for the project site. This alternative would require that the existing park be temporarily dismantled and then reconstructed following this remedial alternative. This alternative includes the following actions:

- Demolition of three asphalt athletic courts and eight concrete bleacher pads
- Removal and reuse of athletic and playground equipment
- Excavation of all soil/fill down to the native material

- Off-site disposal of all soil/fill
- Placement of clean fill in greenspace areas
- Placement of six inches of topsoil in greenspace areas
- Seeding greenspace areas
- Placement of six inches of athletic soil in three baseball infields
- Placement of six inches of clean sub-base in athletic courts and bleachers
- Placement of concrete in bleacher areas
- Replacement of athletic courts
- Installation of geotextile in two playground areas
- Placement of six inches of pea gravel in playground areas
- Placement of boulder barriers around park perimeter

7.0 DETAILED ANALYSIS OF ALTERNATIVES

7.1 General Discussion

The remedial alternatives outlined in Section 6 were individually and comparatively evaluated with respect to the following six criteria as defined in 6 NYCRR 375:

- Overall Protection of Human Health and the Environment
- Compliance with Standards, Criteria, and Guidance
- Short-Term Effectiveness
- Long-Term Effectiveness
- Reduction of Toxicity, Mobility and Volume
- Feasibility

These criteria are discussed in greater detail below. A seventh criterion, community acceptance, will be evaluated by the NYSDEC at the conclusion of the public comment period.

7.1.1 Overall Protection of Human Health and the Environment

This threshold assessment addresses whether a remedy provides adequate protection, and describes how risks posed through each pathway are eliminated, reduced, or controlled. This evaluation allows for consideration of whether the alternative poses any unacceptable short-term or cross-media impacts.

7.1.2 Compliance with Standards, Criteria, and Guidance

A site's remedial program must be designed so as to conform to standards and criteria that are generally applicable, consistently applied, and officially promulgated, and are either directly applicable, or are not directly applicable but are relevant and appropriate, unless good cause exists why conformity should be dispensed with [6 NYCRR 375-1.10(c)(1)(i)].

7.1.3 Short-Term Effectiveness

The effectiveness of alternatives in protecting human health and the environment during construction and implementation of the remedial action is evaluated under this criterion. Short-term effectiveness is assessed in terms of protection of the community, protection of workers, environmental impacts, and time until protection is achieved.

7.1.4 Long-Term Effectiveness

The evaluation of this criterion focuses on the long-term protection of human health and the environment at the completion of the remedial action. Effectiveness is assessed with

respect to the magnitude of residual risks; adequacy of controls, if any, in managing treatment residuals or untreated wastes that remain at the site; reliability of controls against possible failure; and potential to provide continued protection.

7.1.5 Reduction Of Toxicity, Mobility And Volume

This evaluation criterion addresses the preference for selecting a remedial action alternative that permanently and significantly reduces the volume, toxicity, and/or mobility of the hazardous wastes and/or constituents. This preference is satisfied when the treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media. The following is the hierarchy of remedial technologies ranked from most preferable to least preferable:

- Destruction
- Separation/treatment
- Solidification/chemical fixation
- Control and isolation

7.1.6 Feasibility

A feasible remedy is one that is appropriate for site conditions, is capable of being successfully carried out with available technology, and considers, at a minimum, implementability and cost-effectiveness.

7.2 Individual Analysis of Alternatives

The evaluations of the six criteria discussed above for each of the remedial alternatives are presented in the following subsections and summarized in Table 19.

7.2.1 Alternative A – No Action

7.2.1.1 Overall Protection Of Human Health And The Environment

The No Action Alternative does not satisfy the RAOs because of its inability to eliminate the potential for the exposure of the public and future construction and site workers to on-site contaminants. Therefore, this alternative is not protective of human health with respect to the surrounding community because contamination would remain on-site and would not be effectively contained.

7.2.1.2 Compliance with Standards, Criteria, and Guidance

The non-hazardous soil/fill containing elevated contaminant concentrations will remain on-site. In addition, the soil/fill containing hazardous levels of contaminants will also remain on-site. Contaminant concentrations in

groundwater occurring on, and emanating from, the site will continue to exceed the SCGs.

7.2.1.3 Short-Term Effectiveness

Under this alternative, the project site would remain in its current state. Even after construction of the existing cover system, the access controls were not effective in preventing the potential for the exposure of human and environmental receptors because erosion of the cover system has occurred over time in the high pedestrian traffic areas. Therefore, the existing cover is no longer fully effective.

7.2.1.4 Long-Term Effectiveness

The continued erosion of the cover system in high traffic areas will further diminish the efficacy of access controls and increase the potential for contaminant releases to the surrounding community. Therefore, the potential for exposure of human and environmental receptors is expected to increase over time as the cover system continues to erode.

7.2.1.5 Reduction Of Toxicity, Mobility And Volume

This alternative would not reduce the toxicity, mobility or volume of contamination.

7.2.1.6 Feasibility

As this alternative requires no action at the project site, this alternative is considered to be implementable. As shown in Table 20, there is no cost associated with this alternative. However, this alternative does not effectively protect human health and the environment.

7.2.2 Alternative B – Cover System Construction

7.2.2.1 Overall Protection Of Human Health And The Environment

While this alternative would achieve the RAOs for surface soil and non-hazardous subsurface soil/fill, it does not achieve the RAOs for the protection of groundwater resources from hazardous soil/fill because characteristic hazardous soil/fill will remain on-site. In addition, residents of homes with basement sumps downgradient of those areas without interceptor trenches may be exposed to groundwater emanating from the project site. Although short-term exposure risks to construction workers and the surrounding community could result from invasive activities at the site as well as to utility workers to working with the sewer system, these risks can be mitigated through standard construction and health and safety precautions.

7.2.2.2 Compliance with Standards, Criteria, and Guidance

The non-hazardous soil/fill containing elevated contaminant concentrations will remain on-site. In addition, the soil/fill containing hazardous levels of contaminants will also remain on-site. Contaminant concentrations in groundwater occurring on, and emanating from, the site will continue to exceed the SCGs.

7.2.2.3 Short-Term Effectiveness

Although short-term exposure risks to construction workers and the surrounding community could result from construction activities at the site, these risks would be effectively minimized through the use of a soil/fill management plan and standard construction and health and safety precautions. This remedial action could be implemented in a relatively short time-frame, likely less than a year.

7.2.2.4 Long-Term Effectiveness

This alternative would address exposure to contaminated soil/fill in the short-term through containment and isolation. This alternative would also address exposure to contaminated soil/fill in the long-term, as long as the cover system is maintained, especially in high traffic areas. The potential for the erosion of the cover system will be reduced through the implementation of biannual monitoring program. The potential for exposure to groundwater in basement sumps and to future groundwater seeps, if any, is not addressed by this alternative. In addition, exposure risks to construction workers and the surrounding community could result from future invasive activities at the site, but these risks could be effectively minimized through the use of a soil/fill management plan and standard construction and health and safety precautions.

Operation, maintenance, and monitoring (OM&M) of the cover system would be conducted as needed. Maintaining a vegetative cover would reduce erosion of the soil cover system. In order to reduce the potential for disturbance of the soil cover material, berms or mounds composed of clean soil would be constructed in areas in which trees and shrubs would be planted. The asphalt parking lot and athletic courts would be sealed regularly and cracks would be filled.

7.2.2.5 Reduction Of Toxicity, Mobility And Volume

This remedial action alternative would effectively reduce the mobility of the contaminants through control and isolation of the soil/fill material. However, the toxicity and volume of the material would remain the same. Leachable levels of lead and arsenic would remain on-site, posing a continued threat to groundwater resources.

7.2.2.6 Feasibility

This remedial action alternative is appropriate for current and future site conditions and uses. Materials and equipment for site clearing, grading, and placing and maintaining the cover system are readily available. The construction of the cover system would be easily implementable since the site is generally free of structures, debris, and woody vegetation; the site is graded to a regular topographic surface; and access to the site is good. As shown in Table 21, the estimated cost of this alternative is approximately $1.8 million, which makes this alternative relatively cost-effective.

7.2.3 Alternative C – Excavation and Augmentation

7.2.3.1 Overall Protection Of Human Health And The Environment

This alternative would satisfy the short- and long-term goals for the protection of human health and the environment outlined in the RAOs. The contaminated, non-hazardous soil/fill would remain on-site while the characteristic hazardous waste soil/fill would be removed and disposed off-site. Although short-term exposure risks to construction workers and the surrounding community could result from invasive activities at the site, these risks could likely be effectively minimized through the use of a soil/fill management plan and standard construction and health and safety precautions.

7.2.3.2 Compliance with Standards, Criteria, and Guidance

The non-hazardous soil/fill containing elevated contaminant concentrations would remain on-site. However, the soil/fill containing hazardous levels of contaminants would be excavated and disposed at an appropriate off-site location.

7.2.3.3 Short-Term Effectiveness

Although short-term exposure risks to construction workers and the surrounding community could result from construction activities at the site, these risks could likely be effectively minimized through the use of a soil/fill management plan and standard construction and health and safety precautions.

7.2.3.4 Long-Term Effectiveness

This alternative would address exposure to contaminated soil/fill in the short-term through containment and isolation. This alternative would also address exposure to contaminated soil/fill in the long-term, as long as the cover system is maintained, especially in high traffic areas. The potential for erosion of the cover system would be reduced through the implementation of a biannual monitoring

program. In addition, the potential for exposure to groundwater in basement sumps and to future groundwater seeps would be eliminated through the construction of additional interceptor trenches. Although exposure risks to construction workers and the surrounding community could result from future invasive activities at the site, these risks could be effectively minimized through the use of a soil/fill management plan and standard construction and health and safety precautions.

Operation, maintenance, and monitoring (OM&M) of the cover system would be conducted as needed. Maintaining a vegetative cover would reduce erosion of the soil cover system. In order to reduce the potential for disturbance of the soil cover material, berms or mounds composed of clean soil would be constructed in areas in which trees and shrubs would be planted. The asphalt parking lot and athletic courts would be sealed regularly and cracks would be filled.

7.2.3.5 Reduction Of Toxicity, Mobility And Volume

The proposed remedial action alternative would effectively reduce the mobility of the contaminants through control and isolation of the soil/fill material. The non-hazardous soil/fill would be covered with a minimum of two feet of clean material, thereby limiting the potential for erosion via wind or water to affect the subsurface soil/fill. In addition, the hazardous soil/fill would be excavated and properly disposed off-site, and, therefore, the toxicity and volume of the contaminants would be reduced. This action would also remove soil/fill containing leachable levels of lead and arsenic, thereby eliminating the threat to groundwater resources.

The mobility in the subsurface of the contaminants in the groundwater would be reduced through the installation of additional interceptor trenches and conveyance to the Buffalo Sewer Authority (BSA). Furthermore, the treatment of this groundwater at the BSA would reduce the toxicity and volume of contaminants in the groundwater.

7.2.3.6 Feasibility

This remedial action alternative is appropriate for current and future site conditions and uses. Materials and equipment for site clearing, grading, placing and maintaining the cover system, excavating and disposing hazardous soil/fill, and installing the interceptor trench are readily available. The cover system augmentation would be easily implementable since the site is generally free of structures, debris, and woody vegetation; the site is graded to a regular topographic surface; and access to the site is good. In addition, this alternative could be effectively implemented within a reasonable time frame. As shown in Table 22, the estimated cost of this alternative is approximately $2.7 million, which makes this alternative relatively cost-effective.

7.2.4 Alternative D – Complete Removal

7.2.4.1 Overall Protection Of Human Health And The Environment

This alternative is fully protective of human health and the environment under current and future use scenarios. This alternative would satisfy the short- and long-term goals for the protection of human health and the environment outlined in the RAOs. The implementation of this alternative would eliminate the risks to potential receptors posed by the soil/fill. In addition, this alternative would eliminate any impacts to groundwater posed by the on-site soil/fill.

7.2.4.2 Compliance with Standards, Criteria, and Guidance

All contaminated soil/fill would be excavated and disposed at an appropriate off-site location, and only the uncontaminated native material and new, clean, off-site fill and topsoil would remain at the site. No negative impacts to groundwater quality from this clean material are anticipated.

7.2.4.3 Short-Term Effectiveness

Although short-term exposure risks to construction workers and the surrounding community could result from construction activities at the site, these risks could likely be effectively minimized through the use of a soil/fill management plan and standard construction and health and safety precautions.

7.2.4.4 Long-Term Effectiveness

This alternative would effectively address exposure to contaminated soil/fill in the long-term through removal of all contaminated soil/fill from the project site with disposal at an appropriate off-site landfill. In addition, this alternative would eliminate any impacts to groundwater posed by the on-site soil/fill.

7.2.4.5 Reduction Of Toxicity, Mobility And Volume

The proposed remedial action alternative would effectively reduce the toxicity, mobility, and volume of the contaminants through excavation and proper off-site disposal of all soil/fill. In addition, this alternative would eliminate any impacts to groundwater posed by the soil/fill, thereby reducing the volume of contaminants in the groundwater.

7.2.4.6 Feasibility

As shown in Table 23, the estimated cost of this alternative is $22.2 million, and therefore, the very high costs of this alternative make implementation impractical. Although this alternative satisfies other feasibility issues including the

appropriateness for current and future site conditions and uses, the ease of implementability, and reasonable time frame, the high costs are prohibitive, making this alternative infeasible.

7.3 Comparative Analysis and Recommendation

A comparative evaluation of the remedial alternatives is presented in the form of a matrix, shown on Table 19, which includes ratings for each of the criteria discussed above. The comparison of the alternatives is based upon a qualitative system that utilizes relative ratings of *high*, *medium* and *low* to define each alternative's performance with respect to the aforementioned criteria. These ratings are then equated to a numerical scale to produce a relative numerical score for final comparison purposes. The ratings equate to the following conditions and numerical scores:

RATING	DESCRIPTION	NUMERICAL RATING
HIGH	SATISFIES CRITERIA TO A HIGH DEGREE	3
MEDIUM	SATISFIES CRITERIA TO A MODERATE DEGREE	2
LOW	MINIMALLY SATISFIES CRITERIA	1

The aggregate numerical score for each of the alternatives evaluated is shown near the bottom of the matrix. Higher relative scores represent a higher level of effectiveness with respect to the evaluation criteria.

As reflected by Table 17, Alternatives C and D have been identified as the most effective alternatives. Both Alternatives C and D would fully satisfy the RAOs developed for the site, would have a high degree of long-term effectiveness and would render the site suitable for use as a public park. Alternative D received a higher rating than Alternative C for four of the criteria because all contaminated media would be removed under Alternative D, while the non-hazardous contaminated fill would remain on-site but contained under Alternative C. However, the reverse was true for the feasibility criterion because Alternative C has a significantly lower cost than Alternative D. Based upon the relatively higher degree of cost effectiveness as well as the high degree of protection to human health and the environment afforded by this alternative, Alternative C is recommended for implementation.

Under the recommended alternative, a soil/fill management plan should be developed for remediation activities as well as future invasive activities. In addition, air monitoring, appropriate personal protective equipment, and dust suppression measures should be employed during construction activities to prevent exposure of the public and construction workers to the contaminants in the soil/fill.

8.0 SUMMARY AND CONCLUSIONS

A Site Investigation/Remedial Alternatives Report (SI/RAR) program was implemented at the Franczyk Park Site on behalf of the City of Buffalo. The project site is located between Lewis, Babcock, and Fleming Streets in the City of Buffalo, New York and is used as a public park. The City received State financial assistance to conduct this program under the Environmental Restoration, or Brownfield, component of Title 5 of the Clean Water/Clean Air Bond Act of 1996. The objective of this program was to characterize the site and determine the nature and extent of contamination in the surface soil, subsurface soil/fill, and groundwater. The resulting data was used to qualitatively evaluate potential risks to human health and the environment associated with current site conditions and potential future use scenarios. Based on these findings, remedial alternatives were identified, evaluated, and compared.

8.1 Site Conditions

Franczyk Park is a public park composed of two adjoining parcels totaling approximately 16.5 acres. Athletic fields and courts and an asphalt parking area occupy portions of the project site, and a manicured lawn covers the remainder of the project site. The project site is generally rectangular in shape and is bordered by Fleming Street to the southwest, Lewis Street to the northwest and Babcock Street to the southeast. A community center and an auto salvage yard bound the project site to the northeast.

The project site was first developed as an agricultural fertilizer manufacturing facility and these manufacturing operations lasted almost a century. Portions of the site were later used for automobile salvage. The City of Buffalo acquired the project site in 1984. Following an environmental investigation that identified soil/fill material with elevated concentrations of contaminants, primarily metals, the City placed a cover system over the surface of the site and constructed the park. Groundwater seeps that stained the sidewalks surrounding the project site were observed in the late 1990's, and the City responded by installing interceptor trenches in the vicinity of the seeps. During the trench construction, significantly elevated concentrations of lead and arsenic were detected in excavated soils, prompting this investigation of the site.

8.2 Investigation Approach

The Site Investigation was conducted in accordance with the September 2004 Site Investigation/Remedial Alternatives Report Work Plan and modifications detailed in the four Extra Work Authorizations. This investigative work included the following activities:

- Site Survey
- Geophysical Survey
- Test Pit Excavations
- Background Soil Sampling
- Surface Soil Sampling
- Soil Probe Advancement

- Test Boring Advancement
- Subsurface Soil/Fill Sampling
- Monitoring Well Installation
- Groundwater Elevation Monitoring
- Groundwater Sampling
- Data Validation
- Data Evaluation

8.3 Physical Setting

The topography of the project site is generally flat with an approximate elevation of 600 feet above mean sea level. Although the Little Buffalo Creek once flowed through the western portion of the project site, this creek was apparently filled in during the late 1800's. The majority of the storm water on the project site is conveyed either by overland flow off the project site or by a series of drainage swales located in the southern portions of the project site.

Historical information and the results of the site investigation indicate that soil/fill overlies the native soil across the entire site. The cover system placed in 1987 consists of topsoil and cover material. The overburden stratigraphy can be divided into four significant units, which are listed in descending order.

- Topsoil
- Cover Material
- Ten distinct Soil/Fill Units
- Native Material.

Bedrock was not encountered during this investigation.

8.4 Nature and Extent of Contamination

8.4.1 Surface Soil

Throughout the majority of the site, the surface soil at the project site does not contain contaminants at elevated concentrations. However, elevated concentrations of arsenic and lead were detected in one or more surface samples collected from high pedestrian traffic areas. The presence of elevated concentrations of metals in these areas is likely related to the erosion of the topsoil and cover material, exposing the underlying soil/fill material that was present at the project site prior to the construction of the park.

8.4.2 Cover Material

Although a few contaminants were detected in the cover material at concentrations exceeding the applicable regulatory guidance values, these concentrations were generally only slightly above the guidance values. In addition, the concentrations of

analytes were very similar to those detected in the background samples. The presence and concentrations of these analytes are consistent with the project area's urban character.

8.4.3 Soil/Fill Material (Soil/Fill Units B through J)

Contaminants detected in soil/fill material at concentrations that exceed applicable SCGs include PAHs, pesticides, and metals. The presence of these analytes at elevated concentrations in the soil/fill material may be related to poor housekeeping practices associated with historic operations, spills or leaks, and/or the urban character of the area of the project site. In addition, asbestos was detected in one soil/fill sample.

The laboratory results generally indicated that no one particular soil/fill layer was more or less contaminated than other layers present at the project site. However, two areas of the project site were determined to contain higher concentrations of metals, particularly lead and arsenic, than in other portions of the project site. Hazardous waste levels of lead were detected in soil/fill samples collected from the interceptor trench along Fleming Street, and hazardous waste levels of arsenic were detected in soil/fill samples collected from the interceptor trench along Lewis Street.

8.4.4 Groundwater

Groundwater at the project site was encountered at relatively shallow depths, typically below the fine-grained cover material. In a few instances, groundwater levels rose into the zone of the cover material following the advancement of the boring through this material, indicating likely confined or semi-confined conditions. The direction of groundwater flow is generally to the south and southwest and is influenced by the interceptor trenches.

The analysis of groundwater samples revealed elevated concentrations of some VOCs, SVOCs, and metals. The presence of the organic compounds in generally the upgradient locations may be related to former storage tanks in the area or to the salvage operations on the adjacent property to the northeast, or upgradient, of the project site. Other SVOCs that were detected at elevated concentrations in downgradient locations are likely associated with the manufacture of pesticides.

The presence of some of the metals in the groundwater samples may potentially be related to the flow of groundwater through the soil/fill and the dissolution of metals from this material or may be a result of impaired groundwater quality upgradient of the site. Other inorganic analytes detected at elevated concentrations are commonly encountered in uncontaminated, natural environments and are associated more with the groundwater aesthetics than toxicity.

8.5 Contamination Assessment

8.5.1 General Assessment

Under current and planned future use conditions, potential human receptors for on-site contaminants include:

- Persons using the public park for recreational activities;
- Persons living and working in the area surrounding the project site;
- Persons working on the project site; and
- Persons involved in utility work on and adjacent to the project site.

Potential environmental receptors include wildlife utilizing the project site (e.g., rodents, birds, etc.).

If remedial activities were implemented at the project site, potential human receptors during construction would include site workers involved in excavation activities, and persons living in and traveling through the area surrounding the project site.

8.5.2 Soil/Fill

Contaminants of concern in the subsurface soil/fill consist of metals, primarily arsenic and lead, and PAHs. Lead and arsenic have low solubilities and are not expected to significantly migrate substantially in the subsurface or affect groundwater quality, with the exception of the two areas of the project site in which leachable levels of these analytes were detected. The potential for the mechanical transport of subsurface soils contaminated with metals and PAHs, as well as asbestos, is via wind and water erosion, which has been reduced through the placement of the clean cover material. However, the topsoil and cover material have been eroded in high traffic areas, exposing the underlying soil/fill. Under the current and future use scenarios, human and environmental receptors could be exposed to heavy metals in the exposed subsurface soil/fill via:

- Inhalation of airborne particles
- The incidental ingestion of, or dermal contact, with the contaminated media in high traffic areas
- The incidental ingestion of, or dermal contact with, water that has pooled in the high traffic areas and is in contact with contaminated material.

If remediation of the project site is deemed necessary, receptors at and near the project site could be exposed to the contaminants in the subsurface soil/fill during excavation in connection with the remedial activities via the inhalation of contaminated dust, and incidental ingestion of, and/or dermal contact with the contaminated soil/fill. However, the existing interceptor use of appropriate personal protective equipment, dust suppression techniques, and the development and implementation of a Remedial Action Work Plan would likely minimize the risk of exposure during the remedial activities. No complete

exposure pathways to the contaminants in the soil/fill have been identified in connection with the post-remediation period, assuming that the contaminated subsurface soil/fill is not exposed at the ground surface.

8.5.3 Groundwater

The lack of local reliance on groundwater as a source of potable water minimizes the potential for direct human exposure to groundwater contaminants on the project site. In addition, the nearest body of water to which the groundwater at the site will discharge, the Buffalo River, is more than one-half mile from the site, also limiting the potential for direct human exposure to groundwater contaminants. However, the existing interceptor trenches do not collect all of the groundwater that leaves the project site, notably along Fleming Street between the two trenches. Therefore, the potential exists for direct human exposure to groundwater contaminants in homes with basement sumps downgradient of this portion of the project site. Additionally, groundwater seeps were observed to discharge onto the ground surface in the past, and the interceptor trenches installed in two areas of the site addressed those seeps. If new groundwater seeps form along the downgradient park boundary, along Fleming Street in those portions of the project site without interceptor trenches, the potential exists for direct human exposure to groundwater contaminants.

No complete exposure pathways for groundwater contamination have been identified in connection with the post-remedial period, assuming that utility workers employ standard construction and health and safety precautions, and that impacted groundwater is prevented from migrating beyond the downgradient site boundary.

8.6 Remedial Action Objectives

Remedial Action Objectives (RAOs) were identified for each of the contaminated media encountered on the project site. These RAOs are based upon the findings of the SI and the anticipated continued and future use of the project site as a public park, and include:

- Surface Soil - Prevent the exposure of subsurface soil/fill at the ground surface.
- Non-hazardous Subsurface Soil/Fill - Prevent exposure of human and environmental receptors to these contaminants via dermal contact, incidental ingestion or inhalation of particulates.
- Hazardous Subsurface Soil/Fill - Prevent exposure of human and environmental receptors to these contaminants via dermal contact, incidental ingestion or inhalation of particulates. Additionally, prevent the leaching of contaminants to groundwater.
- Groundwater - Prevent exposure of receptors to groundwater via dermal contact and incidental ingestion.

8.7 Remedial Alternatives

8.7.1 Alternative A – No Action

Under this alternative, the site would remain in its current state and no environmental monitoring, remedial activities, institutional or additional access controls would be implemented.

8.7.2 Alternative B – Cover Installation

This alternative combines institutional controls, installation of a containment structure, and environmental monitoring. Under this alternative, a two-foot thick cover system would be placed over the entire site.

8.7.3 Alternative C – Limited Excavation and Augmentation

This alternative combines institutional controls, installation of containment structures, and limited soil removal. Under this alternative, the most severely contaminated material would be removed from the site and the existing cover system would be augmented such that the resulting cover system would be two feet thick or greater. In addition, an interceptor trench would be in installed along Fleming Street.

8.7.4 Alternative D – Complete Removal

This alternative is the most comprehensive, involving the removal and disposal of all soil/fill from the site. Following the excavation and off-site disposal of the fill, clean fill would be brought to the site and graded to elevations at or above the sidewalk.

8.8 Recommended Alternative

Based upon the high degree of protection to human health and the environment afforded by this alternative as well as its high degree of implementability and cost-effectiveness, Alternative C is recommended for implementation.

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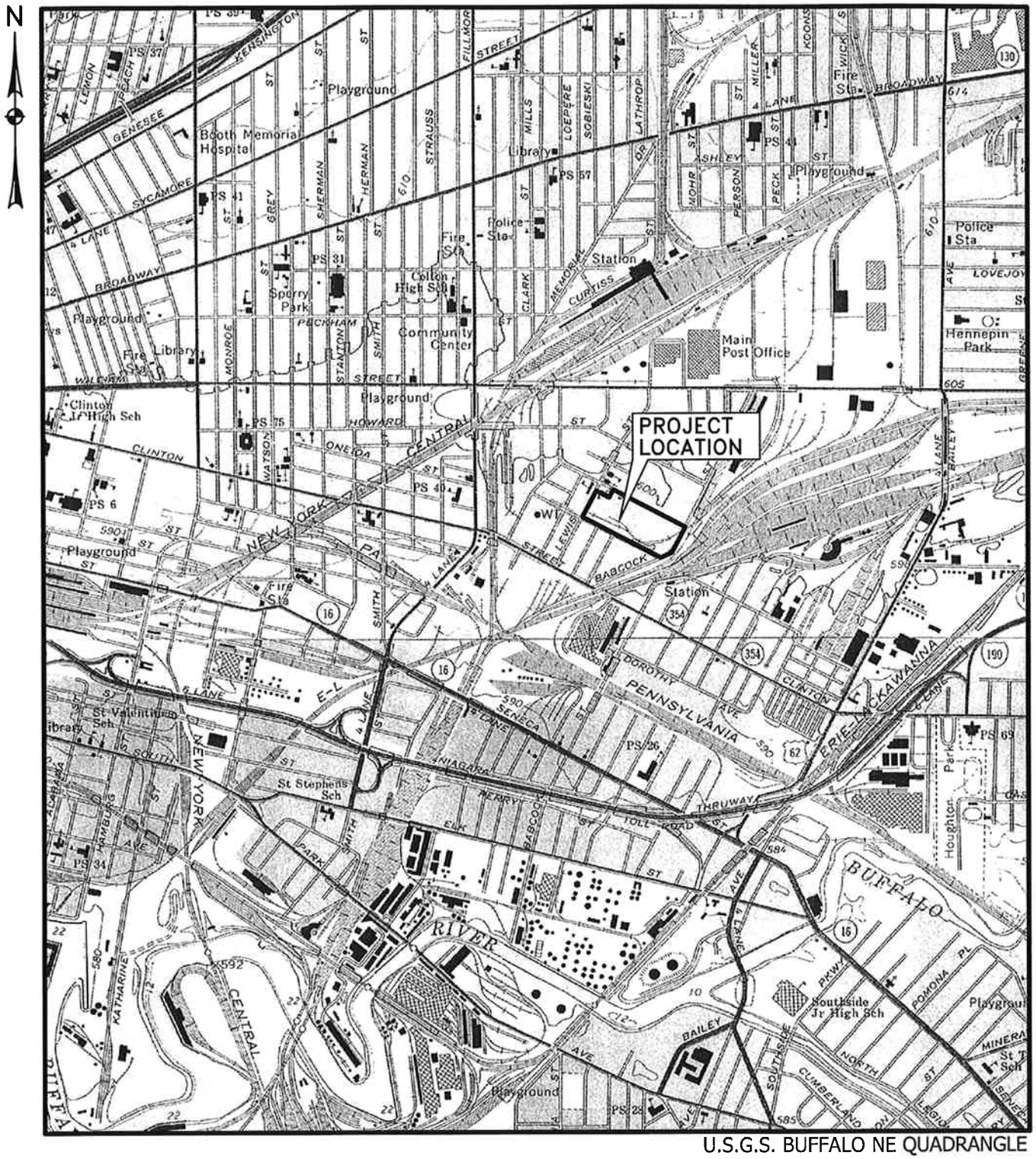

U.S.G.S. BUFFALO NE QUADRANGLE

SITE LOCATION MAP

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SI/RAR - FRANCZYK PARK
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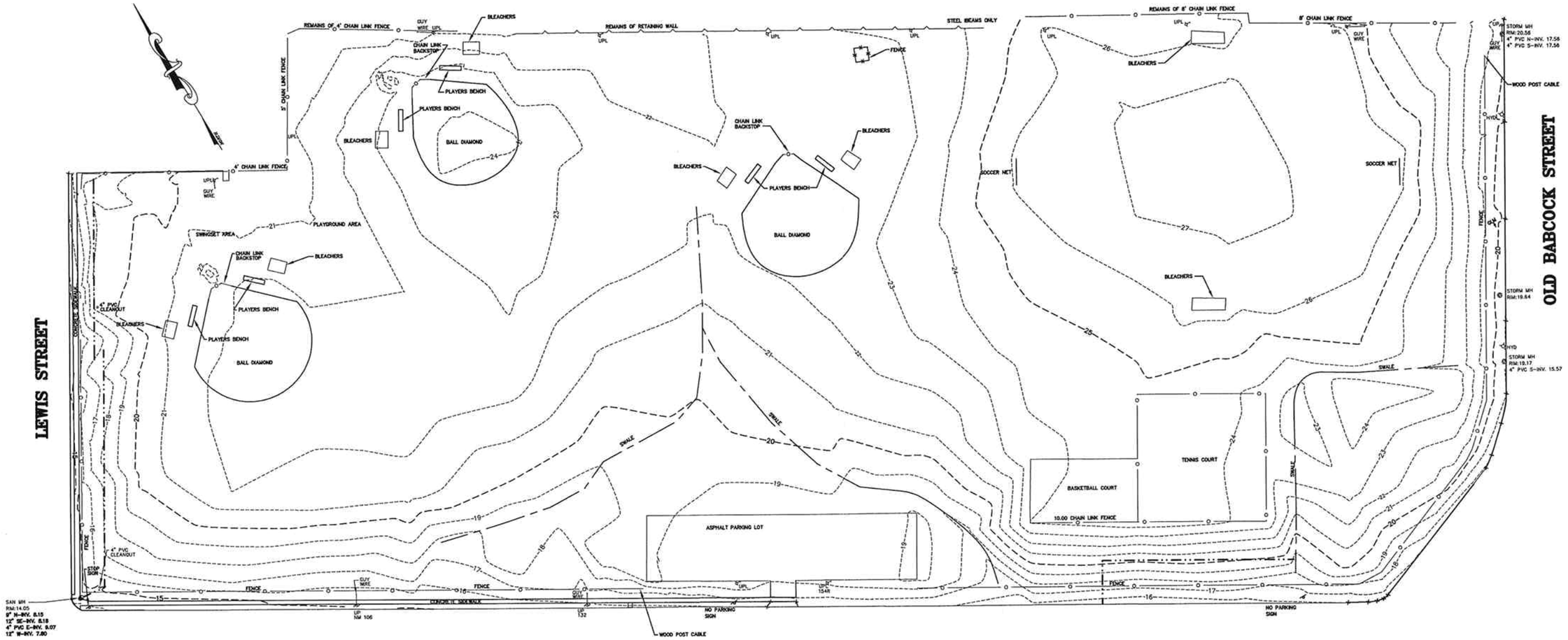
ERIE COUNTY

PROJECT NO. 0030125	SCALE: NTS	DATE: APRIL 2004	FIGURE NO. 1

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\SITEMAPS.dwg 4/15/2004 365554 PM EDT



LEGEND

+758.10	GROUND SHOT (HARD)	SAN MH	SANITARY MANHOLE
—27—	CONTOUR LINE	CO	CLEANOUT
UP	UTILITY POLE	TBOX	TELEPHONE BOX
UP/L	UP/L	SIGN	ONE POST SIGN
GUY	GUY WIRE	EP	EDGE OF PAVEMENT
HYD	HYDRANT	TC	TOP OF CURB
GLM	GASLINE MARKER	BC	BOTTOM OF CURB
GM	GAS METER	SW	SIDE WALK
GV	GASLINE VALVE		APPROXIMATE LOCATION OF INTERCEPTOR TRENCH
CBR	ROUND CATCH BASIN		
STORM MH	STORM MANHOLE		

NOTE:
BENCHMARK ELEVATION 16.84 (BUFFALO CITY DATUM) SET "X" NORTHEAST BOLT HYDRANT SOUTHWEST CORNER OF FLEMING STREET AND CLEMO STREET.

SITE PLAN

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PROJECT NO. 0030125 | SCALE: 1" = 100' | DATE: JULY, 2004 | FIGURE NO. 2

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\FIGURE-2.DWG 7/26/2004 8:29:33 AM EDT

TAX MAP

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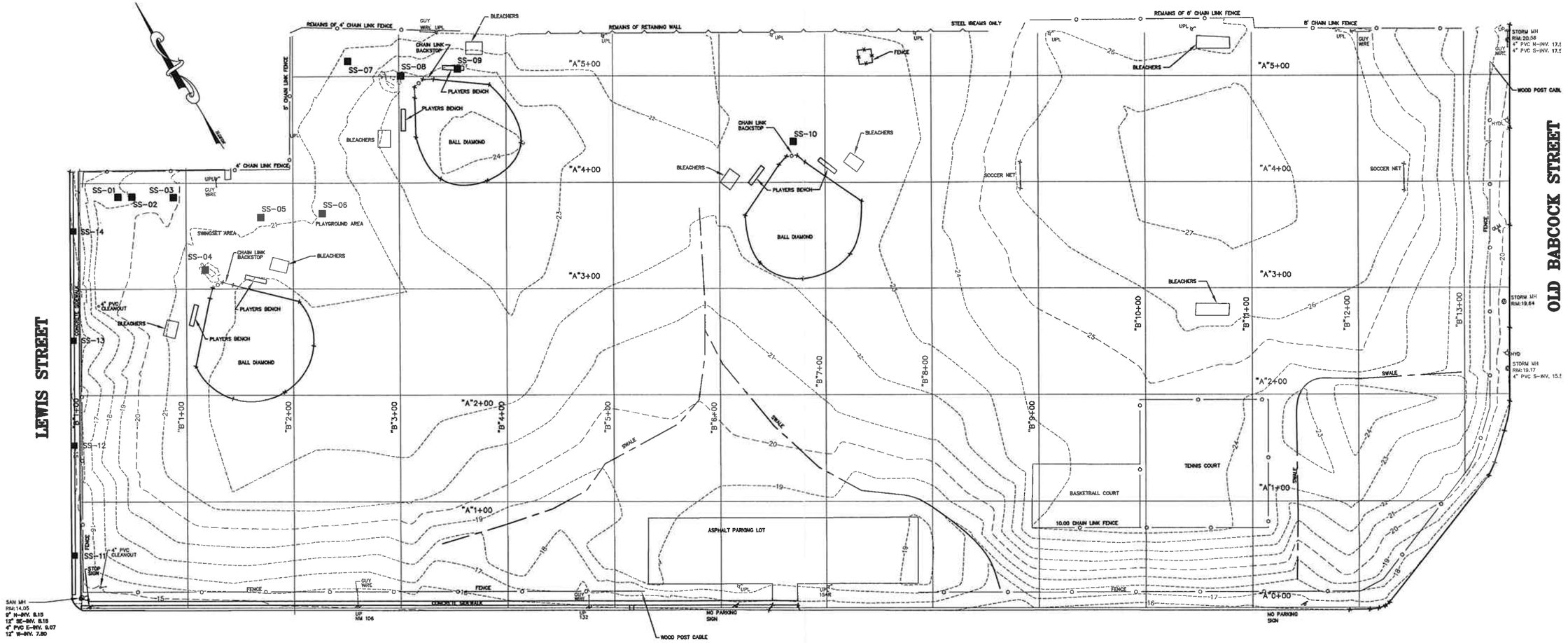
PROJECT NO. 0030125	SCALE: 1" = 250'	DATE: APRIL, 2004	FIGURE NO. 3

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\SITEMAPS.dwg 4/16/2004 8:16:41 AM EDT



LEGEND

+700.10	GROUND SHOT (HARD)	SAN MH	SANITARY MANHOLE
—27—	CONTOUR LINE	CO	CLEANOUT
UP	UTILITY POLE	TBOX	TELEPHONE BOX
UP/L	UP/L	SIGN	ONE POST SIGN
GUY	GUY WIRE	EP	EDGE OF PAVEMENT
HYD	HYDRANT	TC	TOP OF CURB
GLM	GASLINE MARKER	BC	BOTTOM OF CURB
GM	GAS METER	SW	SIDE WALK
GV	GASLINE VALVE	■	SURFACE SOIL SAMPLING LOCATION (14)
CBR	ROUND CATCH BASIN		
STORM MH	STORM MANHOLE		

NOTE:
BENCHMARK ELEVATION 16.84 (BUFFALO CITY DATUM) SET "X" NORTHEAST BOLT HYDRANT SOUTHWEST CORNER OF FLEMING STREET AND CLEMO STREET.

SURFACE SOIL SAMPLING MAP

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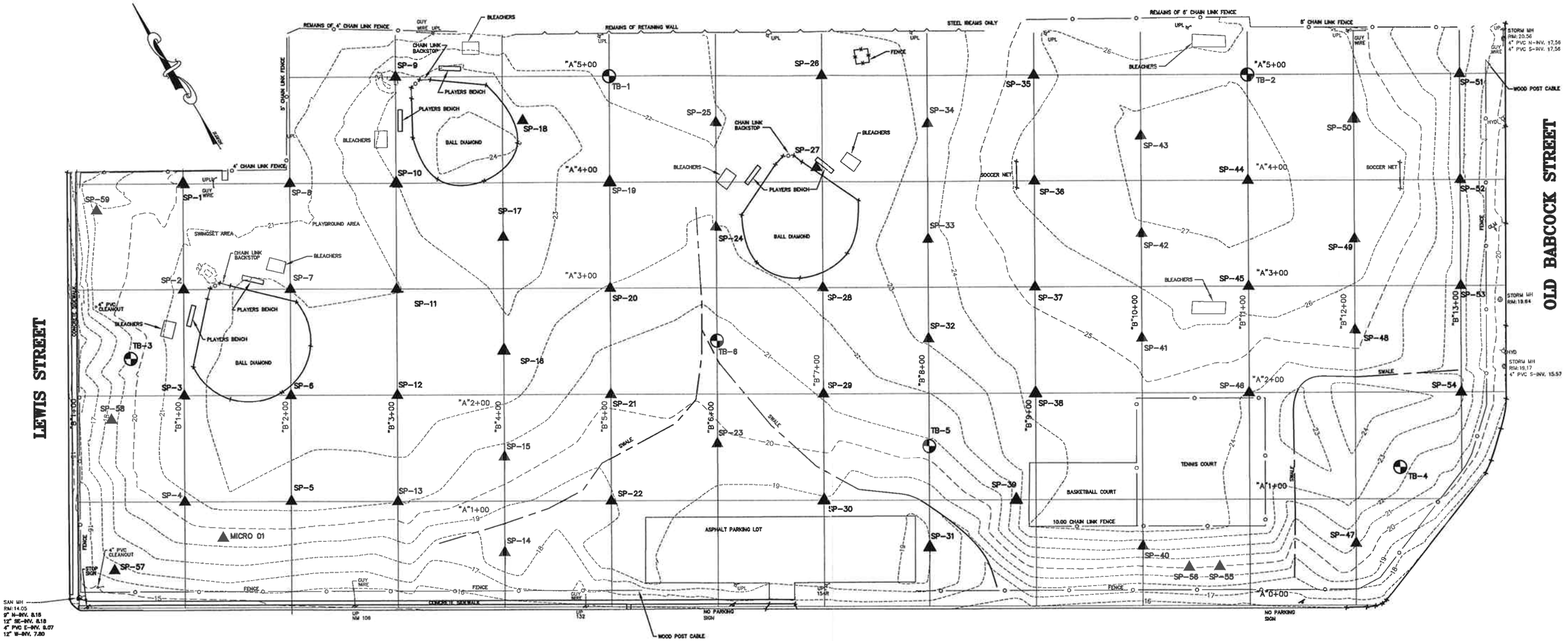
PROJECT NO. 0030125	SCALE: 1" = 100'	DATE: APRIL, 2004	FIGURE NO. 4

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\FIGURE-2.DWG 4/28/2004 3:33:01 PM EDT



LEGEND

X 790.10	GROUND SHOT (HARD)	SAN MH	SANITARY MANHOLE
27	CONTOUR LINE	CO	CLEANOUT
UP	UTILITY POLE	TBOX	TELEPHONE BOX
UP/L	UP/L	SIGN	ONE POST SIGN
GUY	GUY WIRE	EP	EDGE OF PAVEMENT
HYD	HYDRANT	TC	TOP OF CURB
GLM	GASLINE MARKER	BC	BOTTOM OF CURB
GM	GAS METER	SW	SIDE WALK
GV	GASLINE VALVE		**SOIL PROBE (SP) LOCATION (60)**
CBR	ROUND CATCH BASIN		**TEST BORING (TB) LOCATION (8)**
STORM MH	STORM MANHOLE		

NOTE:
BENCHMARK ELEVATION 18.84 (BUFFALO CITY DATUM) SET "X" NORTHEAST BOLT HYDRANT SOUTHWEST CORNER OF FLEMING STREET AND CLEMO STREET.

SOIL PROBE/TEST BORING LOCATION MAP

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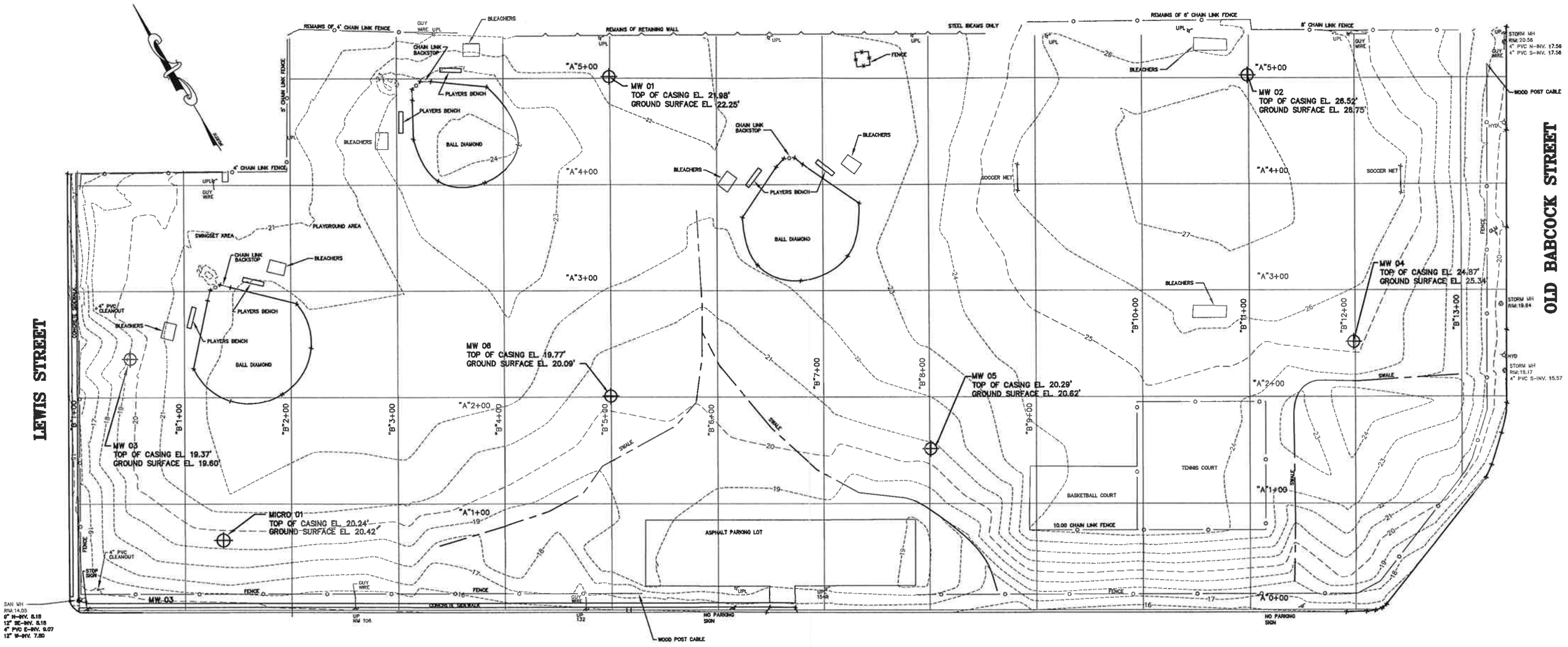
PROJECT NO. 0030125	SCALE: 1" = 100'	DATE: APRIL, 2004	FIGURE NO. 5

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\FIGURE-2.DWG 4/28/2004 3:33:01 PM EDT



LEGEND

+788.10	GROUND SHOT (HARD)	SAN MH	SANITARY MANHOLE
27	CONTOUR LINE	CO	CLEANOUT
UP	UTILITY POLE	TBOX	TELEPHONE BOX
UP/L	UP/L	SIGN	ONE POST SIGN
GUY	GUY WIRE	EP	EDGE OF PAVEMENT
HYD	HYDRANT	TC	TOP OF CURB
GLM	GASLINE MARKER	BC	BOTTOM OF CURB
GM	GAS METER	SW	SIDE WALK
GV	GASLINE VALVE		MONITORING WELL LOCATION (7)
CBR	ROUND CATCH BASIN		
STORM MH	STORM MANHOLE		

NOTE:
BENCHMARK ELEVATION 16.64 (BUFFALO CITY DATUM) SET "X" NORTHEAST BOLT HYDRANT SOUTHWEST CORNER OF FLEMING STREET AND CLEMO STREET.

MONITORING WELL LOCATION MAP

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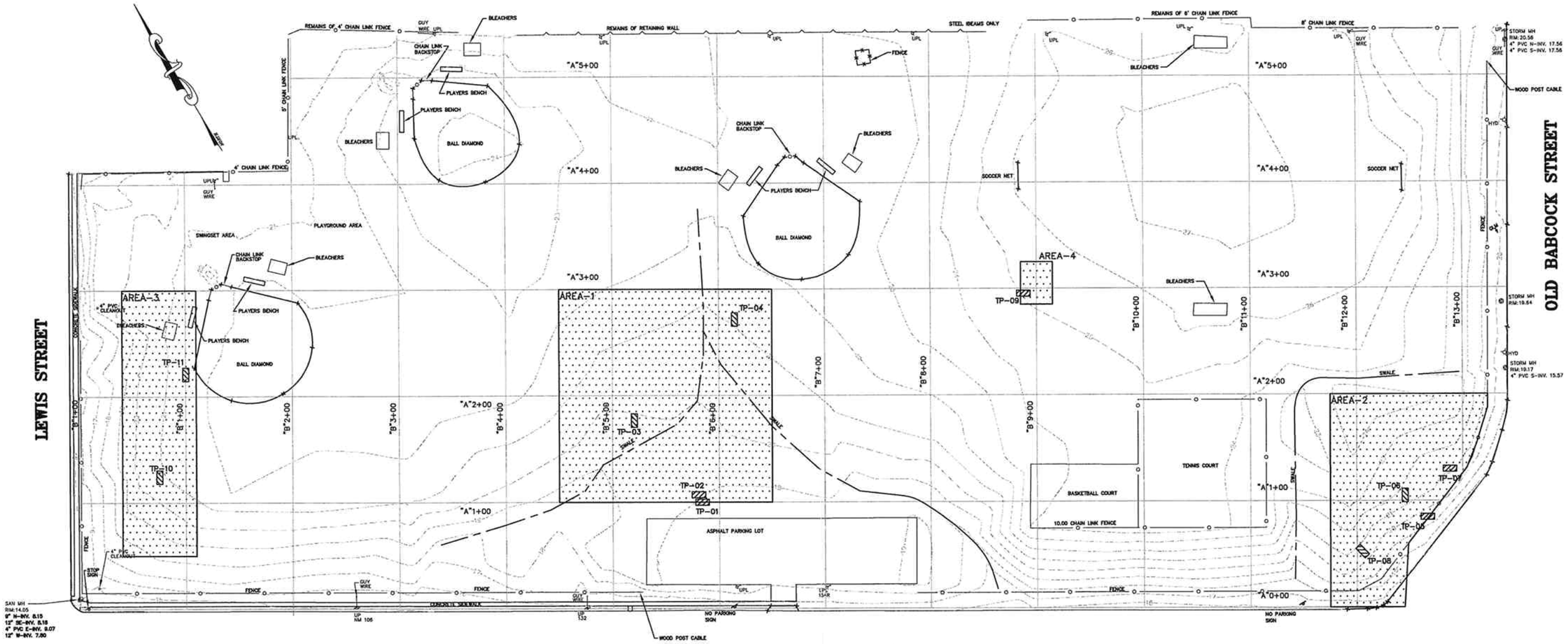
PROJECT NO. 0030125 | SCALE: 1" = 100' | DATE: APRIL, 2004 | FIGURE NO. 6

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\FIGURE-2.DWG 4/28/2004 3:33:01 PM EDT



LEGEND

+788.10	GROUND SHOT (HARD)	SAN MH	SANITARY MANHOLE
92	CONTOUR LINE	CO	CLEANOUT
UP	UTILITY POLE	TBOX	TELEPHONE BOX
UP/L	UP/L	SIGN	ONE POST SIGN
GUY	GUY WIRE	EP	EDGE OF PAVEMENT
HYD	HYDRANT	TC	TOP OF CURB
GLM	GASLINE MARKER	BC	BOTTOM OF CURB
GM	GAS METER	SW	SIDE WALK
GV	GASLINE VALVE		TEST PIT LOCATION (11)
CBR	ROUND CATCH BASIN		GEOPHYSICAL SURVEY AREA
STORM MH	STORM MANHOLE		

NOTE:
BENCHMARK ELEVATION 16.84 (BUFFALO CITY DATUM) SET "X" NORTHEAST BOLT HYDRANT SOUTHWEST CORNER OF FLEMING STREET AND CLEMO STREET.

GEOPHYSICAL SURVEY/TEST PIT LOCATION MAP

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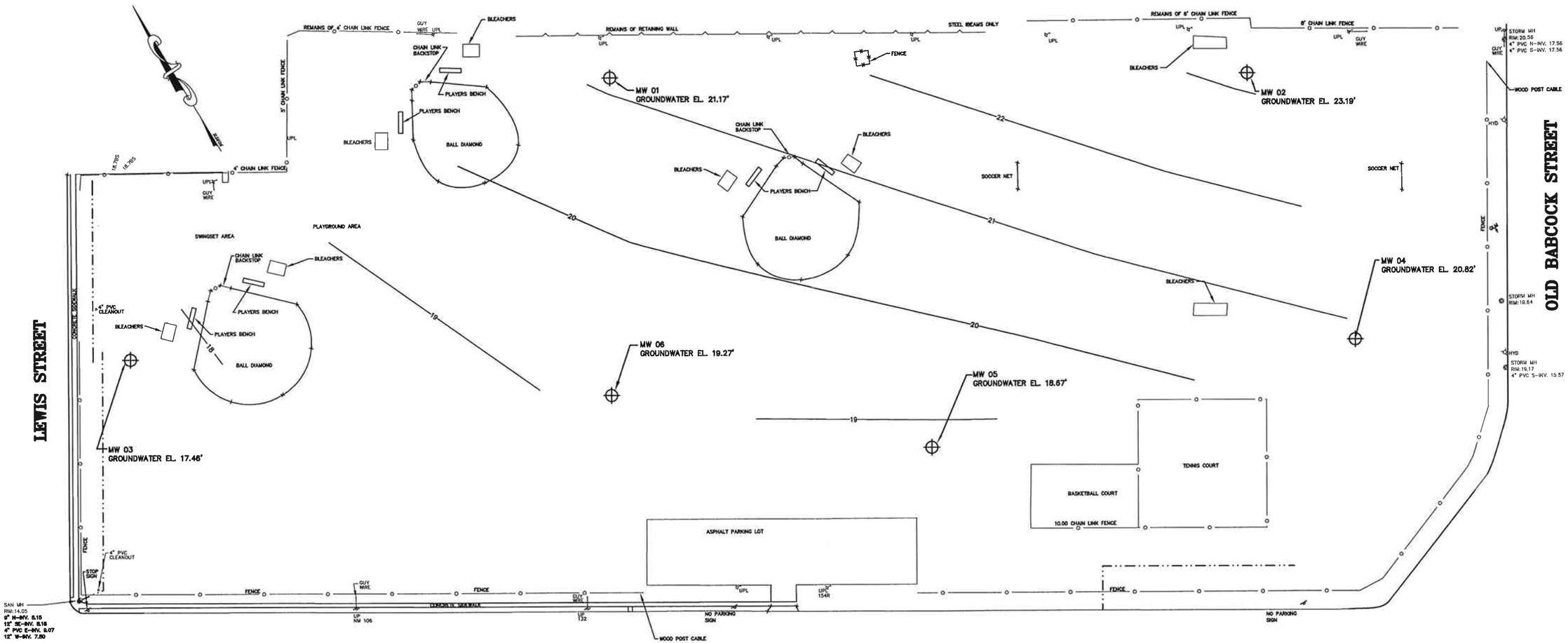
PROJECT NO. 0030125	SCALE: 1" = 100'	DATE: APRIL, 2004	FIGURE NO. 7

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\FIGURE-2.DWG 4/16/2004 11:10:21 AM EDT



LEGEND

X 758.10	GROUND SHOT (HARD)	SAN MH	SANITARY MANHOLE
—19—	CONTOUR LINE (GROUNDWATER)	CO	CLEANOUT
UP	UTILITY POLE	TBOX	TELEPHONE BOX
UP/L	UP/L	SIGN	ONE POST SIGN
GUY	GUY WIRE	EP	EDGE OF PAVEMENT
HYD	HYDRANT	TC	TOP OF CURB
GLM	GASLINE MARKER	BC	BOTTOM OF CURB
GM	GAS METER	SW	SIDE WALK
GV	GASLINE VALVE		APPROXIMATE LOCATION OF INTERCEPTOR TRENCH
CBR	ROUND CATCH BASIN		GROUNDWATER MONITORING WELL (6)
STORM MH	STORM MANHOLE		

NOTE:
BENCHMARK ELEVATION 16.84 (BUFFALO CITY DATUM) SET "X" NORTHEAST BOLT HYDRANT SOUTHWEST CORNER OF FLEMING STREET AND CLEMO STREET.

GROUNDWATER CONTOUR MAP – DEC 12, 2003

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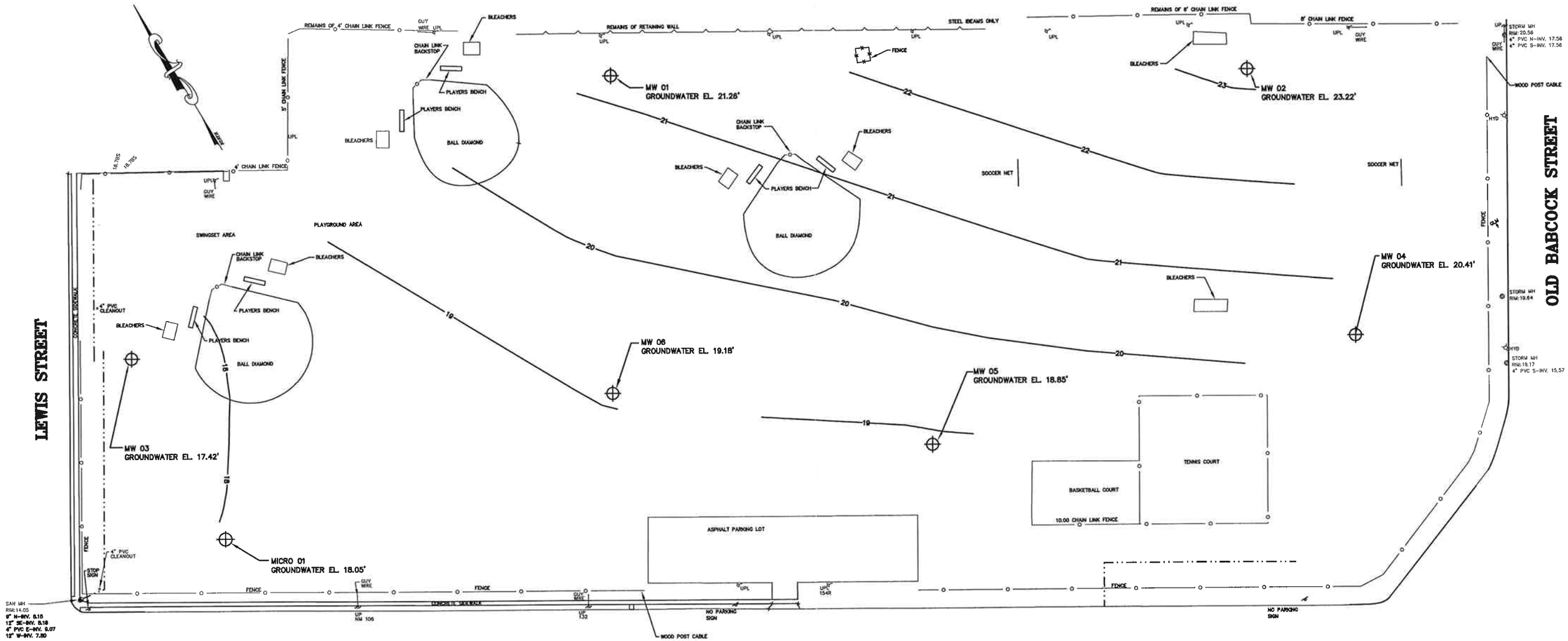
PROJECT NO. 0030125 | SCALE: 1" = 100' | DATE:JULY, 2004 | FIGURE NO. 8

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\FIGURE-8.dwg 7/26/2004 8:41:39 AM EDT



LEGEND

769.10	GROUND SHOT (HARD)	SAN MH	SANITARY MANHOLE
20	CONTOUR LINE	CO	CLEANOUT
UP	UTILITY POLE	TBOX	TELEPHONE BOX
UP/L	UP/L	SIGN	ONE POST SIGN
GUY	GUY WIRE	EP	EDGE OF PAVEMENT
HYD	HYDRANT	TC	TOP OF CURB
GLM	GASLINE MARKER	BC	BOTTOM OF CURB
GM	GAS METER	SW	SIDE WALK
GV	GASLINE VALVE		APPROXIMATE LOCATION OF INTERCEPTOR TRENCH
CBR	ROUND CATCH BASIN		GROUNDWATER MONITORING WELL (7)
STORM MH	STORM MANHOLE		

NOTE:
BENCHMARK ELEVATION 16.84 (BUFFALO CITY DATUM) SET "X" NORTHEAST BOLT HYDRANT SOUTHWEST CORNER OF FLEMING STREET AND CLEMO STREET.

GROUNDWATER CONTOUR MAP – MARCH 8, 2004

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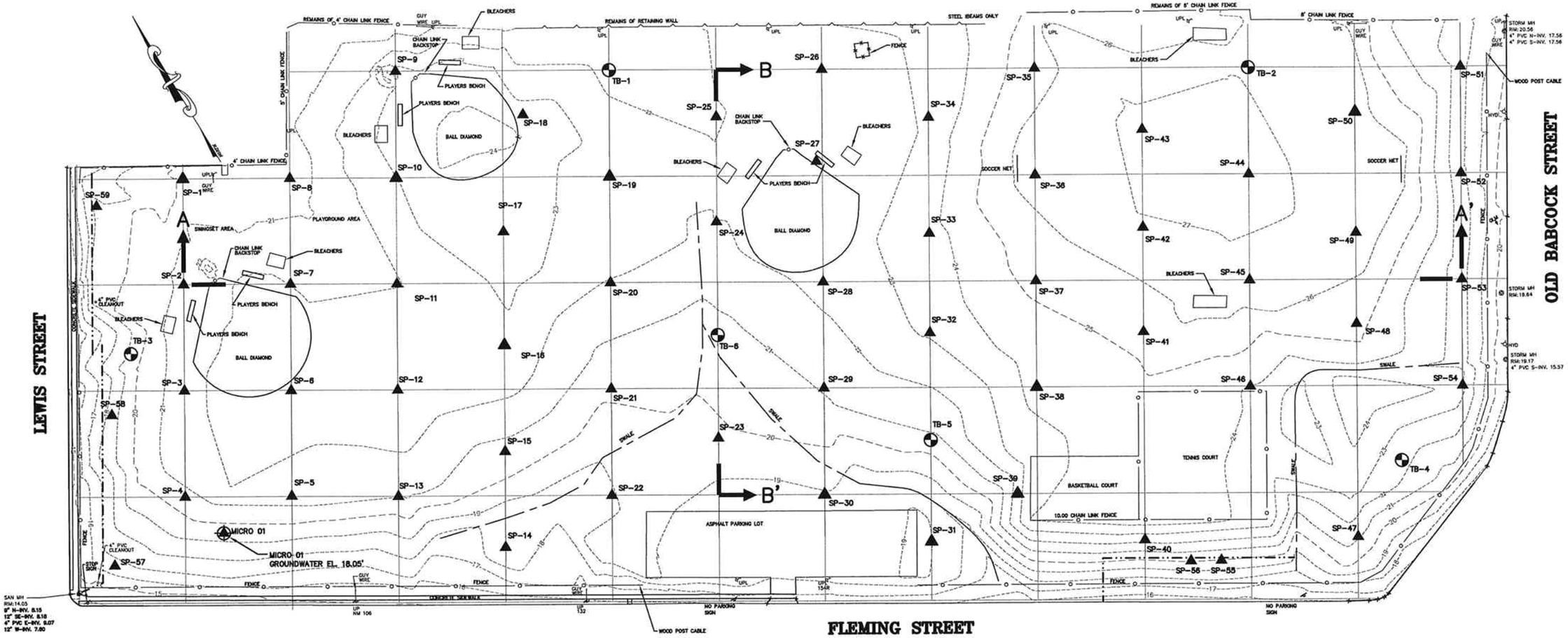
PROJECT NO. 0030125	SCALE: 1" = 100'	DATE: JULY, 2004	FIGURE NO. 9

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\FIGURE-2.DWG 7/26/2004 8:29:33 AM EDT



LEGEND

+78.10	GROUND SHOT (HARD)	SAN MH	SANITARY MANHOLE
—27—	CONTOUR LINE	CO	CLEANOUT
UP	UTILITY POLE	TBOX	TELEPHONE BOX
UP/L	UP/L	SIGN	ONE POST SIGN
GUY	GUY WIRE	EP	EDGE OF PAVEMENT
HYD	HYDRANT	TC	TOP OF CURB
GLM	GASLINE MARKER	BC	BOTTOM OF CURB
GM	GAS METER	SW	SIDE WALK
GV	GASLINE VALVE		APPROXIMATE LOCATION OF INTERCEPTOR TRENCH
CBR	ROUND CATCH BASIN		SOIL PROBE (SP) LOCATION (60)
STORM MH	STORM MANHOLE		TEST BORING (TB) LOCATION (6)

NOTE:
BENCHMARK ELEVATION 16.84 (BUFFALO CITY DATUM) SET "X" NORTHEAST BOLT HYDRANT SOUTHWEST CORNER OF FLEMING STREET AND CLEMO STREET.

SOIL PROBE/TEST BORING CROSS SECTION MAP

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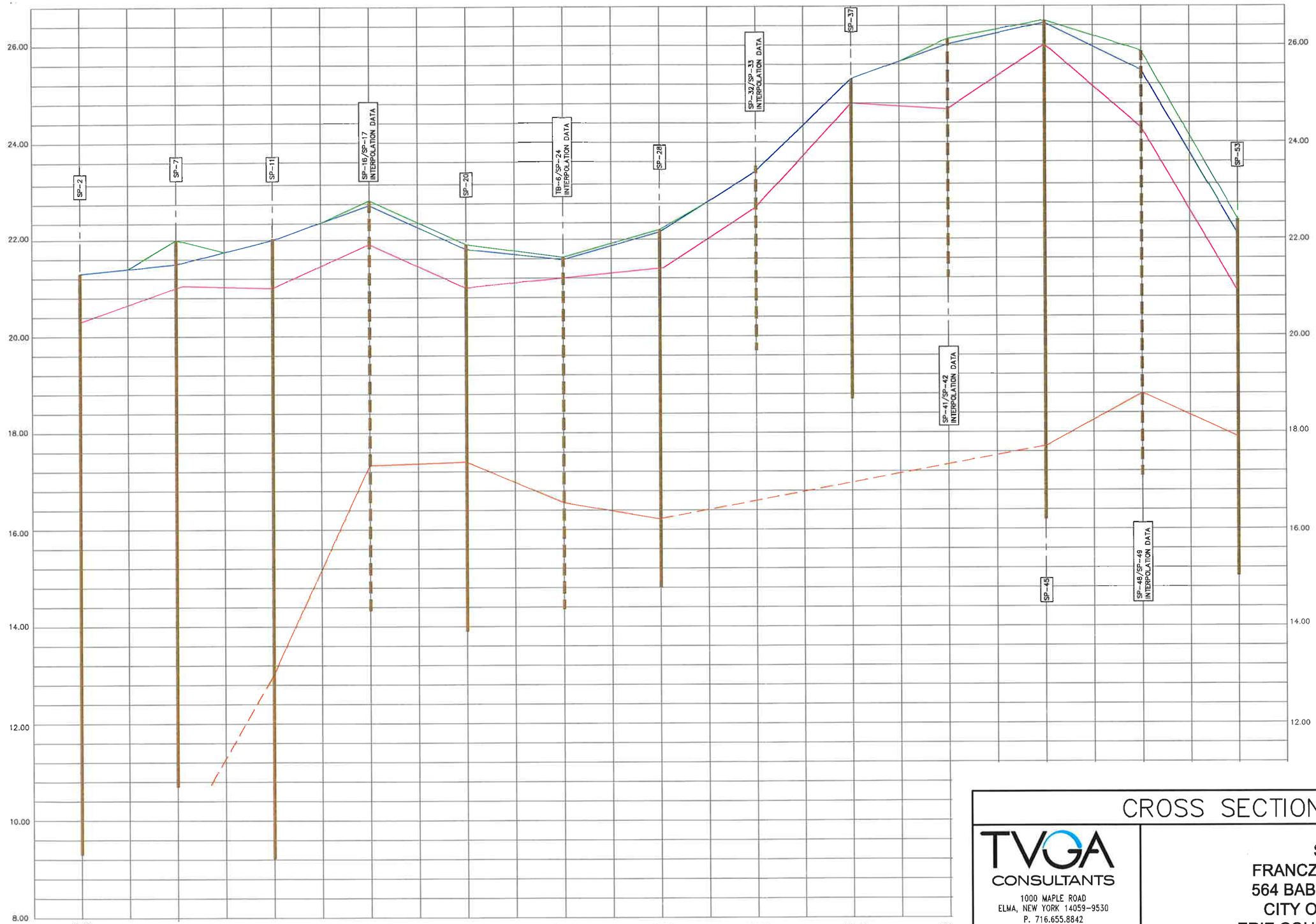
PROJECT NO. 0030125 | SCALE: 1" = 100' | DATE: OCTOBER, 2004 | FIGURE NO. 10

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\FIGURE-2.DWG 10/12/2004 4:25:47 PM EDT



SECTION A–A'
HORIZ. 1" = 100'
VERT. 1" = 2'

LEGEND

- SP-45 — SOIL BORING/PROBE
- SP-48/SP-49 — SOIL BORING/PROBE (INTERPOLATED DATA FROM ADJACENT BORINGS)
- TOPSOIL SURFACE
- TOP OF COVER MATERIAL
- TOP OF SOIL/FILL MATERIAL
- TOP OF NATIVE MATERIAL
- INFERRED TOP OF NATIVE MATERIAL

CROSS SECTION A–A'

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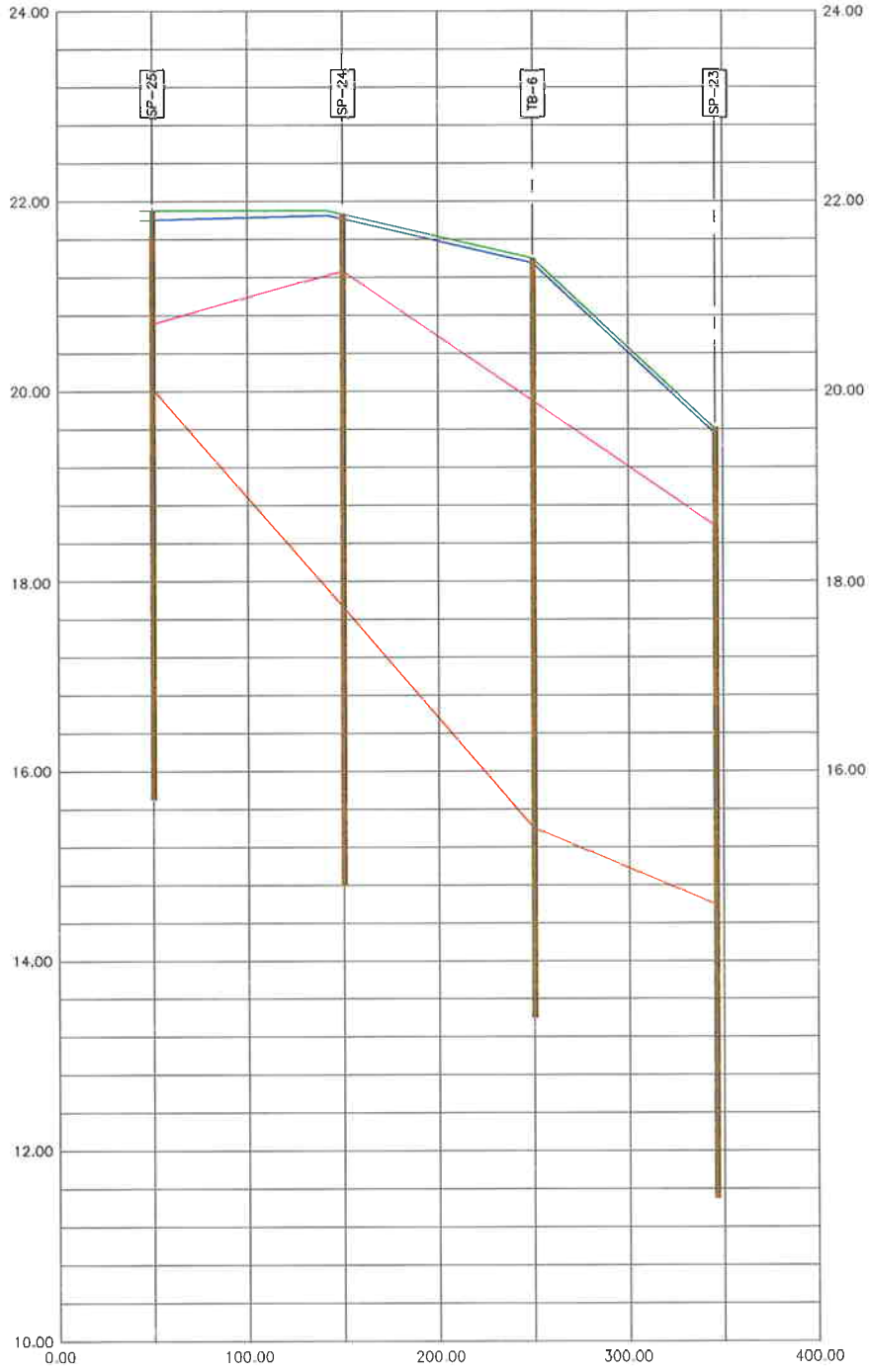
PROJECT NO. 0030125 | SCALE: AS NOTED | DATE: OCTOBER, 2004 | FIGURE NO. 11

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\FIGURE-2.DWG 10/12/2004 42547 PM EDT



SECTION B–B'
HORIZ. 1" = 100'
VERT. 1" = 2'

LEGEND

SP-25 SOIL BORING/PROBE

TOPSOIL SURFACE
TOP OF COVER MATERIAL
TOP OF SOIL/FILL MATERIAL
TOP OF NATIVE MATERIAL

CROSS SECTION B–B'

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PROJECT NO. 0030125	SCALE: AS NOTED	DATE: OCTOBER, 2004	FIGURE NO. 12

S:\Engineering\0030125 - Franczyk Park\CADD\Phase I ESA\FIGURE-2.DWG 10/12/2004 4:25:47 PM EDT

Table 1
Franczyk Park Site SIR
Sampling/Analysis Summary

Sample Identifier	Source	Interval Sampled (ft - bgs)	Location	Analysis											Date
				ASP00 - TCL VOCs	ASP00 - TCL SVOCs	ASP00 - TCL Pest/PCBs	ASP00 - TCL Pesticides	ASP00 - TAL Total Metals	ASP00 - Total Cyanide	ASP00 - Lead/Arsenic	Asbestos	ASP00 - Total Mercury	TCLP - Lead	TCLP - Arsenic	ASP00 - Total Pb, As, Sb, Be, Ni,	
Subsurface Soil															
FP-SP02-D56-S-O	Soil Probe No. 2	5 - 6	A3+00 / B1+00		X					X					11/3/03
FP-SP02-D1112-S-O	Soil Probe No. 2	11 - 12			X					X					11/3/03
FP-SP02-D10.811.5-S-O	Soil Probe No. 2	10.8 - 11.2												X	3/6/04
FP-SP04-D01.5-S-O	Soil Probe No. 4	0 - 1.5	A1+00 / B1+00		X					X					11/3/03
FP-SP04-D1.54-S-O	Soil Probe No. 4	1.5 - 4			X					X			X		11/3/03 & 3/6/04
FP-SP04-D910.7-S-O	Soil Probe No. 4	9 - 10.7			X					X					11/3/03
FP-SP05-D23.5-S-O	Soil Probe No. 5	2 - 3.5	A1+00 / B2+00		X					X			X		11/3/03 3/6/04
FP-SP05-D28-S-O	Soil Probe No. 5	2 - 8			X					X					11/3/03
FP-SP06-D24.3-S-O	Soil Probe No. 6	2 - 4.3	A2+00 / B2+00								X				11/3/03
FP-SP08-D48-S-O	Soil Probe No. 8	4 - 8	A4+00 / B2+00		X					X					11/3/03
FP-SP09-D57.5-S-O	Soil Probe No. 9	5 - 7.5	A5+00 / B3+00		X					X					11/3/03
FP-SP10-D03.5-S-O	Soil Probe No. 10	0 - 3.5	A4+00 / B3+00	X	X	X		X	X						11/3/03
FP-SP10-D3.55-S-O	Soil Probe No. 10	3.5 - 5		X	X	X		X	X						11/3/03
FP-SP10-D58-S-O	Soil Probe No. 10	5 - 8		X	X	X		X	X						11/3/03
FP-SP10-D811.6-S-O	Soil Probe No. 10	8 - 11.6		X	X	X		X	X						11/3/03
FP-SP10C-D00.1-S-O	Soil Probe No. 10	0 - 0.1										X			3/6/04
FP-SP10C-D0.12-S-O	Soil Probe No. 10	0.1 - 2										X			3/6/04
FP-SP10C-D23.5-S-O	Soil Probe No. 10	2 - 3.5										X			3/6/04
FP-SP10N-D0.51-S-O	Soil Probe No. 10 (10 feet north)	0.5 - 1	A4+10 / B3+00									X			3/6/04
FP-SP10S-D0.51-S-O	Soil Probe No. 10 (10 feet south)	0.5 - 1	A3+90 / B3+00									X			3/6/04
FP-SP10E-D0.51.5-S-O	Soil Probe No. 10 (10 feet east)	0.5 - 1.5	A4+00 / B3+10									X			3/6/04
FP-SP10W-D0.52-S-O	Soil Probe No. 10 (10 feet west)	0.5 - 2	A4+00 / B2+90									X			3/6/04
FP-SP10W-D0.52-S-MS/MD	Soil Probe No. 10 (10 feet west)	0.5 - 2	A4+00 / B2+90									X			3/6/04
FP-SP11-D15-S-O	Soil Probe No. 11	1 - 5	A3+00 / B3+00								X				11/3/03
FP-SP13-D02.5-S-O	Soil Probe No. 13	0 - 2.5	A1+00 / B3+00								X				11/4/03
FP-SP15-D25-S-O	Soil Probe No. 15	2 - 5	A1+50 / B4+00								X				11/4/03
FP-SP16-D5.56.3-S-O	Soil Probe No. 16	5.5 - 6.3	A2+50 / B4+00		X					X					11/4/03
FP-SP23-D01-S-O	Soil Probe No. 23	0 - 1	A1+50 / B6+00		X					X					11/4/03
FP-SP23-D13.5-S-O	Soil Probe No. 23	1 - 3.5			X					X				X	11/4/03 & 3/6/04
FP-SP23-D3.55-S-O	Soil Probe No. 23	3.5 - 5			X					X					11/4/03
FP-SP23-D58-S-O	Soil Probe No. 23	5 - 8			X					X					11/4/03
FP-SP24-D0.51-S-O	Soil Probe No. 24	0.5 - 1	A3+50 / B6+00		X					X					11/4/03
FP-SP28-D1.23.5-S-O	Soil Probe No. 28	1.2- 3.5	A3+00 / B7+00		X					X			X		11/5/03 & 3/6/04
FP-SP29-D0.96-S-O	Soil Probe No. 29	0.9 - 6	A2+00 / B7+00		X					X					11/5/03
FP-SP30-D47.5-S-O	Soil Probe No. 30	4 - 7.5	A1+00 / B7+00		X					X					11/5/03
FP-SP30-D2.24-S-O	Soil Probe No. 30	2.2 - 4			X					X					11/5/03
FP-SP31-D0.82.5-S-O	Soil Probe No. 31	0.8 - 2.5	A0+50 / B8+00		X					X					11/5/03
FP-SP33-D0.83.7-S-O	Soil Probe No. 33	0.8 - 3.7	A3+50 / B8+00		X					X					11/5/03
FP-SP34-D35-S-O	Soil Probe No. 34	3 - 5	A4+50 / B8+00		X					X			X		11/5/03 & 3/6/04
FP-SP34-D58-S-O	Soil Probe No. 34	5 - 8			X					X					11/5/03
FP-SP35-D66.6-S-O	Soil Probe No. 35	6 - 6.6	A5+00 / B9+00		X					X					11/5/03
FP-SP36-D0.55-S-O	Soil Probe No. 36	0.5 - 5	A4+00 / B9+00		X					X					11/5/03
FP-SP38-D0.75.5-S-O	Soil Probe No. 38	0.7 - 5.5	A2+00 / B9+00		X					X					11/5/03
FP-SP39-D0.35.5-S-O	Soil Probe No. 39	0.3 - 5.5	A1+00 / B8+80		X					X				X	11/5/03 & 3/6/04
FP-SP44-D47.3-S-O	Soil Probe No. 44	4 - 7.3	A4+00 / B11+00		X					X					11/6/03
FP-SP45-D0.10.5-S-O	Soil Probe No. 45	0.1 - 0.5	A3+00 / B11+00								X				11/6/03
FP-SP45-D0.53-S-O	Soil Probe No. 45	0.5 - 3									X				11/6/03
FP-SP45-D6.58.8-S-O	Soil Probe No. 45	6.5 - 8.8			X					X					11/6/03
FP-SP47-D0.44-S-O	Soil Probe No. 47	0.4 - 4	A0+50 / B12+00								X				11/6/03
FP-SP48-D0.31.2-S-O	Soil Probe No. 48	0.3 - 1.2	A2+50 / B12+00	X	X	X		X	X						11/6/03
FP-SP48-D1.25-S-O	Soil Probe No. 48	1.2 - 5		X	X	X		X	X						11/6/03
FP-SP48-D56.5-S-O	Soil Probe No. 48	5 - 6.5		X	X	X		X	X						11/6/03
FP-SP48-D6.510.4-S-O	Soil Probe No. 48	6.5 - 10.4		X	X	X		X	X						11/6/03
FP-SP48-D6.510.4-S-MS/MSD	Soil Probe No. 48	6.5 - 10.4		X	X	X		X	X						11/6/03
FP-SP52-D1.35.6-S-O	Soil Probe No. 52	1.3 - 5.6	A4+00 / B13+00								X				11/6/03
FP-SP53-D1.54.5-S-O	Soil Probe No. 53	1.5 - 4.5	A3+00 / B13+00		X					X					11/6/03
FP-SP55-D11.3-S-O	Soil Probe No. 55	1 - 1.3	A0+35 / B10+75										X	X	3/6/04
FP-SP56-D13.5-S-O	Soil Probe No. 56	1 - 3.5	A0+35 / B10+45		X								X	X	3/6/04
FP-SP57-D0.81-S-O	Soil Probe No. 57	0.8 - 1	A0+35 / B0+35										X	X	3/6/04
FP-SP58-D3.54-S-O	Soil Probe No. 58	3.5 - 4	A1+75 / B0+30										X		3/6/04
FP-SP59-D0.81-S-O	Soil Probe No. 59	0.8 - 1	A3+75 / B0+15											X	3/6/04
FP-Micro01-D4.55.5-S-O	Micro Well No. 1	4.5 - 5.5	A0+65 \ B1+35										X	X	3/6/04
FP-TB01-D24-S-O	Test Boring No. 1	2 - 4	A5+00 / B5+00								X				11/17/03
FP-TB01-D910-S-O	Test Boring No. 1	9 - 10			X					X					11/17/03
FP-TB02-D69-S-O	Test Boring No. 2	6 - 9	A5+00 / B11+00		X					X					11/17/03
FP-TB03-D77.5-S-O	Test Boring No. 3	7 - 7.5	A2+35 / B0+50		X					X					11/17/03
FP-TB03-D810-S-O	Test Boring No. 3	8 - 10		X	X	X		X	X						11/17/03
FP-TB04-D24-S-O	Test Boring No. 4	2 - 4	A1+30 / B12+42		X					X					11/18/03
FP-TB04-D24.5-S-O	Test Boring No. 4	2 - 4.5			X					X					11/18/03
FP-TB04-D24.5-S-MS/MSD	Test Boring No. 4	2 - 4.5			X					X					11/18/03
FP-TB05-D0.22-S-O	Test Boring No. 5	0.2 - 2	A1+50 / B8+00								X				11/18/03
FP-TB05-D24-S-O	Test Boring No. 5	2 - 4		X											11/18/03
FP-TB05-D24.5-S-O	Test Boring No. 5	2 - 4.5			X	X		X	X						11/18/03
FP-TB06-D24-S-O	Test Boring No. 6	2 - 4	A2+50 / B6+00		X					X					11/19/03
FP-TB06-D24-S-MS/MSD	Test Boring No. 6	2 - 4			X					X					11/19/03

Table 1
Franczyk Park Site SIR
Sampling/Analysis Summary

Sample Identifier	Source	Interval Sampled (ft - bgs)	Location	Analysis												Date
				ASP00 - TCL VOCs	ASP00 - TCL SVOCs	ASP00 - TCL Pest/PCBs	ASP00 - TCL Pesticides	ASP00 - TAL Total Metals	ASP00 - Total Cyanide	ASP00 - Lead/Arsenic	Asbestos	ASP00 - Total Mercury	TCLP - Lead	TCLP - Arsenic	ASP00 - Total Pb, As, Sb, Be, Ni,	
FP-SPXX-RB	Rinse Blank through acetate liner and sampling shoe	-	-	X	X	X		X	X							11/6/03
FP-TBXX-RB	Rinse Blank through 2" split spoon sampler	-	-	X	X	X		X	X							11/18/03
FP-SPXX-TRIP01	Trip Blank	-	-	X												11/6/03
FP-SPXX-TRIP02	Trip Blank	-	-	X												11/18/03
Groundwater																
FP-MW01-GW-O	Monitoring Well No. 1	-	A5+00 \ B5+00	X	X		X	X	X						X	11/21/03 & 3/8/04
FP-MW02-GW-O	Monitoring Well No. 2	-	A5+00 \ B11+00	X	X		X	X	X						X	11/21/03 & 3/8/04
FP-MW02-GW-MS	Monitoring Well No. 2	-	A5+00 \ B11+00	X	X		X	X	X							11/21/03
FP-MW02-GW-MSD	Monitoring Well No. 2	-	A5+00 \ B11+00	X	X		X		X							11/21/03
FP-MW02-GW-MD	Monitoring Well No. 2	-	A5+00 \ B11+00					X								11/21/03
FP-MW03-GW-O	Monitoring Well No. 3	-	A2+35 \ B0+50	X	X		X	X	X						X	11/21/03 & 3/8/04
FP-MWXX-GW-FD	Monitoring Well No. 3	-	A2+35 \ B0+50	X	X		X	X	X							11/21/03
FP-MW04-GW-O	Monitoring Well No. 4	-	A2+50 \ B12+00	X	X		X	X	X						X	11/21/03 & 3/8/04
FP-MW05-GW-O	Monitoring Well No. 5	-	A1+50 \ B8+00	X	X		X	X	X						X	11/21/03 & 3/8/04
FP-MW05-GW-MS/MD	Monitoring Well No. 5	-	A1+50 \ B8+00												X	3/8/04
FP-MWXX-GW-FD	Monitoring Well No. 5	-	A1+50 \ B8+00												X	3/8/04
FP-MW06-GW-O	Monitoring Well No. 6	-	A2+00 \ B5+00	X	X		X	X	X						X	11/21/03 & 3/8/04
FP-Micro01-GW-O	Micro Well No. 1	-	A0+65 \ B1+35												X	3/8/04
FS-MWXX-TRIP03	Trip Blank	-	-	X												11/21/03
Surface Soil/Fill																
FP-SS01-S-O	Surface Soil Sample No.1	0 - 0.5	A3+87 / B0+36					X	X							11/12/03
FP-SS02-S-O	Surface Soil Sample No.2	0 - 0.5	A3+87 / B0+49					X	X							11/12/03
FP-SS03-S-O	Surface Soil Sample No.3	0 - 0.5	A3+87 / B0+88					X	X							11/12/03
FP-SS04-S-O	Surface Soil Sample No.4	0 - 0.5	A3+18 / B1+18					X	X							11/12/03
FP-SS05-S-O	Surface Soil Sample No.5	0 - 0.5	A3+67 / B1+70					X	X							11/12/03
FP-SS06-S-O	Surface Soil Sample No.6	0 - 0.5	A3+71 / B2+28					X	X							11/12/03
FP-SS07-S-O	Surface Soil Sample No.7	0 - 0.5	A5+14 / B2+52					X	X							11/12/03
FP-SS08-S-O	Surface Soil Sample No.8	0 - 0.5	A5+00 / B3+2					X	X							11/12/03
FP-SS09-S-O	Surface Soil Sample No.9	0 - 0.5	A5+7 / B3+55					X	X							11/12/03
FP-SS10-S-O	Surface Soil Sample No.10	0 - 0.5	A4+38 / B6+70					X	X							11/12/03
FS-SS10-S-MS/MD	Surface Soil Sample No.10	0 - 0.5						X	X							11/12/03
FP-SS11-S-O	Surface Soil Sample No.11	0 - 0.5	A0+50 / B0-10							X						3/6/04
FP-SS12-S-O	Surface Soil Sample No.12	0 - 0.5	A1+50 / B0-10							X						3/6/04
FP-SS13-S-O	Surface Soil Sample No.13	0 - 0.5	A2+50 / B0-10							X						3/6/04
FP-SS14-S-O	Surface Soil Sample No.14	0 - 0.5	A3+50 / B0-10							X						3/8/04
FP-SS14-S-MS/MD	Surface Soil Sample No.14	0 - 0.5	A3+50 / B0-10							X						3/8/04
Background Soil Samples																
FP-BG01-S-O	Background Sample No. 1	0 - 0.5	140 Lewis St.		X			X	X							11/25/03
FP-BG02-S-O	Background Sample No. 2	0 - 0.5	143 Fleming St.		X			X	X							11/25/03
FP-BG03-S-O	Background Sample No. 3	0 - 0.5	90 Lewis St.		X			X	X							11/25/03
FP-BG04-S-O	Background Sample No. 4	0 - 0.5	145 Lewis St. (north side)		X			X	X							11/25/03
FP-BG05-S-O	Background Sample No. 5	0 - 0.5	145 Lewis St. (south side)		X			X	X							11/25/03

Table 2
Franczyk Park Site SI/RAR
Monitoring Well Construction Summary

	Ground Surface Elevation (ft)	Top of PVC Casing (TOC) Elevation (ft)	Sandpack Interval (ft-bgs)	Sandpack Elevation (ft-bgs)	Well Screen Interval (ft-bgs)	Well Screen Elevation (ft-bgs)	Soil/Fill Unit	Screened Material
MW-01	22.25	21.98	2.5 to 13.3	19.75 to 8.95	3.0 to 13.0	19.25 to 9.25	C \ B	Clayey-silt, trace to little f-m sand, trace to some gravel, trace brick, trace white sand; Sandy-silt, with trace glass, gravel, coal, black staining and odor.
MW-02	26.75	26.52	3.0 to 14.0	23.75 to 12.75	3.7 to 13.7	26.05 to 13.05	Cover Material \ C \ Native	Silt and Clay to clayey-silt, trace brick, coal, gravel, glass, f sand, concrete; Silty-sand and gravel; Clayey-silt, with orange and gray mottling.
MW-03	19.60	19.37	4.0 to 15.0	15.6 to 4.6	5.0 to 15.0	14.60 to 4.60	C \ H \ B	Clayey-silt, trace brick, black staining; Silt with strong septic odor; Silty-sand, trace clay, wood, and septic odor.
MW-04	25.34	24.87	3.0 to 9.0	22.34 to 16.34	3.5 to 8.5	21.84 to 16.84	C \ B \ Native	Clayey-silt, little brick, wood, coal, maroon sand, white sand, with black staining; Sandy-silt, some gravel, with black staining; Clayey-silt, with gray mottling.
MW-05	20.62	20.29	2.5 to 10.0	18.12 to 10.62	4.0 to 9.0	16.62 to 11.62	E \ B \ C	Sand and gravel, trace maroon sand, fire brick fuel oil smell; Sandy-silt, trace coal fragments; Silt and clay with gray mottling.
MW-06	20.09	19.77	2.5 to 8.0	17.59 to 12.09	3.0 to 8.0	17.09 to 12.09	C \ Native	Slity-sand and gravel, little brick, coal, white sand, trace clay; Sulfur colored silty-sand; Silt and clay with gray mottling, trace glass fragments.
Micro-01	20.24	20.42	2.0 to 7.5	18.24 to 12.74	2.5 to 7.5	17.74 to 12.74	B \ E \ Native	Sandy-silt and clay, trace brick, white silty material; Sandy-gravel and white silty material; Clayey-silt with orange & gray mottling.

Notes:
1. All measurements and elevations are in feet.
2. TOC = Top of PVC casing
3. bgs = Below Ground Surface

Table 3
Franczyk Park Site SI/RAR
Summary of Discrete Soil/Fill Units Encountered

PROBE / BORING NO.	TOPSOIL	COVER MATERIAL	SOIL/FILL UNIT - B	SOIL/FILL UNIT - C	SOIL/FILL UNIT - D	SOIL/FILL UNIT - E	SOIL/FILL UNIT - F	SOIL/FILL UNIT - G	SOIL/FILL UNIT - H	SOIL/FILL UNIT - I	SOIL/FILL UNIT - J	SOIL/FILL UNIT - K	NATIVE MATERIAL
Soil Probes													
1	Y		Y	Y			Y						Y
2		Y	Y	Y		Y							
3	Y	Y	Y			Y							
4		Y	Y			Y							Y
5	Y	Y	Y		Y				Y			Y	Y
6	Y	Y	Y										
7	Y	Y	Y		Y			Y					
8	Y	Y		Y	Y	Y	Y						
9		Y		Y	Y								
10		Y	Y	Y									Y
11		Y		Y	Y								Y
12	Y				Y								
13		Y				Y							
14	Y	Y	Y	Y		Y							Y
15	Y	Y	Y			Y							Y
16		Y	Y				Y				Y		Y
17	Y	Y	Y										Y
18	Y	Y	Y										
19	Y	Y	Y										Y
20	Y	Y	Y										Y
21	Y	Y			Y	Y	Y						Y
22	Y	Y	Y			Y							Y
23	Y	Y	Y	Y									Y
24	Y	Y		Y				Y					Y
25	Y	Y			Y								Y
26		Y		Y	Y								
27		Y	Y	Y									
28	Y	Y		Y		Y							Y
29		Y			Y								Y
30		Y	Y						Y				Y
31		Y			Y								
32		Y	Y										
33		Y	Y										
34		Y			Y			Y					Y
35		Y								Y			
36		Y											
37		Y	Y										
38		Y	Y										
39	Y		Y	Y									
40		Y		Y		Y							Y
41	Y	Y		Y						Y			
42	Y	Y	Y										
43	Y	Y											
44	Y	Y		Y									
45	Y	Y	Y	Y									Y
46	Y	Y	Y										
47	Y	Y			Y								Y
48	Y	Y	Y										Y
49	Y	Y	Y	Y									

Table 3
Franczyk Park Site SI/RAR
Summary of Discrete Soil/Fill Units Encountered

PROBE / BORING NO.	TOPSOIL	COVER MATERIAL	SOIL/FILL UNIT - **B**	SOIL/FILL UNIT - **C**	SOIL/FILL UNIT - **D**	SOIL/FILL UNIT - **E**	SOIL/FILL UNIT - **F**	SOIL/FILL UNIT - **G**	SOIL/FILL UNIT - **H**	SOIL/FILL UNIT - **I**	SOIL/FILL UNIT - **J**	SOIL/FILL UNIT - **K**	NATIVE MATERIAL
50	Y	Y		Y									
51	Y	Y	Y										
52	Y	Y	Y										Y
53	Y	Y	Y										Y
54	Y				Y								Y
55	Y	Y	Y	Y				Y		Y			
56	Y		Y	Y									
57	Y	Y	Y	Y									
58	Y	Y	Y	Y									
59	Y		Y				Y	Y					
Micro 01	Y	Y	Y			Y							Y
Test Borings													
1	Y	Y	Y	Y									
2	Y	Y		Y									Y
3	Y	Y	Y	Y					Y				
4	Y		Y	Y									Y
5	Y	Y	Y	Y		Y							Y
6	Y	Y	Y	Y									Y

Notes:
1. The "Y" listed under the individual soil/fill unit columns indicates that this soil/fill unit was encountered in the listed soil probe / test boring.

Table 4
Franczyk Park Site SI/RAR
Summary of Hydraulic Conductivity Testing

	Test Number	Hydraulic Conductivity	Geometric Mean
Overburden Groundwater Monitoring Wells			
MW01	1	9.42E-05	1.01E-04
	2	1.03E-04	
	3	1.09E-04	
	4	1.00E-04	
MW03	1	5.07E-04	5.79E-04
	2	4.80E-04	
	3	7.06E-04	
	4	6.54E-04	
MW04	1	1.04E-02	8.82E-03
	2	9.10E-03	
	3	7.26E-03	
MW05	1	1.17E-02	1.06E-02
	2	1.19E-02	
	3	9.72E-03	
	4	9.40E-03	
		Overall Geometric Mean	**1.53E-03**

Notes:

1. With the exception of MW04 hydraulic conductivity testing consisted of two falling head tests and two rising head tests per well by adding/removing 1 liter of water for each test performed.
2. The hydraulic conductivity testing at MW04 consisted of three rising head tests by removing 1 liter of water for each test performed.
3. Hydraulic Conductivity is measured in centimeters per second. (cm/sec)

Table 5
Franczyk Park Site SI/RAR
Subsurface Soil Boring/Probe Summary

Boring Number	Ground Surface (site datum)	Topsoil				Cover Material				Fill Soils				Native				Bottom of Boring	
		Top		Bottom		Top		Bottom		Top		Bottom		Top		Bottom			
		(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)
SP-1	20.0	0.0	20.0	0.1	19.9					0.1	19.9	5.7	14.3					5.7	14.3
		0.1 feet thick								5.6 feet thick									
SP-2	21.3					0.0	21.3	1.0	20.3	1.0	20.3	12.3	9.0					12.3	9.0
						1.0 feet thick				11.3 feet thick									
SP-3	21.4					0.0	21.4	2.0	19.4	2.0	19.4	5.7	15.7					5.7	15.7
		Less than 1" of Topsoil				2.0 feet thick				3.7 feet thick									
SP-4	20.6					0.0	20.6	1.5	19.1	1.5	19.1	9.0	11.6	9.0	11.6	10.7	9.9	10.7	9.9
						1.5 foot thick				7.5 foot thick				1.7 feet thick					
SP-5	21.2	0.0	21.2	0.1	21.1	0.1	21.1	2.0	19.2	2.0	19.2	8.0	13.2	8.0	13.2	9.9	11.3	9.9	11.3
		0.1 feet thick				1.9 feet thick				6.0 feet thick				1.9 feet thick					
SP-6	22.5					0.0	22.5	2.0	20.5	2.0	20.5	4.3	18.2					4.3	18.2
		Less than 1" of Topsoil				2.0 feet thick				2.3 feet thick									
SP-7	22.0	0.0	22.0	0.5	21.5	0.5	21.5	1.0	21.0	1.0	21.0	11.3	10.7					11.3	10.7
		0.5 feet thick				0.5 feet thick				10.3 feet thick									
SP-8	20.7					0.0	20.7	1.0	19.7	1.0	19.7	12.5	8.2					12.5	8.2
		Less than 1" of Topsoil				1.0 feet thick				11.5 feet thick									
SP-9	24.4					0.0	24.4	5.0	19.4	5.0	19.4	11.6	12.8					11.6	12.8
		Less than 1" of Topsoil				5.0 feet thick				6.6 feet thick									
SP-10	23.0					0.0	23.0	3.5	19.5	3.5	19.5	8.0	15.0	8.0	15.0	11.6	11.4	11.6	11.4
						3.5 feet thick				4.5 feet thick				3.6 feet thick					
SP-11	22.0					0.0	22.0	1.0	21.0	1.0	21.0	9.0	13.0	9.0	13.0	12.8	9.2	12.8	9.2
						1.0 feet thick				8.0 feet thick				3.8 feet thick					
SP-12	22.9	0.0	22.9	0.4	22.5					0.4	22.5	5.7	17.2					5.7	17.2
		0.4 feet thick								5.3 feet thick									
SP-13	21.0					0.0	21.0	2.5	18.5	2.5	18.5	3.5	17.5					3.5	17.5
		Less than 1" of Topsoil				2.5 feet thick				1.0 feet thick									
SP-14	18.3					0.0	18.3	0.5	17.8	0.5	17.8	5.0	13.3	5.0	13.3	7.0	11.3	7.0	11.3
		Less than 1" of Topsoil				0.5 feet thick				4.5 feet thick				2.0 feet thick					
SP-15	20.7					0.0	20.7	1.0	19.7	1.0	19.7	5.0	15.7	5.0	15.7	7.7	13.0	7.7	13.0
		Less than 1" of Topsoil				1.0 feet thick				4.0 feet thick				2.7 feet thick					
SP-16	22.5					0.0	22.5	1.3	21.2	1.3	21.2	6.4	16.1	6.4	16.1	9.4	13.1	9.4	13.1
						1.3 feet thick				5.1 feet thick				3.0 feet thick					
SP-17	23.4	0.0	23.4	0.5	22.9	0.5	22.9	0.9	22.5	0.9	22.5	5.0	18.4	5.0	18.4	7.7	15.7	7.7	15.7
		0.5 feet thick				0.4 feet thick				4.1 feet thick				2.7 feet thick					
SP-18	23.5	0.0	23.5	0.5	23.0	0.5	23.0	3.4	20.1	3.4	20.1	3.5	20.0					3.5	20.0
		0.5 feet thick				2.9 feet thick				0.1 feet thick									
SP-19	22.5	0.0	22.5	0.1	22.4	0.1	22.4	1.0	21.5	1.0	21.5	4.0	18.5	4.0	18.5	7.6	14.9	7.6	14.9
		0.1 feet thick				0.9 feet thick				3.0 feet thick				3.6 feet thick					
SP-20	21.9	0.0	21.9	0.1	21.8	0.1	21.8	0.9	21.0	0.9	21.0	4.5	17.4	4.5	17.4	8.0	13.9	8.0	13.9
		0.1 feet thick				0.8 feet thick				3.6 feet thick				3.5 feet thick					

Table 5
Franczyk Park Site SI/RAR
Subsurface Soil Boring/Probe Summary

Boring Number	Ground Surface (site datum)	Topsoil				Cover Material				Fill Soils				Native				Bottom of Boring	
		Top		Bottom		Top		Bottom		Top		Bottom		Top		Bottom			
		(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)
SP-21	20.1					0.0	20.1	1.5	18.6	1.5	18.6	6.5	13.6	6.5	13.6	8.0	12.1	8.0	12.1
		Less than 1" of Topsoil				1.5 feet thick				5.0 feet thick				1.5 feet thick					
SP-22	18.9	0.0	18.9	0.1	18.8	0.1	18.8	0.9	18.0	0.9	18.0	5.0	13.9	5.0	13.9	7.8	11.1	7.8	11.1
		0.1 feet thick				0.8 feet thick				4.1 feet thick				2.8 feet thick					
SP-23	19.6					0.0	19.6	1.0	18.6	1.0	18.6	5.0	14.6	5.0	14.6	8.1	11.5	8.1	11.5
		Less than 1" of Topsoil				1.0 feet thick				4.0 feet thick				3.1 feet thick					
SP-24	21.9					0.0	21.9	0.5	21.4	0.5	21.4	4.0	17.9	4.0	17.9	7.1	14.8	7.1	14.8
		Less than 1" of Topsoil				0.5 feet thick				3.5 feet thick				3.1 feet thick					
SP-25	21.9					0.0	21.9	1.2	20.7	1.2	20.7	1.7	20.2	1.7	20.2	6.2	15.7	6.2	15.7
		Less than 1" of Topsoil				1.2 feet thick				0.5 feet thick				4.5 feet thick					
SP-26	22.3					0.0	22.3	0.7	21.6	0.7	21.6	5.2	17.1					5.2	17.1
						0.7 feet thick				4.5 feet thick									
SP-27	22.6					0.0	22.6	2.0	20.6	2.0	20.6	8.0	14.6					8.0	14.6
						2.0 feet thick				6.0 feet thick									
SP-28	22.2					0.0	22.2	1.2	21.0	1.2	21.0	6.0	16.2	6.0	16.2	7.4	14.8	7.4	14.8
		Less than 1" of Topsoil				1.2 feet thick				4.8 feet thick				1.4 feet thick					
SP-29	21.1					0.0	21.1	0.9	20.2	0.9	20.2	6.0	15.1	6.0	15.1	8.0	13.1	8.0	13.1
						0.9 feet thick				5.1 feet thick				2.0 feet thick					
SP-30	18.9					0.0	18.9	2.0	16.9	2.0	16.9	4.0	14.9	4.0	14.9	7.5	11.4	7.5	11.4
						2.0 feet thick				2.0 feet thick				3.5 feet thick					
SP-31	19.0					0.0	19.0	0.8	18.2	0.8	18.2	2.5	16.5					2.5	16.5
						0.8 feet thick				1.7 feet thick									
SP-32	23.2					0.0	23.2	0.7	22.5	0.7	22.5	3.7	19.5					3.7	19.5
						0.7 feet thick				3.0 feet thick									
SP-33	23.6					0.0	23.6	0.8	22.8	0.8	22.8	3.7	19.9					3.7	19.9
						0.8 feet thick				2.9 feet thick									
SP-34	23.3					0.0	23.3	1.3	22.0	1.3	22.0	5.0	18.3	5.0	18.3	8.0	15.3	8.0	15.3
						1.3 feet thick				3.7 feet thick				3.0 feet thick					
SP-35	25.6					0.0	25.6	6.0	19.6	6.0	19.6	6.6	19.0					6.6	19.0
						6.0 feet thick				0.6 feet thick									
SP-36	26.2					0.0	26.2	5.5	20.7									5.5	20.7
						5.5 feet thick													
SP-37	25.3					0.0	25.3	0.5	24.8	0.5	24.8	6.6	18.7					6.6	18.7
						0.5 feet thick				6.1 feet thick									
SP-38	24.2					0.0	24.2	0.7	23.5	0.7	23.5	5.5	18.7					5.5	18.7
						0.7 feet thick				4.8 feet thick									
SP-39	22.5	0.0	22.5	0.3	22.2					0.3	22.2	6.6	15.9					6.6	15.9
		0.3 feet thick								6.3 feet thick									
SP-40	22.5					0.0	22.5	0.7	21.8	0.7	21.8	5.0	17.5	5.0	17.5	7.9	14.6	7.9	14.6
						0.7 feet thick				4.3 feet thick				2.9 feet thick					
SP-41	25.5					0.0	25.5	0.5	25.0	0.5	25.0	5.7	19.8					5.7	19.8
		Less than 1" of Topsoil				0.5 feet thick				5.2 feet thick									

Table 5
Franczyk Park Site SI/RAR
Subsurface Soil Boring/Probe Summary

Boring Number	Ground Surface (site datum)	Topsoil				Cover Material				Fill Soils				Native				Bottom of Boring	
		Top		Bottom		Top		Bottom		Top		Bottom		Top		Bottom			
		(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)
SP-42	26.8	0.0	26.8	0.2	26.6	0.2	26.6	2.2	24.6	2.2	24.6	4.2	22.6					4.2	22.6
		0.2 feet thick				2.0 feet thick				2.0 feet thick									
SP-43	27.2					0.0	27.2	6.7	20.5									6.7	20.5
		Less than 1" of Topsoil				6.7 feet thick													
SP-44	27.4	0.0	27.4	0.5	26.9	0.5	26.9	4.0	23.4	4.0	23.4	7.3	20.1					7.3	20.1
		0.5 feet thick				3.5 feet thick				3.3 feet thick									
SP-45	26.5					0.0	26.5	0.5	26.0	0.5	26.0	8.8	17.7	8.8	17.7	10.3	16.2	10.3	16.2
		Less than 1" of Topsoil				0.5 feet thick				8.3 feet thick				1.5 feet thick					
SP-46	24.0	0.0	24.0	0.2	23.8	0.2	23.8	0.5	23.5	0.5	23.5	3.6	20.4					3.6	20.4
		0.2 feet thick				0.3 feet thick				3.1 feet thick									
SP-47	21.1	0.0	21.1	0.3	20.8	0.3	20.8	0.4	20.7	0.4	20.7	4.0	17.1	4.0	17.1	6.5	14.6	6.5	14.6
		0.3 feet thick				0.1 feet thick				3.6 feet thick				2.5 feet thick					
SP-48	25.3	0.0	25.3	0.3	25.0	0.3	25.0	1.2	24.1	1.2	24.1	6.5	18.8	6.5	18.8	10.4	14.9	10.4	14.9
		0.3 feet thick				0.9 feet thick				5.3 feet thick				3.9 feet thick					
SP-49	26.5	0.0	26.5	0.5	26.0	0.5	26.0	2.0	24.5	2.0	24.5	7.2	19.3					7.2	19.3
		0.5 feet thick				1.5 feet thick				5.2 feet thick									
SP-50	26.4	0.0	26.4	0.2	26.2	0.2	26.2	3.8	22.6	3.8	22.6	7.0	19.4					7.0	19.4
		0.2 feet thick				3.6 feet thick				3.2 feet thick									
SP-51	22.5					0.0	22.5	1.0	21.5	1.0	21.5	5.2	17.3					5.2	17.3
		Less than 1" of Topsoil				1.0 feet thick				4.2 feet thick									
SP-52	22.3	0.0	22.3	0.5	21.8	0.5	21.8	1.3	21.0	1.3	21.0	5.6	16.7	5.6	16.7	7.6	14.7	7.6	14.7
		0.5 feet thick				0.8 feet thick				4.3 feet thick				2.0 feet thick					
SP-53	22.4	0.0	22.4	0.3	22.1	0.3	22.1	1.5	20.9	1.5	20.9	4.5	17.9	4.5	17.9	7.4	15.0	7.4	15.0
		0.3 feet thick				1.2 feet thick				3.0 feet thick				2.9 feet thick					
SP-54	23.5	0.0	23.5	0.5	23.0					0.5	23.0	5.5	18.0	5.5	18.0	7.7	15.8	7.7	15.8
		0.5 feet thick								5.0 feet thick				2.2 feet thick					
SP-55	19.5	0.0	19.5	0.4	19.1	0.4	19.1	0.5	19.0	0.5	19.0	4.0	15.5					4.0	15.5
		0.4 feet thick				0.1 feet thick				3.5 feet thick									
SP-56	19.2	0.0	19.2	1.0	18.2					1.0	18.2	4.0	15.2					4.0	15.2
		1.0 feet thick								3.0 feet thick									
SP-57	16.9	0.0	16.9	0.4	16.5	0.4	16.5	0.8	16.1	0.8	16.1	4.0	12.9					4.0	12.9
		0.4 feet thick				0.4 feet thick				3.2 feet thick									
SP-58	19.0					0.0	19.0	1.5	17.5	1.5	17.5	4.0	15.0					4.0	15.0
		Less than 1" of Topsoil				1.5 feet thick				2.5 feet thick									
SP-59	19.3	0.0	19.3	0.3	19.0					0.3	19.0	4.0	15.3					4.0	15.3
		0.3 feet thick								3.7 feet thick									
Micro-01	20.2	0.0	20.2	0.3	19.9	0.3	19.9	1.0	19.2	1.0	19.2	5.5	14.7	5.5	14.7	8.0	12.2	8.0	12.2
		0.3 feet thick				0.7 feet thick				4.5 feet thick				2.5 feet thick					

Table 5
Franczyk Park Site SI/RAR
Subsurface Soil Boring/Probe Summary

Boring Number	Ground Surface (site datum)	Topsoil				Cover Material				Fill Soils				Native				Bottom of Boring	
		Top		Bottom		Top		Bottom		Top		Bottom		Top		Bottom			
		(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)	(ft. bgs)	elevation (site datum)
TB-01	22.3	0.0	22.3	0.5	21.8	0.5	21.8	1.0	21.3	1.0	21.3	13.3	9.0					13.3	9.0
		0.5 feet thick				0.5 feet thick				12.3 feet thick									
TB-02	26.7	0.0	26.7	0.2	26.5	0.2	26.5	4.7	22.0	4.7	22.0	9.0	17.7	9.0	17.7	18.0	8.7	18.0	8.7
		0.2 feet thick				4.5 feet thick				4.3 feet thick				9.0 feet thick					
TB-03	19.6	0.0	19.6	0.5	19.1	0.5	19.1	2.0	17.6	2.0	17.6	12.0	7.6	12.0	7.6	15.2	4.4	15.2	4.4
		0.5 feet thick				1.5 feet thick				10.0 feet thick				3.2 feet thick					
TB-04	23.6	0.0	23.6	1.5	22.1					1.5	22.1	6.0	17.6	6.0	17.6	16.0	7.6	16.0	7.6
		1.5 feet thick								4.5 feet thick				10.0 feet thick					
TB-05	20.6					0.0	20.6	0.2	20.4	0.2	20.4	7.0	13.6	7.0	13.6	10.0	10.6	10.0	10.6
		Less than 1" of Topsoil				0.2 feet thick				6.8 feet thick				3.0 feet thick					
TB-06	21.4					0.0	21.4	1.5	19.9	1.5	19.9	6.0	15.4	6.0	15.4	8.0	13.4	8.0	13.4
		Less than 1" of Topsoil				1.5 feet thick				4.5 feet thick				2.0 feet thick					

Notes:
1) ft. bgs = feet below ground surface.
2) Blank space indicates stratum was not encountered.
3) With the exception of TB02 the native stratum was not fully penetrated.

Table 6
Franczyk Park Site SI/RAR
Groundwater Elevation Summary

	Ground Surface Elevation	Top of PVC Casing (TOC) Elevation	November 21, 2003		December 12, 2003		March 8, 2004	
			Depth to Groundwater from TOC	Groundwater Elevation	Depth to Groundwater from TOC	Groundwater Elevation	Depth to Groundwater from TOC	Groundwater Elevation
MW-01	22.25	21.98	0.94	21.04	0.81	21.17	0.72	21.26
MW-02	26.75	26.52	3.28	23.24	3.33	23.19	3.30	23.22
MW-03	19.60	19.37	1.91	17.46	1.91	17.46	1.95	17.42
MW-04	25.34	24.87	3.83	21.04	4.05	20.82	4.46	20.41
MW-05	20.62	20.29	1.45	18.84	1.62	18.67	1.44	18.85
MW-06	20.09	19.77	0.13	19.64	0.50	19.27	0.64	19.13
Micro-01	20.24	20.42	NA	NA	NA	NA	2.37	18.05

Notes:

1. All measurements and elevations are in feet.
2. TOC = Top of PVC casing

NA - Micro-01 was installed on March 6, 2004.

Table 7
Franczyk Park Site SI/RAR
Summary of Analytical Results
Background Surface Soil Samples

	FP-BG01-S-O		FP-BG02-S-O		FP-BG03-S-O		FP-BG04-S-O		FP-BG05-S-O		BACKGROUND CONCENTRATION RANGE	TAGM REC. SOIL CLEANUP OBJECTIVE	AVERAGE SITE BACKGROUND VALUE	REGULATORY VALUE
Interval Sampled (feet bgs):	0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5					
Date Collected:	11/25/2003		11/25/2003		11/25/2003		11/25/2003		11/25/2003					
Semi-Volatile Organic Compounds (ug/Kg)														
2-Methylnaphthalene	11	J	120	J	79	J	2,200	U	2,200	U	ND - 120	36,400	70	36,400
Acenaphthene	22	J	150	J	150	J	180	J	95	J	22 - 180	50,000	119	50,000
Acenaphthylene	24	J	280	J	210	J	110	J	61	J	24 - 280	41,000	137	41,000
Anthracene	70	J	690	J	570	J	590	J	530	J	70 - 690	50,000	490	50,000
Benzo(a)anthracene	520		2,700	J	2,400		2,400		2,200		520 - 2,700	224	2,044	224
Benzo(a)pyrene	600		2,400	J	2,400		2,300		2,100	J	600 - 2,400	61	1,960	61
Benzo(b)fluoranthene	690		2,100	J	1,900	J	2,000	J	1,900	J	690 - 2,100	1,100	1,718	1,100
Benzo(ghi)perylene	370	J	1,200	J	1,200	J	1,100	J	1,000	J	370 - 1,200	50,000	974	50,000
Benzo(k)fluoranthene	490		2,400	J	2,500		2,500		2,200		490 - 2,500	1,100	2,018	1,100
Carbazole	96	J	420	J	350	J	310	J	260	J	96 - 420	-	287	-
Chrysene	660		2,600	J	2,400		2,500		2,200		660 - 2,600	400	2,072	400
Dibenzo(a,h)anthracene	150	J	570	J	530	J	540	J	500	J	150 - 570	14	458	14
Dibenzofuran	14	J	150	J	120	J	80	J	2,200	U	ND - 150	6,200	91	6,200
Fluoranthene	1,300		6,500		5,700		5,600		5,800		1,300 - 6,500	50,000	4,980	50,000
Fluorene	24	J	250	J	200	J	160	J	120	J	24 - 250	50,000	151	50,000
Indeno(1,2,3-cd)pyrene	370	J	1,300	J	1,200	J	1,200	J	1,100	J	370 - 1,300	3,200	1,034	3,200
Phenanthrene	650		3,600		3,200		2,700		2,500		650 - 3,600	50,000	2,530	50,000
Phenol	20	J	3,200	U	2,200	U	2,200	U	2,200	U	ND - 20	30	20	30
Pyrene	1,000		4,500		3,900		4,000		3,500		1,000 - 4,500	50,000	3,380	50,000
TAL - Metals (mg/Kg)														
Aluminum	8,490		8,920		8,370		10,300		9,550		8,490 - 10,300	SB	9,126	9,126
Antimony	1.9	JBN	3.7	JBN	3.6	JBN	1.4	JBN	1.9	JBN	1.9 - 3.7	SB	2.5	2.5
Arsenic	5.6		25.3		24.9		21.5		12.3		5.6 - 25.3	7.5 or SB	18	18
Barium	67.3		272		582		161		113		67.3 - 582	300 or SB	239	300
Beryllium	0.47	B	0.75	B	0.73		0.67	B	0.56	B	0.47 - 0.75	0.16 or SB	0.64	0.64
Cadmium	0.03	U	2.4		2.4		0.03	U	0.03	U	ND - 2.4	1 or SB	0.98	1
Calcium	40,200	JE	11,100	JE	19,000	JE	11,300	JE	12,600	JE	11,100 - 40,200	SB	18,840	18,840
Chromium	13.6		34.7		31.7		23		19.8		13.6 - 34.7	10 or SB	25	25
Cobalt	5.2	B	8.4	B	8.8		7.3		6.1	B	5.2 - 8.8	30 or SB	7.2	30
Copper	25.1		122		157		73.8		52.8		25.1 - 157	25 or SB	86	86
Iron	13,600		34,700		25,000		20,000		17,400		13,600 - 34,700	2,000 or SB	22,140	22,140
Lead	96.7		829		1,640		413		243		96.7 - 1,640	SB	644	644
Magnesium	15,400		2,960		6,160		5,510		5,440		2,960 - 15,400	SB	7,094	7,094
Manganese	334		519		520		391		358		334 - 520	SB	424	424
Mercury	0.131		2.1		1.2		0.405		0.383		0.131 - 2.1	0.1	0.844	0.1
Nickel	13.3		73		30		21.7		18.5		13.7 - 73	13 or SB	31	31
Potassium	1,150		1,280		1,140		1,150		1,150		1,150 - 1,280	SB	1,174	1,174
Selenium	0.94	B	5.2	B	2.9	B	2.6	B	1.7	B	0.94 - 5.2	2 or SB	2.7	2.7
Silver	0.44	B	0.79	B	0.65	B	0.26	B	0.12	B	0.12 - 0.79	SB	0.45	0.45
Sodium	140	B	143	B	237	B	85.9	B	52.8	B	52.8 - 237	SB	132	132
Thallium	0.88	B	1.7	B	1.6		1.4		1.1	B	0.88 - 1.7	SB	1.3	1.3
Vanadium	20.7		29.8		30.2		26.2		24.3		20.7 - 30.2	150 or SB	26	150
Zinc	132	JE	966	JE	1140	JE	301	JE	239	JE	132 - 1,140	20 or SB	556	556

Notes:
1. TAGM Recommended Soil Cleanup Objective source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-92-4046) revised January 24, 1994.
2. Site background values for inorganic analytes were determined by averaging the results from the five background samples (including non-detects), and for organic analytes by averaging only the detected concentrations.
3. The regulatory values for inorganic analytes were determined by using the higher of the TAGM and average site background values.
4. (-) = No regulatory value is associated with this analyte.
5. ug/Kg = micrograms per Kilogram (equivalent to parts per billion (ppb)).
6. mg/Kg = milligrams per Kilogram (equivalent to parts per million (ppm)).
7. NA = parameter was not analyzed.
8. ND = parameter was not detected.
9. Only analytes detected in one or more samples are shown.
10. Definitions of data qualifiers are presented in Table 16.

Table 8
Franczyk Park Site SI/RAR
Summary of Analytical Results
Surface Soil/Fill Samples

	TAGM REC. SOIL CLEANUP	SITE BACKGROUND	REGULATORY	FP-SS01-S-O		FP-SS02-S-O		FP-SS03-S-O		FP-SS04-S-O		FP-SS05-S-O		FP-SS06-S-O		FP-SS07-S-O		FP-SS08-S-O		FP-SS09-S-O		FP-SS10-S-O		FP-SS11-S-O	FP-SS12-S-O	FP-SS13-S-O	FP-SS14-S-O	
Date Collected:	OBJECTIVE	VALUE	VALUE	11/12/2003		11/12/2003		11/12/2003		11/12/2003		11/12/2003		11/12/2003		11/12/2003		11/12/2003		11/12/2003		11/12/2003		3/6/2003	3/6/2003	3/6/2003	3/8/2003	
TAL - Metals (mg/Kg)																											
Aluminum	SB	9,126	9,126	5,590		4,740		4,740		9,030		5,060		4,730		8,520		8,780		12,200		8,080		NA	NA	NA	NA	
Antimony	SB	2.5	2.5	6.9	JBN	4.2	JBN	0.78	JBN	0.46	NUJ	0.62	JBN	1.4	JBN	0.66	JBN	0.61	JBN	1.1	JBN	1	JBN	NA	NA	NA	NA	
Arsenic	7.5 or SB	18	18	47.9		68.2		7.4		5.1		4		15.5		5.1		5		4.5		4.9		6	7.9	6.2	6.6	*
Barium	300 or SB	239	300	78.7		111		29.2		46.9		23.2		58.1		42.8		42.7		81.6		45.1		NA	NA	NA	NA	
Beryllium	0.16 or SB	0.64	0.64	0.47	B	0.45	B	0.26	B	0.4	B	0.2	B	0.31	B	0.37	B	0.39	B	0.53	B	0.36	B	NA	NA	NA	NA	
Cadmium	1 or SB	0.98	1	0.55	B	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	NA	NA	NA	NA	
Calcium	SB	18,840	18,840	40,600	JE*	23,100	JE*	53,000	JE*	27,300	JE*	48,000	JE*	54,500	JE*	29,700	JE*	26,400	JE*	11,600	JE*	54,800	JE*	NA	NA	NA	NA	
Chromium	10 or SB	25	25	21.2	JE*	14.6	JE*	5.4	JE*	11.3	JE*	5.1	JE*	9.8	JE*	9.8	JE*	10.4	JE*	13.8	JE*	9.7	JE*	NA	NA	NA	NA	
Cobalt	30 or SB	7	30	6.3	JE	9.1	JE	3.7	JBE	6.7	JE	4.2	JBE	4.8	JBE	6.7	JE	7	JE	7.2	JE	6.4	JE	NA	NA	NA	NA	
Copper	25 or SB	86	86	95.8	*	259	*	29.2	*	17	*	19.3	*	43.7	*	16.1	*	17.8	*	15.8	*	19.4	*	NA	NA	NA	NA	
Cyanide	-	-	-	1.1	UJ	1.1	UJ	1	UJ	1.1	UJ	1.2	J	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1.1	JEN	NA	NA	NA	NA	
Iron	2,000 or SB	22,140	22,140	31,700	JE	72,100	JE	11,600	JE	15,600	JE	11,100	JE	14,300	JE	14,700	JE	15,400	JE	16,600	JE	14,100	JE	NA	NA	NA	NA	
Lead	SB	644	644	883	JE*	330	JE*	81	JE*	17.5	JE*	6.6	JE*	230	JE*	15.9	JE*	15.4	JE*	27.8	JE*	17.9	JE*	35.6	42.4	96	110	*
Magnesium	SB	7,094	7,094	5,840	*	5,910	*	4,900	*	12,600	*	6,680	*	8,090	*	9,750	*	11,500	*	5,950	*	24,300	*	NA	NA	NA	NA	
Manganese	SB	424	424	609	JE*	1,290	JE*	416	JE*	361	JE*	422	JE*	451	JE*	398	JE*	381	JE*	320	JE*	433	JE*	NA	NA	NA	NA	
Mercury	0.1	0.844	0.1	0.547		0.404		0.067		0.024	B	0.014	U	0.405		0.015	U	0.023	B	0.026	B	0.016	B	NA	NA	NA	NA	
Nickel	13 or SB	31	31	20.8	JE	18.9	JE	11.7	JE	16.6	JE	9.7	JE	17	JE	14.2	JE	15.7	JE	16	JE	13.9	JE	NA	NA	NA	NA	
Potassium	SB	1,174	1,174	990		860		651		1,080		567		690		1,030		1,060		1,270		1,170		NA	NA	NA	NA	
Selenium	2 or SB	2.7	2.7	3.2	B	4.7		1.2	B	1.7	B	0.84	B	1.5	B	1.3	B	1.1	B	1.4	B	1.2	B	NA	NA	NA	NA	
Silver	SB	0.45	0.45	0.44	B	0.97	B	0.07	U	0.07	U	0.06	U	0.1	B	0.07	U	0.07	U	0.07	U	0.07	U	NA	NA	NA	NA	
Sodium	SB	132	132	243	B	77.7	B	63.6	B	37.2	B	26	B	42.2	B	49.4	B	49.4	B	78.4	B	112	B	NA	NA	NA	NA	
Thallium	SB	1.3	1.3	1.7		4.6		0.87	B	1.3		0.91	B	0.76	B	1	B	0.99	B	1.1	B	0.9	B	NA	NA	NA	NA	
Vanadium	150 or SB	26	150	17.6		20.6		8.4		17.5		10		9.9		16.3		17.7		21.4		16		NA	NA	NA	NA	
Zinc	20 or SB	556	556	277	JEN	422	JEN	74.2	JEN	71.8	JEN	72.1	JEN	231	JEN	64.1	JEN	70.5	JEN	79.2	JEN	82.1	JEN	NA	NA	NA	NA	

Notes:
1. TAGM Recommended Soil Cleanup Objective source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-92-4046) revised January 24, 1994.
2. Site background values for inorganic analytes were determined by averaging the results from the five background samples.
3. The regulatory values for inorganic analytes were determined by using the higher of the TAGM and average site background values.
4. Shaded boxes represent exceedances of the regulatory value.
5. (-) = No regulatory value is associated with this analyte.
6. ug/Kg = micrograms per Kilogram (equivalent to parts per billion (ppb)).
7. mg/Kg = milligrams per Kilogram (equivalent to parts per million (ppm)).
8. NA = parameter was not analyzed.
9. Only analytes detected in one or more samples are shown.
10. Definitions of data qualifiers are presented in Table 16.

Table 9
Franczyk Park Site SI/RAR
Summary of Analytical Results
Cover Soil Samples

	TAGM REC. SOIL CLEANUP OBJECTIVE	SITE BACKGROUND VALUE	REGULATORY VALUE	FP-SP04-D01.5-S-O		FP-SP10-D03.5-S-O		FP-SP23-D01-S-O		FP-SP36-D05.5-S-O		FP-SP48-D0.31.2-S-O	
Interval Sampled (feet bgs):				0 - 1.5		0 - 3.5		0 - 1		0 - 5.5		0.3 - 1.2	
Fill/Soil Type:				Cover Material		Cover Material		Cover Material		Cover Material		Cover Material	
Date Collected:				11/3/2003		11/3/2003		11/3/2003		11/5/2003		11/6/2003	
Volatile Organic Compounds (ug/Kg)													
2-Butanone	300	-	300	NA		12	U	NA		NA		12	U
Acetone	200	-	200	NA		12	U	NA		NA		12	U
Methylene chloride	100	-	100	NA		12	U	NA		NA		15	U
Tetrachloroethene	1,400	-	1,400	NA		12	U	NA		NA		12	U
Semi-Volatile Organic Compounds (ug/Kg)													
2,4-Dichlorophenol	400	-	400	1,800	U	390	U	360	U	410	U	380	U
2,4-Dimethylphenol	-	-	-	1,800	U	390	U	360	U	410	U	380	U
2-Methylnaphthalene	36,400	-	36,400	1,800	U	29	J	360	U	410	U	21	J
3,3'-Dichlorobenzidine	-	-	-	1,800	U	390	U	360	U	410	U	380	U
4-Methylphenol	900	-	900	1,800	U	390	U	360	U	410	U	380	U
Acenaphthene	50,000	-	50,000	120	J	200	J	360	U	410	U	31	J
Acenaphthylene	41,000	-	41,000	1,800	U	130	J	360	U	410	U	16	J
Anthracene	50,000	-	50,000	460	J	630		37	J	26	J	98	J
Benzo(a)anthracene	224	-	224	1,200	J	1,600		170	J	84	J	260	J
Benzo(a)pyrene	61	-	61	910	J	1,200		160	J	73	J	240	J
Benzo(b)fluoranthene	1,100	-	1,100	910	J	1,400		150	J	72	J	250	J
Benzo(ghi)perylene	50,000	-	50,000	57	J	170	J	110	J	23	J	130	J
Benzo(k)fluoranthene	1,100	-	1,100	1,100	J	820		130	J	77	J	150	J
Bis(2-ethylhexyl) phthalate	50,000	-	50,000	1,800	U	71	J	26	J	52	J	23	J
Butyl benzyl phthalate	50,000	-	50,000	1,800	U	27	J	50	J	410	U	380	U
Carbazole	-	-	-	150	J	290	J	15	J	13	J	36	J
Chrysene	400	-	400	1,100	J	1,400		130	J	84	J	240	J
Di-n-butyl phthalate	8,100	-	8,100	1,800	U	66	J	360	U	410	U	380	U
Di-n-octyl phthalate	50,000	-	50,000	1,800	U	26	J	360	U	410	U	380	U
Dibenzo(a,h)anthracene	14	-	14	150	J	370	J	45	J	410	U	58	J
Dibenzofuran	6,200	-	6,200	58	J	150	J	360	U	410	U	44	J
Diethyl phthalate	7,100	-	7,100	1,800	U	390	U	360	U	410	U	380	U
Fluoranthene	50,000	-	50,000	2,900		3,500	D	390		210	J	690	
Fluorene	50,000	-	50,000	150	J	270	J	10	J	12	J	54	J
Indeno(1,2,3-cd)pyrene	3,200	-	3,200	300	J	740		100	J	25	J	140	J
Naphthalene	13,000	-	13,000	54	J	91	J	360	U	12	J	40	J
Phenanthrene	50,000	-	50,000	2,000		2,500		100	J	150	J	540	
Phenol	30	-	30	1,800	U	390	U	360	U	410	U	380	U
Pyrene	50,000	-	50,000	1,700	J	2,400		330	J	130	J	480	
Total SVOCs	500,000	-	500,000	13,319		18,080		2,313		1,043		3,541	
Pesticides / PCBs (ug/Kg)													
4,4'-DDT	2,100	-	2,100	NA		7.7	U	NA		NA		3.8	U
Aldrin	41	-	41	NA		4	U	NA		NA		1.9	U
alpha-BHC	110	-	110	NA		4	U	NA		NA		1.9	U
beta-BHC	200	-	200	NA		4	U	NA		NA		1.9	U
delta-BHC	300	-	300	NA		4	U	NA		NA		1.9	U
Dieldrin	44	-	44	NA		7.7	U	NA		NA		3.8	U
Endosulfan II	900	-	900	NA		7.7	U	NA		NA		3.8	U
Endrin	100	-	100	NA		7.7	U	NA		NA		3.8	U
Endrin aldehyde	-	-	-	NA		10	J	NA		NA		3.8	U
Endrin ketone	-	-	-	NA		7.7	U	NA		NA		0.81	J
gamma-BHC (Lindane)	60	-	60	NA		4	U	NA		NA		1.9	U
gamma-Chlordane	540	-	540	NA		4	U	NA		NA		1.9	U
Heptachlor epoxide	20	-	20	NA		2.1	JP	NA		NA		1.9	U
Methoxychlor	-	-	-	NA		40	U	NA		NA		19	U
TAL - Metals (mg/Kg)													
Aluminum	SB	9,126	9,126	NA		11,700		NA		NA		10,500	JE
Antimony	SB	2.5	2.5	NA		2.1	JBN	NA		NA		1.1	JBN
Arsenic	7.5 or SB	18	18	4.3	JN*	14.6	JN*	3.6	JN*	6.8	JE	5.6	JE
Barium	300 or SB	239	300	NA		90	E	NA		NA		71.1	JE*
Beryllium	0.16 or SB	0.64	0.64	NA		0.65	JE	NA		NA		0.57	JBE
Cadmium	1 or SB	0.98	1	NA		2.7	JE*	NA		NA		0.02	JNU
Calcium	SB	18,840	18,840	NA		97,700	*	NA		NA		64,300	JE
Chromium	10 or SB	25	25	NA		20.8	JE	NA		NA		14.3	JE
Cobalt	30 or SB	7	30	NA		9.2	JE	NA		NA		7.7	JE
Copper	25 or SB	86	86	NA		165	*	NA		NA		24	JE
Cyanide	-	-	-	NA		1.1	U	NA		NA		1.1	U
Iron	2,000 or SB	22,140	22,140	NA		19,700	JE	NA		NA		18,500	JE
Lead	SB	644	644	67.2	JE*	242	JE*	54.6	JE*	20.2	JE	124	JE
Magnesium	SB	7,094	7,094	NA		17,400		NA		NA		21,500	JE
Manganese	SB	424	424	NA		1,060	JE*	NA		NA		442	JE
Mercury	0.1	0.844	0.1	NA		12.9		NA		NA		0.598	
Nickel	13 or SB	31	31	NA		33.4	JE*	NA		NA		17.6	JE
Potassium	SB	1,174	1,174	NA		3,490	*	NA		NA		2,940	JE
Selenium	2 or SB	2.7	2.7	NA		2	B	NA		NA		1.1	B
Silver	SB	0.45	0.45	NA		0.57	B	NA		NA		0.07	U
Sodium	SB	132	132	NA		335	B	NA		NA		207	B
Thallium	SB	1.3	1.3	NA		0.49	U	NA		NA		0.9	B
Vanadium	150 or SB	26	150	NA		25.4	JE	NA		NA		20.5	JE
Zinc	20 or SB	556	556	NA		3,020	*	NA		NA		86.4	JE

Notes:

1. TAGM Recommended Soil Cleanup Objective source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-92-4046) revised January 24, 1994.
2. Site background values for inorganic analytes were determined by averaging the results from the five background samples.
3. The regulatory values for inorganic analytes were determined by using the higher of the TAGM and average site background values.
4. Shaded boxes represent exceedances of the regulatory value.
5. (-) = No regulatory value is associated with this analyte.
6. ug/Kg = micrograms per Kilogram (equivalent to parts per billion (ppb)).
7. mg/Kg = milligrams per Kilogram (equivalent to parts per million (ppm)).
8. Values for FP-SPXX-RB, FP-TBXX-RB, FP-SPXX-TRIP01 and FP-TBXX-TRIP02 are listed in micrograms per Liter (ug/L).
9. NA = parameter was not analyzed.
10. Only analytes detected in one or more samples are shown.
11. FP-SP05-D3.58-S-O was mistakenly submitted as FP-SP05-D28-S-O on the chain of custody.
12. Definitions of data qualifiers are presented in Table 16.

Table 10
Franczyk Park Site SI/RAR
Summary of Analytical Results
Mercury Near Soil Probe No. 10

Sample ID	Interval Sampled (feet bgs):	Date Collected:	Total - Mercury (mg/Kg)	
FP-SP10-D03.5-S-O	0 - 3.5	11/3/2003	12.9	
FP-SP10C-D00.1-S-O	0 - 0.1	3/6/2004	0.051	JBN*
FP-SP10C-D0.12-S-O	0.1 - 2	3/6/2004	0.053	JBN*
FP-SP10C-D23.5-S-O	2 - 3.5	3/6/2004	20.7	JN*
FP-SP10N-D0.51-S-O	0.5 - 1	3/6/2004	0.017	JBN*
FP-SP10S-D0.51-S-O	0.5 - 1	3/6/2004	0.262	JN*
FP-SP10E-D0.51.5-S-O	0.5 - 1.5	3/6/2004	0.133	JN*
FP-SP10W-D0.52-S-O	0.5 - 2	3/6/2004	0.925	JN*

Notes:

1. Each of the above soil samples was collected from the cover material.
2. The TAGM Recommended Soil Cleanup Objective for Mercury is **0.1 mg/Kg**.
3. The source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-92-4046) revised January 24, 1994.
4. Shaded boxes represent exceedances of the regulatory value.
5. mg/Kg = milligrams per Kilogram (equivalent to parts per million (ppm)).
6. Definitions of data qualifiers are presented in Table 16.

Table 11
Franczyk Park Site SI/RAR
Summary of Analytical Results
Subsurface Fill Samples

	TAGM REC. SOIL CLEANUP OBJECTIVE	SITE BACKGROUND VALUE	REGULATORY VALUE	FP-SP02-D56-S-O	FP-SP02-D1112-S-O	FP-SP04-D1.54-S-O	FP-SP04-D910.7 S-O	FP-SP05-D23.5-S-O	FP-SP05-D3.58-S-O [11]	FP-SP08-D48-S-O	FP-SP09-D57.5-S-O	FP-SP10-D3.55-S-O	FP-SP10-D58-S-O	FP-SP10-D811.6-S-O	FP-SP16-D5.56.3 S-O	FP-SP23-D13.5-S-O	FP-SP23-D3.55-S-O	FP-SP23-D58-S-O	FP-SP24-D0.51-S-O	FP-SP28-D1.23.5 S-O	FP-SP29-D0.96-S-O
Interval Sampled (feet bgs):				5 - 6	11 - 12	1.5- 4	9 - 10.7	2 - 3.5	3.5 - 8	4 - 8	5 - 7.5	3.5 - 5	5 - 8	8 - 11.6	5.5 - 6.3	1 - 3.5	3.5 - 5	5 - 8	0.5 - 1	1.2 - 3.5	0.9 - 6
Fill/Soil Type:				E	C	B	Native	H	D	F	D	B	C	Native	J	B	C	Native	G	E	D
Date Collected:				11/3/2003	11/3/2003	11/3/2003	11/3/2003	11/3/2003	11/3/2003	11/3/2003	11/3/2003	11/3/2003	11/3/2003	11/3/2003	11/3/2003	11/3/2003	11/4/2003	11/4/2003	11/4/2003	11/5/2003	11/5/2003
Volatile Organic Compounds (ug/Kg)																					
2-Butanone	300	-	300	NA	NA	NA	NA	NA	NA	NA	NA	12 U	14 U	12 U	NA	NA	NA	NA	NA	NA	NA
Acetone	200	-	200	NA	NA	NA	NA	NA	NA	NA	NA	12 U	14 U	21	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	100	-	100	NA	NA	NA	NA	NA	NA	NA	NA	12 U	14 U	12 U	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,400	-	1,400	NA	NA	NA	NA	NA	NA	NA	NA	12 U	4 J	12 U	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds (ug/Kg)																					
2,4-Dichlorophenol	400	-	400	4,800 U	460 U	4,200 U	390 U	4,500 U	2,300 U	390 U	420 U	390 U	500 U	410 U	2,300 U	4,000 U	460 U	420 U	450 U	4,200 U	460 U
2,4-Dimethylphenol	-	-	-	4,800 U	460 U	4,200 U	390 U	4,500 U	2,300 U	390 U	420 U	390 U	500 U	410 U	2,300 U	4,000 U	460 U	420 U	450 U	4,200 U	460 U
2-Methylnaphthalene	36,400	-	36,400	20,000	460 U	2,900 J	390 U	1,300 J	320 J	390 U	420 U	43 J	500 U	410 U	2,300 U	450 J	460 U	420 U	450 U	210 J	26 J
4-Methylphenol	900	-	900	170 J	29 J	180 J	390 U	4,500 U	2,300 U	390 U	420 U	390 U	500 U	410 U	2,300 U	4,000 U	460 U	420 U	450 U	4,200 U	460 U
Acenaphthene	50,000	-	50,000	80,000 D	26 J	11,000	11 J	5,400	2,500	390 U	30 J	88 J	500 U	410 U	2,300 U	1,900 J	20 J	420 U	450 U	1,300 J	110 J
Acenaphthylene	41,000	-	41,000	13,000	16 J	840 J	390 U	450 J	200 J	390 U	420 U	50 J	500 U	410 U	2,300 U	1,400 J	13 J	420 U	450 U	320 J	17 J
Anthracene	50,000	-	50,000	110,000 D	53 J	20,000	390 U	12,000	8,700	390 U	76 J	250 J	500 U	410 U	120 J	4,400	59 J	420 U	450 U	3,100 J	250 J
Benzo(a)anthracene	224	-	224	140,000 D	90 J	29,000	14 J	26,000	18,000	390 U	190 J	710	500 U	410 U	410 J	12,000	140 J	420 U	450 U	8,900	610
Benzo(a)pyrene	61	-	61	93,000 D	150 J	24,000	38 J	22,000	15,000	12 J	140 J	570	500 U	410 U	340 J	9,400	110 J	420 U	450 U	6,800	490
Benzo(b)fluoranthene	1,100	-	1,100	140,000 D	120 J	27,000 D	390 U	24,000	16,000	390 U	120 J	970	500 U	410 U	370 J	12,000	120 J	420 U	450 U	6,900	420 J
Benzo(ghi)perylene	50,000	-	50,000	6,300	160 J	1,400 J	29 J	2,400 J	1,300 J	21 J	11 J	60 J	500 U	410 U	2,300 U	770 J	16 J	420 U	450 U	4,700	290 J
Benzo(k)fluoranthene	1,100	-	1,100	170,000 D	130 J	25,000 D	10 J	13,000	8,400	390 U	140 J	1,200	500 U	410 U	400 J	10,000	110 J	420 U	450 U	5,000	430 J
Bis(2-ethylhexyl) phthalate	50,000	-	50,000	4,800 U	460 U	4,200 U	18 J	300 J	2,300 U	43 J	420 U	390 U	30 J	130 J	2,300 U	4,000 U	460 U	12 J	50 J	4,200 U	35 J
Butyl benzyl phthalate	50,000	-	50,000	4,800 U	460 U	4,200 U	390 U	4,500 U	2,300 U	390 U	420 U	390 U	500 U	410 U	2,300 U	4,000 U	460 U	420 U	450 U	4,200 U	460 U
Carbazole	-	-	-	37,000	26 J	11,000	390 U	6,000	3,500	390 U	28 J	120 J	500 U	410 U	2,300 U	1,200 J	13 J	420 U	450 U	1,200 J	120 J
Chrysene	400	-	400	110,000 D	88 J	23,000	12 J	22,000	15,000	390 U	170 J	810	500 U	410 U	390 J	10,000	120 J	420 U	450 U	8,300	570
Di-n-butyl phthalate	8,100	-	8,100	4,800 U	30 J	4,200 U	390 U	4,500 U	2,300 U	28 J	32 J	150 J	300 J	34 J	2,300 U	4,000 U	19 J	19 J	26 J	4,200 U	460 U
Di-n-octyl phthalate	50,000	-	50,000	4,800 U	32 J	4,200 U	11 J	4,500 U	2,300 U	14 J	15 J	44 J	28 J	24 J	2,300 U	4,000 U	26 J	17 J	19 J	4,200 U	12 J
Dibenzo(a,h)anthracene	14	-	14	12,000	460 U	4,100 J	390 U	4,800	3,200	390 U	29 J	120 J	500 U	410 U	2,300 U	1,800 J	460 U	420 U	450 U	2,100 J	140 J
Dibenzofuran	6,200	-	6,200	55,000 D	17 J	8,600	390 U	3,900 J	2,000 J	390 U	18 J	67 J	500 U	410 U	2,300 U	880 J	460 U	420 U	450 U	770 J	85 J
Diethyl phthalate	7,100	-	7,100	4,800 U	460 U	4,200 U	390 U	4,500 U	2,300 U	390 U	420 U	390 U	500 U	410 U	2,300 U	4,000 U	460 U	420 U	450 U	4,200 U	460 U
Fluoranthene	50,000	-	50,000	300,000 D	210 J	110,000 D	32 J	82,000 D	54,000 D	10 J	420	1,300	14 J	410 U	800 J	24,000	340 J	28 J	22 J	22,000	1,600
Fluorene	50,000	-	50,000	79,000 D	29 J	13,000	390 U	6,200	3,400	390 U	29 J	100 J	500 U	410 U	2,300 U	1,600 J	22 J	420 U	450 U	1,500 J	120 J
Indeno(1,2,3-cd)pyrene	3,200	-	3,200	22,000	29 J	7,500	390 U	8,300	5,800	390 U	61 J	250 J	500 U	410 U	100 J	3,400 J	32 J	420 U	450 U	4,500	300 J
Naphthalene	13,000	-	13,000	26,000	35 J	12,000	20 J	4,800	1,000 J	390 U	27 J	60 J	500 U	410 U	2,300 U	730 J	22 J	420 U	450 U	410 J	48 J
Phenanthrene	50,000	-	50,000	380,000 D	190 J	110,000 D	40 J	62,000 D	41,000 D	12 J	400 J	1,000	500 U	410 U	520 J	16,000	290 J	37 J	20 J	15,000	1,200
Phenol	30	-	30	4,800 U	460 U	4,200 U	390 U	4,500 U	2,300 U	390 U	420 U	390 U	500 U	410 U	2,300 U	4,000 U	460 U	420 U	450 U	4,200 U	460 U
Pyrene	50,000	-	50,000	260,000 D	160 J	80,000 D	31 J	31,000	40,000 D	10 J	360 J	970	13 J	410 U	540 J	16,000	220 J	22 J	17 J	16,000	1,200
Total SVOCs	500,000	-	500,000	**2,033,470**	**1,620**	**520,520**	**266**	**338,850**	**223,320**	**150**	**2,296**	**8,730**	**385**	**188**	**3,990**	**127,430**	**1,692**	**135**	**154**	**109,010**	**7,988**
Pesticides / PCBs (ug/Kg)																					
4,4'-DDT	2,100	-	2,100	NA	NA	NA	NA	NA	NA	NA	NA	3.8 JP	5 U	4.1 U	NA	NA	NA	NA	NA	NA	NA
Aldrin	41	-	41	NA	NA	NA	NA	NA	NA	NA	NA	2 UJ	2.6 U	2.1 U	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	110	-	110	NA	NA	NA	NA	NA	NA	NA	NA	2 UJ	2.6 U	2.1 U	NA	NA	NA	NA	NA	NA	NA
beta-BHC	200	-	200	NA	NA	NA	NA	NA	NA	NA	NA	2 UJ	2.6 U	2.1 U	NA	NA	NA	NA	NA	NA	NA
delta-BHC	300	-	300	NA	NA	NA	NA	NA	NA	NA	NA	2 UJ	2.6 U	2.1 U	NA	NA	NA	NA	NA	NA	NA
Dieldrin	44	-	44	NA	NA	NA	NA	NA	NA	NA	NA	3.8 UJ	5 U	4.1 U	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	900	-	900	NA	NA	NA	NA	NA	NA	NA	NA	3.8 UJ	5 U	4.1 U	NA	NA	NA	NA	NA	NA	NA
Endrin	100	-	100	NA	NA	NA	NA	NA	NA	NA	NA	3.8 UJ	5 U	4.1 U	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	2.1 UJ	5 U	4.1 U	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	3.8 UJ	5 U	4.1 U	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	60	-	60	NA	NA	NA	NA	NA	NA	NA	NA	2 UJ	2.6 U	2.1 U	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	-	540	NA	NA	NA	NA	NA	NA	NA	NA	2 UJ	2.6 U	2.1 U	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	20	-	20	NA	NA	NA	NA	NA	NA	NA	NA	2 UJ	2.6 U	2.1 U	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	20 UJ	26 U	21 U	NA	NA	NA	NA	NA	NA	NA
TAL - Metals (mg/Kg)																					
Aluminum	SB	9,126	9,126	NA	NA	NA	NA	NA	NA	NA	NA	12,200	10,100	16,200	NA	NA	NA	NA	NA	NA	NA
Antimony	SB	2.5	2.5	NA	NA	NA	NA	NA	NA	NA	NA	2.9 JBN	3.8 BN	1.5 JBN	NA	NA	NA	NA	NA	NA	NA
Arsenic	7.5 or SB	18	18	184 JN*	580 JN*	97.7 JN*	9.2 JN*	149 JN*	39.8 JN*	6.8 JN*	50.8 JN*	17.5 JN*	5.4 N*	7.7 JN*	12.8 N*	756 JN*	24.8 JN*	8 JN*	146 JN*	421 JE	105 JE
Barium	300 or SB	239	300	NA	NA	NA	NA	NA	NA	NA	NA	139 E	202 E	108 E	NA	NA	NA	NA	NA	NA	NA
Beryllium	0.16 or SB	0.64	0.64	NA	NA	NA	NA	NA	NA	NA	NA	1.5 JE	0.48 BE	0.73 JE	NA	NA	NA	NA	NA	NA	NA
Cadmium	1 or SB	0.98	1	NA	NA	NA	NA	NA	NA	NA	NA	0.28 JBE*	0.03 EU*	0.03 JEU*	NA	NA	NA	NA	NA	NA	NA
Calcium	SB	18,840	18,840	NA	NA	NA	NA	NA	NA	NA	NA	15,500 *	127,000 *	43,500 *	NA	NA	NA	NA	NA	NA	NA
Chromium	10 or SB	25	25	NA	NA	NA	NA	NA	NA	NA	NA	11.5 JE	13.3 E	21.9 JE	NA	NA	NA	NA	NA	NA	NA
Cobalt	30 or SB	7	30	NA	NA	NA	NA	NA	NA	NA	NA	38.8 JE	7.1 BE	13.5 JE	NA	NA	NA	NA	NA	NA	NA
Copper	25 or SB	86	86	NA	NA	NA	NA	NA	NA	NA	NA	107 *	15.7 *	20.4 *	NA	NA	NA	NA	NA	NA	NA
Cyanide	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U	1.5 UJ	1.2 UJ	NA	NA	NA	NA	NA	NA	NA
Iron	2,000 or SB	22,140	22,140	NA	NA	NA	NA	NA	NA	NA	NA	16,700 JE	17,200 E	23,700 E	NA	NA	NA	NA	NA	NA	NA
Lead	SB	644	644	786 JE*	15.8 JE*	6,350 JE*	15.9 JE*	4,220 JE*	389 JE*	9.1 J	244 J	359 JE*	152 E*	9.7 E*	101 E*	2,030 JE*	1,840 JE*	13.9 JE*	684 JE*	4,240 JE	1,730 JE
Magnesium	SB	7,094	7,094	NA	NA	NA	NA	NA	NA	NA	NA	2,770	23,800	16,300	NA	NA	NA	NA	NA	NA	NA
Manganese	SB	424	424	NA	NA	NA	NA	NA	NA	NA	NA	1,250 JE*	516 E*	363 JE*	NA	NA	NA	NA	NA	NA	NA
Mercury	0.1	0.844	0.1	NA	NA	NA	NA	NA	NA	NA	NA	0.162	0.028 B	0.014 B	NA	NA	NA	NA	NA	NA	NA
Nickel	13 or SB	31	31	NA	NA	NA	NA	NA	NA	NA	NA	36.5 JE*	12 E*	29.3 JE*	NA	NA	NA	NA	NA	NA	NA
Potassium	SB	1,174	1,174	NA	NA	NA	NA	NA	NA	NA	NA	1,800 *	2,230 *	2,760 *	NA	NA	NA	NA	NA	NA	NA
Selenium	2 or SB	2.7	2.7	NA	NA	NA	NA	NA	NA	NA	NA	2 B	1.4 B	0.69 B	NA	NA	NA	NA	NA	NA	NA
Silver	SB	0.45	0.45	NA	NA	NA	NA	NA	NA	NA	NA	0.07 B	0.09 U	0.08 U	NA	NA	NA	NA	NA	NA	NA
Sodium	SB	132	132	NA	NA	NA	NA	NA	NA	NA	NA	288 B	1,530	180 B	NA	NA	NA	NA	NA	NA	NA
Thallium	SB	1.3	1.3	NA	NA	NA	NA	NA	NA	NA	NA	0.88 B	0.62 U	0.97 B	NA	NA	NA	NA	NA	NA	NA
Vanadium	150 or SB	26	150	NA	NA	NA	NA	NA	NA	NA	NA	21.4 JE	20.2 E	28.1 JE	NA	NA	NA	NA	NA	NA	NA
Zinc	20 or SB	556	556	NA	NA	NA	NA	NA	NA	NA	NA	392 *	119 *	86.9 *	NA	NA	NA	NA	NA	NA	NA

Notes:

1. TAGM Recommended Soil Cleanup Objective source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-92-4046) revised January 24, 1994.
2. Site background values for inorganic analytes were determined by averaging the results from the five background samples.
3. The regulatory values for inorganic analytes were determined by using the higher of the TAGM and average site background values.
4. Shaded boxes represent exceedances of the regulatory value
5. (-) = No regulatory value is associated with this analyte.
6. ug/Kg = micrograms per Kilogram (equivalent to parts per billion (ppb)).
7. mg/Kg = milligrams per Kilogram (equivalent to parts per million (ppm)).
8. Values for FP-SPXX-RB, FP-TBXX-RB, FP-SPXX-TRIP01 and FP-TBXX-TRIP02 are listed in micrograms per Liter (ug/L).
9. NA = parameter was not analyzed.
10. Only analytes detected in one or more samples are shown.
11. FP-SP05-D3 58-S-O was mistakenly submitted as FP-SP05-D26-S-O on the chain of custody.
12. Definitions of data qualifiers are presented in Table 16.

Table 11
Franczyk Park Site SI/RAR
Summary of Analytical Results
Subsurface Fill Samples

	TAGM REC. SOIL CLEANUP OBJECTIVE	SITE BACKGROUND VALUE	REGULATORY VALUE	FP-SP30-D2.24-S-O	FP-SP30-D47.5-S-O	FP-SP31-D0.82.5-S-O	FP-SP33-D0.83.7-S-O	FP-SP34-D35-S-O	FP-SP34-D58-S-O	FP-SP35-D66.6-S-O	FP-SP38-D0.75.5-S-O	FP-SP39-D0.35.5-S-O	FP-SP44-D47.3-S-O	FP-SP45-D6.58.8-S-O	FP-SP48-D1.25-S-O
Interval Sampled (feet bgs):				2.2 - 4	4 - 7.5	0.8 - 2.5	0.8 - 3.7	3 - 5	5 - 8	6 - 6.6	0.7 - 5.5	0.3 - 5.5	4 - 7.3	6.5 - 8.8	1.2 - 5
Fill/Soil Type:				H	Native	D	B	G	Native	I	B	C	C	B	C
Date Collected:				11/5/2003	11/5/2003	11/5/2003	11/5/2003	11/5/2003	11/5/2003	11/5/2003	11/5/2003	11/5/2003	11/6/2003	11/6/2003	11/6/2003
Volatile Organic Compounds (ug/Kg)															
2-Butanone	300	-	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13
Acetone	200	-	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	54
Methylene chloride	100	-	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15 U
Tetrachloroethene	1,400	-	1,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12 U
Semi-Volatile Organic Compounds (ug/Kg)															
2,4-Dichlorophenol	400	-	400	430 U	380 U	2,000 U	4,100 U	2,100 U	390 U	4,400 U	4,400 U	4,100 U	2,100 U	390 U	4,100 U
2,4-Dimethylphenol	-	-	-	430 U	380 U	2,000 U	4,100 U	2,100 U	390 U	4,400 U	4,400 U	4,100 U	2,100 U	390 U	4,100 U
2-Methylnaphthalene	36,400	-	36,400	430 U	380 U	2,000 U	4,100 U	200 J	390 U	4,400 U	4,400 U	210 J	180 J	25 J	710 J
4-Methylphenol	900	-	900	430 U	380 U	2,000 U	4,100 U	2,100 U	390 U	4,400 U	4,400 U	4,100 U	2,100 U	390 U	4,100 U
Acenaphthene	50,000	-	50,000	430 U	380 U	240 J	160 J	100 J	390 U	260 J	190 J	1,200 J	710 J	180 J	2,100 J
Acenaphthylene	41,000	-	41,000	430 U	380 U	260 J	160 J	85 J	390 U	4,400 U	4,400 U	280 J	260 J	79 J	440 J
Anthracene	50,000	-	50,000	430 U	380 U	1,100 J	490 J	280 J	390 U	890 J	650 J	2,700 J	2,200	1,100	6,300
Benzo(a)anthracene	224	-	224	35 J	380 U	3,400	2,100 J	960 J	390 U	2,800 J	1,900 J	6,700	5,900	2,300	12,000
Benzo(a)pyrene	61	-	61	27 J	380 U	3,000	1,900 J	880 J	390 U	2,500 J	1,700 J	5,600	5,000	1,800	9,400
Benzo(b)fluoranthene	1,100	-	1,100	82 J	380 U	2,500	2,100 J	940 J	390 U	2,800 J	1,400 J	5,400	6,600	3,200	10,000
Benzo(ghi)perylene	50,000	-	50,000	39 J	380 U	1,700 J	630 J	360 J	390 U	740 J	510 J	1,600 J	2,000 J	810	5,200
Benzo(k)fluoranthene	1,100	-	1,100	430 U	380 U	2,400	1,600 J	980 J	390 U	2,000 J	1,800 J	5,500	2,600	2,700	4,800
Bis(2-ethylhexyl) phthalate	50,000	-	50,000	48 J	37 J	2,000 U	300 J	120 J	39 J	510 J	370 J	4,100 U	130 J	32 J	4,100 U
Butyl benzyl phthalate	50,000	-	50,000	430 U	380 U	2,000 U	2,600 J	73 J	390 U	2,300 J	610 J	4,100 U	69 J	390 U	4,100 U
Carbazole	-	-	-	430 U	380 U	600 J	180 J	120 J	390 U	260 J	290 J	1,200 J	940 J	250 J	2,100 J
Chrysene	400	-	400	43 J	380 U	3,300	2,000 J	1,000 J	390 U	2,800 J	1,800 J	6,400	5,400	2,000	9,900
Di-n-butyl phthalate	8,100	-	8,100	430 U	380 U	2,000 U	4,100 U	2,100 U	390 U	4,400 U	4,400 U	4,100 U	2,100 U	950 U	4,100 U
Di-n-octyl phthalate	50,000	-	50,000	430 U	380 U	2,000 U	4,100 U	2,100 U	11 J	4,400 U	4,400 U	4,100 U	2,100 U	390 U	4,100 U
Dibenzo(a,h)anthracene	14	-	14	430 U	380 U	770 J	330 J	170 J	390 U	390 J	260 J	950 J	1,100 J	440	2,500 J
Dibenzofuran	6,200	-	6,200	430 U	380 U	270 J	4,100 U	83 J	390 U	160 J	140 J	720 J	570 J	150 J	1,600 J
Diethyl phthalate	7,100	-	7,100	430 U	380 U	2,000 U	4,100 U	2,100 U	390 U	4,400 U	4,400 U	4,100 U	2,100 U	390 U	4,100 U
Fluoranthene	50,000	-	50,000	88 J	380 U	11,000	4,500	2,100 U	17 J	6,900	5,400	16,000	12,000	5,200 D	24,000
Fluorene	50,000	-	50,000	430 U	380 U	380 J	170 J	120 J	390 U	340 J	290 J	1,300 J	850 J	340 J	2,800 J
Indeno(1,2,3-cd)pyrene	3,200	-	3,200	37 J	380 U	1,700 J	750 J	370 J	390 U	870 J	580 J	2,000 J	2,200	900	5,300
Naphthalene	13,000	-	13,000	430 U	380 U	110 J	4,100 U	2,100 U	390 U	4,400 U	4,400 U	500 J	390 J	63 J	1,100 J
Phenanthrene	50,000	-	50,000	47 J	380 U	6,200	2,300 J	1,400 J	390 U	3,800 J	3,500 J	13,000	8,200	3,900 D	26,000
Phenol	30	-	30	430 U	380 U	2,000 U	4,100 U	2,100 U	390 U	4,400 U	4,400 U	4,100 U	2,100 U	15 J	4,100 U
Pyrene	50,000	-	50,000	63 J	380 U	7,100	3,000 J	1,500 J	10 J	4,700	3,000 J	10,000	7,100	2,900	18,000
Total SVOCs	500,000	-	500,000	**509**	**37**	**46,010**	**25,270**	**9,741**	**467**	**34,820**	**24,390**	**81,260**	**64,399**	**28,384**	**144,250**
Pesticides / PCBs (ug/Kg)															
4,4'-DDT	2,100	-	2,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	26 JP
Aldrin	41	-	41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	33 J
alpha-BHC	110	-	110	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22 U
beta-BHC	200	-	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22 U
delta-BHC	300	-	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22 U
Dieldrin	44	-	44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	54 JP
Endosulfan II	900	-	900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42 U
Endrin	100	-	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42 U
Endrin aldehyde	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42 U
Endrin ketone	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	41 J
gamma-BHC (Lindane)	60	-	60	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22 U
gamma-Chlordane	540	-	540	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.3 NJP
Heptachlor epoxide	20	-	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.9 J
Methoxychlor	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	220 U
TAL - Metals (mg/Kg)															
Aluminum	SB	9,126	9,126	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10,600 JE
Antimony	SB	2.5	2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22.1 J
Arsenic	7.5 or SB	18	18	84.8 JE	7.5 JE	74.1 JE	44.2 E	379 JE	8.3 JE	32.5 JE	50.4 JE	928 JE	159 JE	20.3 E	100 JE
Barium	300 or SB	239	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	187 JE*
Beryllium	0.16 or SB	0.64	0.64	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.82 JE
Cadmium	1 or SB	0.98	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.7 JN
Calcium	SB	18,840	18,840	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99,800 JE
Chromium	10 or SB	25	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	49.5 JE
Cobalt	30 or SB	7	30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.5 JE
Copper	25 or SB	86	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	417 JE
Cyanide	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 U
Iron	2,000 or SB	22,140	22,140	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23,700 JE
Lead	SB	644	644	37.8 JE	13.3 JE	552 JE	97.1 E	4,920 JE	23.5 JE	475 JE	1,810 JE	1,600 JE	1,180 E	19.2 JE	2,660 JE
Magnesium	SB	7,094	7,094	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,360 JE
Manganese	SB	424	424	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,050 JE
Mercury	0.1	0.844	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1
Nickel	13 or SB	31	31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15 JE
Potassium	SB	1,174	1,174	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,650 JE
Selenium	2 or SB	2.7	2.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.1
Silver	SB	0.45	0.45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1 B
Sodium	SB	132	132	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	777
Thallium	SB	1.3	1.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.9
Vanadium	150 or SB	26	150	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42.8 JE
Zinc	20 or SB	556	556	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	953 JE

Notes:

1. TAGM Recommended Soil Cleanup Objective source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-92-4046) revised January 24, 1994.
2. Site background values for inorganic analytes were determined by averaging the results from the five background samples.
3. The regulatory values for inorganic analytes were determined by using the higher of the TAGM and average site background values.
4. Shaded boxes represent exceedances of the regulatory value.
5. (-) = No regulatory value is associated with this analyte.
6. ug/Kg = micrograms per Kilogram (equivalent to parts per billion (ppb)).
7. mg/Kg = milligrams per Kilogram (equivalent to parts per million (ppm)).
8. Values for FP-SPXX-RB, FP-TBXX-RB, FP-SPXX-TRIP01 and FP-TBXX-TRIP02 are listed in micrograms per Liter (ug/L).
9. NA = parameter was not analyzed.
10. Only analytes detected in one or more samples are shown.
11. FP-SP05-D3.58-S-O was mistakenly submitted as FP-SP05-D28-S-O on the chain of custody.
12. Definitions of data qualifiers are presented in Table 16.

Table 11
Franczyk Park Site SI/RAR
Summary of Analytical Results
Subsurface Fill Samples

	TAGM REC. SOIL CLEANUP OBJECTIVE	SITE BACKGROUND VALUE	REGULATORY VALUE	FP-SP48-D56.5-S-O	FP-SP48-D6.510.4-S-O	FP-SP53-D1.54.5-S-O	FP-SP56-D13.5-S-O	FP-TB01-D910-S-O	FP-TB02-D69-S-O	FP-TB03-D77.5-S-O	FP-TB03-D810-S-O	FP-TB04-D24-S-O	FP-TB04-D24.5-S-O	FP-TB05-D24-S-O	FP-TB05-D24.5-S-O	FP-TB06-D24-S-0	FP-TBXX-RB	FP-SPXX-RB	FP-SPXX-TRIP01	FP-TBXX-TRIP02
Interval Sampled (feet bgs):				5 - 6.5	6.5 - 10.4	1.5 - 4.5	1 - 3.5	9 - 10	6 - 9	7 - 7.5	8 - 10	2 - 4	2 - 4.5	2 - 4	2 - 4.5	2 - 4	-	-	-	-	-
Fill/Soil Type:				B	Native	B	B	B	C	H	B	B	B	E	E	C	-	-	-	-	-
Date Collected:				11/6/2003	11/6/2003	11/6/2003	3/6/2004	11/17/2003	11/17/2003	11/17/2003	11/17/2003	11/18/2003	11/18/2003	11/18/2003	11/18/2003	11/19/2003	11/18/2003	11/6/2003	11/6/2003	11/18/2003
Volatile Organic Compounds (ug/Kg)																				
2-Butanone	300	-	300	13 U	12 U	NA	NA	NA	NA	NA	15 U	NA	NA	13 UJ	NA	NA	10 U	10 U	10 U	10 U
Acetone	200	-	200	23	12 U	NA	NA	NA	NA	NA	14 J	NA	NA	33 J	NA	NA	10 U	10 U	10 U	10 U
Methylene chloride	100	-	100	13 U	14 U	NA	NA	NA	NA	NA	16	NA	NA	7 J	NA	NA	10 U	10 U	10 U	10 U
Tetrachloroethene	1,400	-	1,400	13 U	12 U	NA	NA	NA	NA	NA	15 U	NA	NA	13 UJ	NA	NA	10 U	10 U	10 U	10 U
Semi-Volatile Organic Compounds (ug/Kg)																				
2,4-Dichlorophenol	400	-	400	2,100 U	400 U	1,900 U	2,300 U	380 U	2,100 U	440 U	490 U	420 U	390 U	NA	25 J	430 U	10 U	10 U	NA	NA
2,4-Dimethylphenol	-	-	-	2,100 U	400 U	1,900 U	2,300 U	24 J	2,100 U	440 U	490 U	420 U	390 U	NA	430 U	430 U	10 U	10 U	NA	NA
2-Methylnaphthalene	36,400	-	36,400	2,100 U	400 U	1,900 U	640 J	380 U	2,100 U	440 U	490 U	160 J	83 J	NA	150 J	430 U	10 U	10 U	NA	NA
4-Methylphenol	900	-	900	2,100 U	400 U	1,900 U	310 J	380 U	2,100 U	440 U	490 U	110 J	10 J	NA	430 U	430 U	10 U	10 U	NA	NA
Acenaphthene	50,000	-	50,000	110 J	400 U	260 J	3,500	380 U	170 J	34 J	490 U	120 J	140 J	NA	430	430 U	10 U	10 U	NA	NA
Acenaphthylene	41,000	-	41,000	2,100 U	400 U	1,900 U	1,200 J	380 U	87 J	440 U	490 U	44 J	53 J	NA	29 J	430 U	10 U	10 U	NA	NA
Anthracene	50,000	-	50,000	390 J	400 U	950 J	8,000 DJ	380 U	580 J	83 J	490 U	280 J	480	NA	850	13 J	10 U	10 U	NA	NA
Benzo(a)anthracene	224	-	224	1,200 J	51 J	1,700 J	14,000	380 U	2,000 J	130 J	30 J	870	880	NA	2,400	25 J	10 U	10 U	NA	NA
Benzo(a)pyrene	61	-	61	1,000 J	29 J	1,400 J	8,700	380 U	1,900 J	80 J	20 J	740	590	NA	1,800	15 J	10 U	10 U	NA	NA
Benzo(b)fluoranthene	1,100	-	1,100	1,200 J	48 J	1,300 J	9,400 J	380 U	1,800 J	51 J	17 J	600	530	NA	1,800	20 J	10 U	10 U	NA	NA
Benzo(ghi)perylene	50,000	-	50,000	550 J	14 J	660 J	1,400 J	380 U	1,100 J	34 J	490 U	410 J	330 J	NA	800	430 U	10 U	10 U	NA	NA
Benzo(k)fluoranthene	1,100	-	1,100	660 J	18 J	980 J	6,400 J	380 U	1,200 J	96 J	25 J	840	580	NA	1,600	14 J	10 U	10 U	NA	NA
Bis(2-ethylhexyl) phthalate	50,000	-	50,000	2,100 U	46 J	120 J	2,300 U	380 U	2100 U	440 U	490 U	420 U	390 U	NA	430 U	63 J	2 J	10 U	NA	NA
Butyl benzyl phthalate	50,000	-	50,000	2,100 U	400 U	1,500 J	2,300 U	380 U	2100 U	440 U	490 U	420 U	390 U	NA	430 U	430 U	10 U	10 U	NA	NA
Carbazole	-	-	-	140 J	400 U	280 J	3,000	18 J	140 J	16 J	490 U	140 J	250 J	NA	530	430 U	10 U	10 U	NA	NA
Chrysene	400	-	400	1,100 J	40 J	1,600 J	7,600	380 U	1,900 J	120 J	25 J	820	780	NA	2,300	22 J	10 U	10 U	NA	NA
Di-n-butyl phthalate	8,100	-	8,100	2,100 U	400 U	1,900 U	2,300 U	380 U	2,100 U	19 J	32 J	53 J	22 J	NA	25 J	15 J	10 U	10 U	NA	NA
Di-n-octyl phthalate	50,000	-	50,000	2,100 U	400 U	1,900 U	2,300 U	380 U	2,100 U	440 U	490 U	420 U	390 U	NA	430 U	430 U	0.4 J	10 U	NA	NA
Dibenzo(a,h)anthracene	14	-	14	250 J	400 U	330 J	160 J	380 U	510 J	19 J	490 U	220 J	180 J	NA	450	430 U	10 U	10 U	NA	NA
Dibenzofuran	6,200	-	6,200	80 J	400 U	200 J	3,500	380 U	94 J	16 J	490 U	110 J	170 J	NA	340 J	430 U	10 U	10 U	NA	NA
Diethyl phthalate	7,100	-	7,100	2,100 U	400 U	1,900 U	2,300 U	380 U	2,100 U	440 U	490 U	420 U	390 U	NA	430 U	430 U	0.7 J	10 U	NA	NA
Fluoranthene	50,000	-	50,000	2,700	150 J	3,700	28,000 D	380 U	4,100	220 J	80 J	1,600	1,600	NA	4,500 D	66 J	10 U	10 U	NA	NA
Fluorene	50,000	-	50,000	150 J	400 U	420 J	5,600	380 U	180 J	43 J	490 U	120 J	320 J	NA	560	430 U	10 U	10 U	NA	NA
Indeno(1,2,3-cd)pyrene	3,200	-	3,200	580 J	15 J	690 J	1,900 J	380 U	1,100 J	34 J	490 U	420	360 J	NA	860	430 U	10 U	10 U	NA	NA
Naphthalene	13,000	-	13,000	2,100 U	400 U	72 J	1,600 J	380 U	57 J	440 U	490 U	97 J	79 J	NA	300 J	430 U	10 U	10 U	NA	NA
Phenanthrene	50,000	-	50,000	1,600 J	62 J	3,000	16,000	19 J	2,300	250 J	70 J	1,400	2,000	NA	4,200 D	67 J	10 U	10 U	NA	NA
Phenol	30	-	30	2,100 U	400 U	1,900 U	2,300 U	380 U	2,100 U	440 U	490 U	420 U	390 U	NA	430 U	430 U	10 U	10 U	NA	NA
Pyrene	50,000	-	50,000	1,900 J	98 J	3,000	18,000 DJ	380 U	3,200	230 J	58 J	1,500	1,500 J	NA	3,200	39 J	10 U	10 U	NA	NA
Total SVOCs	500,000	-	500,000	**13,610**	**571**	**22,142**	**137,510**	**61**	**22,418**	**1,475**	**1,317**	**10,654**	**11,187**	NA	**27,579**	**789**				
Pesticides / PCBs (ug/Kg)																				
4,4'-DDT	2,100	-	2,100	16 U	3.9 U	NA	NA	NA	NA	NA	4.8 U	NA	NA	NA	13 NJP	NA	0.096 U	0.11 U	NA	NA
Aldrin	41	-	41	8.5 U	2 U	NA	NA	NA	NA	NA	2.5 U	NA	NA	NA	11 U	NA	0.048 U	0.054 U	NA	NA
alpha-BHC	110	-	110	8.5 U	2 U	NA	NA	NA	NA	NA	2.5 U	NA	NA	NA	11 U	NA	0.048 U	0.054 U	NA	NA
beta-BHC	200	-	200	8.5 U	2 U	NA	NA	NA	NA	NA	2.5 U	NA	NA	NA	11 U	NA	0.048 U	0.054 U	NA	NA
delta-BHC	300	-	300	3.6 J	2 U	NA	NA	NA	NA	NA	2.5 U	NA	NA	NA	11 U	NA	0.048 U	0.054 U	NA	NA
Dieldrin	44	-	44	53 JP	3.9 U	NA	NA	NA	NA	NA	4.8 U	NA	NA	NA	21 U	NA	0.096 U	0.11 U	NA	NA
Endosulfan II	900	-	900	16 U	3.9 U	NA	NA	NA	NA	NA	4.8 U	NA	NA	NA	8 JP	NA	0.096 U	0.11 U	NA	NA
Endrin	100	-	100	7.7 NJP	3.9 U	NA	NA	NA	NA	NA	4.8 U	NA	NA	NA	8.1 JP	NA	0.096 U	0.11 U	NA	NA
Endrin aldehyde	-	-	-	16 U	3.9 U	NA	NA	NA	NA	NA	4.8 U	NA	NA	NA	21 U	NA	0.096 U	0.11 U	NA	NA
Endrin ketone	-	-	-	16 U	3.9 U	NA	NA	NA	NA	NA	4.8 U	NA	NA	NA	34 JP	NA	0.096 U	0.11 U	NA	NA
gamma-BHC (Lindane)	60	-	60	8.5 U	2 U	NA	NA	NA	NA	NA	2.5 U	NA	NA	NA	11 U	NA	0.048 U	0.054 U	NA	NA
gamma-Chlordane	540	-	540	8.5 U	2 U	NA	NA	NA	NA	NA	2.5 U	NA	NA	NA	11 U	NA	0.048 U	0.054 U	NA	NA
Heptachlor epoxide	20	-	20	5.1 JP	2 U	NA	NA	NA	NA	NA	2.5 U	NA	NA	NA	11 U	NA	0.048 U	0.054 U	NA	NA
Methoxychlor	-	-	-	31 J	20 U	NA	NA	NA	NA	NA	25 U	NA	NA	NA	110 U	NA	0.48 U	0.54 U	NA	NA
TAL - Metals (mg/Kg)																				
Aluminum	SB	9,126	9,126	12,000 JE	16,500 JE	NA	NA	NA	NA	NA	5,850 J	NA	NA	NA	2,070 J	NA	89.2 B	113 B	NA	NA
Antimony	SB	2.5	2.5	4 JBN	1.9 JBN	NA	NA	NA	NA	NA	2.2 JB	NA	NA	NA	8.4 J	NA	4.3 B	3.9 U	NA	NA
Arsenic	7.5 or SB	18	18	26.9 JE	8 JE	15.7 JE	NA	1.2 JBN*	67 JN*	6.1 JN*	10.4 N*	9.9 JN*	8.6 JN*	NA	127 N*	52.9 JN*	4 B	3.4 U	NA	NA
Barium	300 or SB	239	300	121 JE*	108 JE*	NA	NA	NA	NA	NA	159 J	NA	NA	NA	132 J	NA	9.1 B	1.4 B	NA	NA
Beryllium	0.16 or SB	0.64	0.64	0.7 JE	0.5 JE	NA	NA	NA	NA	NA	0.27 JB	NA	NA	NA	0.27 JB	NA	0.14 B	0.1 U	NA	NA
Cadmium	1 or SB	0.98	1	0.88 JN	0.02 JNU	NA	NA	NA	NA	NA	0.03 UJ	NA	NA	NA	0.03 UJ	NA	0.2 U	0.2 U	NA	NA
Calcium	SB	18,840	18,840	66,800 JE	41,400 JE	NA	NA	NA	NA	NA	6,360 J	NA	NA	NA	30,700 J	NA	258 B	258 B	NA	NA
Chromium	10 or SB	25	25	41.6 JE	22.8 JE	NA	NA	NA	NA	NA	14.6 J	NA	NA	NA	7.9 J	NA	0.6 U	0.6 U	NA	NA
Cobalt	30 or SB	7	30	6.7 JBE	11.5 JE	NA	NA	NA	NA	NA	2 JB	NA	NA	NA	5.6 JB	NA	0.7 U	0.7 U	NA	NA
Copper	25 or SB	86	86	207 JE	27.2 JE	NA	NA	NA	NA	NA	11.3 J	NA	NA	NA	329 J	NA	0.89 B	0.8 U	NA	NA
Cyanide	-	-	-	1.2 U	1.1 U	NA	NA	NA	NA	NA	1.4 U	NA	NA	NA	1.3 U	NA	10 U	10 U	NA	NA
Iron	2,000 or SB	22,140	22,140	17,000 JE	27,400 JE	NA	NA	NA	NA	NA	2,080 J	NA	NA	NA	38,300 J	NA	93.4 B	109	NA	NA
Lead	SB	644	644	316 JE	17.3 JE	137 JE	NA	5 J*	91.2 J*	41.3 J*	73.7 J*	259 J*	109 J*	NA	810 J*	1,480 J*	1.9 U	1.9 U	NA	NA
Magnesium	SB	7,094	7,094	11,100 JE	16,900 JE	NA	NA	NA	NA	NA	882 J	NA	NA	NA	977 J	NA	55.5 B	75.4 B	NA	NA
Manganese	SB	424	424	1,120 JE	378 JE	NA	NA	NA	NA	NA	32.4 J	NA	NA	NA	220 J	NA	1.3 B	1.8 B	NA	NA
Mercury	0.1	0.844	0.1	0.431	0.045 B	NA	NA	NA	NA	NA	0.063 JBN	NA	NA	NA	1 JN	NA	0.055 U	0.055 U	NA	NA
Nickel	13 or SB	31	31	11.8 JE	27.5 JE	NA	NA	NA	NA	NA	2 J	NA	NA	NA	9.8 J	NA	1.4 B	1 B	NA	NA
Potassium	SB	1,174	1,174	3,670 JE	3,370 JE	NA	NA	NA	NA	NA	1,050 J	NA	NA	NA	1,660 J	NA	24.9 U	38.9 B	NA	NA
Selenium	2 or SB	2.7	2.7	1.8 B	1.3 B	NA	NA	NA	NA	NA	0.61 U	NA	NA	NA	4.2 B	NA	4.1 U	4.1 U	NA	NA
Silver	SB	0.45	0.45	0.45 B	0.08 B	NA	NA	NA	NA	NA	0.09 U	NA	NA	NA	2.4	NA	0.6 U	0.6 U	NA	NA
Sodium	SB	132	132	654 B	296 B	NA	NA	NA	NA	NA	135 B	NA	NA	NA	158 B	NA	206 U	206 U	NA	NA
Thallium	SB	1.3	1.3	1.5	1.3	NA	NA	NA	NA	NA	0.86 B	NA	NA	NA	2.5	NA	4 U	4 U	NA	NA
Vanadium	150 or SB	26	150	33.7 JE	30.5 JE	NA	NA	NA	NA	NA	23.3 J	NA	NA	NA	15.5 J	NA	0.6 U	0.6 U	NA	NA
Zinc	20 or SB	556	556	456 JE	73.6 JE	NA	NA	NA	NA	NA	123 J	NA	NA	NA	585 JEN*	NA	1.3 U	1.6 B	NA	NA

Notes:

1. TAGM Recommended Soil Cleanup Objective source is NYSDEC Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels (HWR-92-4046) revised January 24, 1994.
2. Site background values for inorganic analytes were determined by averaging the results from the five background samples.
3. The regulatory values for inorganic analytes were determined by using the higher of the TAGM and average site background values.
4. Shaded boxes represent exceedances of the regulatory value.
5. (-) = No regulatory value is associated with this analyte.
6. ug/Kg = micrograms per Kilogram (equivalent to parts per billion (ppb)).
7. mg/Kg = milligrams per Kilogram (equivalent to parts per million (ppm)).
8. Values for FP-SPXX-RB, FP-TBXX-RB, FP-SPXX-TRIP01 and FP-TBXX-TRIP02 are listed in micrograms per Liter (ug/L).
9. NA = parameter was not analyzed.
10. Only analytes detected in one or more samples are shown.
11. FP-SP05-D3.58-S-O was mistakenly submitted as FP-SP05-D28-S-O on the chain of custody.
12. Definitions of data qualifiers are presented in Table 16.

Table 12
Franczyk Park Site SI/RAR
Summary of Analytical Results
TCLP Lead and Arsenic

Sample ID	Interval Sampled (feet bgs):	Fill/Soil Type:	Date Collected:	TCLP Concentration (ug/L)		Total Concentration (mg/kg)	
				Arsenic	Lead	Arsenic	Lead
FP-SP04-D1.54-S-O	1.5 - 4	B	3/6/2004	NA	336	97.7 JN*	6,350 JE *
FP-SP23-D13.5-S-O	1 - 3.5	B	3/6/2004	144	NA	756 JN *	2,030 JE *
FP-SP02-D10.811.5-S-O	10.8 - 11.5	C	3/6/2004	3,580	NA	560 JN *	15.8 JE*
FP-SP39-D0.35.5-S-O	0.3 - 5.5	C	3/6/2004	165	NA	928 JE	1,600 JE
FP-SP28-D1.23.5-S-O	1.2 - 3.5	E	3/6/2004	NA	1,350	421 JE	4,240 JE
FP-SP34-D35-S-O	3 - 5	G	3/6/2004	NA	38.4	379 JE	4,920 JE
FP-SP05-D23.5-S-O	2 - 3.5	H	3/6/2004	NA	1,850	149 JN *	4,220 JE *
FP-SP55-D11.3-S-O	1 - 1.3	B	3/6/2004	5,130	245	NA	NA
FP-SP56-D13.5-S-O	1 - 3.5	B	3/6/2004	2,490	22.8	NA	NA
FP-SP57-D0.81-S-O	0.8 - 1	B	3/6/2004	108	39,400	NA	NA
FP-SP58-D3.54-S-O	3.5 - 4	B	3/6/2004	NA	2,750	NA	NA
FP-SP59-D0.81-S-O	0.8 - 1	B	3/6/2004	121	NA	NA	NA
FP-Micro01-D4.55.5-S-O	4.5 - 5.5	E	3/6/2004	10 U	6 U	NA	NA

Notes:

1. The regulatory level for Arsenic and Lead is 5,000 ug/L
2. 40 CRF Part 261.24 is the source of the regulatory value, which lists the maximum contaminant levels for the toxicity characteristic for deterimining if a solid waste is defined as a hazardous waste.
3. Shaded boxes represent exceedances of the regulatory value.
4. (-) = No regulatory value is associated with this analyte.
5. ug/L = micrograms perLiter (equivalent to parts per billion (ppb)).
6. NA = parameter was not analyzed.
7. Definitions of data qualifiers are presented in Table 16.

Table 13
Franczyk Park Site SI/RAR
Summary of Analytical Results
Groundwater Samples - November 21, 2003

Date Collected:	REGULATORY VALUE	FP-MW01-GW-O 11/21/2003		FP-MW02-GW-O 11/21/2003		FP-MW03-GW-O 11/21/2003		FP-MWXX-GW-FD 11/21/2003		FP-MW04-GW-O 11/21/2003		FP-MW05-GW-O 11/21/2003		FP-MW06-GW-O 11/21/2003		FP-MWXX-RB 11/21/2003		FP-MWXX-TB 11/21/2003	
Volatile Organic Compounds (ug/L)																			
4-Methyl-2-pentanone	-	88	J	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U
Acetone	50	73	J	10	UJ	10	UJ	10	UJ	50	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Benzene	1	68	J	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U
Toluene	5	37	J	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U
Trichloroethene	5	34	J	10	U	10	U	10	U	50	U	10	U	10	U	10	U	10	U
Semi-Volatile Organic Compounds (ug/L)																			
2,4-Dimethylphenol	50	280	D	10	U	10	U	9	U	10	UJ	10	U	10	U	10	U	NA	
2-Methylnaphthalene	-	14		10	U	10	U	9	U	10	UJ	10	U	10	U	10	U	NA	
2-Methylphenol	-	170	D	10	U	10	U	9	U	10	UJ	10	U	10	U	10	U	NA	
4-Methylphenol	-	74		10	U	4	J	4	J	10	UJ	10	U	10	U	10	U	NA	
Acenaphthene	20	8	J	10	U	10	U	9	U	10	UJ	10	U	10	U	10	U	NA	
Acetophenone	-	5	J	10	U	0.6	J	9	U	10	UJ	10	U	10	U	10	U	NA	
Benzaldehyde	-	4	J	10	U	0.7	J	9	U	10	UJ	10	U	10	U	10	U	NA	
Biphenyl	-	3	J	10	U	10	U	9	U	10	UJ	10	U	10	U	10	U	NA	
Bis(2-ethylhexyl) phthalate	5	10	U	3	J	10		9	U	0.6	J	1	J	10	U	10	U	NA	
Butyl benzyl phthalate	50	10	U	10	U	10	U	9	U	10	UJ	0.5	J	10	U	10	U	NA	
Caprolactam	-	10	UJ	5	J	10	U	6	J	10	UJ	10	U	10	U	6	J	NA	
Carbazole	-	22		10	U	10	U	9	U	10	UJ	10	U	10	U	10	U	NA	
Di-n-butyl phthalate	50	2	J	0.5	J	0.9	J	0.6	J	1	J	1	J	10	U	10	U	NA	
Dibenzofuran	-	7	J	10	U	10	U	9	U	10	UJ	10	U	10	U	10	U	NA	
Diethyl phthalate	50	10	U	10	U	1	J	9	U	10	UJ	10	U	10	U	10	U	NA	
Fluorene	50	8	J	10	U	10	U	9	U	0.3	J	10	U	10	U	10	U	NA	
Naphthalene	10	130	D	10	U	10	U	9	U	10	UJ	0.4	J	10	U	10	U	NA	
Pentachlorophenol	1	2	J	25	U	24	U	24	U	24	UJ	24	U	24	U	25	U	NA	
Phenanthrene	50	7	J	3	J	0.9	J	0.7	J	4	J	2	J	10	U	10	U	NA	
Pesticides (ug/L)																			
4,4'-DDT	0.2	0.096	U	0.059	NJP	0.096	U	0.096	U	0.092	J	0.097	U	0.097	U	0.098	U	NA	
Dieldrin	0.004	0.096	U	0.037	NJ	0.096	U	0.096	U	0.05	J	0.097	U	0.097	U	0.098	U	NA	
Endrin	Non - Detect	0.044	J	0.1	U	0.096	U	0.096	U	0.096	U	0.097	U	0.097	U	0.098	U	NA	
gamma-Chlordane	0.05	0.048	U	0.05	U	0.048	U	0.048	U	0.022	NJP	0.049	U	0.049	U	0.049	U	NA	
Methoxychlor	35	0.096	U	0.5	U	0.48	U	0.48	U	0.031	JP	0.49	U	0.49	U	0.49	U	NA	
TAL - Metals (ug/L)																			
Aluminum	-	737	U	822	U	306,000		302,000		485	U	268	U	144	U	233		NA	
Antimony	3	6.2	B	8.2	B	20.1	B	18.6	B	5.4	B	11	B	12	B	3.9	U	NA	
Arsenic	25	21.5		141		3.4	U	3.4	U	21.1		340		9.9	B	3.4	U	NA	
Barium	1,000	18.9	B	2.8	B	20.9	B	25.9	B	27.4	B	21.1	B	34.4	B	9.1	B	NA	
Beryllium	3	0.86	B	0.4	B	10		10.4		0.47	B	0.42	B	0.32	B	0.1	U	NA	
Cadmium	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	1.2	B	0.2	U	NA	
Calcium	-	712,000		458,000		320,000		314,000		634,000		521,000		559,000		419	B	NA	
Chromium	50	2.4	B	0.6	U	31.9		30.4		3.2	B	0.6	U	0.6	U	0.6	U	NA	
Cobalt	-	5.2	B	31	B	189		182		11.6	B	26.9	B	12.5	B	0.7	U	NA	
Copper	200	4.7	B	6.8	B	0.8	U	0.8	U	6.7	B	21.3	B	9.8	B	0.8	U	NA	
Cyanide (mg/L)	0.2	0.053	J	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	NA	
Iron	300	7,450		28,700		1,160,000		1,160,000		26,800		145,000		1,100		434		NA	
Lead	25	23.3		1.9	U	17.8		16.9		3.9		22.5		83		1.9	U	NA	
Magnesium	35,000	816,000		113,000		634,000		636,000		227,000		257,000		105,000		267	B	NA	
Manganese	300	48,500		2,470		14,800		14,400		5,160		4,960		1,330		7.9	B	NA	
Nickel	100	15.4	B	34	B	261		251		24.6	B	17.5	B	9.5	B	0.9	U	NA	
Potassium	-	1,600,000		53,100		83,300		81,500		186,000		150,000		39,100		92.4	B	NA	
Selenium	10	31	B	6.7	B	7.2	B	11.5	B	6.8	B	8.7	B	21.2	B	4.1	U	NA	
Silver	50	1.8	B	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	NA	
Sodium	20,000	392,000		130,000		93,200		90,900		164,000		89,700		36,300		279	B	NA	
Vanadium	-	15.4	B	1.8	B	88.7		84.5		1.1	B	2.1	B	0.6	U	0.6	U	NA	
Zinc	2,000	12.5	B	258		137		136		20.3		253		314		14.7	B	NA	

Notes:
1. Regulatory values for groundwater were derived from NYS Ambient Water Quality Standards TOGS 1.1.1 (Source of Drinking Water, Groundwater), June 1998.
2. Guidance value was used when was not standard is available.
3. (-) = No regulatory value is associated with this analyte.
4. Shaded boxes represent exceedances of the regulatory value.
5. ug/L = micrograms per Liter (equivalent to parts per billion (ppb)).
6. mg/L = milligrams per Liter (equivalent to parts per million (ppm)).
7. NA = parameter was not analyzed.
8. Only analytes detected in one or more samples are shown.
9. Definitions of data qualifiers are presented in Table 16.

Table 14
Franczyk Park Site SI/RAR
Summary of Analytical Results
Groundwater Samples - March 8, 2004

Date Collected:	REGULATORY VALUE	FP-MW01-GW-O 11/21/2003		FP-MW02-GW-O 11/21/2003		FP-MW03-GW-O 11/21/2003		FP-MW04-GW-O 11/21/2003		FP-MW05-GW-O 11/21/2003		FP-MWXX-GW-FD 11/21/2003		FP-MW06-GW-O 11/21/2003		FP-MICRO01-GW 11/21/2003		FP-MWXX-RB 11/21/2003	
TAL - Metals (ug/L)																			
Antimony	3	3.2	U	7	B	11	B	3.2	U	7.9	B	4.1	B	9.1	B	3.2	U	4.7	B
Arsenic	25	28.4		116		3.2	U	31.6		88.6		88		33.1		9.3	B	3.2	U
Beryllium	3	0.53	B	0.49	B	8.8		0.71	B	0.78	B	0.67	B	0.42	B	0.76	B	0.2	U
Lead	25	1.7	U	1.7	U	5		1.7	U	2.5	B	3.9		194		46.6		1.7	U
Nickel	100	28.8	B	28	B	126		26.1	B	7.6	B	7	B	10.4	B	4.2	B	2.7	B
Selenium	10	7.4	B	3.1	U	17.3	B	3.2	B	6.4	B	7.2	B	5.2	B	5.3	B	3.1	U

Notes:
1. Regulatory values for groundwater were derived from NYS Ambient Water Quality Standards TOGS 1.1.1 (Source of Drinking Water, Groundwater), June 1998.
2. Guidance value was used when was not standard is available.
3. (-) = No regulatory value is associated with this analyte.
4. Shaded boxes represent exceedances of the regulatory value.
5. ug/L = micrograms per Liter (equivalent to parts per billion (ppb)).
6. Definitions of data qualifiers are presented in Table 16.

Table 15
Franczyk Park Site SI/RAR
Summary of Analytical Results
Groundwater in the Interceptor Trenches

Date Collected:	REGULATORY VALUE	Fleming Street Trench			Lewis Street Trench		
		5/4/2001	4/3/2002	3/31/2003	5/4/2001	4/3/2002	3/31/2003
Metals (ug/L)							
Arsenic	25	970	NA	NA	75	NA	NA
Cadmium	5	20	NA	NA	6	NA	NA
Chromium	50	110	NA	NA	6	NA	NA
Copper	200	320	NA	NA	20	NA	NA
Lead	25	580	NA	NA	530	NA	NA
Mercury	0.7	NA	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	210	NA	NA
Selenium	10	NA	NA	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA	NA	NA
Zinc	2,000	2,000	8	120	8,700	8	90
Total Solids	-	3,500,000	NA	3,000	400,000	5,000	2,000
pH	6 - 8.5	7.06	7.75	8.5	7	7.57	8.5

Notes:
1. Regulatory values for groundwater were derived from NYS Ambient Water Quality Standards TOGS 1.1.1 (Source of Drinking Water, Groundwater), .
2. Guidance value was used when was not standard is available.
3. (-) = No regulatory value is associated with this analyte.
4. Shaded boxes represent exceedances of the regulatory value.
5. ug/L = micrograms per Liter (equivalent to parts per billion (ppb)).
6. NA = parameter was not analyzed.

Table 16
Franczyk Park Site SI/RAR
Definitions of Data Qualifiers

ORGANIC DATA QUALIFIERS	
ND or U	Indicates compound was analyzed for, but not detected.
J	Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
C	This flag applies to pesticide results where the identification has been confirmed by GC/MS.
B	This flag is used when the analyte is found in the associated blank, as well as in the sample.
E	This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.
D	This flag identifies all compounds identified in an analysis at the secondary dilution factor.
N	Indicates presumptive evidence of a compound. This flag is used for tentatively identified compounds, where the identification is based on the Mass Spectral library search. It is applied to all TIC results.
P	This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two valves is reported on the data page and flagged with a "P".
A	This flag indicates that a TIC is a suspected aldol-condensation product.
[1]	Indicates coelution.
*	Indicates analysis is not within the quality control limits.

Table 16
Franczyk Park Site SI/RAR
Definitions of Data Qualifiers

INORGANIC DATA QUALIFIERS	
ND or U	Indicates element was analyzed for, but not detected. Report with the detection limit value.
J	Indicates the associated value is an estimated quantity.
B	Indicates a value greater than or equal to the instrument detection limit, but less than the quantitation limit.
N	Indicates spike sample recovery is not within the quality control limits.
K	Indicates the post digestion spike recovery is not within the quality control limits.
S	Indicates value determined by the Method of Standard Addition.
M	Indicates duplication injection results exceeded quality control limits.
W	Post digestion spike for Furnace AA analysis is out of quality control limits (85-115%) while sample absorbance is less than 50% of spike absorbance.
E	Indicates a value estimated or not reported due to the presence of interferences.
H	Indicates analytical holding time exceedance. The value obtained should be considered an estimate.
*	Indicates analysis is not within the quality control limits.
+	Indicates the correlation coefficient for the Method of Standard Addition is less than 0.995.

Table 17
General Response Actions

Franczyk Park Site

General Response Actions		
Soil/Fill (Hazardous)	**Soil/Fill (Non-Hazardous)**	**Groundwater**
No action	No action	No action
Institutional controls	Institutional controls	Institutional controls
Containment (Cover System)	Containment (Cover System)	Groundwater monitoring
Excavation and off-site disposal	Excavation and off-site disposal	Installation of Additional Interceptor Trenches

Table 18
Development of Site-Wide Alternatives

Franczyk Park Site

Alternative Identifier	Name	Description	Areas of Concern		
			Soil/Fill (Hazardous)	Soil/Fill (Non-Hazardous)	Groundwater
A	"No Action"	Project site remains in current condition.	No action.	No action.	No action.
B	"Cover System Construction"	Install cover system (soil and asphalt) over entire site.	Containment with two feet of new soil or asphalt cover. Institutional controls (soil/fill management plan).	Containment with two feet of new soil or asphalt cover. Institutional controls (soil/fill management plan).	Institutional controls (water use restrictions). Groundwater monitoring.
C	"Limited Excavation and Augmentation"	Removal of hazardous soil, installation of additional trench, and augmentation of existing cover.	Excavate and dispose off-site all hazardous soil/fill.	Containment with soil or asphalt cover through augmentation of existing cover to a minimum thickness of two feet. Institutional controls (soil/fill management plan).	Containment through the installation of an interceptor trench along Fleming Street between the two existing trenches. Institutional controls (water use restrictions).
D	"Complete Excavation"	Excavate and dispose off-site all soil/fill.	Excavate and dispose off-site all hazardous soil/fill.	Excavate and dispose off-site all non-hazardous soil/fill.	No action.

Table 19
Comparison of Site Wide Alternatives

Franczyk Park Site

Criteria	Site Wide Remedial Alternatives							
	A "No Action"		B "Cover System Construction"		C "Limited Excavation and Augmentation"		D "Complete Excavation"	
	Rating/Score							
Overall Protection Of Human Health And The Environment	Low	1	Low-Medium	1.5	Medium-High	2.5	High	3
Compliance With SCGs	Low	1	Low	1	Medium	2	High	3
Short-Term Effectiveness	Low	1	Medium	2	Medium	2	Medium	2
Long-Term Effectiveness	Low	1	Medium	2	Medium-High	2.5	High	3
Reduction Of Toxicity, Mobility And Volume	Low	1	Low-Medium	1.5	Medium	2	High	3
Feasibility	Low	1	High	3	High	3	Low	1
Aggregate Score		6		11		14		15

Notes:

1) If the Site-Wide Remedial Alternative satisfies the criteria to a high degree it is assigned a score of 3.

2) If the Site-Wide Remedial Alternative satisfies the criteria to a moderate degree it is assigned a score of 2.

3) If the Site-Wide Remedial Alternative minimally satisfies the criteria it is assigned a score of 1.

Table 20
Franczyk Park Site
Cost Estimate - Alternative A
No Action

Item	Note	Unit	Quantity	Cost/Unit	Cost
No Action					
No Action	Implementation			$ -	
Total					**$0.00**

Notes:
Sources include:

2004 RS Means Environmental Remediation Cost Data-Assemblies 10th Edition (unit prices include a 30% markup for overhead and profit).
2004 RS Means Heavy Construction Cost Data 16th Edition.
Engineer's Estimate.

rt = round trip
cy = cubic yard
sy = square yard
lf = linear foot
sf = square foot
ton = 2,000 pounds

Table 21
Franczyk Park Site
Cost Estimate - Alternative B
Site-Wide Cover System

Item	Note	Unit	Quantity	Cost/Unit	Cost
Institutional Controls					
Deed Restrictions	Soil/Fill Management Plan	ls	1	$ 7,000.00	$7,000
Pre-Cover Activities					
Perimeter excavation	Track mounted excavator, 1cy	cy	1,893	$ 2.43	$4,599
Site Grading	300 HP Dozer	cy	8,548	$ 3.27	$27,951
Asphalt/Concrete Demolition	Bleacher pads and tennis/ basketball court	day	3	$ 837.43	$2,512
Remove Athletic Equipment	Three man crew	day	4	$ 1,331.22	$5,325
Removal Equipment	Backhoe and operator	day	4	$ 663.03	$2,652
Site-Wide Cover					
Clean Fill	Unclassified fill, 6" lifts	cy	37,893	$ 11.64	$440,879
Topsoil	6" lifts	cy	12,029	$ 36.19	$435,353
Seeding	Mechanical Seeding	acre	14.91	$ 4,712.50	$70,273
Playground/Swing Area Cover/Reconstruction					
Geotextile	12 oz.	sy	400	$ 2.68	$1,071
Pea Gravel	Hand Spread	cy	46.3	$ 97.00	$4,491
Reinstall swings and playground equipment	Three man crew	day	2	$ 1,331.22	$2,662
Equipment Costs	Reinstallation equipment	ls	1	$ 250.00	$250
Soccer/Ball Field Construction					
Bleacher Pad Sub base	sand/gravel mix	cy	133	$ 14.66	$1,955
Topsoil/sand mix	6" lifts (Baseball in-fields)	cy	556	$ 25.23	$14,018
Reinstall baseball/soccer equipment	Three man crew	day	4	$ 1,331.22	$5,325
Equipment Costs	Reinstallation equipment	ls	1	$ 2,000.00	$2,000
Concrete	Bleacher Pads 6" reinforced	sf	2,400	$ 5.33	$12,792
Tennis/Basketball Court					
Court Sub base	sand/gravel mix	cy	1,033	$ 14.66	$15,153
Court Reconstruction	Labor, equipment and materials	ls	2	$ 85,940.40	$171,881
Fencing		lf	650	$ 16.71	$10,862
Security/Aesthetics					
Trees		ea.	10	$ 200.00	$2,000
Boulders	Along west, south and east perimeter	cy	359	$ 25.00	$8,979
Subtotal					$1,249,983
Additional Capital Costs					
Mob/Demob/Decon	5% of Subtotal				$62,499
Contingencies	15% of Subtotal				$187,497
Engineering/Oversight	10% of Subtotal				$124,998
Subtotal					$374,995
Capital Cost Subtotal					**$1,624,978**
Annual Groundwater Sampling					
Scoping/Sample Collection	Labor/Equipment	ls	1	$ 1,600.00	$1,600
Analytical	Groundwater Samples (7)	ls	1	$ 2,900.00	$2,900
Evaluation	Reporting	ls	1	$ 1,800.00	$1,800
Subtotal (Annual Cost)					$6,300
Biannual Cover Monitoring					
Cover Monitoring		event	2	$ 3,400.00	$6,800
Capital Cost Subtotal					$1,624,978
Present Worth - Biannual Cover and Annual GW Monitoring (30 years)					$201,380
Total Project Cost					$1,826,357

Notes:

Sources include:

2004 RS Means Environmental Remediation Cost Data-Assemblies 10th Edition (unit prices include a 30% markup for overhead and profit).

2004 RS Means Heavy Construction Cost Data 16th Edition.

Engineer's Estimate.

The reconstruction of the athletic fields does not include a drainage system.

Present Worth Analysis assumes an interest rate of five percent.

ls = lump sum
cy = cubic yard
sy = square yard
lf = linear foot
sf = square foot
ton = 2,000 pounds

Table 22
Franczyk Park Site
Cost Estimate - Alternative C
Hazardous Waste Removal / Interceptor Trench / Cover Augmentation

Item	Note	Unit	Quantity	Cost/Unit	Cost
Institutional Controls					
Deed Restrictions	Soil/Fill Management Plan	ls	1	$ 7,000.00	$7,000
Remedial Investigation Hazardous Fill					
Scoping/Sample Collection	Labor/Equipment	event	1	$ 4,400.00	$4,400
Analytical	24 Soil Samples	event	1	$ 1,700.00	$1,700
Evaluation	Reporting	event	1	$ 3,400.00	$3,400
Hazardous Fill Removal					
Hazardous Fill Excavation	Track mounted excavator, 1 cy	cy	3,704	$ 2.79	$10,333
Hazardous Fill Transportation/Disposal	Transportation to and disposal at CWM	ton	5,556	$ 150.00	$833,333
Clean Fill	Unclassified fill, 6" lifts	cy	3,704	$ 11.64	$43,093
Pre-Removal Demolition					
Asphalt/Concrete Demolition	Bleacher pads and tennis/ basketball court	day	3	$ 837.43	$2,512
Remove Athletic Equipment	Three man crew	day	4	$ 1,331.22	$5,325
Removal Equipment	Backhoe and operator	day	4	$ 663.03	$2,652
Groundwater Interceptor Trench					
Trench Excavation	Track mounted excavator, 1 cy	cy	489	$ 2.79	$1,364
Geotextile	12 oz.	sy	2,200	$ 2.68	$5,892
Stone for Trench	Gravel, 6" lifts	cy	326	$ 15.04	$4,902
Perforated Piping	4" HDPE	lf	1,100	$ 10.01	$11,011
Cleanout Piping	4" HDPE	lf	25	$ 5.23	$131
Saw Cut Pavement	Access to install tie in to City sewer	ls	1	$ 1,000.00	$1,000
Tie-in Trench Excavation	Track mounted excavator, 1 cy	cy	133	$ 2.79	$372
Tie-in Piping	Solid 4" HDPE piping	lf	300	$ 5.23	$1,568
Pavement/Sidewalk Repair	Includes sidewalk, curb and pavement repair	ea.	5	$ 500.00	$2,500
Clean Fill	Unclassified fill, 6" lifts	cy	244	$ 11.64	$2,844
Post-Trench Activities					
Soil Sampling	Waste characterization	ea.	2	$ 675.00	$1,350
Transportation/Disposal	Non-haz fill	ton	933	$ 60.00	$56,000
Cover Augmentation					
Clean Fill	Unclassified fill	cy	16,049	$ 11.64	$186,730
Topsoil	6" lifts	cy	12,029	$ 36.19	$435,353
Seeding	Mechanical Seeding	acre	14.91	$ 4,712.50	$70,273
Playground/Swing Area Cap/Reconstruction					
Geotextile	12 oz.	sy	400	$ 2.68	$1,071
Pea Gravel	Hand Spread	cy	46.3	$ 97.00	$4,491
Reinstall swings and playground equipment	Three man crew	day	2	$ 1,331.22	$2,662
Equipment Costs	Reinstallation equipment	ls	1	$ 250.00	$250
Soccer/Ball Field Construction					
Bleacher Pad Sub base	sand/gravel mix	cy	44	$ 14.66	$652
Topsoil/sand mix	6" lifts (Baseball in-fields)	cy	556	$ 25.23	$14,018
Reinstall baseball/soccer equipment	Three man crew	day	4	$ 1,331.22	$5,325
Equipment Costs	Reinstallation equipment	ls	1	$ 1,000.00	$1,000
Concrete	Bleacher Pads 6" reinforced	sf	2,400	$ 5.33	$12,792

Table 22
Franczyk Park Site
Cost Estimate - Alternative C
Hazardous Waste Removal / Interceptor Trench / Cover Augmentation

Item	Note	Unit	Quantity	Cost/Unit	Cost
Tennis/Basketball Court					
Court Sub base	sand/gravel mix	cy	344	$ 14.66	$5,051
Court Reconstruction	Labor, equipment and materials	ls	2	$ 85,940.40	$171,881
Fencing		lf	650	$ 16.71	$10,862
Security/Aesthetics					
Trees		ea.	10	$ 200.00	$2,000
Boulders	Along west, south and east perimeter	cy	359	$ 25.00	$8,979
Subtotal					$1,936,071
Additional Capital Costs					
Mob/Demob/Decon	5% of Subtotal				$96,804
Contingencies	15% of Subtotal				$290,411
Engineering/Oversight	10% of Subtotal				$193,607
Subtotal					$580,821
Capital Cost Subtotal					**$2,516,893**
Annual Groundwater Sampling					
Scoping/Sample Collection	Labor/Equipment	ls	1	$ 1,600.00	$1,600
Analytical	Groundwater Samples (5)	ls	1	$ 2,300.00	$2,300
Evaluation	Reporting	ls	1	$ 1,800.00	$1,800
Subtotal (Annual Cost)					$5,700
Biannual Cover Monitoring					
Cover Monitoring		event	2	$ 3,400.00	$6,800
Capital Cost Subtotal					$2,516,893
Present Worth - Biannual Cover and Annual GW Monitoring (30 years)					$192,156
Total Project Cost					$2,709,049

Notes:

Sources include:

2004 RS Means Environmental Remediation Cost Data-Assemblies 10th Edition (unit prices include a 30% markup for overhead and profit).

2004 RS Means Heavy Construction Cost Data 16th Edition.

Engineer's Estimate.

The reconstruction of the athletic fields does not include a drainage system.

The volume of clean fill required to augment the existing cover material was calculated using AutoCADD cut and fill functions.

ls = lump sum
cy = cubic yard
sy = square yard
lf = linear foot
sf = square foot
ton = 2,000 pounds

Table 23
Franczyk Park Site
Cost Estimate - Alternative D
Site-Wide Soil/Fill Removal

Item	Note	Unit	Quantity	Cost/Unit	Cost
Remedial Investigation Hazardous Fill					
Scoping/Sample Collection	Labor/Equipment	event	1	$ 4,400.00	$4,400
Analytical	24 Soil Samples	event	1	$ 1,700.00	$1,700
Evaluation	Reporting	event	1	$ 3,400.00	$3,400
Hazardous Fill Removal					
Hazardous Fill Excavation	Track mounted excavator, 1 cy	cy	3,704	$ 2.79	$10,333
Hazardous Fill Transportation/Disposal	Transportation to and disposal at CWM	ton	5,556	$ 150.00	$833,333
Pre-Removal Demolition					
Asphalt/Concrete Demolition	Bleacher pads and tennis/ basketball court	day	3	$ 837.43	$2,512
Parking Lot Demolition		cy	290	$ 50.09	$14,540
Remove Athletic Equipment	Three man crew	day	4	$ 1,331.22	$5,325
Removal Equipment	Backhoe and operator	day	4	$ 663.03	$2,652
Site-Wide Fill Removal					
Fill Excavation	Excavation, On-site transportation, On-site management and loading	cy	182,636	$ 7.98	$1,457,438
Soil Sampling	Waste characterization	ea.	37	$ 675.00	$24,975
Transportation/Disposal	Non-haz fill	ton	229,233	$ 60.00	$13,753,971
Backfill					
Stockpiled Cover Material	Loading from sockpile, On-site transportation, Spreading & Compaction	cy	29,814	$ 5.07	$151,159
Topsoil	6" lifts	cy	12,029	$ 36.19	$435,353
Seeding	Mechanical Seeding	acre	14.91	$ 4,712.50	$70,273
Playground/Swing Area Reconstruction					
Pea Gravel	Hand Spread	cy	46.3	$ 97.00	$4,491
Reinstall swings and playground equipment	Three man crew	day	2	$ 1,331.22	$2,662
Equipment Costs	Reinstallation equipment	ls	1	$ 250.00	$250
Soccer/Ball Field Reconstruction					
Topsoil/sand mix	6" lifts (Baseball in-fields)	cy	556	$ 25.23	$14,018
Reinstall baseball/soccer equipment	Three man crew	day	4	$ 1,331.22	$5,325
Equipment Costs	Reinstallation equipment	ls	1	$ 1,000.00	$1,000
Concrete	Bleacher Pads 6" reinforced	sf	25	$ 5.33	$133
Tennis/Basketball Court Construction					
Court Reconstruction	Labor, equipment and materials	ls	2	$ 85,940.40	$171,881
Fencing		lf	650	$ 16.71	$10,862
Parking Lot Construction					
Parking Lot	10" sub grade, 9" base and 1.5" topping	sy	1,742	$ 30.97	$53,932

Table 23
Franczyk Park Site
Cost Estimate - Alternative D
Site-Wide Soil/Fill Removal

Item	Note	Unit	Quantity	Cost/Unit	Cost
Security/Aesthetics					
Trees		ea.	10	$ 200.00	$2,000
Boulders	Along west, south and east perimeter	cy	359	$ 25.00	$8,979
Subtotal					$17,046,897
Mob/Demob/Decon	5% of Subtotal				$852,345
Contingencies	15% of Subtotal				$2,557,035
Engineering/Oversight	10% of Subtotal				$1,704,690
Subtotal					$5,114,069
Total					$22,160,966

Notes:

Sources include:

2004 RS Means Environmental Remediation Cost Data-Assemblies 10th Edition (unit prices include a 30% markup for overhead and profit).

2004 RS Means Heavy Construction Cost Data 16th Edition.

Engineer's Estimate.

The reconstruction of the athletic fields does not include a drainage system.

ls = lump sum
cy = cubic yard
sy = square yard
lf = linear foot
sf = square foot
ton = 2,000 pounds

APPENDIX A

SUMMARY OF PREVIOUS ENVIRONMENTAL SITE INVESTIGATIONS

PREVIOUS ENVIRONMENTAL REPORTS RELATED TO FRANCZYK PARK

SUMMARY OF ANALYTICAL FINDINGS

PRIOR TO PARK DEVELOPMENT

1. Report on the Investigation of the Babcock Street Site, July 1985, Ecology and & Environment

Surface Soil Samples

- Three composite surface soil/fill samples were collected at 200-foot intervals east/west across the project site along the north, center and south of the site.
- SVOCs were detected at each location.
- South and center locations had SVOCs above TAGM 4046 guidance values (TAGM).
- South and center locations contained pesticides below TAGM values.
- Tested for TCLP metals with no exceedances of the regulatory thresholds.
- Each sample had exceedances of TAGM for multiple metals including one or more of the following: arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc.
- Lead average was 7036 ppm with 17,800 ppm detected at the center location.
- Mercury was 9.6 ppm in north sample.

Subsurface Soil Sample

- Five composite subsurface soil/fill samples were collected from soil borings B-1, B-2, B-4, B-9, and B-12.
- SVOCs were detected at each location.
- Three locations contained SVOCs above TAGM 4046 guidance values.
- Pesticides were detected at two locations; however concentrations were below TAGM.
- Location B-2 had one parameter exceeding TAGM for pesticides.
- Tested for TCLP metals with no exceedances of the regulatory thresholds.
- Each sample had exceedances of TAGM for multiple metals including one or more of the following: arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc.
- Lead average in the subsurface soil/fill was 919 ppm with 1760 ppm detected at B-9.

Groundwater Sample

- Four monitoring wells were sampled (B-1, B-7, B-8, and B-9).
- There were no exceedances of Water Quality Standards (WQS) for metals.
- Each groundwater sample had an exceedance of one or more SVOCs.
- Pesticides were detected in B-9 (2,4-D and Silvex).

2. Report on NFTA Bus Garage Soils, April 15, 1987, PTL Laboratory

Subsurface Soil Samples

- Fourteen jars of soil were collected from borings advanced on the NFTA Bus Garage Property located southeast of William and Babcock Streets.
- Samples were analyzed for Cyanide, Phenols, and Total metals.
- Each sample had exceedances of TAGM for multiple metals including one or more of the following: arsenic, cadmium, chromium, lead, and nickel.

- Lead average in the subsurface soil was 794 ppm with 2253 ppm the highest recorded.
- Cyanide was detected in all but one sample at levels ranging from (0.06 ppm to 0.40 ppm).
- Phenols were detected in 9 of the 14 samples at levels exceeding TAGM. Concentrations ranged from 0.8 ppm to 5 ppm.

3. Report on Downtown Stadium/Pilot Field Soils, April 26, 1987, PLT Laboratory

Soil Samples

- Two soil samples of clay and sand were collected during the construction of Pilot Field.
- Samples were analyzed for cyanide, phenols, and thirteen metals.
- Both samples exceeded TAGM for one or more of the following: cadmium, chromium, nickel, and zinc.

Although correspondence obtained from City records indicates that soil from the NFTA Bus Garage and Pilot Field sites was utilized as fill material on the Franczyk Park property prior to development of the site as a public park, it is uncertain that the laboratory analytical data included as Item 2 and 3 above is the same material that was transported to the site. No site sketches showing where the sampling was performed, no chain-of-custody forms, no trucking slips, or other information documenting that the tested material was transported to the site was located when reviewing City records.

AFTER PARK DEVELOPMENT

4. Laboratory Analytical Results for Buffalo Urban Renewal Agency (BURA), May 1989

Groundwater Samples

- Analytical sampling results for four temporary groundwater monitoring wells at Franczyk Park.
- Field sampling report details the purging and sampling of four MWs.
- W-1 exceeded WQS for arsenic, cadmium, chromium, copper, iron, mercury, lead, nickel, and selenium. No VOCs. No SVOCs.
- In W-1, Heptachlor detected at 0.2ppb (which exceeds the WQS) was the only pesticide detected in any of the wells.
- W-2 exceeded WQS for cadmium, iron, lead, copper, and selenium. No Pesticides. No VOCs. No SVOCs.
- W-3 exceeded WQS for arsenic, cadmium, iron, lead, and selenium. No Pesticides. No VOCs. No SVOCs.
- W-4 exceeded WQS for cadmium, chromium, iron, lead, and selenium. No Pesticides. No VOCs. No SVOCs.

5. Environmental GW Testing Results, Gus Franczyk Park, Babcock & Fleming Streets Buffalo, NY, April 25, 1990, ECCO

Groundwater Samples

- Field sampling report details the purging and sampling of four MWs.

- W-1 exceeded WQS for arsenic, barium, chromium, copper, iron, lead, nickel, selenium, and zinc. No Pesticides. No VOCs.
- W-2 exceeded WQS for arsenic, cadmium, chromium, iron, lead, nickel, and selenium. No Pesticides. No VOCs.
- W-3 exceeded WQS for iron, lead, and selenium. No Pesticides. No VOCs.
- W-4 exceeded WQS for arsenic, cadmium, chromium, copper, iron, lead, nickel, and selenium. No Pesticides. No VOCs

6. Gus Franczyk Park Leachate Sampling, Babcock and Fleming Streets, July 25, 1990, ECCO

Water Sample

- One water sample collected from a surface seep outbreak near the southeast corner of the site was analyzed for total metals, VOCs, and pesticides/herbicides.
- No VOCs were detected.
- Four pesticides/herbicides were detected above WQS.
- Four metals exceeded WQS (arsenic, iron, lead and selenium); however, the sample was determined to be turbid.

7. Gus Franczyk Park Leachate Sampling, Babcock & Fuming (sic.) Streets, August 3, 1990, ECCO

Water Sample

- One water sample was collected from a surface seep in the southeast corner of the site to be analyzed for PCBs.
- Aroclor 1221 was detected (4.62 ppm) but was below TAGM.
- Report indicated that the PCBs were likely part of the sediment and not the leachate, since earlier analysis of MW W-4 did not detect PCBs.

8. Gus Franczyk Park Report to City Community Development, November 13, 1990, ECCO

Surface Water

- One surface water seep sample was collected from the seep area at the southeast corner of the site near MW-4 and analyzed for PCBs.
- No PCBs were detected.

Surface Soil

- One composite surface soil sample was collected and analyzed for PCBs from the seep area at the southeast corner of the site near MW-4.
- No PCBs were detected.

9. Agrico/Franczyk Park Site, Buffalo, Erie County, Leachate Samples, June 25, 1998 Memo from Dave Symanski (DEC) to Martin Doster (DEC)

Water Samples

- Two leachate samples collected from observed leachate points. F1 near the southwest corner of the park and F2 from an area near the southeast corner.
- No VOCs were detected in either sample.
- F1 contained SVOCs and pesticides, but were below WQS.
- F1 contained arsenic (2870 ug/l), and lead (148 ug/l) above WQS. Of less concern, aluminum, iron, magnesium, manganese, sodium, and titanium were also above the WQS.
- F2 contained Lead (462 ug/l), and Hg (2.2 ug/l) above WQS. Of less concern, aluminum, iron, magnesium, manganese, sodium, and titanium were also above the WQS.

10. Franczyk Park Site Sampling and Analysis Report, July 1998, Acres International

Groundwater Samples

- FP1 collected from the southeast corner of the site near Fleming and Babcock Streets, and FP2 collected from the southwest corner of the site near Fleming and Lewis Streets from shallow holes at these locations.
- Each had a detection of one VOC however the detections were below the WQS.
- FP2 had ten SVOCs detected with only carbozole estimated above the WQS.
- No SVOCs were detected in FP1.
- No Pesticides/PCBs in either sample.
- FP1 and FP2 had tin, arsenic, cadmium, copper, iron, lead, manganese, sodium, and zinc above the WQS.

Surface Soil Samples

- FP-1 and FP-2 collected from 0 to 6 inches in the vicinity of the groundwater samples.
- Two VOCs detected (acetone in FP1 and acetone and methylene chloride in FP2) below TAGM.
- Sixteen SVOCs detected in FP-1 with five above TAGM.
- Seven SVOCs detected in FP-2 with none above the TAGM.
- Metals greater than TAGM included arsenic in FP-1 (8,280 ppm), mercury in FP-2 (0.79 ppm) and zinc in both.

11. Phase II ESA Report Franczyk Park Site, Buffalo, NY, December 8, 1998 Report by Benchmark Environmental Engineering

Attempt to define the extent and concentrations of metals near two seeps (one at Lewis near Fleming and one at Fleming near Babcock).

Surface Soil Samples

- Four composite surface soil samples were collected at 0 to 2 feet bgs in seep areas.
- Exceeded TAGM for arsenic in three of the samples (two from southwest side and one from southeast side).
- Exceeded TAGM for iron in all four locations.

Subsurface Soil Samples

- Five soil borings were placed in each of the two seep areas.
- 7 of 10 samples exceeded TAGM guidance values for metals (two from southwest side and five from southeast side).

12. Franczyk Park, Laboratory Report Project (Number FP-001), December 21, 1998, Upstate Laboratories, Inc.

Surface Soil Samples

- 101 surface soil samples collected on a 100-foot grid on December 21, 1998 were analyzed for arsenic.
- One off-site background soil sample was collected for arsenic analysis. Laboratory results indicated an arsenic concentration of 9.2 mg/kg. In subsequent discussions with the City, NYSDOH and NYSDEC, it was agreed that 10 mg/kg would be an acceptable background arsenic concentration.
- Results ranged from 2 to 88 mg/kg.
- Samples above TAGM included one in the northwest corner and one from the southeast corner of the site.

13. Summary of Franczyk Park Geoprobe and Surface Soil Sample Investigation and Laboratory Analysis Report, October 31, 2000, Acres International

Subsurface Soil Samples

- 61 soil samples were collected from 23 probe hole locations and analyzed for TCLP lead. No probe logs were completed.
- 13 samples collected along Lewis St. exceeded the TCLP extraction value of 5mg/l.
- Three of the 13 samples were collected from 0 to 6 inches bgs.
- Two composite subsurface soil samples collected (one from the southwest corner and one from southeast corner of the site) were analyzed for full TCLP. Only barium was detected, and the result was well below the regulatory value.

Surface Soil Samples

- 40 near surface soil samples were collected/analyzed for total arsenic from the fenced-in seep areas.
- 11 of 22 samples from the area along Fleming St. exceeded the site-specific background level of 10 mg/kg for arsenic.
- 4 of 18 samples along Lewis St. exceeded the site-specific background level for arsenic.

14. Franczyk Park Drainage Improvement Project, Near Surface Soil Investigation within Fenced Seep Areas – TCLP Lead and Full TCLP and RCRA Characteristics Report, December 8, 2000, Acres International

Surface Soil Samples

- Individual samples FS1 through 4 were composited; and individual samples FS5 through 20 were also composited from the Fleming Street fenced area and the resulting composite samples were analyzed for TCLP lead.

- Individual samples LS1 through 9 were composited; individual samples LS11 and 12 were composited, and LS10 and LS13-18 were composited from the Lewis Street seep area and each resulting composite sample was analyzed for TCLP lead.
- No hazardous levels of leachable lead (5 mg/l) were detected.
- The 40 samples collected earlier (October 30, 2000) were also composited and analyzed for full TCLP and no analytes were detected above guidance values.

15. Franczyk Park Drainage Improvement Project Report on GW Trench Samples in Support of BSA Discharge Permit, March 29, 2001, Acres International

Groundwater Samples

- Collected and analyzed two groundwater samples from two trenches for metals and pH.
- Exceeded Buffalo Sewer Authority standards for mercury. Acres recommended holding excavation water for 48 hours to settle out solids and then pumping it to the BSA sewer system.

16. Franczyk Park Drainage Improvement Project, Topsoil Analytical Testing, April 9, 2001, Acres International

Surface Soil Samples

- Consisted of a review of SLC analytical testing of topsoil proposed for use at the park over the excavated trench areas.
- Mercury was the only parameter above TAGM.

17. Franczyk Park Drainage Improvement Project, Lead Surface Soils, April 26, 2001 by Acres International

Surface Soil Samples

- Twenty-eight surface soil samples were collected in the northern portion of the site and analyzed for lead, while one sample from the southwest corner of the site was analyzed for arsenic.
- Three samples are above site average for Lead (92.48 ppm).
    - Along Fleming St, lead was detected at 237 ppm.
    - Under west swings, lead was detected at 1360 ppm.
    - Under east swings, lead was detected at 227 ppm.
    - The average lead concentration, less the three highest values, was 30.6 ppm.
- Arsenic was detected at 35.5 ppm in the sample collected from the southwest corner of the project site.

18. Franczyk Park Drainage Improvement Project, Construction Closeout Report, September 12, 2001, Acres International

Confirmatory Subsurface Soil (Lewis Street, southwest corner) samples within trench

- Eleven subsurface soil samples collected from soil excavated from the Lewis Street trench were analyzed for lead and arsenic.
- Arsenic concentrations ranged from 5.32 ppm to 206 ppm.
- Lead concentrations ranged from 27.9 ppm to 5,250 ppm.

Confirmatory Subsurface Soil (Fleming Street, southeast corner) samples within trench

- Three samples collected from soil excavated from the Fleming Street trench were analyzed for lead and arsenic.
- Arsenic concentrations ranged from 361 ppm to 9,790 ppm.
- Lead concentrations ranged from 1,300 ppm to 15,800 ppm.

Subsurface Soil (Fleming Street, southeast corner) samples excavated from trenches

- Four samples collected from soil excavated from the Fleming Street trench were analyzed for lead and arsenic.
- Arsenic concentrations ranged from 106 ppm to 22,400 ppm.
- Lead concentrations ranged from 69.3 ppm to 21,100 ppm.

Subsurface Soil (Lewis Street, southwest corner) samples excavated from trenches

- Nineteen samples collected from soil excavated from the Lewis Street trench were analyzed for lead and arsenic.
- Arsenic concentrations ranged from 6.84 ppm to 260 ppm, ND at one location.
- Lead concentrations ranged from 21.5 ppm to 26,600 ppm, ND at one location.
- TCLP testing of excavated soil indicated exceedance for lead.

APPENDIX B

GEOPHYSICAL SURVEY REPORT

338 Harris Hill Road, Suite 201
Williamsville, New York 14221
(716) 565-0624 • Fax (716) 565-0625

GEOMATRIX

December 5, 2003

James Manzalla
TVGA
1000 Maple Road
Elma, New York 14059-0264

Dear Mr. Manzalla:

Subject: Geophysical Survey Results – Franczyk Park, Buffalo, NY

1.0 INTRODUCTION

This report presents the results of a geophysical investigation performed at Franczyk Park in Buffalo, NY. Historical information compiled by others indicates a potential for drums and underground storage tanks (USTs) to exist beneath the site. A total of four areas were geophysically surveyed as follows.

Area 1. A 200 ft x 200 ft area north of the parking lot where drums were allegedly buried.

Area 2. A triangular shaped area at the northwest corner of the intersection of Fleming and Old Babcock Street where an automotive fuel facility was once located.

Area 3. A rectangular area near the northeast corner of Lewis and Fleming Street where a remediation system was recently installed.

Area 4. A small area near a soil boring that encountered metal during a previous investigation.

A geophysical survey was performed by Geomatrix Consultants, Inc. (Geomatrix) to map the distribution of buried metals in an attempt to locate anomalies indicative of underground metallic objects. The survey was performed on November 11, 2003 utilizing electromagnetic techniques.

The geophysical results presented herein are intended to serve as a guide to focus any future intrusive investigations, if warranted. Additional collaborative data are generally necessary to confirm geophysical anomalies.

2.0 METHODOLOGY

A reference grid was installed to facilitate data acquisition along lines spaced three feet apart. The grid was marked with orange and red spray paint.

The site was geophysically surveyed using the Geonics EM61. The EM61 unit is a high sensitivity, high resolution time domain electromagnetic (TDEM) metal detector that can

detect both ferrous and nonferrous metallic objects. It has an approximate investigation depth of 10 feet. The processing console is contained in a backpack worn by the operator which is interfaced to a digital data logger. The transmitter and two receiver coils are located on a two-wheeled cart that is pulled by the operator.

The device's transmitter coil generates a pulsed primary EM field at a rate of 150 pulses per second, inducing eddy currents into the subsurface. The decay rates of these eddy currents are measured by two, 3.28 foot by 1.64 foot (1 meter by ½ meter) rectangular receiver coils. By taking the measurements at a relatively long time frame after termination of the primary pulse, the response is practically independent of the survey area's terrain conductivity. Specifically, the decay rates of the eddy currents are much longer for metals than for normal soils allowing the discrimination of the two.

Data are collected from the EM61's two receiver coils. One of the receiver coils is located coincident to the transmitter coil. The other receiver coil is located 1.31 feet (0.4 meters) above the transmitter coil. Data from the top receiver coil are stored on Channel 1 of a digital data logger. Data from the bottom receiver coil are stored on Channel 2 of the data logger. Channel 1 and Channel 2 data are simultaneously recorded at each station location. The instrument responses are recorded in units of milliVolts (mV). Data were recorded digitally by a data logger at a rate of approximately 2 measurements per foot along the survey lines which were spaced 3 feet apart.

EM61 **(Photo not from this site)**

3.0 RESULTS

The EM61 data for this Site are presented in Figures 1 through 4. All maps are shown with a common scale for comparative purposes. The color bar to the right of the maps indicates the colors associated with the respective measured values. Areas suspected to be free of buried metals are shown as color shades of blue. All areas exhibiting a response greater than background (0 to 15 mVolts) likely contain buried metals. These areas are depicted in shades of dark blue through red on the figure.

Area 1. The geophysical data for Area 1 is shown in Figure 1. Two anomalies, labeled **A** and **B** were identified. These anomalies may represent the location of the alleged buried drums.

Alternatively theses anomalies may represent miscellaneous buried metals. Several linear anomalies are observed in Figure 1 and may represent buried utilities associated with prior site use. It is possible that any of the additional above background responses may be significant, however, it is more likely that they are associated with minor amounts of buried metals.

Area 2. The geophysical data for Area 2 is shown in Figure 2. Five anomalies, labeled **C through H** are identified. These anomalies may represent the location of USTs. Alternatively theses anomalies may represent miscellaneous buried metals. These data should be reviewed relative to any existing maps showing details of the prior use of the property. It is possible that any of the additional above background responses may be related to USTs, however, it is more likely that they are associated with minor amounts of buried metals.

Area 3. The geophysical data for Area 3 is shown in Figure 3. This survey was performed to attempt to identify any north-south trending trench in filled with metallic objects. Numerous buried metal anomalies were observed in the data set and any of these may be significant from an environmental perspective.

Area 4. The geophysical data for Area 4 is shown in Figure 4. A soil boring encountered buried metal at coordinate 12N,12E. This survey was performed to further characterize the distribution of buried metal in this area.

4.0 LIMITATIONS

The geophysical methods used during this survey are established, indirect techniques for non-invasive subsurface reconnaissance exploration. As these instruments utilize indirect methods, they are subject to inherent limitations and ambiguities. All geophysical methods utilize interpretative techniques which can be significantly impacted by varying site conditions. Anomalies can only be identified if they show recognizable patterns against data representative of background or natural conditions. Therefore, where possible, confirmation of any geophysical anomalies identified or interpreted should be sought through the use of historical aerial photography, test pit and/or borehole information.

We trust the information contained in this report is sufficient for your present needs. Please do not hesitate to contact us if you have any questions or require additional information.

Sincerely yours,
GEOMATRIX CONSULTANTS, INC.

John Luttinger
Senior Geophysicist

BALL DIAMOND

"A"3+00

"A"2+00

"A"1+00

"B"5+00

"B"6+00

"B"7+00

MW

B

A

0 25E 50E 75E 100E 125E 150E 175E 200E

0 25N 50N 75N 100N 125N 150N 175N 200N

Parking Lot

GB

145 143 141 138 136 134 131 129 127 124 122 120 117 115 113 110 108 105 103 101 98 96 94 91 89 87 84 82 80 77 75 73 70 68 66 63 61 59 56 54 52 49 47 45 42 40 38 35 33 30 28 26 23 21 19 16 14 12 9 7 5 2 0

Surface or buried metal

Background

EM61 Response (mVolts)

A Geophysical anomaly discussed in report

Interpreted linear anomaly

Grid North

Scale 1:360

25 0 25 50

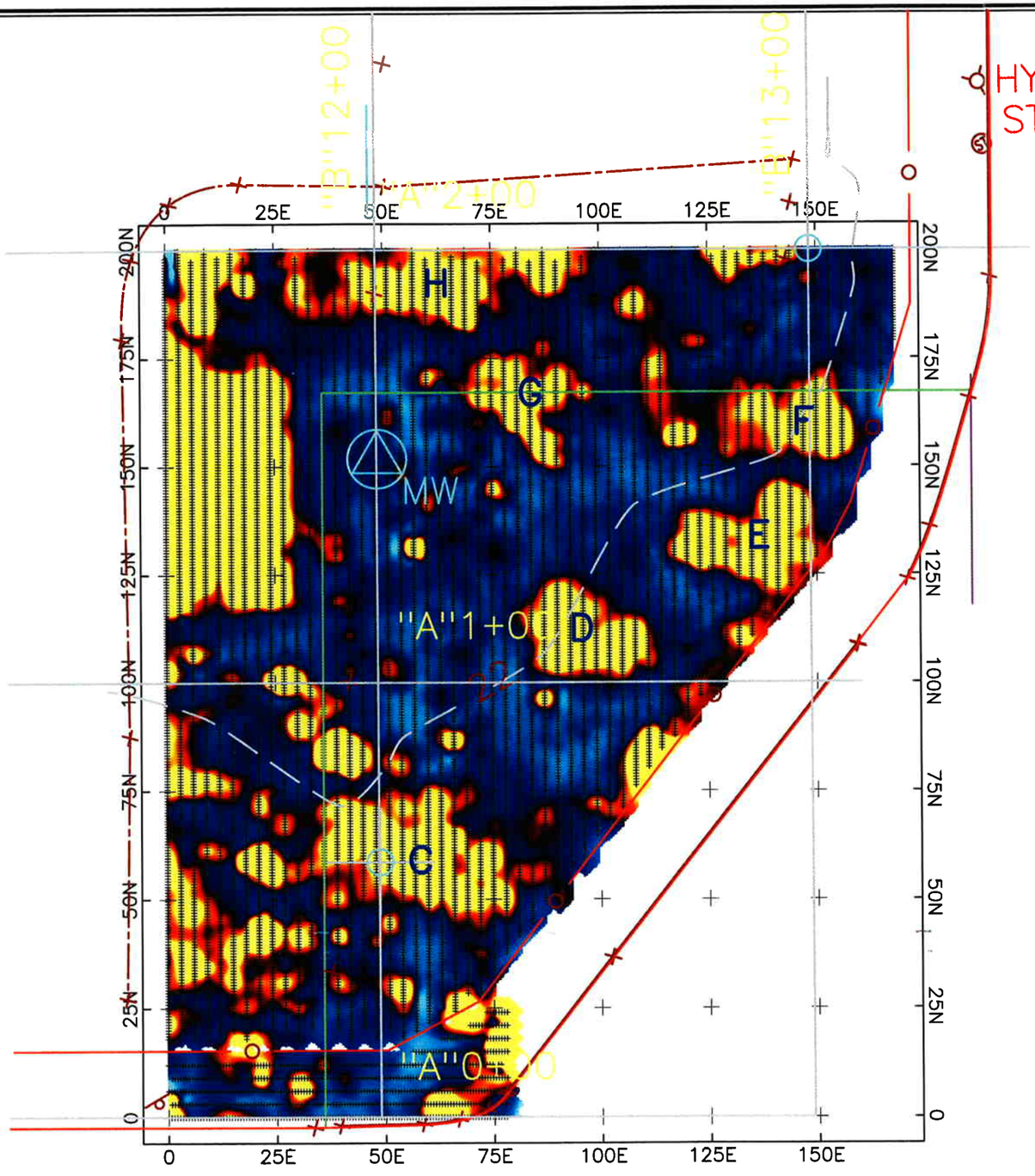
(feet)

Figure 1

Geophysical Survey Results
Color Contours of EM61 Data
(mVolts)

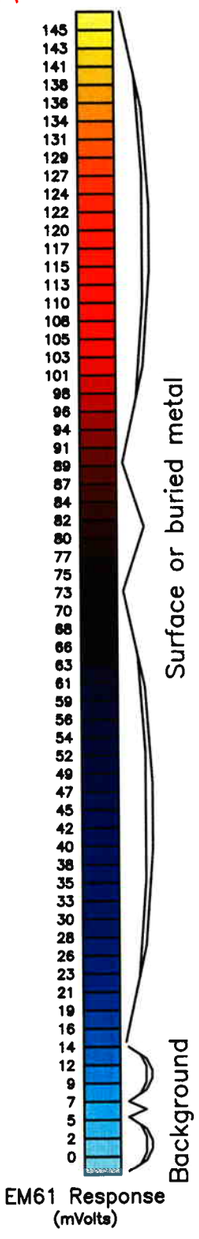
Area 1
Franczyk Park
Buffalo, NY
TVGA Consultants

Geomatrix



FLEMING STREET

OLD BABCOCK STREET



A — Geophysical anomaly discussed in report

Interpreted linear anomaly

Grid North

Scale 1:360

25 0 25 50

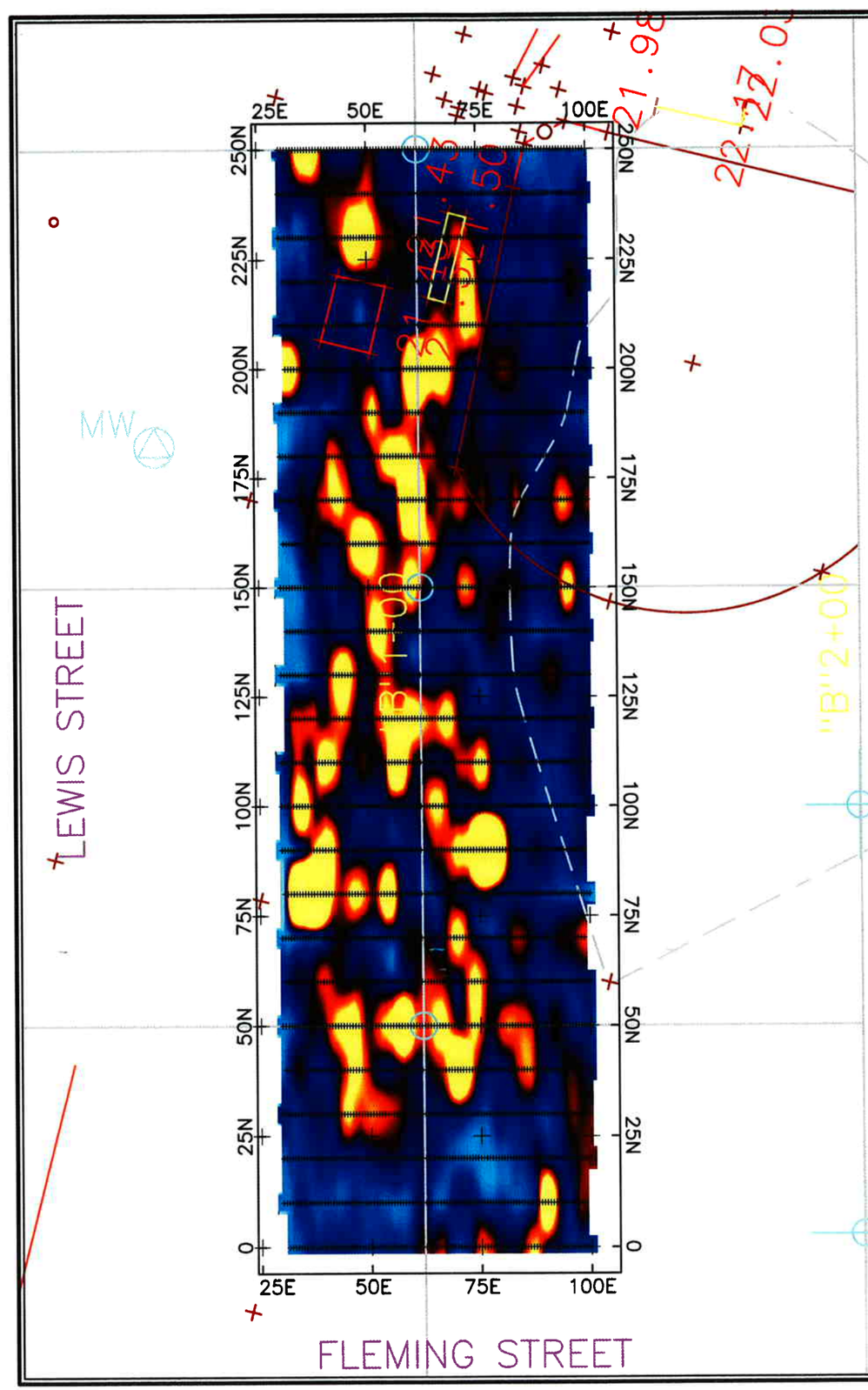
(feet)

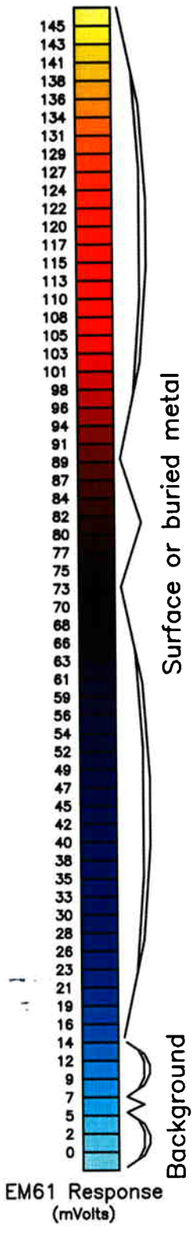
Figure 2

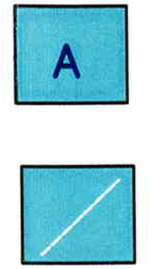
Geophysical Survey Results
Color Contours of EM61 Data
(mVolts)

Area 2
Franczyk Park
Buffalo, NY
TVGA Consultants

Geomatrix

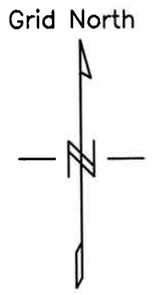






Geophysical anomaly discussed in report

Interpreted linear anomaly



Scale 1:360

25 0 25 50

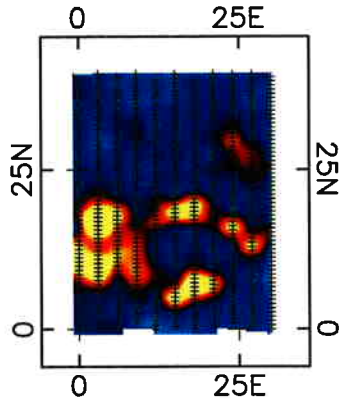
(feet)

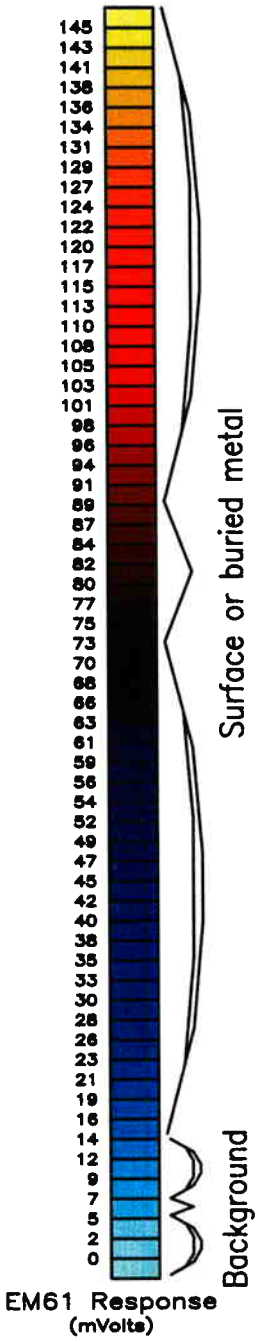
Figure 3

Geophysical Survey Results
Color Contours of EM61 Data
(mVolts)

Area 3
Franczyk Park
Buffalo, NY
TVGA Consultants

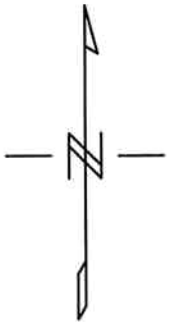
Geomatrix





Geophysical anomaly discussed in report

Interpreted linear anomaly



Scale 1:360

25 0

(feet)

Figure 4

Geophysical Survey Results
Color Contours of EM61 Data
(mVolts)

Area 4
Franczyk Park
Buffalo, NY
TVGA Consultants

Geomatrix

APPENDIX C

FIELD LOGS

PIT NO: 1	TEST PIT LOG	TVGA CONSULTANTS

Project Name: Franczyk Park Site SI/RAR
Project No: 0030125
Project Location: Buffalo, New York
Date: 12/10/03

Description A1 +00 / B6-12

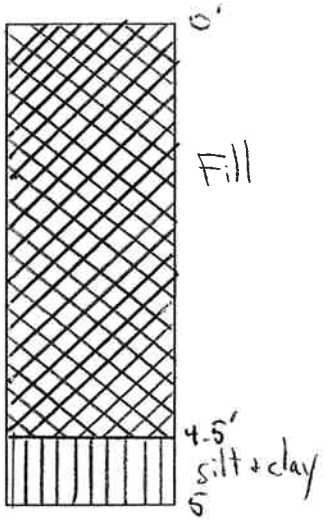
Depth 5' bgs

0	Surface: ≈ 1" of Brown Topsoil
	Dark Brown, sandy-silt, w/ bricks, railroad spikes, & various other metal fragments, damp
1	
2	As above, moist
3	As above, wet
4	As above, w/ iron staining, saturated
	Brown silt and clay.
5	
6	

Comments: The railroad spikes & metal fragments are most likely responsible for the anomaly.

Location Sketch: See Figure 7

Cross Section:



Geologist: J. Manzella

Operator: Ron Brown

PIT NO: 2	**TEST PIT LOG**	TVGA CONSULTANTS

Project Name: Franczyk Park Site SI/RAR
Project No: 0030125
Project Location: Buffalo, New York
Date: 12/10/03

Description A1+7 / B6-16

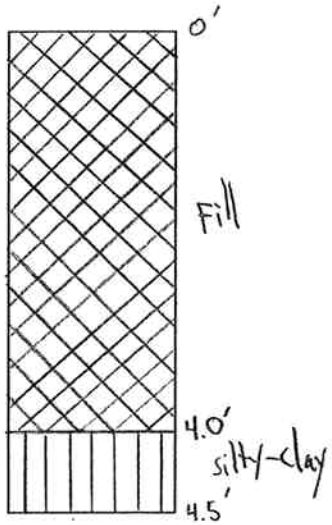
Depth 4.5' bgs

0	Surface: Brown, Topsoil dump.
	Dark Brown, silty-Sand, w/ bricks, slag, 3 ≈ 12" diameter metal fragments as well as smaller
1	metal fragments, iron staining. damp.
2	As above, Moist
3	As above, wet
4	Brown, silty-clay, saturated.
5	
6	

Comments: The metal fragments discovered in the top 1' was likley responsible for the anomoly

Location Sketch See Figure 7

Cross Section:



Geologist: J. Manzella

Operator: Ron Brown

PIT NO: 3	**TEST PIT LOG**	TVGA CONSULTANTS

Project Name: Franczyk Park Site SI/RAR
Project No: 0030125
Project Location: Buffalo, New York
Date: 12/10/03

Description A2-20 / B5+20

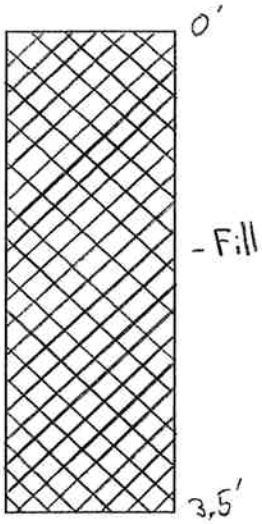
Depth 3.5

0	Surface: Brown Topsoil, damp.
	Red. Brown, silt & clay, damp.
1	Dark Brown, sandy-silt, w/ iron staining, brick & metal fragments (3" long bolt, metal wiring & smaller fragments), wood, damp.
2	As above, w/ re-bar reinforced concrete slab on north end of testpit.
	Red sand layer
3	Brown clayey-silt
4	
5	
6	

Comments: Encountered Re-bar reinforced concrete @ 2' bgs at North end of Testpit.

Location Sketch

Cross Section:



Geologist: J. Manzella

Operator: Ron Brown

PIT NO: 4	**TEST PIT LOG**	TVGA CONSULTANTS

Project Name: Franczyk Park Site SI/RAR | Project No: 0030125

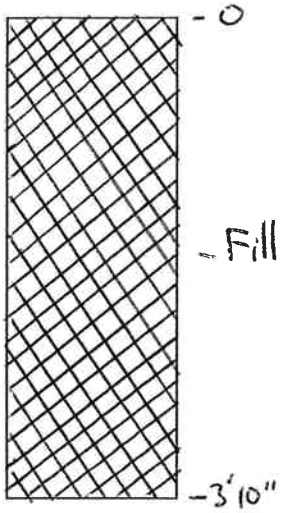
Project Location: Buffalo, New York | Date: 12/10/03

Description	
Depth	3' 10"
0	Surface: Brown topsoil, damp.
	Red-Brown, silt and clay, little brick, damp.
1	Dark Brown, sandy-silt & silty-sand, w/ piece of concrete w/ rebar, & wire mesh, brick, wood, various metal fragments, Moist.
2	As above w/ < 2" layer of Red Sand.
3	
	As above, Saturated.
4	
5	
6	

Comments: Refusal @ 3'10" due to concrete slab.

Location Sketch See Figure 7

Cross Section:



Geologist: J. Manzella

Operator: Russ Brown

PIT NO: 5

TEST PIT LOG

TVGA CONSULTANTS

Project Name: Franczyk Park Site SI/RAR

Project No: 0030125

Project Location: Buffalo, New York

Date: 12/10/03

Description A1-15 / B12 + 63

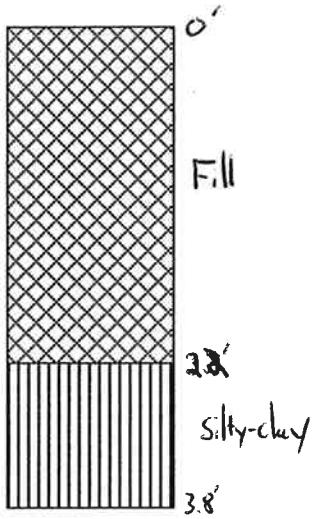
Depth 3.8' bgs

0	Surface: < 1" of Brown topsoil, damp.
	Red-Brown, silt & clay, some wood pieces, damp
1	Dark Brown, Sandy-Silt, w/ bricks, slag, wood pieces, large concrete pieces, a 0.5" thick by 3' long metal wire, moist.
2	Brown silty-clay, damp
3	
4	
5	
6	

Comments: Metal wire was mostlikly responsible for anomaly

Location Sketch: See Figure 7

Cross Section:



Geologist: J. Manzella

Operator: Ron Brown

PIT NO: 6	TEST PIT LOG	TVGA CONSULTANTS

Project Name: Franczyk Park Site SI/RAR
Project No: 0030125
Project Location: Buffalo, New York
Date: 12/10/03

Description A1+10 / B12+45

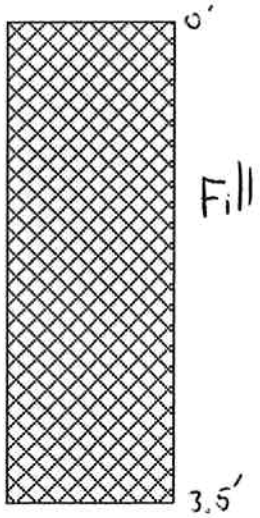
Depth 3.5'

0	Surface: < 1" of Brown topsoil, damp.
	Brown, clayey-silt, little sand, redbricks, firebricks, moist.
1	
2	
	As above w/ angle iron, car axel, a 2" diameter pipe ≈ 10' long
3	Dark brown, sandy-silt, w/ brick and metal fragments.
	Concrete @ 3.5' bgs resulted in ending pit at this depth
4	
5	
6	

Comments: The metalic items encountered at 2.5' bgs were the likly cause of the anomaly

Location Sketch See Figure 7

Cross Section:



Geologist: J. Manzella

Operator: Ron Brown

PIT NO: 7	TEST PIT LOG	TVGA CONSULTANTS

Project Name: Franczyk Park Site SI/RAR
Project No: 0030125
Project Location: Buffalo, New York
Date: 12/10/03

Description A1+30 /B13-8

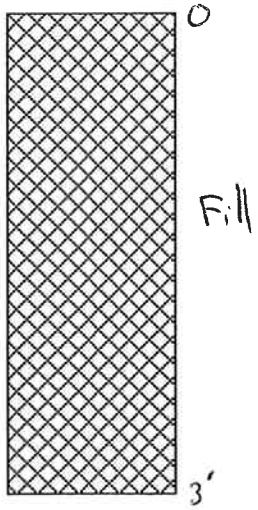
Depth 3'

0	Surface: Brown topsoil, dump.
	Red Brown, silt and clay, little gravel brick.
1	Dark Brown, Sandy-silt, trace clay, bricks, a Metal pipe or car axel, concrete pieces
	a wire cable, Moist.
2	
	Brown, Sand and gravel, Moist
3	Impassable concret slab encountered @ 3' bgs.
4	
5	
6	

Comments: Metal pipe encounted at 2' bgs was likly cause of anomoly

Location Sketch See Figure 7

Cross Section:



Geologist: J. Manzella

Operator: Ron Brown

PIT NO: 8	TEST PIT LOG	TVGA CONSULTANTS

Project Name: Franczyk Park Site SI/RAR
Project No: 0030125
Project Location: Buffalo, New York
Date: 12/10/03

Description AO+55 / B12+5

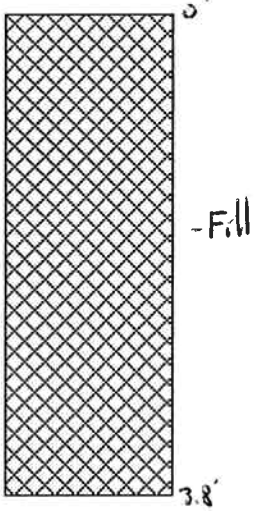
Depth 3.8'

0	Surface: Brown Topsoil, damp.
	Red-Black, silt and clay, trace gravel, brick fragments, damp.
1	Random Fill - Tan - Dark Brown - Brown, sandy-silt-clay w/ iron staining w/ large Slabs of
	concrete (as large as 1.5' thick x 2' wide x 4' long) some w/ rebar, also were bricks and railroad
2	spikes and other Metal fragments including random car parts, rubber, tires, + brake lines.
3	
	Brown silty-clay w/ gray Mottles.
4	
5	
6	

Comments: The rebar in the concrete other fragments at 1' bgs were the likley results of the anomaly

Location Sketch See Figure 7

Cross Section:



Geologist: J. Manzella

Operator: Ron Brown

PIT NO: 9	TEST PIT LOG	TVGA CONSULTANTS

Project Name: Franczyk Park Site SI/RAR
Project No: 0030125
Project Location: Buffalo, New York
Date: 12/10/03

Description A3-5/B9-12

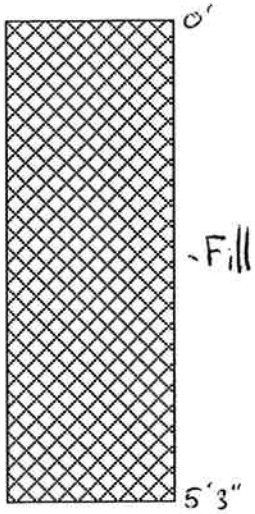
Depth 5' 3"

0	Surface: Brown topsoil w/ rootlets damp.
	Red-Brown, silt and clay w/ gravel and brick fragments, damp.
1	Dark Brown, sandy-silt w/ bricks, wood, rubber pieces, rope, moist.
	Brown, clayey-silt w/ wood pieces, trace white sand, gravel, minor black staining, moist.
2	
3	
4	
	As above, w/ black coal like material.
5	Dark Brown, sandy-silt w/ bricks, wood, rubber pieces, wet.
6	

Comments: A 1" diameter x 2' long metal pipe and metal wire was encountered at 0.4-0.8' bgs.

Location Sketch: See Figure 7

Cross Section:



Geologist: J. Manzella

Operator: Ron Brown

PIT NO: 10	TEST PIT LOG	TVGA CONSULTANTS

Project Name: Franczyk Park Site SI/RAR
Project No: 0030125
Project Location: Buffalo, New York
Date: 12/10/03

Description A1+30 / B1-25

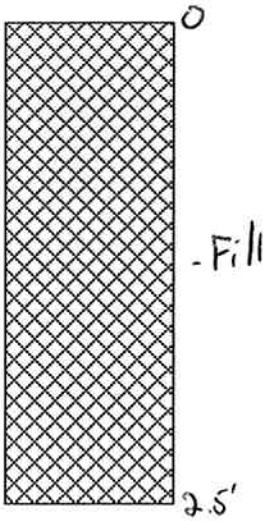
Depth 2.5'

0	Surface: Brown topsoil, dump
	Red-Brown, silty-clay w/ gravel, brick, wood fragments.
1	Dark Brown, sandy-silt w/ brick, metal wire + two 1" diameter metal pipes ea ~ 2' long.
2	Brown, Sandy-gravel + bricks in a pile that appeared to a building Foster.
3	
4	
5	
6	

Comments: The metal pipe at 0.5'-1' bgs was the likly anomoly.

Location Sketch See Figure 7

Cross Section:



Geologist: J. Manzella

Operator: Ron Brown.

PIT NO: 11	TEST PIT LOG	TVGA CONSULTANTS

Project Name: Franczyk Park Site SI/RAR
Project No: 0030125
Project Location: Buffalo, New York
Date: 12/10/03

Description A2+25 / B1+00

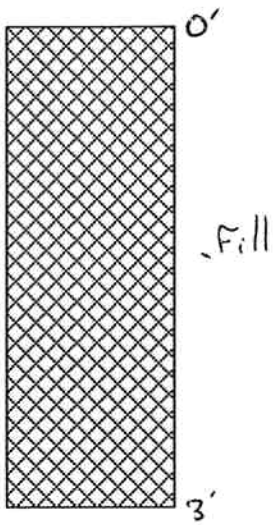
Depth 3'

0	Surface: Brown topsoil, damp.
	Red-Brown, silt + clay w/ trace brick fragments, trace gravel.
1	
2	Random Fill - Dark Brown, sandy, silt w/ bricks, metal wire, wood pieces, trace white sand,
	saturated.
3	
4	
5	
6	

Comments: Metalic anomaly at 2.5' was an x 4' diameter C-clamp.

Location Sketch

Cross Section:



Geologist: J. Manzella

Operator: Ron Brown

TVGA CONSULTANTS

SOIL PROBE LOG

PROBE NO. |

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A4+00
E-W Coord B1+00
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-3-03	8:30	≈4.5'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							≈1" Brown topsoil w/rootlets.		
							Brown, F-c sand, some gravel, damp	0	0
		S1		36"			Black, sandy-silt, trace gravel, damp.		
							Brown, silt, trace sand, orange mottling, trace coal fragments, damp		
							Gray, silty-clay, orange mottling, trace sand, coal, moist		
	5								
		S2		22"			Black, f-c sand, saturated.	0	0
							Refusal @ 5.7' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 2

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+00
E-W Coord B1+00
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-3-03	9:00	≈ 8'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown, Silty-clay, Moist		
		S1		38"			Brown, silty-sand, Some gravel, moist	0	0
							Brown, Silty-clay, moist		
							Dark Brown, silty-sand, some gravel, clay, trace brick, coal fragments moist.		
	5						As above, brown w/more sand		
		S2		38"			white, gravelly-sand, and silt, moist. w/septic odor	0	0
							Brown gravelly-silt, trace sand, clay.		
							As above saturated.	0	0
	10	S3		26"					
							Gray silty-clay, with Fecal/gasoline odor.	40	0.6
		S4		NR			Refusal @ 12.3' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 3

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2100
E-W Coord B1100
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-3-03	9:10	≈4.5'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							~1" of Brown topSoil Red-Brown, Silty-clay, damp.	0	0
		S1		42			Brown-Gray silty-sand, w/ brick Pieces, Moist	0	1.9
							Wood fragments w/ Creosote smell.	0.7	—
	5						Gray, Gravelly-Sand, and sulfur Material, Saturated	1.7	—
		S2		24			R. Fusil @ 5.7' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 4

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A 1+00
E-W Coord B 1+00
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-3-03	10:30	∑ 4'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Red-Brown silty-clay, some brick fragments, trace gravel, Moist		
		S1		42			Dark Brown - Black, sandy - s.lt, little brick, coal, wood, gravel, Moist.	0	0
	5	S2		36			Dark-Brown - Brown - Gray, F-C sand and gravel, and brick fragments, saturated.	0	0
		S3		36			Brown S.lty-Clay, w/ orange and gray Mottling, damp.	0	0
	10						Refusal @ 10.7' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 5

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A1+00
E-W Coord B2+00
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-3-03	11:30	≈4.5		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
		S1		36			≈1" Brown Topsoil Red Brown silty-clay, moist.	0	0
							Dark Brown-Black, Silt w/ little red brick, fire brick, coal fragments moist.		
	5						Mainly Red Brick w/ glass, organic material + 1" of white brick at bottom, Saturated.		
		S2		38			Gray Silty sand, and clay, some coal, Saturated.	0	0.8
							Tan-Brown, clay, trace silt, saturated.		
							Gray silty sand, and clay, some coal, saturated.		
		S3		27			Brown silty-clay, trace sand, wet.	0	0
	10						Refusal @ 9.9' bgs		
	15								
	20								
	25								
	30								

TVGA CONSULTANTS

SOIL PROBE LOG

PROBE NO. 6

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2+00
E-W Coord B2+00
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-3-03	11:50	≈4'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							<1" Brown Topsoil Red-Brown, silt and clay, damp.		
							Black-Brown Silty-sand, w/ even mix (little) red brick, wood w/ Creosote smell, trace fire Brick, moist Gray, silty-sand and clay, little fgravel, and wood w/ a volatile odor wet.		
							As above, saturated.		
							Refusal @ 4.3' bgs		
	5								
	10								
	15								
	20								
	25								
	30								

TVGA CONSULTANTS

SOIL PROBE LOG

PROBE NO. 7

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+00
E-W Coord B2+00
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-3-03	12:00	≈ 4.5'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown Topsoil, damp.		
							Red-Brown, silt and clay, damp		
		S1		25			Dark Brown, sandy-silt, little glass, metal, brick, slag, coal frags Moist.	0	0
							As above, Wet		
	5	S2		30			Red. f Sand and f gravel, Saturated.	0	0
							Brown-Gray, f-c Sand, and gravel, some ceramic Pieces, trace Clay, Saturated.		
							Brown silty-clay, w/orange mottling, Saturated		
	10	S3		40			Black, Sandy-gravel, some organic material, brick Pieces, wet	0	0
							Gray, clayey-silt, w/black staining, trace Sand. wet.		
							Refusal @ 11.3' bgs		
	15								
	20								
	25								
	30								

TVGA CONSULTANTS

SOIL PROBE LOG

PROBE NO. 8

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord N4100
E-W Coord B2100
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-3-03	2:10	≈4.5'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							<1" Brown Topsoil Red-Brown Silt + clay, damp	0	0
		S1		36			Random Fill - Mixture of silty-gravel, and f-c sand, w/ Brick, coal, glass, wet.	0	0
	5						Gray-Brown, f-c sand, some wood pieces, Saturated.	3.0	0
		S2		36					
							Dark Brown, f-c sand w/ brick and c gravel, Saturated w/ unusual odor.	0	1.4
	10	S3		38			Brown silty-clay and sand, Saturated.	0	0
							Dark Brown Sandy-gravel, saturated.	0.2	0.6
	15						Refusal @ 12.5' bgs		
	20								
	25								
	30								

TVGA CONSULTANTS

SOIL PROBE LOG

PROBE NO. 9

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord N5100
E-W Coord E3100
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-3-03	2:45	≈6'	

Equipment Data			
		Casing	Sampler	Core
Type		Acetate	Macro Core	
Diameter		1.75"	2.0"	
Weight				
Fall				

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		1			<1" Brown Topsoil, damp. Red-Brown, silt & clay, little gravel, trace brick, coal fragments, dump.	0	0.4
	5	S2		1			Random Fill - Black, silt, sand, and gravel, little clay, saturated	0	0
	10	S3		1			Brown silty-clay, w/ orange mottling, little wood, coal fragments, trace sand, gravel, saturated.	0	0.2
	15						Refusal @ 11.6' bgs		
	20								
	25								
	30								

TVGA CONSULTANTS

SOIL PROBE LOG

PROBE NO. 10

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A400
E-W Coord B300
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-3-03	3:30	∇ 9'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
		S1		1			Red-Brown silty-clay, little coal, brick fragments, moist.	0	0
	5	S2		1			Random Fill - Dark Brown-Black silt and sand w/ brick and coal fragments, wet	0	0.1
							Brown-Tan, clayey-Silt, w/ gray-black staining, gray mottling, little coal fragments, wet.	0	0
	10	S3		1			Brown, clayey-silt w/ gray mottling, saturated w/ mild petroleum odor.	1.9	23.0
	15						Refusal @ 11.6' bgs.		
	20								
	25								
	30								

TVGA CONSULTANTS

SOIL PROBE LOG

PROBE NO. 11

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+00
E-W Coord B3+00
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-3-03	3:50	≈ 8'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Red-Brown silt & clay moist.		
		S1		39			Random Fill - Black, Red and Tan, Sand and gravel, wet.	0	0
	5	S2		35			Brown, silty-clay, w/ gray mottling, trace glass, brick fragments, Saturated.	0	0
	10	S3		48			Brown clayey-silt, orange mottling, Some f sand, wet.	0	0
		S4		30			Refusal @ 12.8'	0	0
	15								
	20								
	25								
	30								

TVGA CONSULTANTS

SOIL PROBE LOG

PROBE NO. 12

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2+00
E-W Coord 03+00
Start Date 11-3-03
Finish Date 11-3-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-3-03	4:10	▼		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		1			Brown Topsoil, dump Random Fill – Gray clay, silt and sand, w/black staining, some red brick, little white brick, moist	0	0
	5	S2		1				0	0
	10						Refusal @ 5.7' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 13

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A1+00
E-W Coord B3+00
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-4-03	8:00	—		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		33			Red-Brown, silt and clay, little gravel, coal fragments, trace brick, damp.	0	0
							Dark Brown-Black, sandy-gravel, some brick fragments, coal fragments, damp	0	0.8
	5						Refusal @ 3.5' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 14

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A0+50
E-W Coord B4+00
Start Date 11-4-03
Finish Date 11-14-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-4-03	8:30	≈ 5'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							3" Brown Topsoil Red-Brown silt + clay, and Brick fragments, damp.	0	0.1
		S1		39			Dark Brown-Black, silt - sand, some gravel, little brick, coal fragments damp.	0	0
							Brown, clayey-silt, damp.	0	0
	5						Brown, sandy-gravel, trace clay, w/ coal, brick fragments, saturated.	0	0
		S2		30			Brown, clayey-silt, w/ gray mottling, wet.	0	0
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 15

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A1+50
E-W Coord B4+00
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-4-03	9:00	≈4'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							21" Brown Topsoil. Red-Brown, silt and clay, little gravel, brick fragments, damp.	0	0.1
				42			Dark Brown silty-sand and gravel, some clay, little brick, coal fragments, trace wood fragments, damp.	0	—
		S1					Black, Sandy-gravel, some wood, coal fragments, little green sand, trace brick fragments, trace fibrous material, Saturated.	0	0.1
	5	S2		43			Brown, clayey-silt, w/ gray mottling; moist	0	0.1
							Refusal @ 7.7' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 16

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2150
E-W Coord B4100
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-4-03	9:40	—		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Red-Brown, Silt and clay, trace coal, brick fragments, damp.	0	0
		S1		48			Random Fill - Dark Brown-Black, silty-sand, some brick, coal fragments, little green sand, trace fire brick, trace white silty material, moist. w/ Black staining.	0	0.3
	5	S2		48			white, silty material, moist, w/ mild odor.	0	2.5
							Black, Sand and coal fragments, Moist.	0	—
							Brown, clayey-silt, w/ gray mottling, Moist.	0	0.1
	10	S3		—			Refusal @ 9.4' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 17

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+50
E-W Coord B4+00
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-4-03	10:15	5'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0						Brown Topsoil	0	0
							Red-Brown clayey silt, trace brick, coal, dump.	0	0.1
		S1					Black-Brown, silty-Sand, some clay, little, wood, glass, brick, coal, metal, wet.	0	0.4
	5						As above saturated.		
		S2					Brown clayey-silt w/gray mottling, moist.	0	0.1
	10						Refusal at 7.7' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 18

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord
E-W Coord
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-4-03	10:45	—		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		30			Brown Topsoil w/rootlets damp	0	0
							Red. Brown silt and clay, trace gravel, brick, coal, damp.	0	0.1
							Black silty-sand, trace coal, brick, moist w/concrete in probe T.P.	0	0.1
	5						Refusal @ 3.5' bgs.		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 19

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A4100
E-W Coord B5+00
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-4-03	10:50	≈ 4'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown - Topsoil, damp.	0	—
							Red, Brown, silt and clay, damp.	0	0.1
		S1		1			Brown - Black, silty-sand and gravel, some gray clay, trace brick, wood, metal, coal pieces, saturated.	0	0.1
	5						Brown, clayey-silt, w/gray mottling, damp.		
		S2		1				0	0.1
							Refusal @ 7.6' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 20

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+00
E-W Coord B5+00
Start Date 11-4-05
Finish Date 11-4-05
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-4-05	1115	≈ 4.5'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							3" Brown Topsoil, Damp Red, Brown, silt and clay w/roots damp	0	0
		S1		36			Dark-Brown silty-sand and gravel, some clay, little brick, coal, wood wet.	0	0.1
							As above Saturated.		
	5	S2		48			Brown, clayey silt, w/ gray Mottling, trace sand, gravel damp.	0	0.1
							Refusal @ 8.0' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 21

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2100
E-W Coord B5100
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-4-03	11:30	≈ 4.0'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		1			< 1" of Brown topsoil, damp. Red, Brown silt and clay, little coal, brick, gravel, trace iron staining, moist.	0	0.1
							Random Fill - Dark Brown - Black, silty-sand and gravel, little Brick, coal, white silty material, trace clay, wet.	0	0.1
	5	S2		1			Black-Gray sandy-gravel, trace coal, brick, saturated.	0	0.1
							Yellow silt/ Sulfur like material, saturated.	0	0.1
							Brown, silt & clay, w/gray mottling, trace glass fragments, damp	0	0.1
	10						Refusal @ 8.0' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 22

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A1100
E-W Coord B5700
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-4-03	12:15	≈4.5'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							≈1" of Brown topsoil, dump. Red, Brown silt and clay, trace, brick, coal fragments, dump	0	—
		S1		38			Random Fill - Dark Brown - Gray, silty-sand and gravel w/ iron staining, some clay, wood, little Brick, coal, glass, Moist	0	0.1
							Red - Brown, Clayey - Silt, Moist.	0	0.1
	5						Brown sandy-gravel, little coal, glass, brick, saturated. iron staining was present.	0	0.1
		S2		42			Brown, clayey-silt w/ gray mottling, Moist	0	0.1
	10						Refusal @ 7.8' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 23

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A1150
E-W Coord B6400
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-4-03	1:30	≈ 4.5	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0						<1" of Brown Topsoil, dump Red-Brown, silt and clay, trace gravel, brick, damp	0	0.1
		S1		45			Black, sandy-silt, w/iron staining, trace whitesilty material, trace coal, brick, glass, wood fragments, moist	0.1	0.6
	5						Gray, clayey-silt, w/ black staining, trace sand, wood fragments saturated.	0	0.2
		S2		48			Brown, clayey-silt, w/ gray mottling, moist.	0	0
	10	S3		NR			Refusal @ 8.1' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 24

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+50
E-W Coord B6+00
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-4-03	—	—	

Equipment Data			
		Casing	Sampler	Core
Type		Acetate	Macro Core	
Diameter		1.75"	2.0"	
Weight				
Fall				

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0						~1" Brown topsoil, damp.	0	—
							Red, Brown, silt and clay, some gravel, trace brick, coal, damp	0	0.1
							Red, silt and sand, little fine gravel, trace brick, glass, wet.		
		S1		39			Brown-Gray, clayey-silt, w/ iron staining, some fine sand, little wood, coal, wet.	0	0.1
	5						Brown clayey-silt w/ gray mottling, moist.		
		S2		42				0	0.1
							Refusal @ 7.1' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 25

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A4+50
E-W Coord B6+00
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-4-03	2:30	—		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							<6" of Brown topsoil, damp.		
							Red-Brown, silt and clay, minor Black staining, little coal, brick, damp	0	0
				48"			Random fill- Brown, silt and sand, little asphalt, wood, sponge material, hard plastic, trace fibrous material, damp.	0	—
		S1					Brown, clayey-silt w/ gray mottling, little fine sand, moist.	0	0.1
	5	S2		30"					
							Refusal @ 6.2' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 26

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A5+00
E-W Coord B7+00
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-4-03	3:00	≈4.2'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Rd. brown, silt and clay, trace gravel, dump.	0	0
		S1		24			Brown, clayey-silt, little brick, trace wood, coal, gravel, wet.	0	0
							As above moist.		
	5						Brown-silt, clay and fine gravel, some brick, trace wood, coal, saturated.	0.1	0.7
		S2		4			Refusal @ 5.2' bgs on top of Concrete.		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 27

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A4+00
E-W Coord B7+00
Start Date 11-4-03
Finish Date 11-4-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-4-03	3:15	—		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
		S1		—			Red-Brown, silt and clay, trace gravel, damp.	0	0
							Dark Brown – Black, Silty-Sand, little coal, trace brick, glass, wet, faint odor.	0.1	0.2
	5	S2		—			Brown silt and clay, trace gravel, coal, wood fragments (which appeared to be of natural deposition), moist.	0	0
	10						Refusal @ 8' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 38

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+00
E-W Coord B7+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-5-03	8:00	≈ 3'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							3" Brown Topsoil, damp. Red-Brown silt and clay, trace gravel, damp.	0	0.1
		S1		44			Red and Brown sand and gravel, little red sand, trace sulfur colored sand, trace white sand, trace wood fragments, saturated.	0	0.1
	5	S2		46			Tan clay and silt, little fine sand, little glass shards, wet. w/ iron staining	0	0.2
							Brown-Red, clayey silt w/ gray mottling, damp.	0	0.1
							Refusal @ 7.4' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 29

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2100
E-W Coord B7400
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-5-03	9:00	≈4.5'	

Equipment Data			
		Casing	Sampler	Core
Type		Acetate	Macro Core	
Diameter		1.75"	2.0"	
Weight				
Fall				

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Red-Brown, silt and clay, trace gravel, damp	0	0
		S1		1			Random Fill- Dark Brown and gray, silty-sand and clay some gravel, trace brick, wood, wet, w/ black and iron staining.		
	5						As above saturated.	0	0.1
		S2		1			Brown, clay and silt, w/ gray mottling/iron stain, wet.	0	0
	10						Concluded @ 8' bgs on native soil		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 30

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A1+00
E-W Coord B3+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-5-03	9:30	—	

Equipment Data			
		Casing	Sampler	Core
Type		Acetate	Macro Core	
Diameter		1.75"	2.0"	
Weight				
Fall				

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		1			Red-Brown, silt and clay, little gravel, trace brick, fine sand, damp.	0	0.1
							Brown-Red, silty-sand, little gravel, trace coal, damp.	0	—
							Brown, silt w/ iron staining at top, Black staining at Bottom, little fine sand, trace brick, coal, moist.	0	0
	5	S2		1			Brown, clayey-silt w/ gray mottling, trace shale fragments, moist.	0	0
							Refusal @ 7.5' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 31

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A0+50
E-W Coord B8+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-5-03	9:45	—	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		26			Red-Brown, silt and clay w/ rootlets, trace gravel, damp.	0	0.2
							Random Fill - Brown-Gray, silty-sand and clay, some brick, trace wood, coal, moist.	0	0
							Refusal @ 2.5' w/ concrete in probe tip.		
	5								
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 32

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2+50
E-W Coord 68+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-5-03	10:00	≈ 2'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Red-Brown, silt and clay, w/ rootlets, damp.	0	0
		S1		1			Brown-Gray, Silty-sand and gravel, some clay, trace coal, brick, Saturated.	0	0
	5						Refusal @ 3.7' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 33

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+50
E-W Coord B3+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-5-03	10:30	—		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Red-Brown, silt and clay, w/ root lets, damp.	0	0
		S1		–			Brown-Gray, silty-Sand and gravel, some clay, trace brick, coal, wet.	0	0.1
	5						Refusal @ 3.7' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 34

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A4+50
E-W Coord B8+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-5-03	10:45	≈ 3'	

Equipment Data			
		Casing	Sampler	Core
Type		Acetate	Macro Core	
Diameter		1.75"	2.0"	
Weight				
Fall				

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Red-Brown, silt and clay, trace gravel, brick, damp.	0	—
		S1		40			Random Fill - Dark Brown-Gray, silty-sand and gravel, some clay, trace yellow sand, brick, coal, saturated.	0	0.1
	5						Red, silty-sand and gravel, saturated.	0	0.1
		S2		36			Brown, clayey-silt, w/ gray mottling, moist.	0	0.1
	10						Concluded Probe @ 8' bgs in native soil		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 35

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A 5+00
E-W Coord B 7+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-5-03	11:20	≈6.0'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		40			Red-Brown, silt and clay, trace gravel, brick, dump.	0	0
	5	S2		31			As above, wet.		
							Black organic material, faint odor, saturated.	0.1	—
							Refusal @ 6.6' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 36

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A4+00
E-W Coord B4+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-5-03	11:40	—		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		1			Red-Brown, silt and Clay, trace brick, gravel, moist, w/ minor black staining	0	0.1
	5	S2		1			Refusal @ 5.5' bgs on shale like rock.		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 37

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A 100
E-W Coord B9+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-5-03	12:00	~6'	

Equipment Data			
		Casing	Sampler	Core
Type		Acetate	Macro Core	
Diameter		1.75"	2.0"	
Weight				
Fall				

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Red-Brown, silt and clay, w/ rootlets, trace brick, moist.	0	
		S1		1			Dark Brown - Brown, Sandy-silt, some clay, little gravel, brick wood, trace white sand, trace hard plastic pieces, trace metal fragments in probe tip, wet.	0	0.1
	5	S2		1			Auger saturated.		
							Refusal @ 6.6' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 38

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2300
E-W Coord B9100
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-5-03	12:40	≈ 4.5'	

Equipment Data			
		Casing	Sampler	Core
Type		Acetate	Macro Core	
Diameter		1.75"	2.0"	
Weight				
Fall				

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Red-Brown, silt and clay, damp.	0	0
		S1		1			Dark Brown, sand-silt, little wood, brick, gravel, trace glass, hard plastic, trace white sand, wet.	0	0.1
	5						As above, w/ minor black staining, saturated.		
		S2		1			Refusal @ 5.5' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 39

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A1+00
E-W Coord B9+80
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-5-03	1:00	—		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0						Brown, topsoil, w/ roots, damp.	0	—
		S1		1			Dark Brown, clayey-silt, some(f) sand, little gravel, brick, glass trace styrafoam, moist.	0	0.4
	5	S2		1			Dark Brown – Black-Gray, silty-sand, little orange sand, little greenish gray sand, trace gravel, wet.	0	0.4
							Refusal @ 6.6' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 40

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A0+50
E-W Coord B10+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-5-03	1:30	≈ 4.5	

Equipment Data			
		Casing	Sampler	Core
Type		Acetate	Macro Core	
Diameter		1.75"	2.0"	
Weight				
Fall				

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Red-Brown, silt and clay, w/roots, trace brick, coal, dump.	0	0
							Brown, clayey-silt, some (F) sand, iron staining, trace coal, brick, trace white sand, moist.	0	0.2
		S1		34			Dark Brown, sandy-gravel, w/iron staining, little clay, trace metal, brick wet.	0	0.7
	5						As above saturated.		
		S2		46			Brown, clayey-silt, w/gray mottling, moist. As above trace (F) sand.	0	0
							Refusal @ 7.9' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 41

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2150
E-W Coord B1400
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-5-03	2:10	≈5'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown, Topsoil, damp.	0	0
							Red-Brown, silt and clay, trace brick, moist.	0	0.1
							Dark Brown, clayey-silt, and (F-C) sandy-gravel, little brick, coal, wood, trace fire brick, moist	0	0.1
	5						As above wet.		
							As above saturated.		
							Black organic Material w/wood pieces, saturated.	0	—
							Refusal @ 5.7' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 42

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+50
E-W Coord B10+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-5-03	2:30	≈4'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0						Brown Topsoil, damp	0	—
		S1		36			Red-Brown, silt and clay, little gravel, trace brick, damp	0	0.3
	5						Dark Brown-Brown, silt and clay, some f-c sandy gravel, iron staining, trace brick, glass, damp	0	0.3
		S2		6			as above Saturated.		
	10						Refusal @ 4.2' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 43

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A4+50
E-W Coord B0+00
Start Date 11-5-03
Finish Date 11-5-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-5-03	3:15	—		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0						< 1" of Brown, Topsoil, w/roots, damp.	0	—
		S1		48			Red Brown, silt and clay, trace fine sand into foot, little brick, trace fine gravel, moist	0	0
	5	S2		—			As above, wet		
							Refusal @ 6.7' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 44

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A4 +00
E-W Coord B11 +00
Start Date 11-6-03
Finish Date 11-6-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-6-03	8:30	–		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown Topsoil, damp.	0	0
		S1		45"			Red-Brown, Silt and clay, trace wood, coal, brick, damp	0	0
	5	S2		40			Dark Brown, Silt and clay, little brick, wood, coal, firebrick, gravel (w/ maroon colored pieces), Minor black staining, Moist.	0	0.3
							Refusal @ 7.3' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 45

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+00
E-W Coord B1+00
Start Date 11-6-03
Finish Date 11-6-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-6-03	9:00	≈4.0'	

Equipment Data			
		Casing	Sampler	Core
Type		Acetate	Macro Core	
Diameter		1.75"	2.0"	
Weight				
Fall				

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown Topsoil, damp	0	0
							Red-Brown, Silt and clay, trace brick, gravel, fire brick, slag, roots, damp		
		S1		46			Dark Brown, clayey-silt, little coal, brick, glass, trace fire brick, minor iron staining, moist.	0	0
	5						Brown-Gray, Sandy-silt, black staining, some gravel, trace brick, wood, saturated.	0	0.2
		S2		48					
							Brown, Silty-sand, black staining, little gravel, moist.	0	0.1
	10	S3		47			Brown, clayey-silt, some gravel, gray mottles, damp	0	0
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 46

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord 83403
E-W Coord 81400
Start Date 11-6-03
Finish Date 11-6-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-6-03	9:20	≈ 3.5'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown Topsoil damp.	0	0
							Red-Brown silt and clay, trace brick, coal fragments, damp	0	0
		S1		22			Dark Brown, silty-sand and clay, w/ black staining, and iron staining, trace brick, glass, wood, saturated.	0	0
	5						Refusal @ 3.6' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 47

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A0+50
E-W Coord B13+00
Start Date 11-6-03
Finish Date 11-6-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-6-03	10:00	≈ 4.0'	

Equipment Data			
		Casing	Sampler	Core
Type		Acetate	Macro Core	
Diameter		1.75"	2.0"	
Weight				
Fall				

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown Topsoil, damp.	0	-
							Red-Brown, silt and clay, trace gravel, damp.		
							Random Fill no layer thicker than 3" thick. Top – Bottom:		
							– Black, silty-sand, trace glass, gravel, damp.		
							– Brown, clayey-silt, little wood, coal pieces, trace fabric, damp		
							– Gray-Brown, sandy-gravel (looks like crushed concrete), damp.	0	0.1
	5						– Dark Brown, sandy-silt w/maroon pieces, trace glass damp.		
							– Gray-Brown, sandy gravel as above, damp.		
							– Brown-Gray sand-gravel w/ iron staining		
							– as above Brown, Saturated.		
							Brown, clayey-silt, w/ gray mottling, damp.	0	0
	10						Refusal @ 6.5' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 48

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2+50
E-W Coord B12+00
Start Date 11-6-04
Finish Date 11-6-04
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-6-03	10:30	≈ 4.5'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown Topsoil damp	0	—
							Red-Brown, silt and clay, trace coal, brick. damp.	0	0
		S1		48			Dark Brown, clayey-silt, black staining, little brick, wood, coal, Maroon silty-sand, white sand, moist	0	0.2
	5						As above, saturated		
		S2		40			Gray, sandy-silt, black staining, some gravel, saturated.	0	0.1
							Brown, clayey-silt, w/gray mottling damp.	0	0
	10	S3		22					
							Refusal @ 10.4' bgs.		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 49

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+50
E-W Coord B12+00
Start Date 11-6-03
Finish Date 11-6-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-6-03	11:30	—	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown Topsoil, dump.	0	—
				48			Red-Brown, silt and clay, trace gravel, brick, dump.	0	—
		S1					Dark Brown, clayey-silt, minor black staining, iron staining, little gravel, brick, trace fire brick, coal, moist.	0	0.2
	5								
		S2		31			Gray-Black, sandy-silt, w/ trace clay, trace brick, maroon silty-sand, gravel, glass, wet.	0	0.1
							Refusal @ 7.2' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 50

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A4+50
E-W Coord B12+00
Start Date 11-6-03
Finish Date 11-6-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-6-03	12:00	–	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown Topsoil, damp.	0	–
		S1		1			Red-Brown, silt and clay, trace brick, gravel, glass, damp.	0	0
	5						Dark Brown, clayey-silt, little gravel, wood, brick, trace metal, coal, damp	0	0.1
		S2		1			Gray-Brown, clay and silt, some (f) sand, little gravel, trace wood, brick, wet.		
							Refusal @ 7.0' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 51

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A5+00
E-W Coord B13+00
Start Date 11-6-03
Finish Date 11-6-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
11-6-03	12:15	≈ 4.5'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							7 1" of Brown Topsoil, damp.	0	-
							Red-Brown, silt and clay, trace gravel, brick, moist.	0	0
		S1					Gray-Brown, Sandy-Silt, w/ black staining, some clay, little gravel, trace coal, wood, brick, plastic wet.	0	0.1
	5						As above, saturated		
		S2					Refusal @ 5.2' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 52

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A4+00
E-W Coord B13+00
Start Date 11-6-03
Finish Date 11-6-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-6-03	1:15	≈4.0'	

Equipment Data			
		Casing	Sampler	Core
Type		Acetate	Macro Core	
Diameter		1.75"	2.0"	
Weight				
Fall				

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown Topsoil, w/roots dump.	0	—
							Red Brown, silt and clay, little brick, coal, gravel, glass, trace wood, dump.	0	0
		S1		1			Dark Brown, sand-silt and clay, some brick fragments, little organic material, trace glass, coal, fire brick, wet	0	0.1
	5						As above Saturated.		
		S2		1			Brown, clayey-silt, w/gray mottling, trace fine gravel, dump.	0	0
							Refusal @ 7.6' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 53

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3 +00
E-W Coord B13 +00
Start Date 11-6-03
Finish Date 11-6-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-6-03	2:00	∇ 4.5'	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0						Brown, Topsoil, damp.	0	—
							Red-Brown, silt and clay, trace brick, gravel, damp	0	0
		S1		1			Brown-Gray, Sandy-silt and gravel, little clay, little white and red fine gravel, trace white silty material, minor black staining, trace wood, faint odor, saturated.	0	0.1
	5	S2		1			Brown, clayey-silt, w/ gray mottling, damp.	0	0
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 54

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2 +00
E-W Coord B 13 +00
Start Date 11-6-03
Finish Date 11-6-03
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-6-03	2:30	—	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0						Brown Topsoil, damp	0	0
		S1		1			Random Fill, No layer thicker than 10" thick; Top to Bottom: - Brown, silt, some gravel, trace plastic, wood, brick, damp. - Tan, clayey-silt, w/ white silty material and brick, damp. - Yellow/white, gravel and F-C sand, damp. - Black, Silty-sand, trace brick, damp. - Red brick pieces, damp. - Brown, clay and silt, w/ iron and black staining, damp. - Brown, sandy-silt, w/ iron and black staining, trace mat, moist. - Red, brick and gravel, moist.	0	0
	5								
		S2		1			Brown, clayey-silt w/ gray mottling, damp	0	0
	10						Refusal @ 7.7' bgs		
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 55

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A0+35
E-W Coord B10+75
Start Date 3-6-04
Finish Date 3-6-04
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
3-6-04	2:10	∑ 1.2'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		44			Brown, fossil, w/ rootlets, damp.	0	—
							Red-Brown, silt and clay, damp	0	
							Red Sand, w/ iron staining, wet	0	
							Black organic material (wood) w/ creosote smell, wet.	0	
							Red-Brown, silty sand and gravel, mild sheen, saturated, faint odor.	0	
							Dark Brown, clayey-silt, some (f) sand, w/ gray mottling, moist.		
	5						Concluded Soil Probe @ 4.0' bgs.		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 56

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A0+35
E-W Coord B10+45
Start Date 3-6-04
Finish Date 3-6-04
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
3-6-04	2:20	—		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		44			Brown, Topsoil w/ rootlets, damp.	—	
							Black, sandy-silt, little red-purple sandy material, wet, w/ fine coal	0.7	—
							Dark Brown, clayey-silt and sand, trace coal fragments wet.	—	
	5						Concluded Soil Probe @ 4.0' bgs.		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 57

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A0+35
E-W Coord B0+35
Start Date 3-6-04
Finish Date 3-6-04
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
3-6-04	10:00	—		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		42			Brown, Topsoil, moist.	0	—
							Red-Brown, silt and clay, little brick and coal pieces, damp.	0	
							Dark Brown - Black, silty sand and gravel, little brick, coal, glass, moist.	0	
							orange, clayey-silt, little brick, gravel, moist.	0	
							Brown, clayey-silt, w/ gray mottling and brick, wet.	0	
	5						Concluded Soil Probe @ 4.0' bgs		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 58

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A1+75
E-W Coord B0+30
Start Date 3-6-04
Finish Date 3-6-04
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
3-6-04	10:00	3.5'		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							<1" of Brown, Topsoil, wet	0	
							Red-Brown, silty-clay, trace brick, wood, damp	0	
		S1		39			Yellow brown, silty-clay, trace gravel, wet.	0	—
							Gray, silty-sand and gravel, trace yellow silty-sand (soil for life), saturated	0	
	5								
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. 59

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A3+75
E-W Coord B0+15
Start Date 3-6-04
Finish Date 3-6-04
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
3-6-04	10:55	—	

Equipment Data			
	Casing	Sampler	Core
Type	Acetate	Macro Core	
Diameter	1.75"	2.0"	
Weight			
Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1		25			Brown topsoil w/ rootlets damp.	0	—
							Brown (f-m) sand moist.		
							Black silty-sand and gravel wet.		
							Red sand, gravel and brick moist.		
							Yellow-orange, silty-sand. moist.		
	5						Dark Brown-Black, sandy-silty-clay moist.		
							Concluded Soil Probe @ 4' bgs.		
	10								
	15								
	20								
	25								
	30								

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SOIL PROBE LOG

PROBE NO. Micro 01

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A0+65
E-W Coord B1+35
Start Date 3-6-04
Finish Date 3-6-04
Driller R. Rose
Geologist J. Manzella

Groundwater Data (feet)				Equipment Data			
Date	Time	Depth	Elev		Casing	Sampler	Core
3-6-04	8:35	≈4' bgs		Type	Acetate	Macro Core	
				Diameter	1.75"	2.0"	
				Weight			
				Fall			

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
							Brown, topsoil w/ rootlets, wet.	0	
							Red-Brown, silt and clay, some brick, coal, dump.		
							Red-orange, pulverized brick, dump.		
							Dark-Brown-Black, sandy-silt and clay, trace brick, white silty material, wet	0	—
							As above saturated.		
	5						As above w/ gravel and wood fragments.		
							Greenish-Gray, sandy-gravel and white silty material, saturated.		
							Brown, clayey-silt w/ orange and gray mottles, moist.	0	
							Concluded soil probe @ 8.0' bgs.		
	10								
	15								
	20								
	25								
	30								

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TEST BORING LOG

BORING NO. 1

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A5+00
E-W Coord B5+00
Start Date 11-17-03
Finish Date 11-17-03
Driller J. Jones
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-17-03	8:50	2'	

Equipment Data			
	Casing	Sampler	Core
Type	HSA	SS	
Diameter	4.25"	2.0"	
Weight		140 #	
Fall		30"	

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
			2 5				Brown Topsoil w/rootlets & wood, dump.		
		S1	10 12	14			Red-Brown, silt and clay, trace gravel, damp.	0	0
			7 7				Dark-Brown, clayey-silt, trace gravel, coal, brick, wet saturated.		
		S2	7 7	24			Brown, clayey-silt, w/gray mottling, little white sand, trace sandy-silt, brick, wet.	0	0
	5		11 7						
		S3	11 16	NR			No Recovery	0	0
			21 17						
		S4	15 24	1"			Brown, clay and silt, some gravel, Saturated.	0	0
		S5	5 7	12			As above, trace sand.		
	10		8 9				Gray-Brown, sandy-silt, w/ black staining, trace coal pieces, & Funny smell among like, wet.	0	0
		S6	10 11	16			As above, Sandy-silt, trace glass, gravel, unusual odor among like, trace black gravel and coal fragments, saturated.	0	0
			12 14						
		S7	5 12	10			As above, no staining, trace concrete.	0	3.7
			50/3						
	15						Split Spoon and Auger Refusal at 13.3' bgs		
	20								
	25								
	30								

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TEST BORING LOG

BORING NO. 2

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A 5100
E-W Coord B 1100
Start Date 11-17-03
Finish Date 11-17-03
Driller J. Jones
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-17-03	10:45	≈8'	

Equipment Data			
	Casing	Sampler	Core
Type	HSA	SS	
Diameter	4.25"	2.0"	
Weight		140 #	
Fall		30"	

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1	2 5	19			Brown Topsoil, damp.	0	0
			6 8				Red-Brown, silt + clay, trace brick, gravel, coal, (F-C) sand, moist		
		S2	8 9	20				0	0
			10 12						
	5	S3	7 50/3	3			As above trace slag, concrete	0	0
			- -				Concrete		
		S4	4 5	24			Gray-Brown, clay and silt, some (F) Sand, little gravel, white sand trace black silty material, black staining throughout + some orange/gray mottling wet.	0	0
			8 7						
		S5	4 6	20			As above, Saturated.	0	0
	10		8 9				Brown, clayey silt, w/ gray mottling, moist.	0	0
		S6	5 10	21			As above.	0	0
			12 17						
		S7	17 25	11			Brown, silty-sand and gravel, Saturated.	0	0
			28 24				Brown, clayey-silt, w/ gray mottling, moist.	0	0
	15	S8	9 11	20			As above, w/ orange mottling.	0	0
			14 17						
		S9	17 20	24			As above, no mottling	0	0
			21 30				Gray, Sandy-silt, trace rock fragments, moist.	0	0
	20						Concluded augering @ 14' bgs and split-spooning @ 18' bgs.		
	25								
	30								

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TEST BORING LOG

BORING NO. 3

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2+35
E-W Coord B0+50
Start Date 11-17-03
Finish Date 11-17-03
Driller J. Jones
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-17-03	3:30	∑ 8.0'	

Equipment Data			
	Casing	Sampler	Core
Type	HSA	SS	
Diameter	4.25"	2.0"	
Weight		140 #	
Fall		30"	

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
		S1	3 4 / 6 3	6			Brown, Topsoil, damp. Red-Brown, silt and clay, trace brick, moist.	0	0
		S2	5 7 / 3 7	4			Gray, Sandy-silt, and red brick, trace white sand, saturated.	0	0
	5	S3	6 2 / 5 6	18			Brown-Gray, clayey-silt, w/ black staining, trace brick saturated.	0	0.9
		S4	3 4 / 5 5	20			Gray silt, w/ Strong Septic odor, wet. Brown-Black, silty-sand, w/ very strong Septic smell, saturated	0	0.8
		S5	1 2 / 2 3	12			Gray-Brown, silt and sand, trace clay, wood, moist, slight Septic odor, saturated.	0	0
	10	S6	3 2 / 2 3	12			Brown, silt and sand, trace clay, slight septic odor, saturated. Brown-Gray, silty-sand, strong sulfur smell	0	0.1
		—	— — / — —	—			No Recovery	0	5.3
	15	S7	18 42 / 50/2" —	8			Gray, sandy-silt and rock fragments, saturated.	0	—
							Split Spoon and Auger Refusal @ 15.2' bgs.		
	20								
	25								
	30								

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TEST BORING LOG

BORING NO. 4

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A1+30
E-W Coord B12+42
Start Date 11-18-03
Finish Date 11-18-03
Driller J. Jones
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-18-03	11:15	≈15'	

Equipment Data			
	Casing	Sampler	Core
Type	HSA	SS	
Diameter	4.25"	2.0"	
Weight		140 #	
Fall		30"	

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
		S1	3 4 / 11 7	16			Brown Topsoil w/roots. damp.	0	0
							As above. and gravel.	0	0
		S2	10 10 / 12 12	18			Dark Brown - Brown, Sandy-silt, some black sand, iron staining trace Maroon sand, brick, gravel, damp.		
	5	S3	8 8 / 10 12	16			As above.	0	0
							Brownish-Red, clayey-silt, w/ gray mottling, trace wood fragments damp.	0	0
		S4	9 15 / 24 22	14			As above, no wood.	0	0
		S5	9 12 / 18 22	16			As above.	0	0
	10	S6	12 19 / 24 28	20			As above.	0	0
		S7	5 4 / 7 9	21			Brown, silty-clay, w/ gray mottling, w/ a rock stuck in the spoon tip. wet.	0	0
	15	S8	5 5 / 5 5	18			As above saturated.	0	0
							Concluded Split Spoon Sampling and Augering at 16' bgs.		
	20								
	25								
	30								

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TEST BORING LOG

BORING NO. 5

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A1+50
E-W Coord B3+00
Start Date 11-18-03
Finish Date 11-18-03
Driller J. Jones
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-18-03	3:00	∇ 2'	

Equipment Data			
	Casing	Sampler	Core
Type	HSA	SS	
Diameter	4.25"	2.0"	
Weight		140 #	
Fall		30"	

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
		S1	2' 8 / 20 28	18			Brown, Topsoil, damp. Red-brown, silty-clay, trace coal fragments, damp. Dark Brown, clayey-silt and brick fragments, trace glass, coal, orange/gray sand, gravel, damp	0	0
		S2	10 9 / 8 6	16			Dark Brown - Black, (F-C) Sand and gravel, trace maroon sand, fire brick, faint fuel oil smell, saturated.	0	0
	5	S3	6 2 / 2 3	11			As above. Dark Brown, Sandy-silt, trace coal fragments, wet.	0	0
		S4	6 7 / 7 14	12			Brown, Sandy-silt, w/orange mottling.	0	0
		S5	12 16 / 18 24	12			Brown, silty-clay, w/gray Mottling damp.	0	0
	10						As above.	0	0
							Concluded Splitspoon Sampling and Augering at 10' bgs		
	15								
	20								
	25								
	30								

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TEST BORING LOG

BORING NO. G

Project: Franczyk Park Site SI/RAR
Client: City of Buffalo, Office of Strategic Planning
Contractor: SLC Environmental Services

Project No. 0030125
GS Elev
WS Ref Elev
N-S Coord A2150
E-W Coord B6100
Start Date 11-19-03
Finish Date 11-19-03
Driller J. Jones
Geologist J. Manzella

Groundwater Data (feet)			
Date	Time	Depth	Elev
11-19-03	8:30	~2'	

Equipment Data			
	Casing	Sampler	Core
Type	HSA	SS	
Diameter	4.25"	2.0"	
Weight		140 #	
Fall		30"	

Well Construction	Depth (feet)	Sample No.	Blows per 6"	Recovery (in.)	Log	Unified	Field Description	Remarks PID Reading (ppm) Direct	Head
	0	S1	2 5 / 8 17	14			Brown Topsoil, damp Red-Brown, silt-fine clay, trace brick, moist.	0	0
		S2	4 4 / 4 6	12			Dark Brown, silty-sand, w/ maroon colored sand, little brick, iron staining, little gravel, moist. Gray-Brown, clayey-silt and fine sand, little brick and gravel, wet.	0	0
	5	S3	4 4 / 9 13	16			As above, Tan-orange, no brick or gravel. Brown-silt & clay, w/ gray mottling, trace glass fragments, moist	0	0
		S4	10 22 / 24 27	14			As above, no glass, trace wood, damp	0	0
	10						Concluded Split-Spoon Sampling and Augering at 8' bgs.		
	15								
	20								
	25								
	30								

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MONITORING WELL SAMPLING LOG

MW NO: 01

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: _____
Screen Length: _____

Purge Information:

(1) Depth to Bottom of Well: 12.7' (from TOC)

(2) Depth to Water: 0.71 ft (from TOC)

(3) Column of Water: 11.98 (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 1.95 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: Peristaltic Pump

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	1.8	1.8	1.8				
Time	1:42	1:47	2:00	2:04				
ORP/EH (MV)	—	—	—	—				
pH	6.50	6.59	6.61	6.56				
Cond. (MS/CM)	9.4	6.81	9.38	10.6				
Turb. (NTU)	10	10	10	10				
Salinity (%)	0.50	0.34	0.49	0.57				
D.O. (mg/l)	1.08	1.91	0.97	0.62				
Temp. (°C)	5.7	4.4	5.6	6.8				

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:

Sample Method: _____

No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE

Sample Time: _____

Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: _____

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: 2

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 3-3-04
Screen Length: _____

Purge Information:

(1) Depth to Bottom of Well: 13.74 (from TOC)

(2) Depth to Water: 3.30 ft (from TOC)

(3) Column of Water: 10.48 (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 1.71 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: Peristaltic pump

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	1.7	2.0	1.0				
Time	10:33	10:40	10:45	11:03				
ORP/EH (MV)	–	–	–	–				
pH	6.00	5.94	5.94	6.01				
Cond. (MS/CM)	3.03	2.91	2.87	2.84				
Turb. (NTU)	10	10	10	10				
Salinity (%)	0.14	0.13	0.13	0.13				
D.O. (mg/l)	1.85	3.23	3.04	1.41				
Temp. (°C)	5.1	4.7	4.5	4.8				

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:

Sample Method: _____

No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE

Sample Time: _____

Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: _____

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: 3

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: _____
Screen Length: _____

Purge Information:

(1) Depth to Bottom of Well: 14.43 (from TOC)

(2) Depth to Water: 1.95 ft (from TOC)

(3) Column of Water: 12.48 (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 2.03 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: _____

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	2.00	2.0	2.0				
Time	3:02	3:09	3:21	3:33				
ORP/EH (MV)	—	—	—	—				
pH	4.57	5.07	4.65	4.47				
Cond. (MS/CM)	10.03	6.13	6.47	6.30				
Turb. (NTU)	152	198	37	10				
Salinity (%)	0.55	0.31	0.31	0.32				
D.O. (mg/l)	4.32	6.44	6.02	0.51				
Temp. (°C)	8.5	7.5	7.6	8.1				

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:

Sample Method: 11

No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE

Sample Time: _____

Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: _____

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: 4

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 3-8-04
Screen Length: _____

Purge Information:

(1) Depth to Bottom of Well: 8.00 (from TOC)

(2) Depth to Water: 4.46 ft (from TOC)

(3) Column of Water: 3.64 (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 0.59 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: Peristal tic pump

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	0.30	0.60	0.6				
Time	10:09	10:11	10:14					
ORP/EH (MV)	—	—	—	—	—	—		
pH	6.51	6.42	6.60	6.67				
Cond. (MS/CM)	4.53	4.37	4.56	4.64				
Turb. (NTU)	10	10	10	10				
Salinity (%)	0.21	0.21	0.23	0.23				
D.O. (mg/l)	0.03	4.51	4.45					
Temp. (°C)	5.0	5.1	5.5					

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:

Sample Method: _____

No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE

Sample Time: _____

Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: _____

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL DEVELOPMENT LOG

MW NO: 05

Project Name: Franczyk Park Site SI/RAR Sampling
Project Location: Buffalo, New York

Project No: 0030125
Date: 3-8-11
Screen Length: _____

Purge Information:

(1) Depth to Bottom of Well: 8.25 (from TOC)

(2) Depth to Water: 1.44 ft (from TOC)

(3) Column of Water: 6.8 (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 1.1 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: Peristaltic Pump

Volume Conversion:

2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	1.10	1.20	1.30				
Time	9:20	9:22	9:28	9:34				
ORP/EH (MV)	—	—	—	—				
pH	6.08	5.96	6.42	6.52				
Cond. (MS/CM)	5.27	4.18	3.58	3.47				
Turb. (NTU)	9	3	10	10				
D.O. (mg/l)	1.17	2.81	2.70	2.12				
Salinity (%)	0.26	0.20	0.17	0.16				
Temp. (°C)	4.2	3.8	3.5	3.5				

Total Volume Purged: _____ gal Total Purge Time: _____

Development Info:

Development Method: _____

Comments: _____

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: 6

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 3-8-04
Screen Length: _____

Purge Information:

(1) Depth to Bottom of Well: 7.67 (from TOC)

(2) Depth to Water: 0.64 ft (from TOC)

(3) Column of Water: 7.03 (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 1.14 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: Peristaltic Pump

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Inch'l	1.20	1.2	1.2				
Time	11:45	11:53	11:58	11:59				
ORP/EH (MV)	—	—	—	—				
pH	6.31	6.21	6.43	6.47				
Cond. (MS/CM)	2.69	2.73	2.79	2.79				
Turb. (NTU)	642	785	157	46				
Salinity (%)	0.11	0.12	[illegible]	0.13				
D.O. (mg/l)	0.82	2.21	[illegible]	3.70				
Temp. (°C)	2.3	3.7	4.2	4.7				

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:

Sample Method: _____

No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE

Sample Time: _____

Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: _____

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: MW-1

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 3-3-21
Screen Length: 5'

Purge Information:

(1) Depth to Bottom of Well: 6.85 (from TOC)

(2) Depth to Water: 2.38 ft (from TOC)

(3) Column of Water: 4.47 (#1 - #2)

(4) Casing Diameter: 1 x in

(5) Volume Conversion: ~~0.163~~ 0.041 gal/ft

(6) 1 Vol. of Well: 0.18 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: _____

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	0.25						
Time	2:31	2:35						
ORP/EH (MV)	—	—	—	—	—	—	—	—
pH	7.50	7.22						
Cond. (MS/CM)	3.32	2.93						
Turb. (NTU)	799	224						
Salinity (%)	0.15	0.13						
D.O. (mg/l)	0.97	10.39						
Temp. (°C)	4.6	4.1						

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:

Sample Method: ~~PP~~ 0

No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE

Sample Time: _____

Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: _____

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: MW-1

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 7-2-04
Screen Length: _____

Purge Information:

(1) Depth to Bottom of Well: _____ (from TOC)

(2) Depth to Water: _____ ft (from TOC)

(3) Column of Water: _____ (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: _____ gal

Method of Purging: WaTerra/Bailer/Submersible/Other: _____

Volume Conversion: (MW-1)

2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)								
Time			2:42	2:50				
ORP/EH (MV)								
pH			7.24	7.33				
Cond. (MS/CM)			3.04	3.07				
Turb. (NTU)			10	10				
Salinity (%)			0.14	0.14				
D.O. (mg/l)			3.05	2.86				
Temp. (°C)			4.2	4.0				

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:

Sample Method: _____

No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE

Sample Time: _____

Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: _____

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: 6

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-21-05
Screen Length: 5'

Purge Information:

(1) Depth to Bottom of Well: 7.67' (from TOC)

(2) Depth to Water: 0.13 ft (from TOC)

(3) Column of Water: 7.54 (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 1.23 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: Peristaltic Pump

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	1.25	1.25	1.25	Sample			
Time	3:21	3:31	3:35	3:44	3:55			
ORP/EH (MV)	-15	3	12	28	32			
pH	5.66	5.69	5.66	5.59	5.60			
Cond. (MS/CM)	2.90	2.96	2.87	2.77	2.78			
Turb. (NTU)	163.0	120	58.7	28.7	25.2			
Salinity (%)	0.1	0.1	0.1	0.1	0.1			
D.O. (mg/l)	4.27	1.91	2.27	1.94	1.88			
Temp. (°C)	12.58	12.46	12.53	12.42	12.44			

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:

Sample Method: Peristaltic Pump

No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE

Sample Time: 3:55

Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: Brown - cloudy

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL DEVELOPMENT LOG

MW NO: 1

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-20-03
Screen Length: 10'

Purge Information:

(1) Depth to Bottom of Well: 12.20' (from TOC)

(2) Depth to Water: 0.99' (from TOC) ft

(3) Column of Water: 11.21' (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 1.83 gal

Method of Purging: WaTerra/(Bailer)/Submersible/Other: _____

Volume Conversion:

2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:	4.74	6.36	8.21	9.20	11.10	11.67		
Vol Purged (gal)	2.00	2.00	2.00	3.00	3.00	0.75		
Time	9.56	10:03	10:12	10:32	10:48	11:00		
ORP/EH (MV)	26	-107	-145	-156	-136	-140		
pH	5.66	5.82	5.82	5.79	5.82	5.83		
Cond. (MS/CM)	1.63	16.0	16.6	17.7	19.90	19.6		
Turb. (NTU)	71000	71000	71000	71000	71000	71000		
D.O. (mg/l)	2.81	3.96	1.91	2.41	4.31	4.60		
Salinity (%)	0.9	0.9	1.0	1.0	1.2	1.2		
Temp. (°C)	11.77	11.98	12.57	12.72	12.60	12.20		

Total Volume Purged: _____ gal Total Purge Time: _____

Development Info:

Development Method: _____

Comments: Very turbid w/ unusual odor, tan colored, bottom was soft, but after Vol 5 was cleaned up

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL DEVELOPMENT LOG

MW NO: 2

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-20-03
Screen Length: 10'

Purge Information:

(1) Depth to Bottom of Well: 13.74' (from TOC)

(2) Depth to Water: 3.28' (from TOC) ft

(3) Column of Water: 10.46' (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 1.70 gal

Method of Purging: WaTerra/(Bailer)/Submersible/Other: _____

Volume Conversion:

2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:		5.19	5.81	6.69	8.39	8.05		
Vol Purged (gal)	Init.	2.00	2.00	3.00	5.00	2.00		
Time	11:30	11:36	11:46	11:57	12:13	12:30		
ORP/EH (MV)	-65	-70	-67	-78	-74	-70		
pH	5.75	5.43	5.46	5.46	5.50	5.57		
Cond. (MS/CM)	3.43	3.03	3.18	3.34	3.36	3.32		
Turb. (NTU)	>1000	480	266	348	>999	184		
D.O. (mg/l)	4.72	4.85	4.47	4.51	4.34	6.34		
Salinity (%)	0.2	0.1	0.2	0.2	0.2	0.2		
Temp. (°C)	12.85	14.00	12.03	12.23	12.23	12.00		

Total Volume Purged: _____ gal Total Purge Time: _____

Development Info:

Development Method: _____

Comments: Yellow colored H_2O. Turbidity increased @ Bottom even though the bottom was not silt

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL DEVELOPMENT LOG

MW NO: 3

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-20-03
Screen Length: 10'

Purge Information:

(1) Depth to Bottom of Well: 14.43' (from TOC)

(2) Depth to Water: 1.81' (from TOC) ft

(3) Column of Water: 12.62' (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 2.06 gal

Method of Purging: WaTerra/(Bailer)/Submersible/Other: _____

Volume Conversion:

2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:		505	5.41	603	6.11			
Vol Purged (gal)	Init	5.00	5.25	5.25	5.25			
Time	1:50	2:07	2:25	2:38	2:56			
ORP/EH (MV)	-65	-30	-9	9	4			
pH	5.36	5.27	5.03	5.06	5.02			
Cond. (MS/CM)	7.86	7.66	8.32	9.60	9.20			
Turb. (NTU)	>1000	>1000	>1000	>1000	>1000			
D.O. (mg/l)	2.75	2.46	3.87	2.43	2.61			
Salinity (%)	0.4	0.4	0.5	0.5	0.5			
Temp. (°C)	13.46	13.26	13.45	13.35	13.45			

Total Volume Purged: _____ gal Total Purge Time: _____

Development Info:

Development Method: _____

Comments: Gray w/ chemical odor, septic/sulfur like.

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL DEVELOPMENT LOG

MW NO: 4

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-20-03
Screen Length: 5'

Purge Information:

(1) Depth to Bottom of Well: 8.00' (from TOC)

(2) Depth to Water: 3.90' (from TOC) ft

(3) Column of Water: 4.10' (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 0.67 gal

Method of Purging: WaTerra/(Bailer)/Submersible/Other: _____

Volume Conversion:

2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:		5.61	6.91	7.91	D/Y			
Vol Purged (gal)	Intial	1.00	1.00	1.25	0.2			
Time	12:50	12:55	1:03	1:14	1:25			
ORP/EH (MV)	+65	-106	-102	-90	-106			
pH	~~5.14~~ 5.59	5.65	5.66	5.71	5.83			
Cond. (MS/CM)	4.23	4.76	4.75	4.77	4.56			
Turb. (NTU)	81.6	99.5	425	>1000	>1000			
D.O. (mg/l)	3.95	3.55	3.85	5.91	6.76			
Salinity (%)	0.2	0.2	0.2	0.2	0.2			
Temp. (°C)	11.86	11.99	12.32	12.26	12.06			

Total Volume Purged: _____ gal Total Purge Time: _____

Development Info:

Development Method: _____

Comments: H2O was yellow

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL DEVELOPMENT LOG

MW NO: 5

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-20-03
Screen Length: 5'

Purge Information:

(1) Depth to Bottom of Well: 8.25' (from TOC)

(2) Depth to Water: 1.24' (from TOC) ft

(3) Column of Water: 7.01' (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 1.14 gal

Method of Purging: WaTerra/(Bailer)/Submersible/Other:

Volume Conversion:

2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:		1.41	1.54	1.59				
Vol Purged (gal)	Initial	5.00	5.25	5.00				
Time	3:18	3:28	3:39	3:47				
ORP/EH (MV)	-44	-71	-68	-67				
pH	5.47	5.64	5.61	5.62				
Cond. (MS/CM)	472	4.66	4.59	4.53				
Turb. (NTU)	>1000	>1000	>1000	>1000				
D.O. (mg/l)	4.44	2.37	3.07	3.35				
Salinity (%)	0.2	0.2	0.2	0.2				
Temp. (°C)	11.91	10.90	10.74	10.83				

Total Volume Purged: _____ gal Total Purge Time: _____

Development Info:

Development Method: _____

Comments: water was very turbid, tan, Developed 3x Vol per purge due to almost instantaneous recharge.

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL DEVELOPMENT LOG

MW NO: 6

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-20-03
Screen Length: 5'

Purge Information:

(1) Depth to Bottom of Well: 7.67' (from TOC)

(2) Depth to Water: 0 ft (from TOC)

(3) Column of Water: 7.67 (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 1.25 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: _____

Volume Conversion:

2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	5.00	5.00	2.5				
Time	4:15	4:21	4:30	4:40				
ORP/EH (MV)	-7	7	17	23				
pH	5.71	5.66	5.66	5.66				
Cond. (MS/CM)	3.24	3.10	3.17	3.15				
Turb. (NTU)	>1000	>1000	>1000	>1000				
D.O. (mg/l)	2.62	2.43	2.37	2.27				
Salinity (%)	0.2	0.2	0.2	0.2				
Temp. (°C)	11.16	11.63	11.02	11.73				

Total Volume Purged: _____ gal Total Purge Time: _____

Development Info:

Development Method: _____

Comments: well had almost instant recharge was not able to bail well water Deeper than 2" below TOC each volume, water settles ≈ 1/4" above TOC

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: 1

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-21-03
Screen Length: 10'

Purge Information:
(1) Depth to Bottom of Well: 12.2' (from TOC)
(2) Depth to Water: 0.94 ft (from TOC)
(3) Column of Water: 11.26 (#1 - #2)
(4) Casing Diameter: 2 in
(5) Volume Conversion: 0.163 gal/ft
(6) 1 Vol. of Well: 1.84 gal
Method of Purging: WaTerra/Bailer/Submersible/Other: Peristaltic Pump

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	2.00	2.00	2.00	Sample			
Time	10:20	10:28	10:39	10:57	11:10			
ORP/EH (MV)	6	-64	-93	-115	-135			
pH	5.52	5.56	5.67	5.74	5.83			
Cond. (MS/CM)	185	17.2	19.1	20.7	20.7			
Turb. (NTU)	936	57.2	330.0	268	720			
Salinity (%)	1.1	1.0	1.1	1.2	1.2			
D.O. (mg/l)	3.82	3.72	2.67	1.58				
Temp. (°C)	12.36	12.06	12.6	13.14	13.00			

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:
Sample Method: Peristaltic pump
Sample Time: 11:10
No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE
Sample Analyses: TCL VOCs, SVOCs, ~~PCBs~~/Pesticides and TAL Metals + Cyanide

Comments: slight sheen, & odor-chemical, tan colored water, was suds-y like soap bubbles

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: 3

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-21-03
Screen Length: 10'

Purge Information:

(1) Depth to Bottom of Well: 14.43' (from TOC)

(2) Depth to Water: 1.91 ft (from TOC)

(3) Column of Water: 12.52 (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 2.04 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: Peristaltic Pump

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	2.00	2.00	2.00	Sample			
Time	8:41	8:49	9:02	9:10	9:17			
ORP/EH (MV)	91	71	61	84	73			
pH	4.75	4.70	4.63	4.58	4.54			
Cond. (MS/CM)	8.15	8.23	8.77	8.60	8.47			
Turb. (NTU)	82.1	23.5	22.2	26.3	31.7			
Salinity (%)	0.4	0.4	0.5	0.5	0.5			
D.O. (mg/l)	3.01	1.93	1.7	2.4	2.35			
Temp. (°C)	13.54	13.72	13.9	13.98	14.02			

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:

Sample Method: Peristaltic

Sample Time: 9:20

No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE

Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: Slight yellow color. Hydrogen sulfide smell

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: 2

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-21-03
Screen Length: 10'

Purge Information:

(1) Depth to Bottom of Well: 13.74' (from TOC)

(2) Depth to Water: 3.28 ft (from TOC)

(3) Column of Water: 10.46 (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 1.70 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: Peristaltic Pump

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	1.70	1.70	1.70	Sample			
Time	11:57	12:07	12:15	12:28	12:40			
ORP/EH (MV)	-22	-19	-30	-24	-35			
pH	5.75	5.56	5.58	5.58	5.60			
Cond. (MS/CM)	3.33	2.72	2.94	3.13	3.18			
Turb. (NTU)	32.8	13.0	10.5	8.5	7.9			
Salinity (%)	0.2	0.1	0.1	0.2	0.2			
D.O. (mg/l)	2.03	2.18	2.01	1.94	1.70			
Temp. (°C)	13.53	12.78	12.74	12.80	12.96			

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:

Sample Method: Peristaltic Pump

Sample Time: 12:40

No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE

Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: Light sheen, yellow water

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: 4

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-21-05
Screen Length: 5'

Purge Information:
(1) Depth to Bottom of Well: 8.00' (from TOC)
(2) Depth to Water: 3.83 ft (from TOC)
(3) Column of Water: 4.17 (#1 - #2)
(4) Casing Diameter: 2 in
(5) Volume Conversion: 0.163 gal/ft
(6) 1 Vol. of Well: 0.68 gal
Method of Purging: WaTerra/Bailer/Submersible/Other: Peristaltic Pump

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	1.00	1.00	1.00	Sample			
Time	1:20	1:25	1:28	1:33	1:35			
ORP/EH (MV)	24	-6	-23	-29	-18			
pH	5.76	5.78	5.79	5.77	5.78			
Cond. (MS/CM)	4.82	4.72	4.64	4.45	4.47			
Turb. (NTU)	334	376	28.6	36.7	43.8			
Salinity (%)	0.2	0.2	0.2	0.2	0.2			
D.O. (mg/l)	4.46	2.97	2.87	4.08	5.63			
Temp. (°C)	13.00	12.63	12.96	13.24	13.35			

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:
Sample Method: Peristaltic Pump
Sample Time: 1:35
No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE
Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: Light Brown water to Yellow

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL SAMPLING LOG

MW NO: 5

Project Name: Franczyk Park Site SI/RAR
Project Location: Buffalo, New York

Project No: 0030125
Date: 11-21-05
Screen Length: 5'

Purge Information:

(1) Depth to Bottom of Well: 8.25' (from TOC)

(2) Depth to Water: 1.45 ft (from TOC)

(3) Column of Water: 6.8 (#1 - #2)

(4) Casing Diameter: 2 in

(5) Volume Conversion: 0.163 gal/ft

(6) 1 Vol. of Well: 1.11 gal

Method of Purging: WaTerra/Bailer/Submersible/Other: Peristaltic Pump

Volume Conversion:
2" = 0.163 4" = 0.653 6" = 1.469 8" = 2.611 10" = 4.08

Field Analysis:

Vol Purged (gal)	Initial	1.2	1.2	1.2	Sample			
Time	2:40	2:47	2:53	3:00	3:10			
ORP/EH (MV)	36	-29	-35	-44	-47			
pH	5.70	5.76	5.77	5.76	5.75			
Cond. (MS/CM)	5.36	4.95	4.74	4.70	4.60			
Turb. (NTU)	257.8	67.7	41.6	26.6	42.0			
Salinity (%)	0.3	0.3	0.2	0.2	0.2			
D.O. (mg/l)	4.63	2.04	1.87	1.63	1.88			
Temp. (°C)	13.3	12.72	12.15	12.05	12.02			

Total Volume Purged: _____ gal Total Purge Time: _____

Sampling Info:

Sample Method: Peristaltic Pump

No. of Bottles: 2 x 40 mL VOA, 4 x 1 L Amber, 1 x 8oz HDPE, 1 x 4oz HDPE

Sample Time: 3:10

Sample Analyses: TCL VOCs, SVOCs, PCBs/Pesticides and TAL Metals + Cyanide

Comments: Yellow colored water

Logged By: J. Manzella

TVGA CONSULTANTS

MONITORING WELL INSTALLATION REPORT

PROJECT Francezyk Park Site SE/RAR
FILE NO. 0030125
CONTRACTOR SLC Environmental Services Inc.
DATE OF INSTALLATION 11-17-03
LOCATION A5+00 / B5+00

GEOLOGIST J. Manzella
DRILLER J. Jones
WELL NO. MW01
BORING NO. TB01
SHEET 1 OF 1

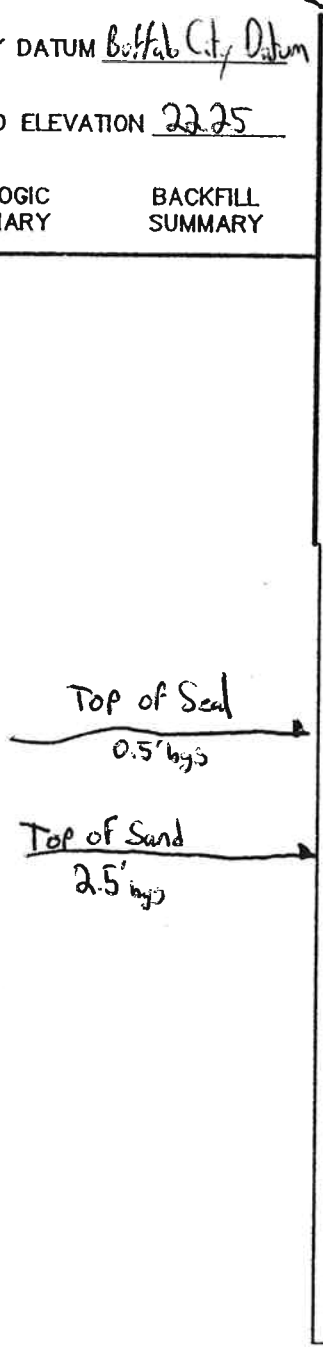
LOCK NO. [ ]

SURVEY DATUM Buffalo City Datum

GROUND ELEVATION 22.25

GEOLOGIC SUMMARY

BACKFILL SUMMARY



ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF CASING	22.25
ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF RISER PIPE	3.5" bgs
THICKNESS OF SURFACE SEAL	0.2'
TYPE OF SURFACE SEAL	Concrete grout
TYPE OF PROTECTIVE CASING	Flush-Mounted Stainless-Steel
INSIDE DIAMETER OF PROTECTIVE CASING	8"
ELEVATION/DEPTH OF BOTTOM OF PROTECTIVE CASING	12"
INSIDE DIAMETER OF RISER PIPE	2"
TYPE OF BACKFILL AROUND RISER	Bentonite
DIAMETER OF BORE HOLE WITHIN TEST SECTION	4.25"
TYPE OF COUPLING	Threaded
ELEVATION/DEPTH OF TOP OF SCREEN	3'
TYPE OF WELL SCREEN	PVC
SCREEN SLOT SIZE	No. 10 slot
DIAMETER OF WELL SCREEN	2"
TYPE OF BACKFILL AROUND WELL SCREEN	No. 1 Sand
ELEVATION/DEPTH OF BOTTOM OF WELL SCREEN	13'
ELEVATION/DEPTH OF BOTTOM OF BOREHOLE	13.3'

(FIGURES REFER TO ELEVATION____DEPTH____)

TVGA CONSULTANTS

MONITORING WELL INSTALLATION REPORT

PROJECT: Franczyk Park Site SE/RAR
FILE NO.: 003025
CONTRACTOR: SLC Environmental Services Inc.
DATE OF INSTALLATION: 11-17-03
LOCATION: A 5+00 / B11+00

GEOLOGIST: J. Manzella
DRILLER: J. Jones
WELL NO.: MW02
BORING NO.: TB2
SHEET: 1 OF 1

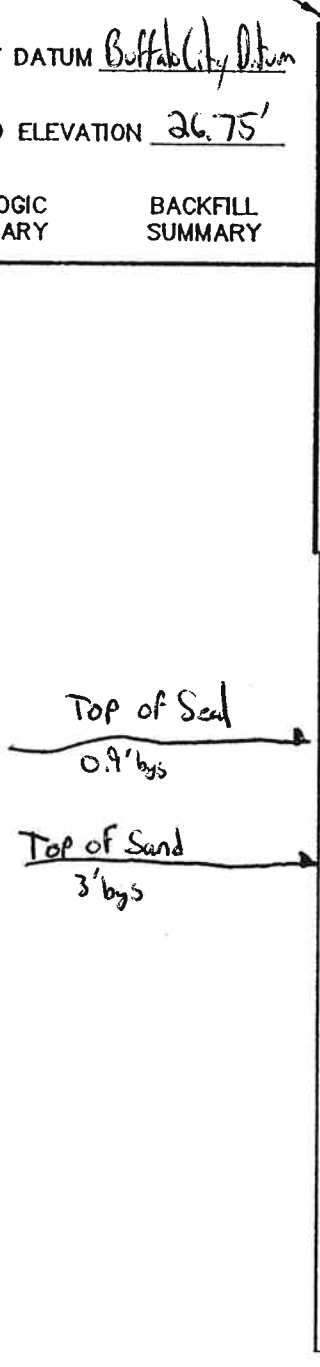
LOCK NO.: [ ]

SURVEY DATUM: Buffalo City Datum

GROUND ELEVATION: 26.75'

GEOLOGIC SUMMARY

BACKFILL SUMMARY



ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF CASING	26.75'
ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF RISER PIPE	4.0" bgs
THICKNESS OF SURFACE SEAL	0.5'
TYPE OF SURFACE SEAL	Concrete grout
TYPE OF PROTECTIVE CASING	Flush-Mounted Stainless-Steel
INSIDE DIAMETER OF PROTECTIVE CASING	8"
ELEVATION/DEPTH OF BOTTOM OF PROTECTIVE CASING	12"
INSIDE DIAMETER OF RISER PIPE	2"
TYPE OF BACKFILL AROUND RISER	Bentonite
DIAMETER OF BORE HOLE WITHIN TEST SECTION	4.25"
TYPE OF COUPLING	Threaded
ELEVATION/DEPTH OF TOP OF SCREEN	3.7'
TYPE OF WELL SCREEN	PVC
SCREEN SLOT SIZE	No. 10 slot
DIAMETER OF WELL SCREEN	2"
TYPE OF BACKFILL AROUND WELL SCREEN	No. 1 Sand
ELEVATION/DEPTH OF BOTTOM OF WELL SCREEN	13.7'
ELEVATION/DEPTH OF BOTTOM OF BOREHOLE	14'

(FIGURES REFER TO ELEVATION____DEPTH____)

TVGA CONSULTANTS

MONITORING WELL INSTALLATION REPORT

PROJECT	Francezyk Park Site SE/RAR	GEOLOGIST	J. Manzella
FILE NO.	0030125	DRILLER	J. Jones
CONTRACTOR	SLC Environmental Services Inc.	WELL NO.	MW03
DATE OF INSTALLATION	11-18-03	BORING NO.	TB03
LOCATION	A2+35 / B0+45	SHEET	1 OF 1

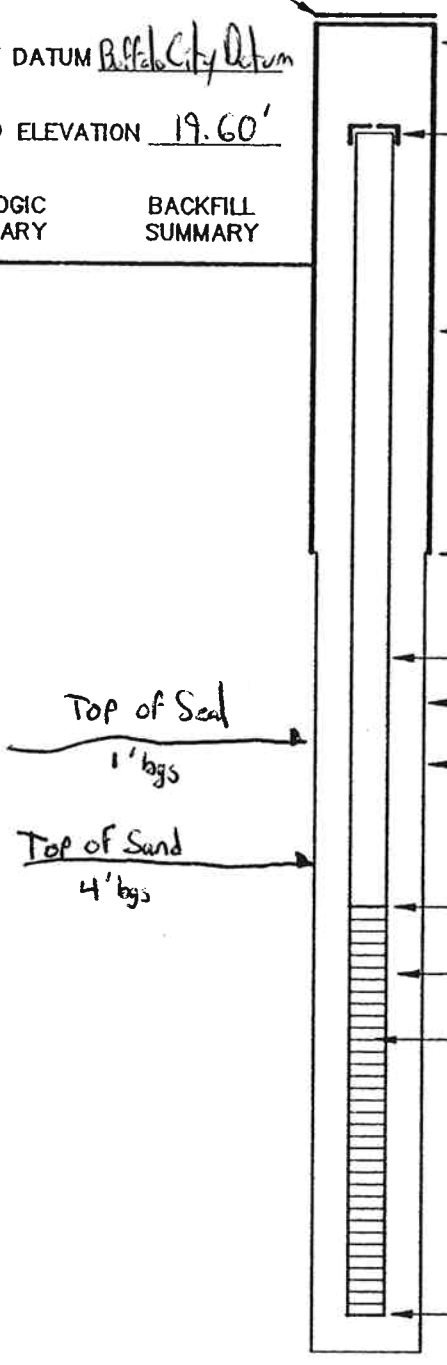
LOCK NO. [ ]

SURVEY DATUM Buffalo City Datum

GROUND ELEVATION 19.60'

GEOLOGIC SUMMARY

BACKFILL SUMMARY



ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF CASING	19.60'
ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF RISER PIPE	3" bgs
THICKNESS OF SURFACE SEAL	0.5'
TYPE OF SURFACE SEAL	Concrete grout
TYPE OF PROTECTIVE CASING	Flush-Mounted Stainless-Steel
INSIDE DIAMETER OF PROTECTIVE CASING	8"
ELEVATION/DEPTH OF BOTTOM OF PROTECTIVE CASING	12"
INSIDE DIAMETER OF RISER PIPE	2"
TYPE OF BACKFILL AROUND RISER	Bentonite
DIAMETER OF BORE HOLE WITHIN TEST SECTION	4.25"
TYPE OF COUPLING	Threaded
ELEVATION/DEPTH OF TOP OF SCREEN	5'
TYPE OF WELL SCREEN	PVC
SCREEN SLOT SIZE	No. 10 slot
DIAMETER OF WELL SCREEN	2"
TYPE OF BACKFILL AROUND WELL SCREEN	No. 1 Sand
ELEVATION/DEPTH OF BOTTOM OF WELL SCREEN	15'
ELEVATION/DEPTH OF BOTTOM OF BOREHOLE	15'

(FIGURES REFER TO ELEVATION____DEPTH____)

TVGA CONSULTANTS

MONITORING WELL INSTALLATION REPORT

PROJECT: Franczyk Park Site SI/RAR
FILE NO.: 003025
CONTRACTOR: SLC Environmental Services Inc.
DATE OF INSTALLATION: 11-18-03
LOCATION: A2+50 / B12+00

GEOLOGIST: J. Manzella
DRILLER: J. Jones
WELL NO.: MW04
BORING NO.: SP No. 48
SHEET: 1 OF 1

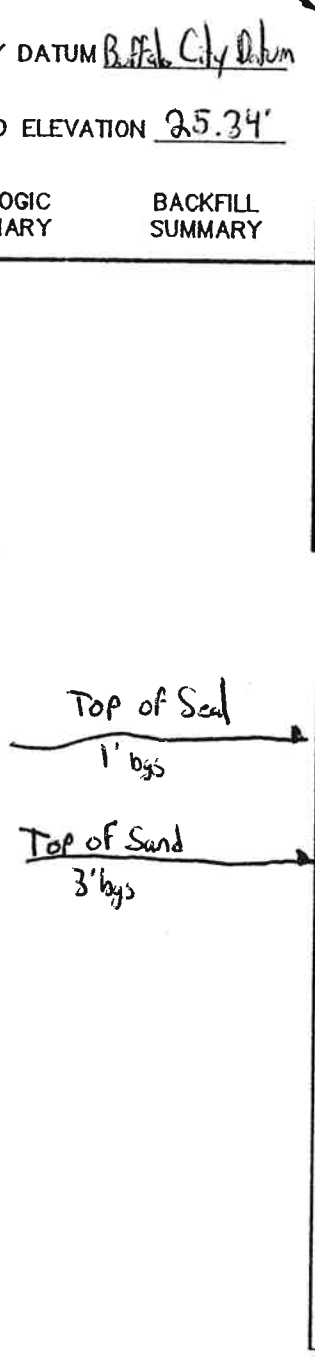
LOCK NO.: [ ]

SURVEY DATUM: Buffalo City Datum

GROUND ELEVATION: 25.34'

GEOLOGIC SUMMARY

BACKFILL SUMMARY



ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF CASING	25.34'
ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF RISER PIPE	5.5" bgs
THICKNESS OF SURFACE SEAL	0.7'
TYPE OF SURFACE SEAL	Concrete grout
TYPE OF PROTECTIVE CASING	Flush-Mounted Stainless-Steel
INSIDE DIAMETER OF PROTECTIVE CASING	8"
ELEVATION/DEPTH OF BOTTOM OF PROTECTIVE CASING	12"
INSIDE DIAMETER OF RISER PIPE	2"
TYPE OF BACKFILL AROUND RISER	Bentonite
DIAMETER OF BORE HOLE WITHIN TEST SECTION	4.25"
TYPE OF COUPLING	Threaded
ELEVATION/DEPTH OF TOP OF SCREEN	3.5'
TYPE OF WELL SCREEN	PVC
SCREEN SLOT SIZE	No. 10 slot
DIAMETER OF WELL SCREEN	2"
TYPE OF BACKFILL AROUND WELL SCREEN	No. 1 Sand
ELEVATION/DEPTH OF BOTTOM OF WELL SCREEN	8.5'
ELEVATION/DEPTH OF BOTTOM OF BOREHOLE	9'

(FIGURES REFER TO ELEVATION____DEPTH____)

TVGA CONSULTANTS

MONITORING WELL INSTALLATION REPORT

PROJECT	Franczyk Park Site SE/RAR	GEOLOGIST	J. Manzella
FILE NO.	003025	DRILLER	J. Jones
CONTRACTOR	SLC Environmental Services Inc.	WELL NO.	MW05
DATE OF INSTALLATION	11-18-03	BORING NO.	TB05
LOCATION	A1+50 / B3+00	SHEET	1 OF 1

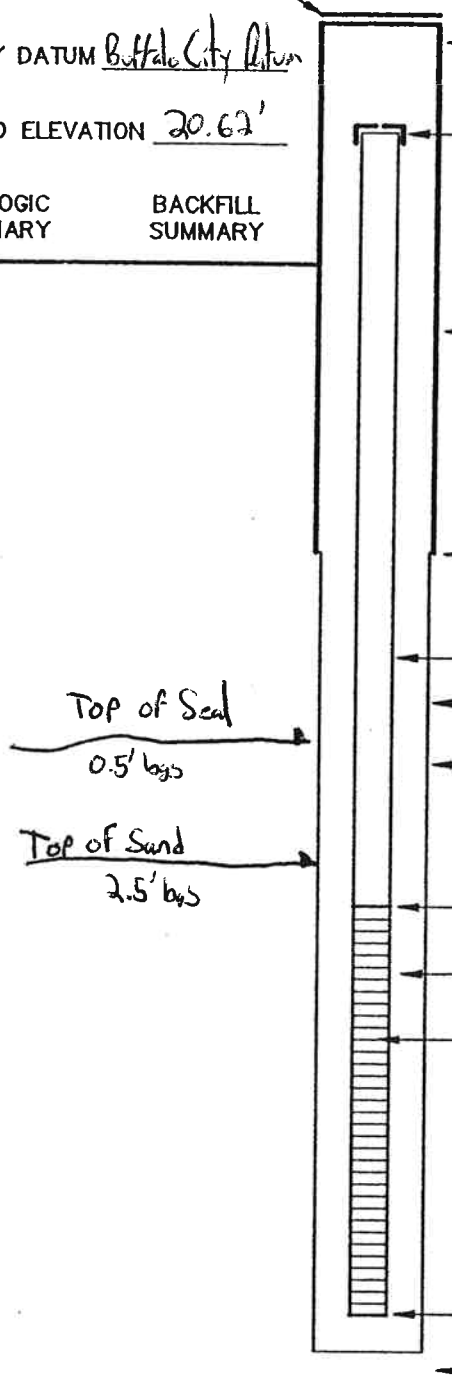
LOCK NO. [ ]

SURVEY DATUM Buffalo City Datum

GROUND ELEVATION 20.62'

GEOLOGIC SUMMARY

BACKFILL SUMMARY



ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF CASING	20.62'
ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF RISER PIPE	5.25" bgs
THICKNESS OF SURFACE SEAL	0.4'
TYPE OF SURFACE SEAL	Concrete grout
TYPE OF PROTECTIVE CASING	Flush-Mounted Stainless-Steel
INSIDE DIAMETER OF PROTECTIVE CASING	8"
ELEVATION/DEPTH OF BOTTOM OF PROTECTIVE CASING	12"
INSIDE DIAMETER OF RISER PIPE	2"
TYPE OF BACKFILL AROUND RISER	Bentonite
DIAMETER OF BORE HOLE WITHIN TEST SECTION	4.25"
TYPE OF COUPLING	Threaded
ELEVATION/DEPTH OF TOP OF SCREEN	4'
TYPE OF WELL SCREEN	PVC
SCREEN SLOT SIZE	No. 10 slot
DIAMETER OF WELL SCREEN	2"
TYPE OF BACKFILL AROUND WELL SCREEN	No. 1 Sand
ELEVATION/DEPTH OF BOTTOM OF WELL SCREEN	9'
ELEVATION/DEPTH OF BOTTOM OF BOREHOLE	10'

(FIGURES REFER TO ELEVATION____DEPTH____)

TVGA CONSULTANTS

MONITORING WELL INSTALLATION REPORT

PROJECT Franczyk Park Site SE/RAR
FILE NO. 003025
CONTRACTOR SLC Environmental Services Inc.
DATE OF INSTALLATION 11-19-03
LOCATION A2+00/B5+00

GEOLOGIST J. Manzella
DRILLER J. Jones
WELL NO. MW06
BORING NO. SP No. 21
SHEET 1 OF 1

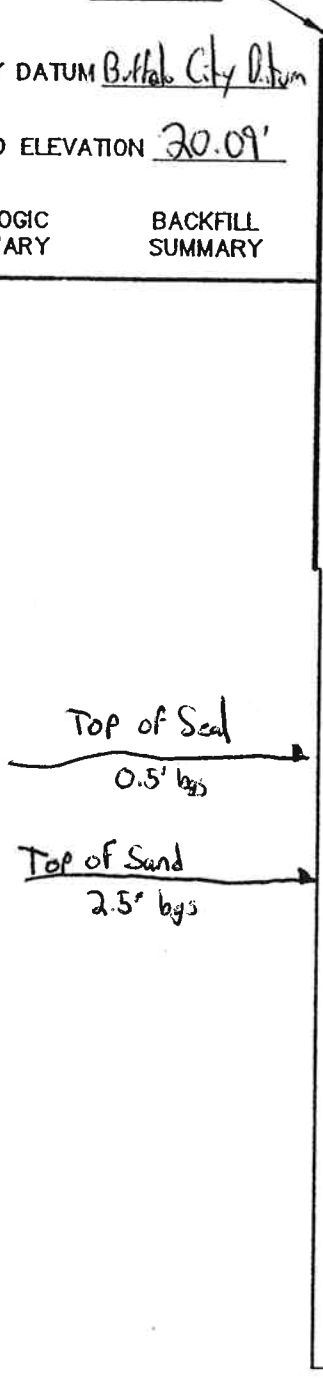
LOCK NO. [ ]

SURVEY DATUM Buffalo City Datum

GROUND ELEVATION 20.09'

GEOLOGIC SUMMARY

BACKFILL SUMMARY



ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF CASING	20.09'
ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF RISER PIPE	4.0" bgs
THICKNESS OF SURFACE SEAL	0.3'
TYPE OF SURFACE SEAL	Concrete grout
TYPE OF PROTECTIVE CASING	Flush-Mounted Stainless-Steel
INSIDE DIAMETER OF PROTECTIVE CASING	8"
ELEVATION/DEPTH OF BOTTOM OF PROTECTIVE CASING	12"
INSIDE DIAMETER OF RISER PIPE	2"
TYPE OF BACKFILL AROUND RISER	Bentonite
DIAMETER OF BORE HOLE WITHIN TEST SECTION	4.25"
TYPE OF COUPLING	Threaded
ELEVATION/DEPTH OF TOP OF SCREEN	3'
TYPE OF WELL SCREEN	PVC
SCREEN SLOT SIZE	No. 10 slot
DIAMETER OF WELL SCREEN	2"
TYPE OF BACKFILL AROUND WELL SCREEN	No. 1 Sand
ELEVATION/DEPTH OF BOTTOM OF WELL SCREEN	8'
ELEVATION/DEPTH OF BOTTOM OF BOREHOLE	8'

(FIGURES REFER TO ELEVATION____DEPTH____)

TVGA CONSULTANTS

MONITORING WELL INSTALLATION REPORT

PROJECT: Franczyk Park Site SE/RAR
FILE NO.: 003025
CONTRACTOR: SLC Environmental Services Inc.
DATE OF INSTALLATION: 3-6-04
LOCATION: A0+65 / B1+35

GEOLOGIST: J. Manzella
DRILLER: R Rose
WELL NO.: Micro-01
BORING NO.: Micro-01
SHEET: 1 OF 1

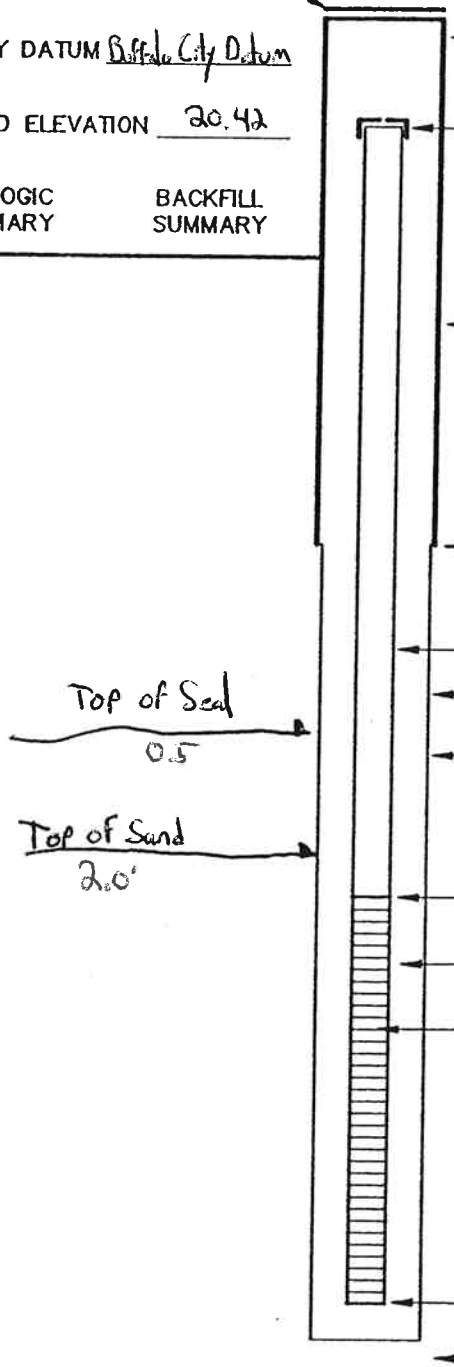
LOCK NO.: [ ]

SURVEY DATUM: Buffalo City Datum

GROUND ELEVATION: 20.42

GEOLOGIC SUMMARY

BACKFILL SUMMARY



ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF CASING	20.42
ELEVATION/STICK UP ABOVE/BELOW GROUND SURFACE OF RISER PIPE	20.24
THICKNESS OF SURFACE SEAL	0.5'
TYPE OF SURFACE SEAL	Concrete grout
TYPE OF PROTECTIVE CASING	Flush-Mounted Stainless-Steel
INSIDE DIAMETER OF PROTECTIVE CASING	4"
ELEVATION/DEPTH OF BOTTOM OF PROTECTIVE CASING	6"
INSIDE DIAMETER OF RISER PIPE	1"
TYPE OF BACKFILL AROUND RISER	Bentonite
DIAMETER OF BORE HOLE WITHIN TEST SECTION	2.1"
TYPE OF COUPLING	Threaded
ELEVATION/DEPTH OF TOP OF SCREEN	2.5
TYPE OF WELL SCREEN	PVC
SCREEN SLOT SIZE	No. 10 slot
DIAMETER OF WELL SCREEN	1"
TYPE OF BACKFILL AROUND WELL SCREEN	No. 1 Sand
ELEVATION/DEPTH OF BOTTOM OF WELL SCREEN	7.5
ELEVATION/DEPTH OF BOTTOM OF BOREHOLE	8'

(FIGURES REFER TO ELEVATION____DEPTH____)

APPENDIX D

SLUG TEST RESULTS

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW01
TEST NUMBER:	Test No. 1
DATE:	25-Nov-03
TIME:	9:08 am
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	10 feet	304.8 cm
t_o	382 seconds	382 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.03 feet	29.664 cm

METHOD: Rising Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was removed from the wellbore. The rising head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

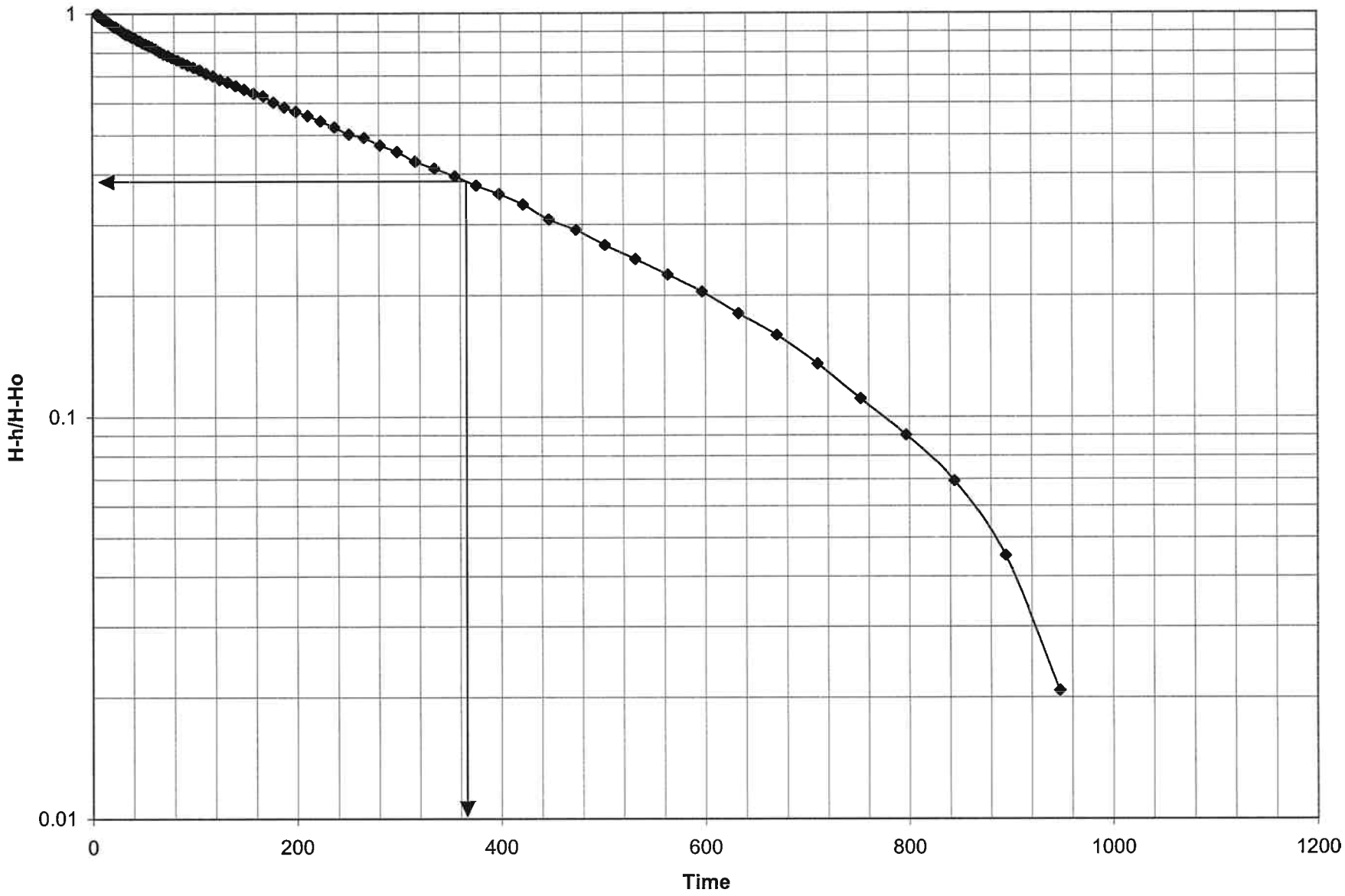
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

Where:

- **K =** Permeability or Hydraulic Conductivity (cm/sec)
- **r =** Radius of the well screen (cm)
- **ln =** Natural Logarithm
- **L =** Screen length (cm)
- **to =** Time lag when H-h/H-ho=0.37 (seconds)
- **R =** Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	30
ln L/R =	3.401197
$2Lt_o$ =	232867.2

K= 9.42E-05


1
0.1
0.01
H-h/H-Ho
0
200
400
600
800
1000
1200
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW01
TEST NUMBER:	Test No. 2
DATE:	25-Nov-03
TIME:	9.55 am
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	10 feet	304.8 cm
t_o	350 seconds	350 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.03 feet	29.664 cm

METHOD: Rising Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was removed from the wellbore. The rising head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

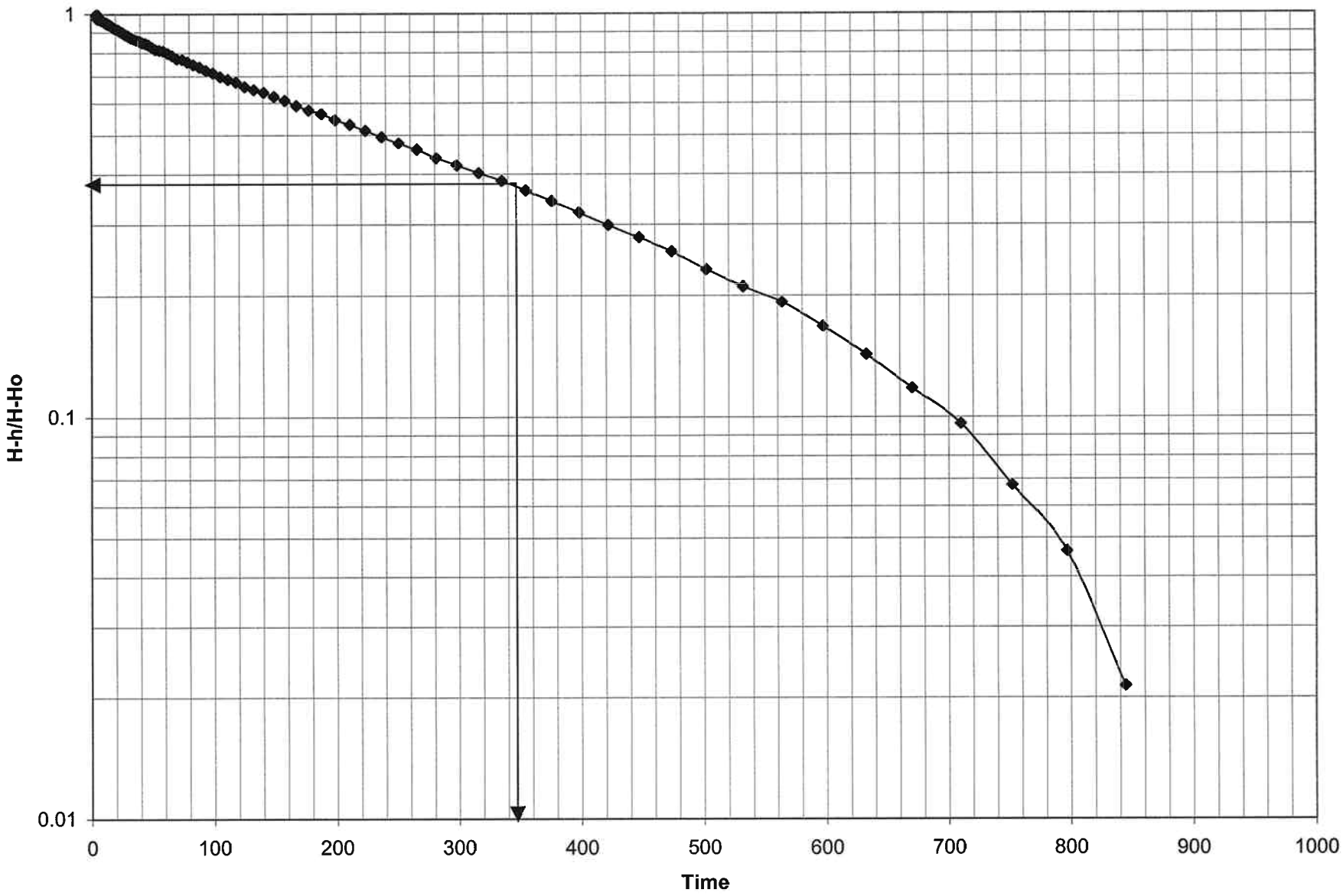
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

Where:

- **K =** Permeability or Hydraulic Conductivity (cm/sec)
- **r =** Radius of the well screen (cm)
- **ln =** Natural Logarithm
- **L =** Screen length (cm)
- **to =** Time lag when H-h/H-ho=0.37 (seconds)
- **R =** Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	30
ln L/R =	3.401197
$2Lt_o$ =	213360

K= 1.03E-04


1
0.1
0.01
H-h/H-Ho
0
100
200
300
400
500
600
700
800
900
1000
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW01
TEST NUMBER:	Test No. 3
DATE:	25-Nov-03
TIME:	10:18 AM
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	10 feet	304.8 cm
t_o	330 seconds	330 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.03 feet	29.664 cm

METHOD: Falling Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was inserted into the wellbore. The falling head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

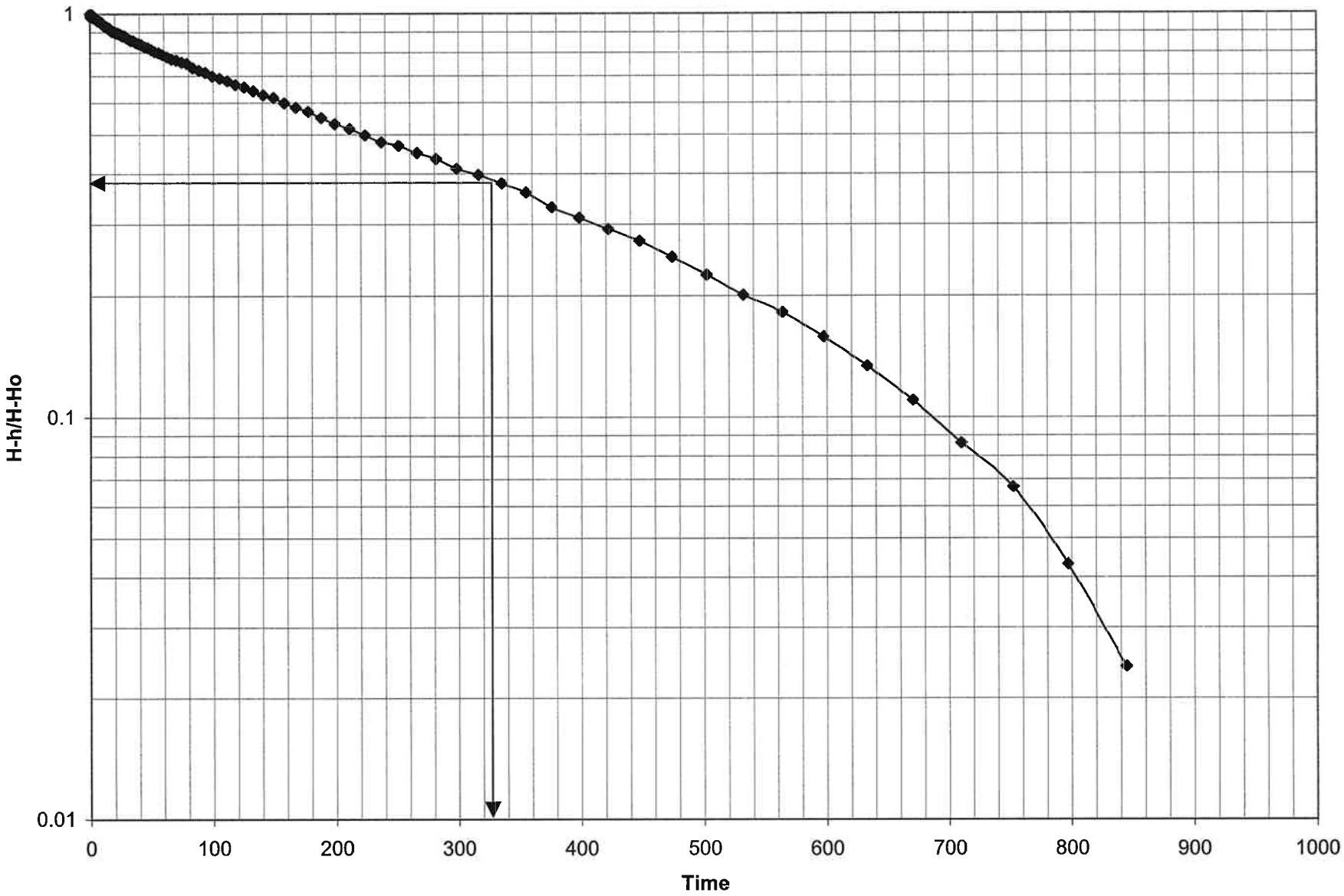
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

K= **1.09E-04**

Where:

K = Permeability or Hydraulic Conductivity (cm/sec)
r = Radius of the well screen (cm)
ln = Natural Logarithm
L = Screen length (cm)
to = Time lag when H-h/H-ho=0.37 (seconds)
R = Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	30
ln L/R =	3.401197
$2Lt_o$ =	201168


1
0.1
0.01
H-h/H-Ho
0
100
200
300
400
500
600
700
800
900
1000
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW01
TEST NUMBER:	Test No. 4
DATE:	25-Nov-03
TIME:	10:40 AM
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	10 feet	304.8 cm
t_o	360 seconds	360 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.03 feet	29.664 cm

METHOD: Falling Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was inserted into the wellbore. The falling head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

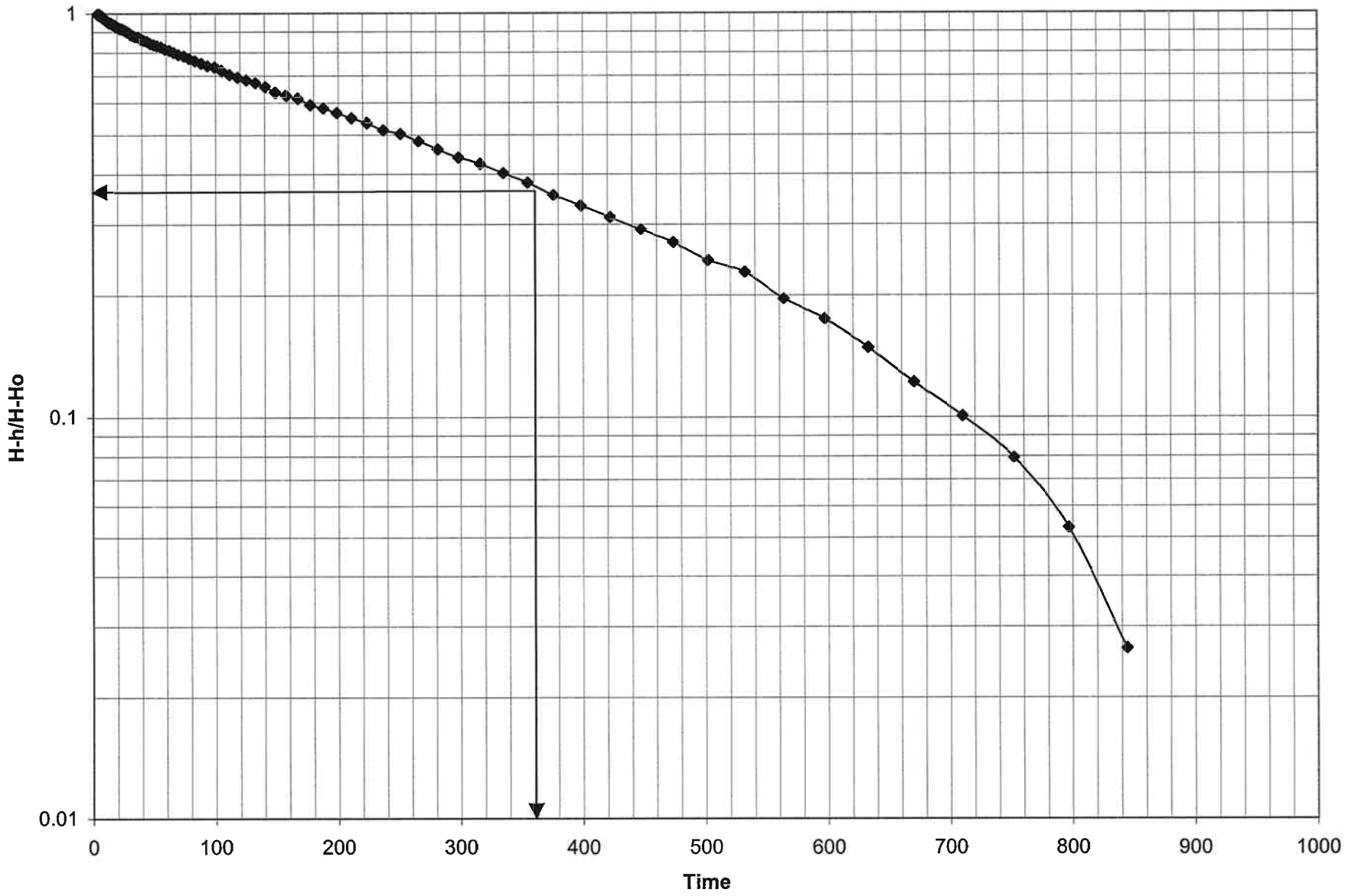
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

Where:

K = Permeability or Hydraulic Conductivity (cm/sec)
r = Radius of the well screen (cm)
ln = Natural Logarithm
L = Screen length (cm)
to = Time lag when H-h/H-ho=0.37 (seconds)
R = Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	30
ln L/R =	3.401197
$2Lt_o$ =	219456

K= **1.00E-04**


1
0.1
0.01
H-h/H-Ho
0
100
200
300
400
500
600
700
800
900
1000
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW03
TEST NUMBER:	Test No. 1
DATE:	25-Nov-03
TIME:	3:14 pm
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	10 feet	304.8 cm
t_o	71 seconds	71 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.92 feet	55.296 cm

METHOD: Rising Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was removed from the wellbore. The rising head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

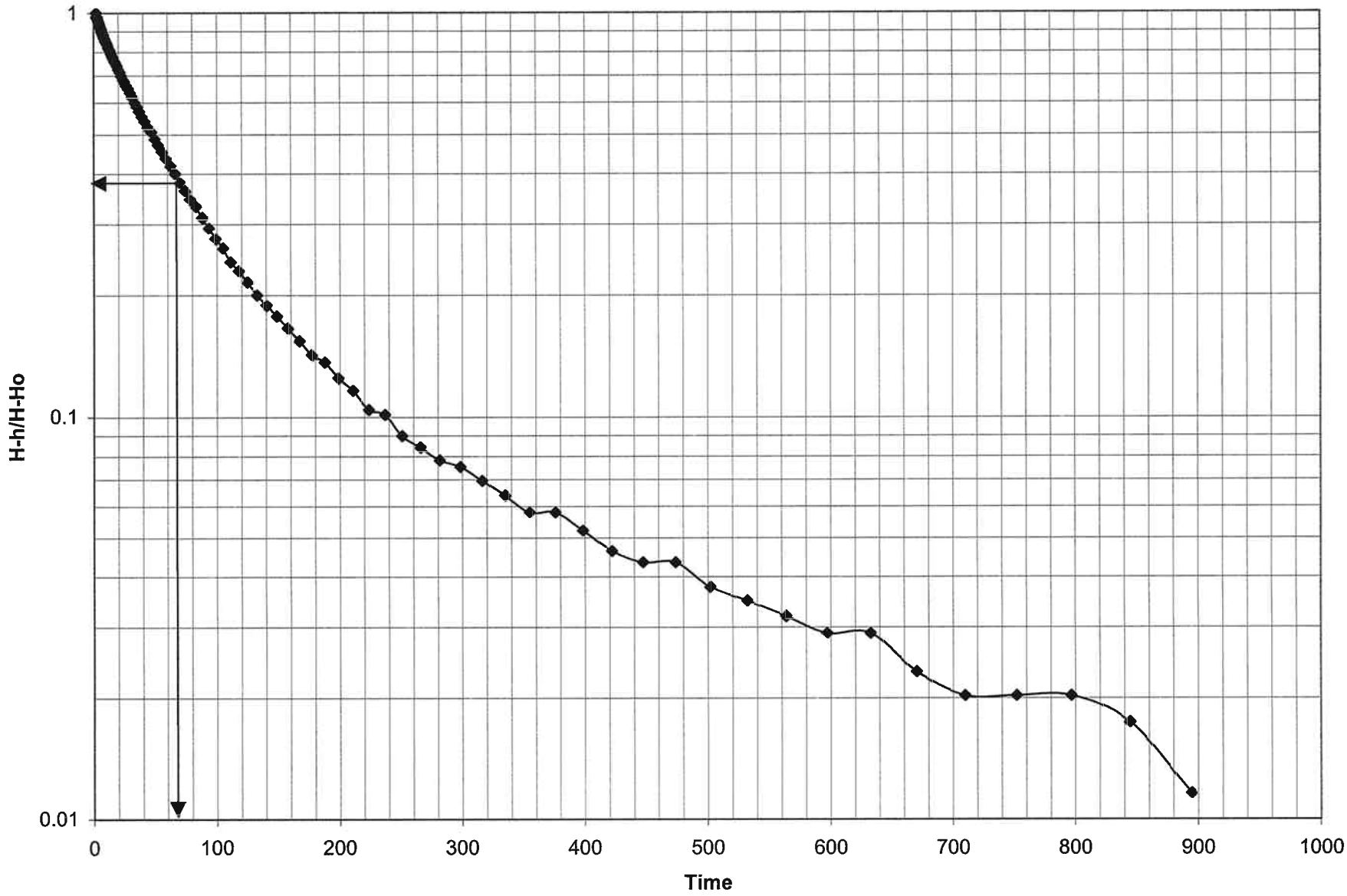
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

K= **5.07E-04**

Where:

K = Permeability or Hydraulic Conductivity (cm/sec)
r = Radius of the well screen (cm)
ln = Natural Logarithm
L = Screen length (cm)
to = Time lag when H-h/H-ho=0.37 (seconds)
R = Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	30
ln L/R =	3.401197
$2Lt_o$ =	43281.6


1
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0.01
H-h/H-Ho
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100
200
300
400
500
600
700
800
900
1000
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW03
TEST NUMBER:	Test No. 2
DATE:	25-Nov-03
TIME:	3:43 pm
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	10 feet	304.8 cm
t_o	75 seconds	75 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.92 feet	55.296 cm

METHOD: Rising Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was removed from the wellbore. The rising head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

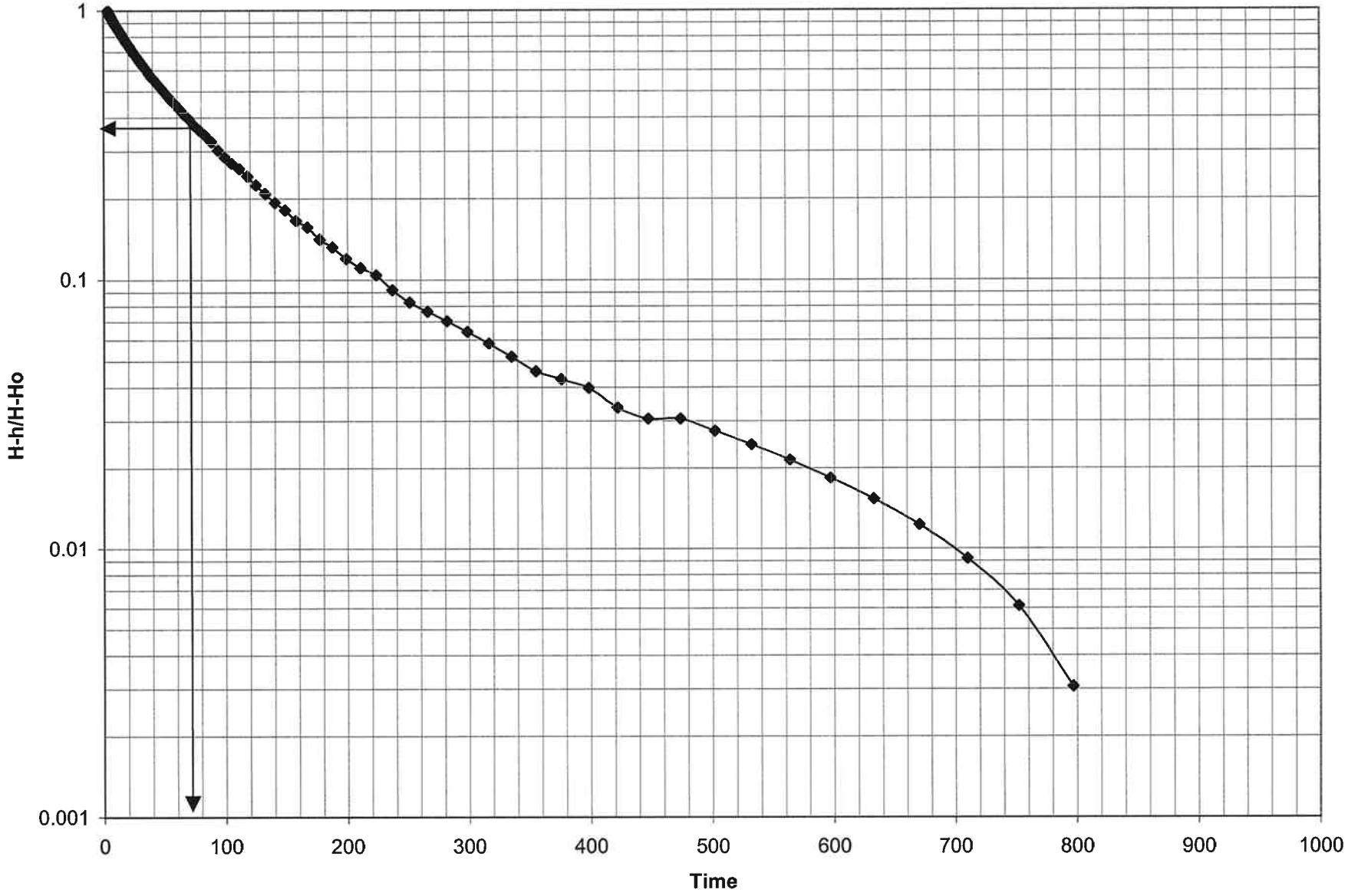
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

Where:

- **K =** Permeability or Hydraulic Conductivity (cm/sec)
- **r =** Radius of the well screen (cm)
- **ln =** Natural Logarithm
- **L =** Screen length (cm)
- **to =** Time lag when H-h/H-ho=0.37 (seconds)
- **R =** Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	30
ln L/R =	3.401197
$2Lt_o$ =	45720

K= 4.80E-04


1
0.1
0.01
0.001
H-h/H-Ho
0
100
200
300
400
500
600
700
800
900
1000
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW03
TEST NUMBER:	Test No. 3
DATE:	25-Nov-03
TIME:	4:09 pm
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	10 feet	304.8 cm
t_o	51 seconds	51 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.92 feet	55.296 cm

METHOD: Falling Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was inserted into the wellbore. The falling head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

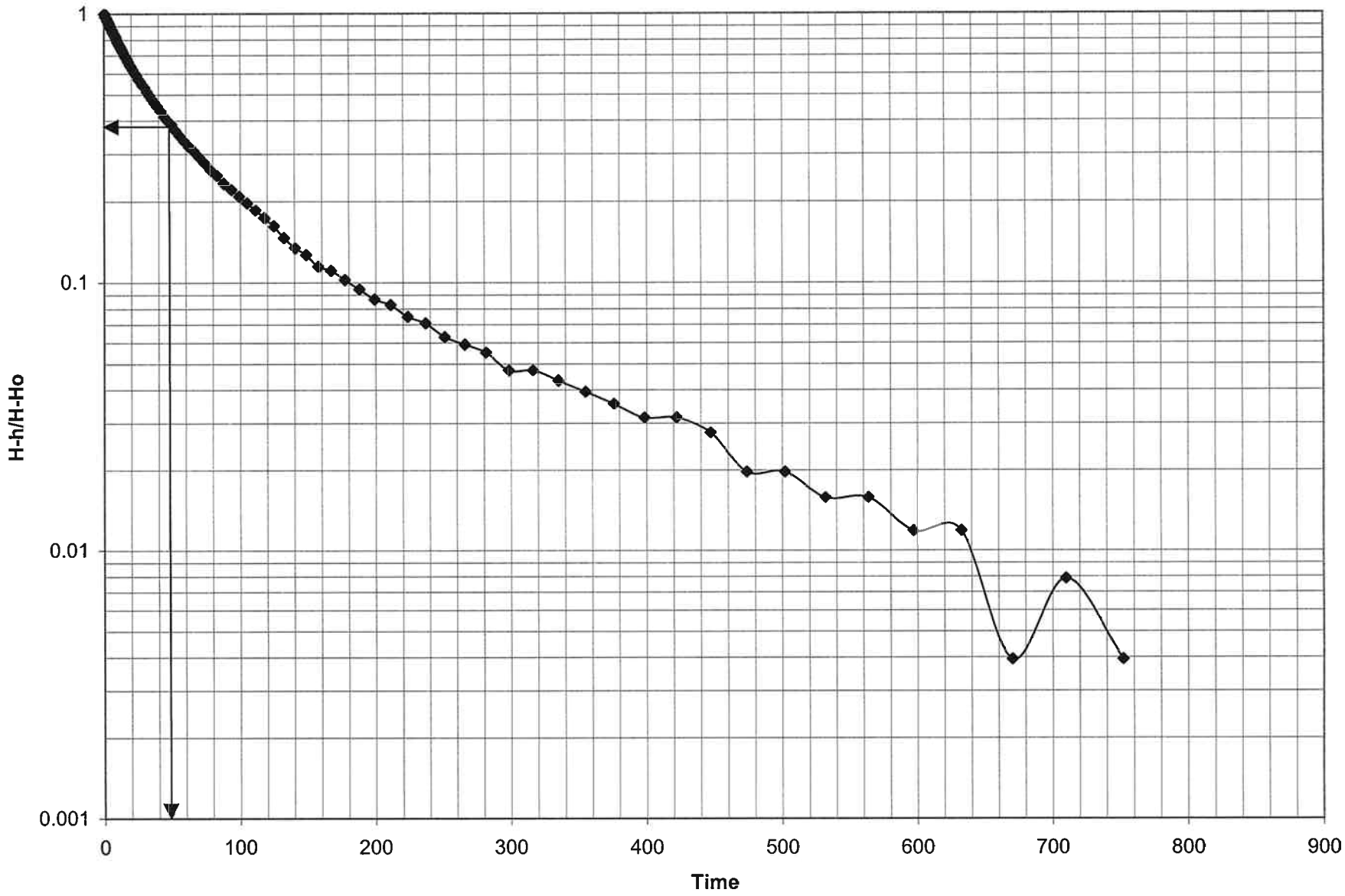
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

K= **7.06E-04**

Where:

K = Permeability or Hydraulic Conductivity (cm/sec)
r = Radius of the well screen (cm)
ln = Natural Logarithm
L = Screen length (cm)
to = Time lag when H-h/H-ho=0.37 (seconds)
R = Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	30
ln L/R =	3.401197
$2Lt_o$ =	31089.6


1
0.1
0.01
0.001
H-h/H-Ho
0
100
200
300
400
500
600
700
800
900
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW03
TEST NUMBER:	Test No. 4
DATE:	25-Nov-03
TIME:	4:34 pm
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	10 feet	304.8 cm
t_o	55 seconds	55 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.92 feet	55.296 cm

METHOD: Falling Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was inserted into the wellbore. The falling head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

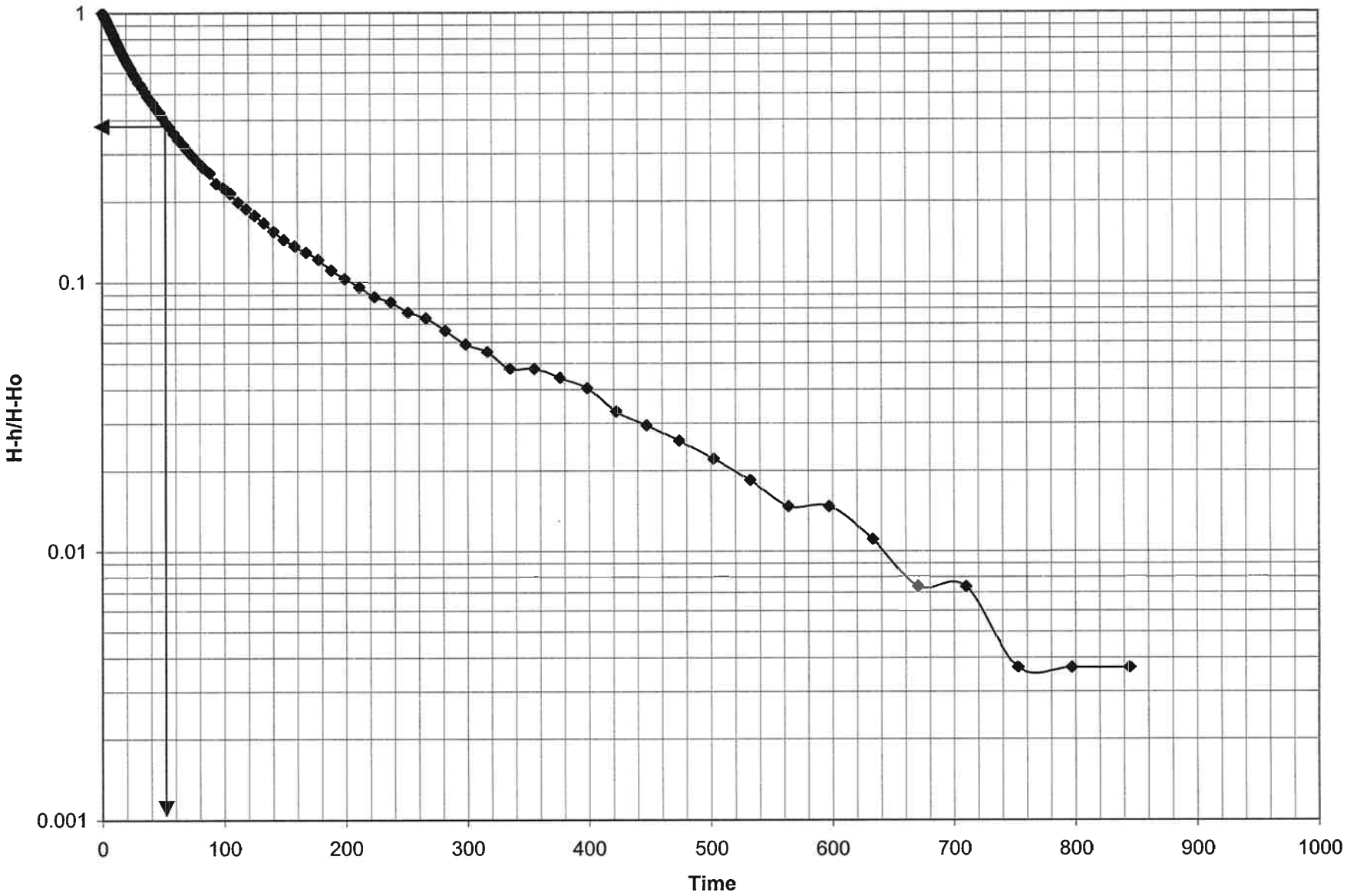
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

Where:

K = Permeability or Hydraulic Conductivity (cm/sec)
r = Radius of the well screen (cm)
ln = Natural Logarithm
L = Screen length (cm)
to = Time lag when H-h/H-ho=0.37 (seconds)
R = Borehole radius (cm)

K= **6.54E-04**

r =	2.54
r^2 =	6.4516
L/R =	30
ln L/R =	3.401197
$2Lt_o$ =	33528


1
0.1
0.01
0.001
H-h/H-Ho
0
100
200
300
400
500
600
700
800
900
1000
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW04
TEST NUMBER:	Test No. 1
DATE:	25-Nov-03
TIME:	11:17 am
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	5 feet	152.4 cm
t_o	5.5 seconds	5.5 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.03 feet	29.664 cm

METHOD: Rising Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was removed from the wellbore. The rising head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

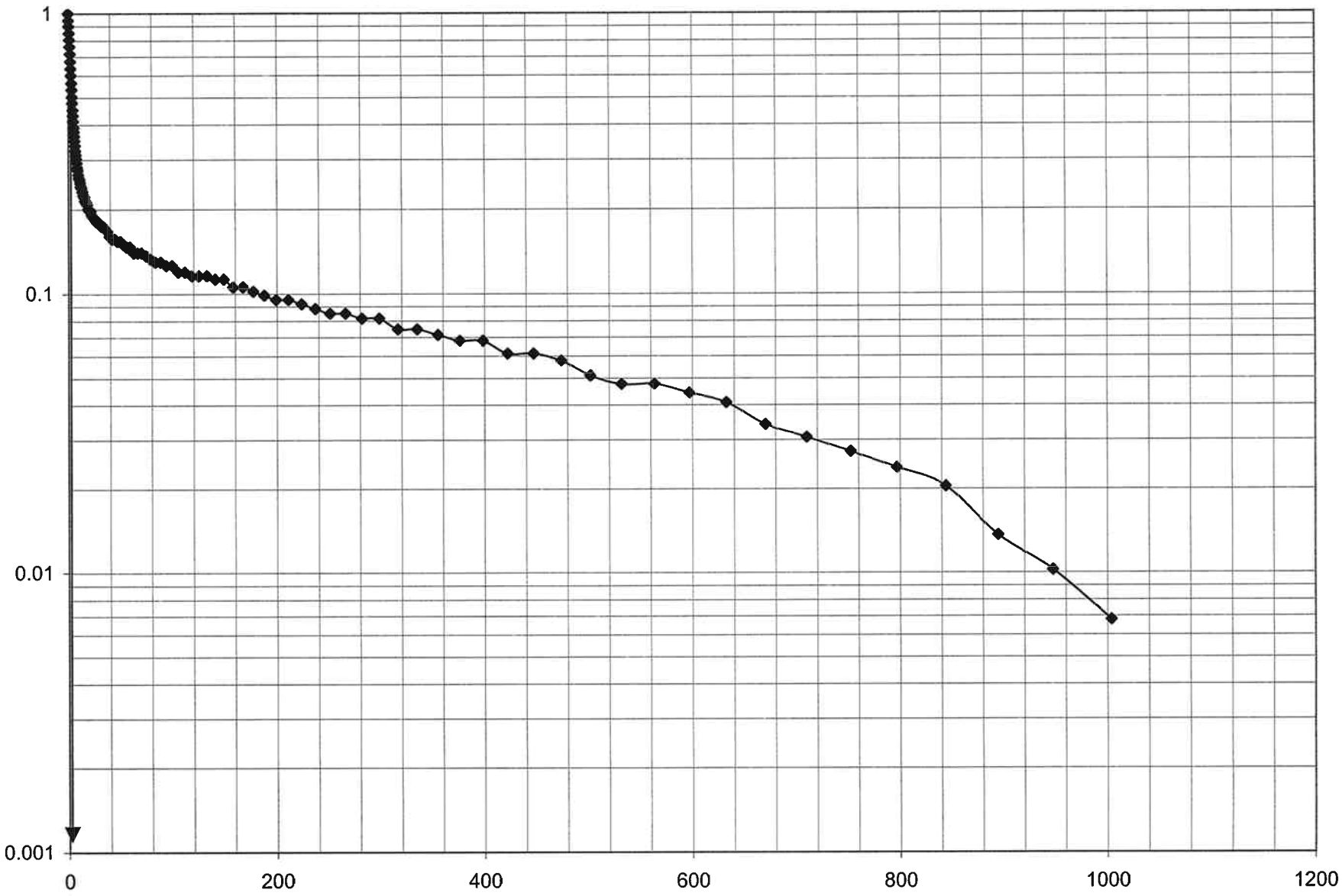
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

Where:

- **K =** Permeability or Hydraulic Conductivity (cm/sec)
- **r =** Radius of the well screen (cm)
- **ln =** Natural Logarithm
- **L =** Screen length (cm)
- **to =** Time lag when H-h/H-ho=0.37 (seconds)
- **R =** Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	15
ln L/R =	2.70805
$2Lt_o$ =	1676.4

K= **1.04E-02**


1
0.1
0.01
0.001
0
200
400
600
800
1000
1200

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW04
TEST NUMBER:	Test No. 2
DATE:	25-Nov-03
TIME:	11:48 am
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	5 feet	152.4 cm
t_o	6.3 seconds	6.3 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.03 feet	29.664 cm

METHOD: Rising Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was removed from the wellbore. The rising head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

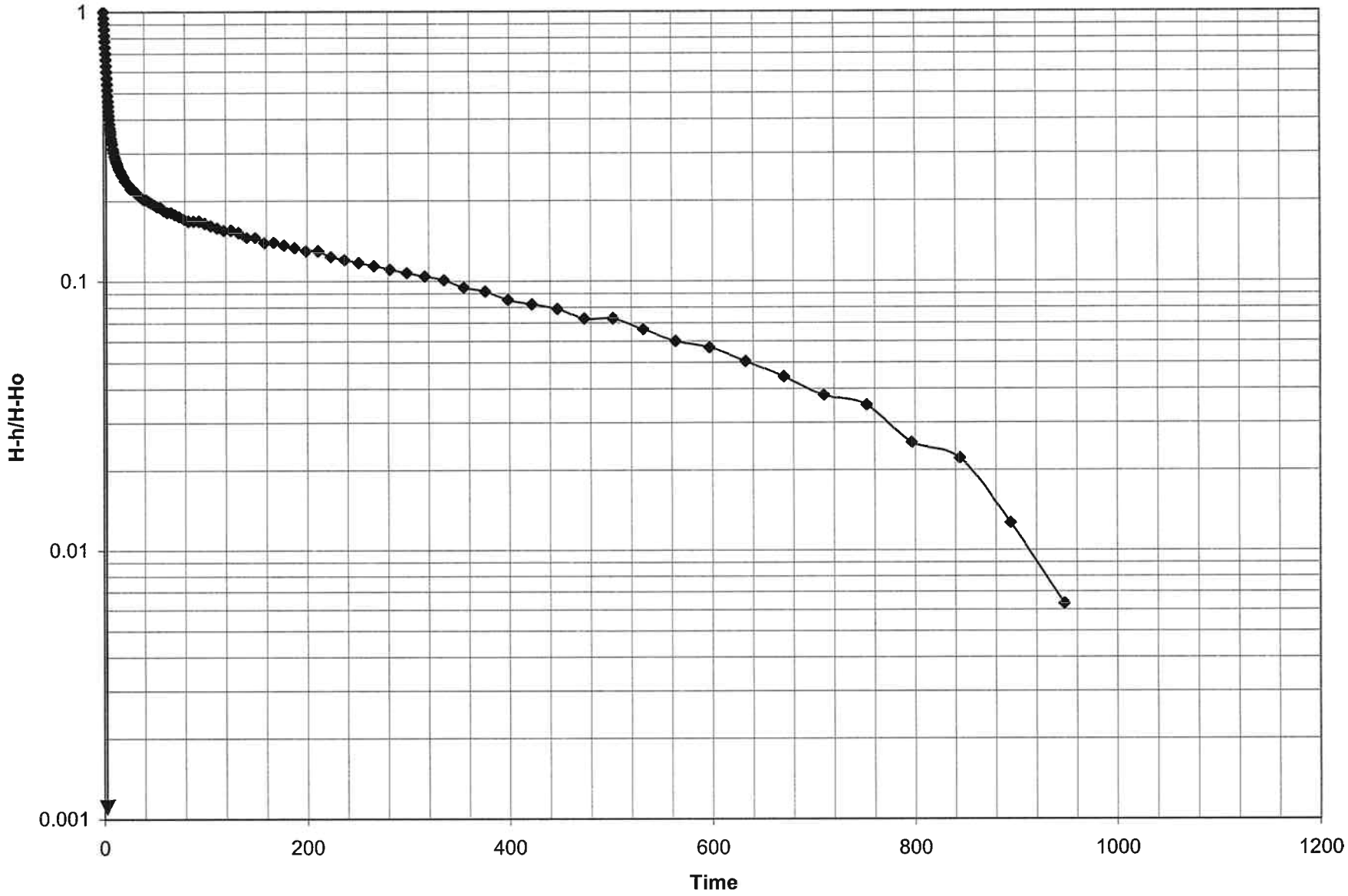
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

K= **9.10E-03**

Where:

- **K =** Permeability or Hydraulic Conductivity (cm/sec)
- **r =** Radius of the well screen (cm)
- **ln =** Natural Logarithm
- **L =** Screen length (cm)
- **to =** Time lag when H-h/H-ho=0.37 (seconds)
- **R =** Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	15
ln L/R =	2.70805
$2Lt_o$ =	1920.24


1
0.1
0.01
0.001
H-h/H-Ho
0
200
400
600
800
1000
1200
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW04
TEST NUMBER:	Test No. 3
DATE:	25-Nov-03
TIME:	12:15 am
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	5 feet	152.4 cm
t_o	7.9 seconds	7.9 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.03 feet	29.664 cm

METHOD: Rising Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was removed from the wellbore. The rising head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

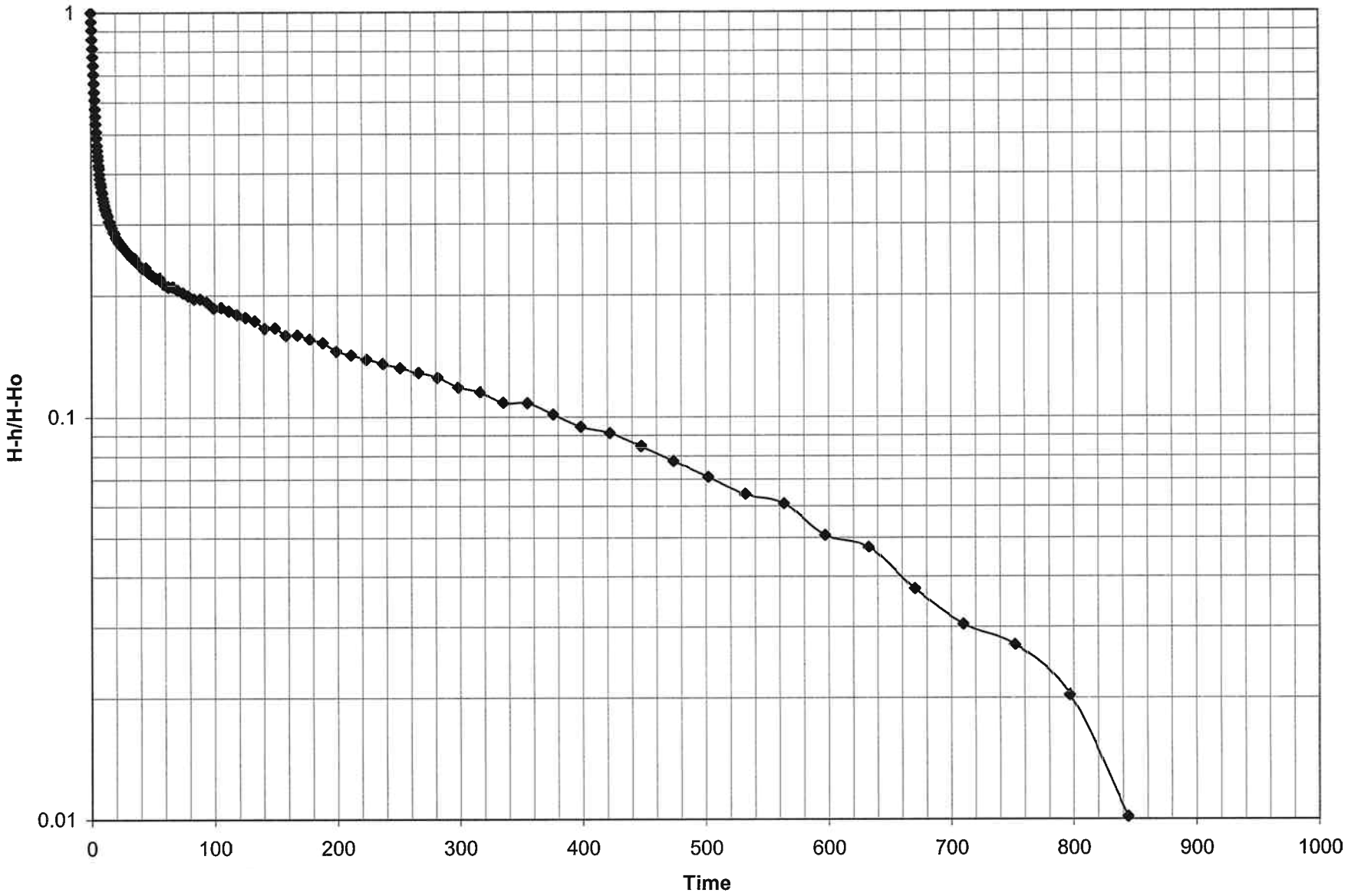
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

K= **7.26E-03**

Where:

K = Permeability or Hydraulic Conductivity (cm/sec)
r = Radius of the well screen (cm)
ln = Natural Logarithm
L = Screen length (cm)
to = Time lag when H-h/H-ho=0.37 (seconds)
R = Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	15
ln L/R =	2.70805
$2Lt_o$ =	2407.92


1
0.1
0.01
H-h/H-Ho
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100
200
300
400
500
600
700
800
900
1000
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW05
TEST NUMBER:	Test No. 1
DATE:	25-Nov-03
TIME:	1:47 am
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	5 feet	152.4 cm
t_o	4.9 seconds	4.9 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.03 feet	29.664 cm

METHOD: Rising Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was removed from the wellbore. The rising head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

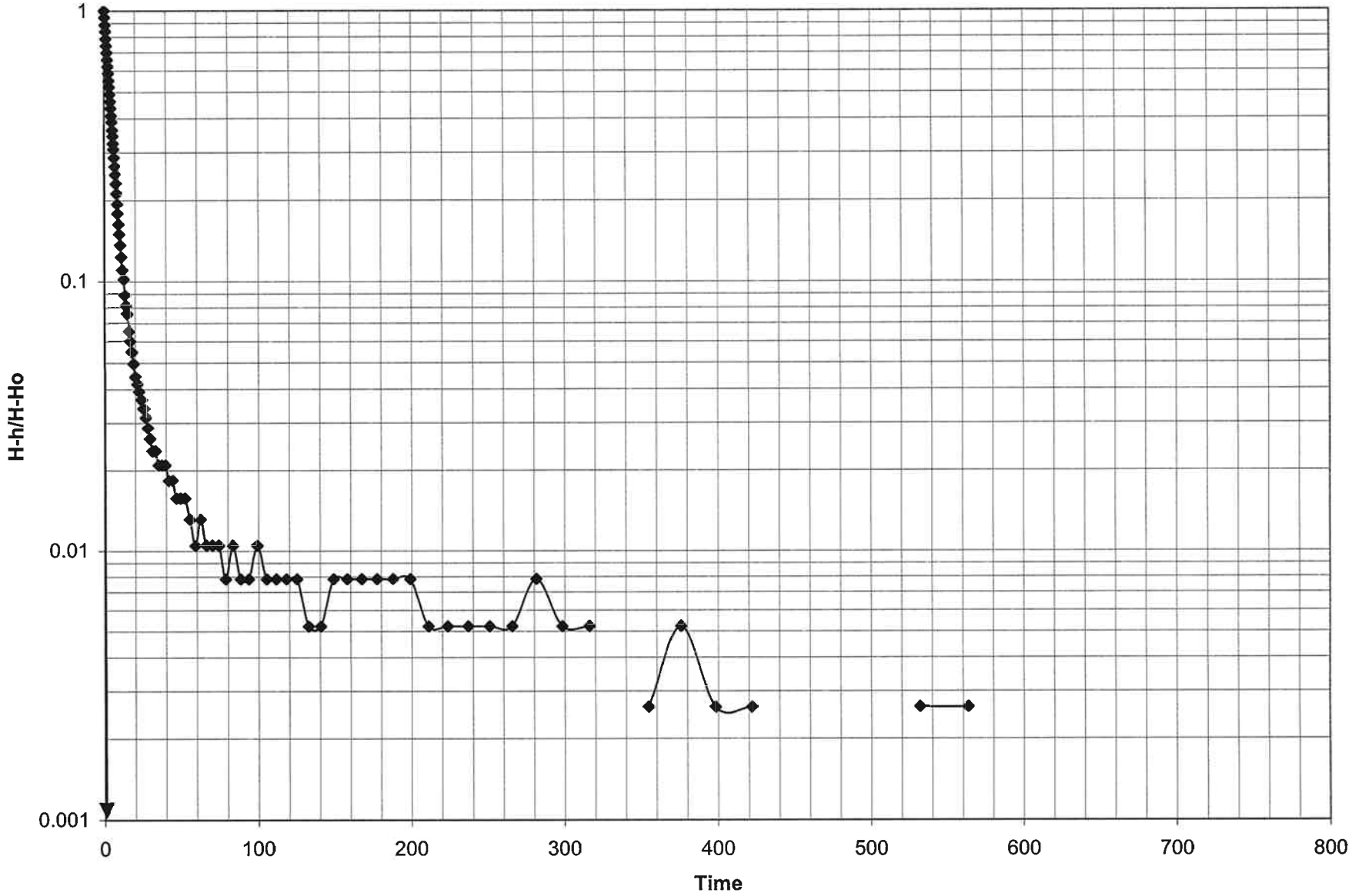
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

Where:

- **K =** Permeability or Hydraulic Conductivity (cm/sec)
- **r =** Radius of the well screen (cm)
- **ln =** Natural Logarithm
- **L =** Screen length (cm)
- **to =** Time lag when H-h/H-ho=0.37 (seconds)
- **R =** Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	15
ln L/R =	2.70805
$2Lt_o$ =	1493.52

K= **1.17E-02**


1
0.1
0.01
0.001
H-h/H-Ho
0
100
200
300
400
500
600
700
800
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW05
TEST NUMBER:	Test No. 2
DATE:	25-Nov-03
TIME:	2:02 pm
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	5 feet	152.4 cm
t_o	4.8 seconds	4.8 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.03 feet	29.664 cm

METHOD: Rising Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was removed from the wellbore. The rising head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

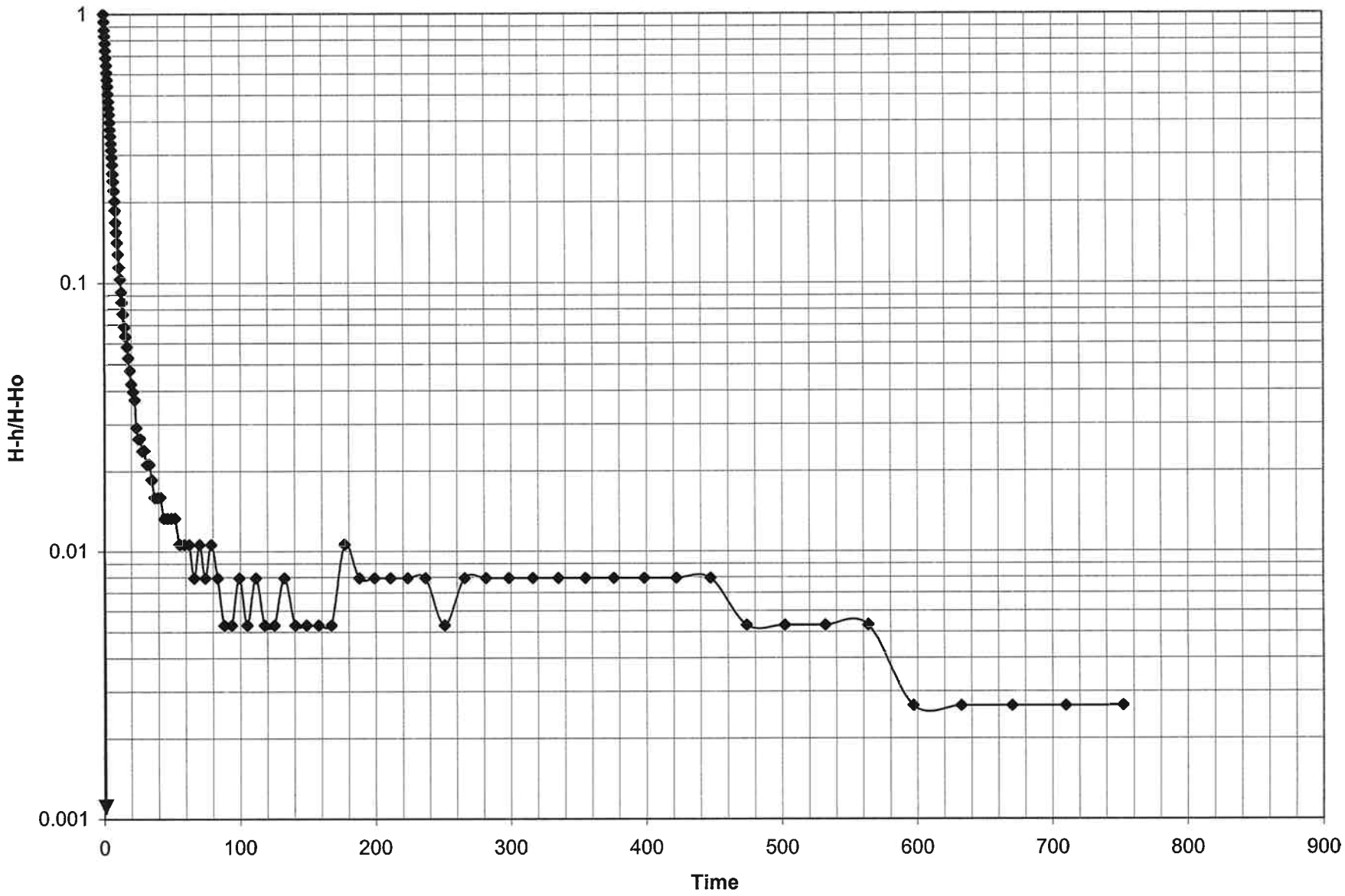
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

Where:

- **K =** Permeability or Hydraulic Conductivity (cm/sec)
- **r =** Radius of the well screen (cm)
- **ln =** Natural Logarithm
- **L =** Screen length (cm)
- **to =** Time lag when H-h/H-ho=0.37 (seconds)
- **R =** Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	15
ln L/R =	2.70805
$2Lt_o$ =	1463.04

K= 1.19E-02


1
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0.01
0.001
H-h/H-Ho
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300
400
500
600
700
800
900
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW05
TEST NUMBER:	Test No. 3
DATE:	25-Nov-03
TIME:	2:20 pm
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	5 feet	152.4 cm
t_o	5.9 seconds	5.9 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.03 feet	29.664 cm

METHOD: Falling Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was inserted into the wellbore. The falling head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

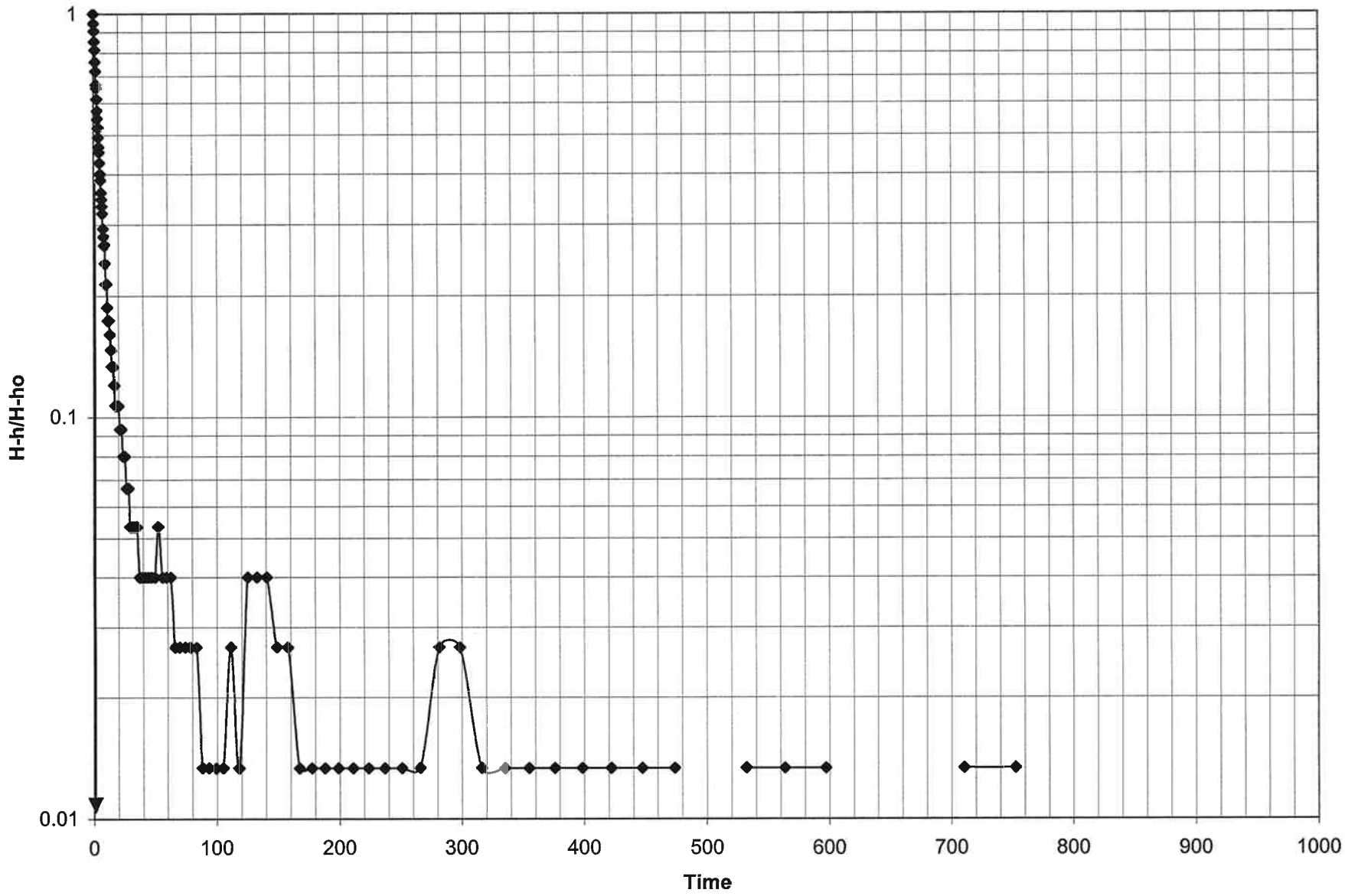
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

K= **9.72E-03**

Where:

- **K =** Permeability or Hydraulic Conductivity (cm/sec)
- **r =** Radius of the well screen (cm)
- **ln =** Natural Logarithm
- **L =** Screen length (cm)
- **to =** Time lag when H-h/H-ho=0.37 (seconds)
- **R =** Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	15
ln L/R =	2.70805
$2Lt_o$ =	1798.32


1
0.1
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H-h/H-ho
0
100
200
300
400
500
600
700
800
900
1000
Time

HYDRAULIC CONDUCTIVITY TEST (ASTM D4044-96)

WELL IDENTIFICATION:	Franczyk Park MW05
TEST NUMBER:	Test No. 4
DATE:	25-Nov-03
TIME:	2:38 pm
PERSONNEL:	D.McCOY, J. MANZELLA

	US UNITS	METRIC UNITS
INSIDE DIAMETER OF WELL SCREEN:	2 inches	5.08 cm
RADIUS OF WELL SCREEN	1 inches	2.54 cm
INSIDE DIAMETER OF WELL BORE	8 inches	20.32 cm
RADIUS OF WELL BORE	4 inches	10.16 cm
LENGTH OF WELL SCREEN:	5 feet	152.4 cm
t_o	6.1 seconds	6.1 seconds
VOLUME OF SLUG:	0.264 gallons	1 liters
PRE-TEST WATER LEVEL:	1.03 feet	29.664 cm

METHOD: Falling Head Test. The Mini-Troll transducer was installed approximately 0.5' above the bottom of the screened interval and allowed to stabilize. A 1 liter slug was inserted into the wellbore. The falling head was monitored by the transducer for the duration of the test.

CALCULATION: Hvorslev

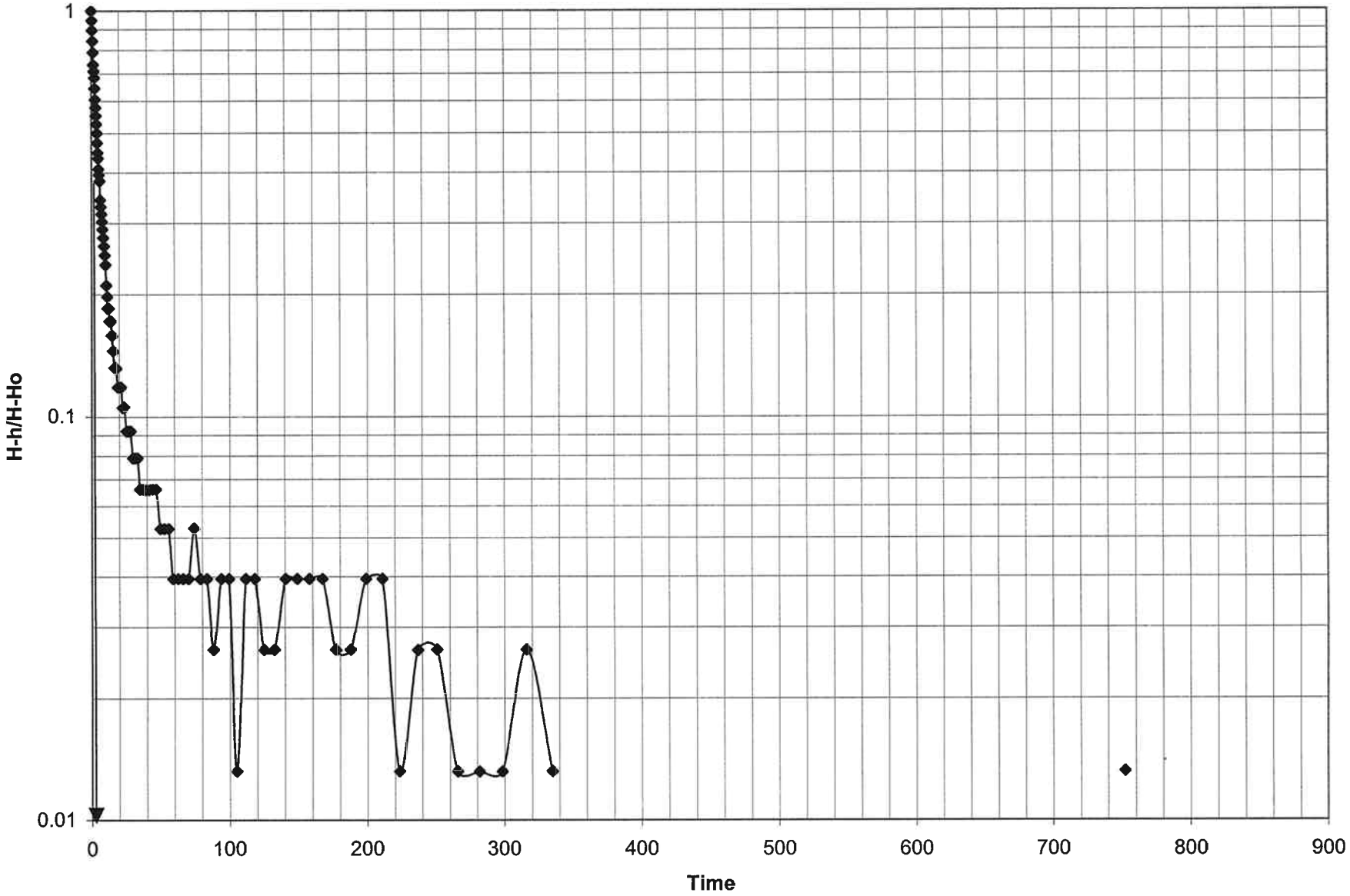
$$K = \frac{r^2 \ln L/R}{2 L t_o}$$

K= **9.40E-03**

Where:

K = Permeability or Hydraulic Conductivity (cm/sec)
r = Radius of the well screen (cm)
ln = Natural Logarithm
L = Screen length (cm)
to = Time lag when H-h/H-ho=0.37 (seconds)
R = Borehole radius (cm)

r =	2.54
r^2 =	6.4516
L/R =	15
ln L/R =	2.70805
$2Lt_o$ =	1859.28


1
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H-h/H-Ho
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200
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Time

APPENDIX E

DATA VALIDATION REPORT

Data Validation Services

120 Cobble Creek Road P. O. Box 208
North Creek, N. Y. 12853
Phone 518-251-4429
Facsimile 518-251-4428

January 26, 2004

James Manzella
TVGA Engineering
P. O. Box H
Elma, NY 14059

RE: **D**ata **U**sability **S**ummary **R**eport for the Franczyk Park site
STL-Buffalo SDG/Package Nos. A03-A674, A03-A825, A03-B071, A03-B189, A03-B395, and A03-B497

Dear Mr. Manzella:

Review has been completed for the data packages generated by Severn Trent Laboratories that pertain to samples collected 11/3/03 through 11/25/03 at the Franczyk Park site. Ten soil location samples were analyzed for full NYSDEC ASP CLP TCL/TAL compounds. Seven aqueous samples were analyzed for the ASP CLP TCL/TAL compounds with the exception that no PCB analyses were required. Thirty six soil samples were processed for TCL semivolatiles and total arsenic and lead. Fifteen soil samples were analyzed for TAL metals and total cyanide; five of those samples were also processed for TCL semivolatiles. Methodologies utilized were the 2000 NYSDEC ASP CLP. Sample matrix spikes, and rinse and trip blanks were also processed.

The data packages submitted contained full deliverables for validation, but this usability report is generated from review of the summary form information, with review of sample raw data, and limited review of associated QC raw data. Full validation has not been performed. However, the reported summary forms have been reviewed for application of validation qualifiers, per the USEPA Region 2 validation SOPs and the USEPA National Functional Guidelines for Data Review, as affects the usability of the sample data. The following items were reviewed:

* Laboratory Narrative Discussion
* Custody Documentation
* Holding Times
* Surrogate and Internal Standard Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Preparation/Calibration Blanks
* Field Duplicate Correlations
* Control Spike/Laboratory Control Samples
* Instrumental Tunes and IDLs
* Calibration/CRI/CRA Standards
* ICP Interference Check Standards
* ICP Serial Dilution Correlations
* Sample Result Verification

Those items listed above which show deficiencies are discussed within the text of this narrative. All of the other items were determined to be acceptable for the DUSR review level.

In summary, samples were processed in general compliance with protocol, and most results are primarily usable as reported, or with usable with minor edit or qualification as estimated or edit to nondetection. The exceptions are that four pesticide analytes in one sample and one pesticide analyte in another sample are not usable due to apparent sample matrix effects. Matrix interferences were evident in the metals soil results, resulting in many qualifications of detected element values as estimated. Generally the samples show good accuracy and precision.

Copies of the laboratory case narratives and laboratory NYSDEC Sample Identification and Analytical Requirement Summary Forms are attached to this text, and should be reviewed in conjunction with this report. Included with this report are red-ink edited sample report forms that represent final qualified samples results. The following text discusses quality issues of concern.

General/Data Completeness

Soil sample identification referenced within this report are prefixed with "FP-" and suffixed with "-S-O". Aqueous samples are prefixed with "FP-" and suffixed with "-GW".

Discrepancies in sample identifications were resolved at sample receipt. The Rinse Blank collected 11/21/03 was not entered on the custody form at sample collection, but was noted upon sample receipt.

Rinse and trip blanks show no contamination that results in qualification of sample reported target analyte results, with the following exceptions:

f. bis(2-ethylhexyl)phthalate, diethylphthalate, and di-n-octylphthalate in the rinse blank associated with samples collected 11/17/03 through 11/19/03. Detections in associated samples are edited to nondetection ("U").
g. aluminum in the rinse blank associated with aqueous samples collected 11/21/03. Detections in associated samples with the exceptions of MW03 and MW-FD are edited to nondetection.
h. The Tentatively Identified Compound (TIC) sulfur dioxide in the rinse blank associated with aqueous samples collected 11/21/03. Detections in associated samples are edited to nondetection.

Aqueous blind field duplicate evaluation of MW03 shows acceptable correlations for the full TCL/TAL analytes (exception of PCBs, which were not processed for the aqueous samples). No soil field duplicates were evaluated with this sampling event; laboratory duplicate correlations were generally within validation guidelines.

The required analyses are not reflected on most of the custody forms submitted with the samples, as these were determined subsequent to laboratory receipt.

TCL Volatiles by ASP CLP

Results for analytes initially reported with the "E" flag are to be derived from the dilution analysis. Other results for those samples can be used from the initial analyses.

All NYSDEC holding times were met with the exception of sample TB05-D24, which was processed at 15 days from VTSR (beyond the allowable 10 days). Results for that sample are qualified as estimated ("UJ" or "J"), with a low bias.

Results for methylene chloride for samples in which they are flagged with "B" (and for all methylene chloride detections in SDG A03-B674) are considered external contamination, as evidenced by presence in associated method blanks. Those results are edited to nondetection ("U"). Other low level detected results for these analytes should be regarded with caution, suspect as contamination.

Soil matrix spikes of SP48-D6.510.4 show acceptable recoveries, but variances between the spike recoveries that result in elevated duplicate correlations for the five analytes evaluated. This variance is not evident in the surrogate recoveries of those spikes, indicating a probable spiking technique error. Sample results are unaffected.

Aqueous matrix spikes of FP-MW02-OB show acceptable accuracy and precision.

Instrument tunes were within required ranges, and surrogate recoveries and internal standard responses were acceptable.

All calibrations standards show responses within validation guidelines, with the following exceptions:

a. 1,2-dibromo-3-chloropropane results are estimated in samples collected 11/03/03 and 11/04/03 due to low response factor (0.047).
b. the acetone detection in TB03-D810 is estimated due to elevated associated continuing calibration standard response (43%D).
c. acetone results in the aqueous samples are estimated due to low associated continuing calibration standard response (33%D).

Tentatively Identified Compounds (TICs) flagged as "B" by the laboratory are considered external contamination (indicated by presence in associated blanks), and results should be rejected as sample components.

Per protocol, the TIC naphthalene should not have been reported for sample MW-01, as it is a semivolatile target analyte.

The TICs at 8.35' and 9.67' in TB03-D810 can be characterized as being a-pinene and limonene, respectively.

The TIC at 11.43' in MW01 can be characterized as being camphor. The other two high concentrated TICs in that sample are cyclic ketones.

Aqueous samples MW01 and MW04 were run at fivefold or tenfold dilutions, without target analyte detections (and with only low level chromatographic responses for MW04). Reporting limits for nondetected analytes in those samples are therefore elevated as reported.

Semivolatile Analyses by ASP CLP

Results for analytes initially reported with the "E" flag are to be derived from the dilution analysis. Other results from those samples can be used from the initial analyses.

The reported detection of anthracene in MW01 is actually the response for phenanthrene (also reported). The result for anthracene in that sample is edited to nondetection.

Holding times were met, with the exception of aqueous sample MW04-OB, which was reextracted at twelve days from collection due to initial extraction failure. The results, derived from the reextraction, are qualified as estimated, with a low bias.

Surrogate and internal standard responses were acceptable, with the exception of very slightly elevated responses (202%, above 200% limit) for internal standard d12-perylene in SP44-D47.3. Detected results for the seven associated compounds are qualified as estimated ("J") for that sample.

Detections of phenol, naphthalene, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, di-n-octylphthalate, and di-n-butylphthlate that are flagged as "B" in the samples are considered external contamination (as evidenced by the presence in associated method blanks), and edited to nondetection at the CRDL. Other low level detections of these compounds are also suspect as being contamination.

Soil matrix spikes of SP08-D48, SP48-D6.510.4, TB06-D024, and TB04-D24.5, and aqueous matrix spikes of MW02-OB, show acceptable accuracy and precision values within recommended ranges, or elevated recoveries for analytes not detected in the project samples. The exception is that pyrene showed an outlying recovery (16%, below 35%) in the matrix spike of TB04-D24.5. The result for that analyte in the parent sample is qualified as estimated.

Calibrations standards showed responses within validation guidelines, with the following exceptions, results for which are qualified as estimated (low bias) in the associated samples:

a. hexachlorocyclopentadiene (31%D), 2,4-dinitrophenol (65%D), 4-nitrophenol (28%D), 4,6-dinitro-3-methylphenol (26%D), and pentachlorophenol (31%D) in all except three samples (which are listed below in sections b. and c.) in SDG A03-A674
b. 2,4-dinitrophenol (35%D to 63%D) in SP23-D01, in thirteen samples collected 11/05/03 and 11/06/03, and in MW-03, MW05, MW06, and MW-GW-FD
c. hexachlorocyclopentadiene (33%D), 2,4-dinitrophenol (35%D), and pentachlorophenol (35%D) in SP23-D58 and SP24-D0.5
d. 2,4-dinitrophenol (47%D), 4-nitrophenol (42%D), and pentachlorophenol (29%D) in TB05 -D24.5, TB06-D024, and all five samples collected 11/25/03
e. hexachlorocyclopentadiene (33%D), 2,4-dinitrophenol (29%D), 4-nitrophenol (39%D) in TB01 D910, TB04-D24, and MW04
f. 2,4-dinitrophenol (70%D) and 4-nitrophenol (44%D) in TB03-D810, TB02-D69, TB04-D24.5, TB05-D24.5, and TB03-D77.5
g. 2,4-dinitrophenol (44%D) and caprolactum (27%D) in MW01 and MW02

Tentatively Identified Compounds (TICs) flagged as "B" or "A" by the laboratory are considered external contamination (indicated by presence in associated blanks), and results should be rejected as sample components.

Per protocol, the TIC methyl isobutyl ketone should not have been reported for sample MW-01, as it is a volatile target analyte.

Instrumental tunes meet protocol requirements. Some of the raw data spectra are not legible, and would require resubmission for full validation.

TCL Pesticides/PCBs by ASP CLP

Many sample pesticide detections show very poor dual column quantitative correlation (indicating matrix interference resulting in potential false positives), the results are either qualified as estimated ("J" for >25%D and <70%D), tentative in identification and estimated in value ("NJ" for ≥70%D and <90%D), or are edited to nondetection ("U" for ≥90%D) at either the CRDL or originally reported concentration, whichever is greater. These edits are reflected on the attached qualified forms, and involve editing most of the detections to nondetection.

The surrogate standard TCX shows very low recoveries (below 10%) in sample SP10-D3.55. The surrogate DCB recoveries in that sample were acceptable. Due to the TCX failure, results for early eluting target analytes a-BHC, b-BHC, d-BHC, and g-BHC are rejected ("R") in that sample, and results for the other pesticides are qualified as estimated ("J" or "UJ"). This sample was not reextracted, so it is not known if the failure was due to matrix effect.

Surrogate DCB shows elevated recoveries in SP48-D1.25 and SP48-D56.5, and results for detected analytes in those samples are therefore qualified as estimated. TCX recoveries in those samples were acceptable.

Holding times were met and blanks show no contamination.

Matrix spike evaluations for accuracy and precision on MW02 and SP48-D65104 were acceptable. Those for SP10-D3.55 show low recoveries for aldrin, with one falling below 10%. The result for that compound in the parent sample is therefore rejected.

Noncompliant elevated recoveries were observed for dieldrin and endrin (>110%) in the GPC cleanup. The detection of endrin in TB05-D24.5 is qualified as estimated.

These outlying GPC recoveries were not flagged as such in some of the data packages, and not addressed in the case narrative.

The QC summary Form 7D for calibration standard of 10/08/03 00:11 shows incorrect entries for 4,4'-DDT. The actual response was compliant. Some of the summary forms outlying Aroclor responses also have incorrect entries; actual responses are acceptable. Sample results are unaffected.

Noncompliant standard responses observed in standard reported in SDG A03-A825 were not discussed in the laboratory case narrative. Those of the six standards showing outlying responses (some

>30%D) on one of the two columns were acceptable on the other, so no additionally qualification is made, although the outlying standard responses may have contributed to elevated sample dual column quantitative correlation (and subsequent qualification).

TAL Metals/CN by CLP-M

Numerous element results are qualified as estimated due to outlying correlations from the ICP serial dilution evaluations. This evaluation indicates matrix effects that (with these samples) cause a low bias to reported values. These project samples show significant numbers of correlations (up to twenty in a single sample) exceeding 10%D, and detected results of those elements are qualified as estimated in all associated samples. The biases generally do not exceed 20%D. Although the analysis protocol requires digestion of 1 gram of sample to a final volume of 200 mL, the laboratory processed the samples to a noncompliant final concentration two fold more concentrated than that of the protocol. This allows for lower reporting limits, but may well contribute to the matrix effect that results in outlying serial dilution evaluations.

The following are ICP serial dilution outliers and associated qualifications:

Sample	Element	%D	Associated Samples
SP10-D03.5	Beryllium	13	Those collected 11/3 and 11/4*
	Cadmium	18	
	Chromium	13	
	Cobalt	17	
	Iron	15	
	Lead	14	
	Manganese	15	
	Nickel	17	
	Vanadium	11	

* No qualification for sample SP16-D5.5-6.3, which showed acceptable matrix spikes and ICP serial dilution results.

SP48-D6.510.4	Aluminum	22	Those collected 11/5 and 11/6,
	Barium	22	TB05-D24.5, and TB03-D810
	Beryllium	23	
	Calcium	35	
	Chromium	30	
	Cobalt	30	
	Copper	23	
	Iron	29	
	Magnesium	23	
	Manganese	28	
	Nickel	30	
	Potassium	16	
	Vanadium	26	
	Zinc	33	
SP28-D1.23.5	Arsenic	30	Those collected 11/5 and 11/6
	Lead	13	

Sample	Element	%D	Associated Samples
BG01	Calcium	13	Those at "BG" locations
	Zinc	11	
SS10	Calcium	19	Those at "SS" locations
	Chromium	11	
	Cobalt	14	
	Iron	12	
	Lead	11	
	Manganese	11	
	Nickel	11	
	Zinc	15	

ICP serial dilution correlations for arsenic and lead in SP16-D5.56.3, TB01-D910, TB04-D24.5, TB06-D024, and for TAL metals in MW02-OB and the rinse blanks are acceptable.

Due to delay in authorization, the cyanide processing for ten samples at the "SS" locations was performed thirteen days beyond the allowable technical holding time, just within the limit for usable data. Those results are therefore qualified as estimated ("UJ"), with a possible very low bias.

Cyanide analyses of four samples collected 11/3/03 and 11/4/03 were initially processed in a batch with noncompliant low recovery of the LCS (55%). The reanalyses were performed two days beyond the allowable technical holding time, with outlying LCS recovery of 127%. The reanalyses are to be used, with all reported results qualified as estimated, with a low bias. The bias from the outlying holding time is not expected to be as great as that implied in the initial analysis.

The following samples exhibited matrix spike recoveries or duplicate correlations outside the validation action ranges, indicating either a matrix effect on recovery of analytes from the samples or a nonhomogenous matrix. Associated sample results are qualified as estimated ("J" or "UJ"):

Sample ID	Element	Outlying %Rec	Outlying %RPD	Associated Samples
SP10-D03.5	Antimony	39 and 34		Collected 11/3&11/4*
	Arsenic	153		
SP48-D6.510.4	Antimony	18		Collected 11/5& 11/6
	Cadmium	60		TB05-D24.5 and TB03-D810
SS10	Antimony	20		At "SS" locations
	Zinc	73		
TB04-D24.5	Arsenic	130	>100	Collected 11/17
	Lead		>100**	through 11/19
TB05-D24.5	Mercury	144		TB05-D24.5 and TB03-D810
MW02-OB	Mercury	70		Aqueous samples
BG02	Antimony	27 and 25		At "BG" locations

* No qualification for sample SP16-D5.5-6.3, which showed acceptable matrix spikes and ICP serial dilution results.

** The lead duplicate results for TB04-D24.5 were an order of magnitude higher than the parent sample. Arsenic results vary by a factor of five.

Arsenic and lead matrix spike/duplicate evaluations of SP16-D5.56.3, and TAL metals matrix spike/duplicate evaluations of rinse blanks, show acceptable accuracy and precision. The arsenic and lead matrix spikes of TB06-D024 could not be evaluated due to very high sample concentrations.

Cyanide matrix spike and duplicate evaluations of SP48-D6.510.4 and MW02-OB show acceptable accuracy and precision. Those for SS10 show one acceptable recovery at 103% and one at only 14%. The associated samples are already qualified due to outlying holding time.

Elevated cyanide LCS recoveries did not adversely affect sample results, as they show no detection.

ICP post digest spike recoveries for almost all samples were within recommended limits.

The cyanide result for MW01 is qualified as estimated due to inconsistent results determined in multiple analyses (10 ppb, 35 ppb, and 53 ppb).

The cyanide result for BG03 has been edited to reflect detection above CRDL (3.1 ppm) as indicated by the raw data.

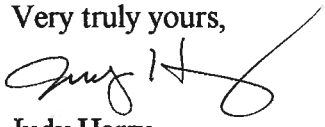
The reporting limit results for cyanide not detected in the samples at locations "BG" have been edited during validation. Those reported by the laboratory were not corrected for moisture content.

Some of the preparation and instrument blanks show detections above CRDL for iron and lead. All associated sample results have been confirmed as being higher than validation or laboratory action levels. A few form errors were observed on QC summary forms regarding application of laboratory flags and action levels. Validation review was performed using correct data.

Neither of the two samples processed for TAL metals and reported in SDG A03-B189 were processed for matrix spike/duplicate or ICP serial dilution. For purposes of qualification, they were associated with samples collected about two weeks prior, beyond the seven day ASP allowable limit. Overall rates of QC for the project were acceptable.

Please do not hesitate to contact me if you have comments or questions regarding this report.

Very truly yours,



Judy Harry

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, N. Y. 12853

Phone 518-251-4429

Facsimile 518-251-4428

April 22, 2004

James Manzella
TVGA Engineering
P. O. Box H
Elma, NY 14059

RE: **Data Usability Summary Report** for the Franczyk Park site
STL-Buffalo SDG Nos. SS0304, SP0304, and MW0304

Dear Mr. Manzella:

Review has been completed for the data packages generated by Severn Trent Laboratories that pertain to samples collected 3/06/034 and 3/08/04 at the Franczyk Park site. Eight aqueous samples were analyzed for six metals, four soil samples were analyzed for total lead and arsenic, and seven soil samples were analyzed for mercury. Four soil samples were analyzed for TCLP arsenic, five for TCLP lead, and four for TCLP arsenic and lead. One of the latter soil samples was also processed for TCL semivolatiles. Methodologies utilized were the 2000 NYSDEC ASP CLP and SW846. Sample matrix spikes, and a rinse blank were also processed.

The data packages submitted contained full deliverables for validation, but this usability report is generated from review of the summary form information, with review of sample raw data, and limited review of associated QC raw data. Full validation has not been performed. However, the reported summary forms have been reviewed for application of validation qualifiers, per the USEPA Region 2 validation SOPs and the USEPA National Functional Guidelines for Data Review, as affects the usability of the sample data. The following items were reviewed:

* Laboratory Narrative Discussion
* Custody Documentation
* Holding Times
* Surrogate and Internal Standard Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Preparation/Calibration Blanks
* Field Duplicate Correlations
* Control Spike/Laboratory Control Samples
* Instrumental Tunes and IDLs
* Calibration/CRI/CRA Standards
* ICP Interference Check Standards
* ICP Serial Dilution Correlations
* Sample Result Verification

Those items listed above which show deficiencies are discussed within the text of this narrative. All of the other items were determined to be acceptable for the DUSR review level.

In summary, samples were processed in general compliance with protocol, and most results are usable as reported, or usable with minor edit or qualification as estimated.

Copies of the laboratory case narratives and laboratory NYSDEC Sample Identification and Analytical Requirement Summary Forms are attached to this text, and should be reviewed in conjunction with this report. Included with this report are red-ink edited sample report forms that represent final qualified samples results. The following text discusses quality issues of concern.

General/Data Completeness

Soil sample identification referenced within this report are prefixed with "FP-" and suffixed with "-S-O". Aqueous samples are prefixed with "FP-" and suffixed with "-GW-O".

The rinse blank shows no contamination above the CRDL.

Aqueous blind field duplicate evaluation of MW05 shows acceptable correlations for the six metals. No soil field duplicate evaluation was performed.

Semivolatile Analyses by ASP CLP

Results for analytes initially reported with the "E" flag are to be derived from the dilution analysis. Additionally, the results for benzo(b)fluoranthene and benzo(k)fluoranthene are also to be derived from the dilution analysis, as they were not resolved in the initial analysis, and the combined response was misreported as detections for both compounds.

Holding times were met, and surrogate and internal standard responses were acceptable. Instrumental tunes meet protocol requirements.

Spiked blanks show accuracy and precision values within recommended ranges, or elevated recoveries for analytes not detected in the project samples.

Calibrations standards showed responses within validation guidelines, with the following exceptions, results for which are qualified as estimated (low bias) in the sample: hexachlorocyclopentadiene (32%RSD and 46%D), 2,4-dinitrophenol (38%D), 4-nitrophenol (38%D), and pentachlorophenol (28%D)

Tentatively Identified Compounds (TICs) flagged as "B" or "A" by the laboratory are considered external contamination (indicated by presence in associated blanks), and results should be rejected as sample components.

Metals and TCLP Metals by CLP

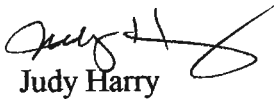
Matrix spike/duplicate evaluations of aqueous sample MW05 (6 elements), and soil sample SS14 (lead and arsenic) show acceptable accuracy and precision. Matrix spike/duplicate evaluations of the leachates SP02-D10.811.5 (TCLP arsenic), SP34-D35 (TCLP lead), and MICRO01-D4.55.5 (TCLP lead and arsenic) were also acceptable.

The matrix spikes of mercury in SP10W-D0.52 show elevated duplicate correlation (95%RPD) and recoveries (395% and 1114%). A nonhomogeneous matrix is suspected, and mercury results for the soil samples are qualified as estimated ("J").

ICP serial dilution evaluations were performed on aqueous sample MW05, soil samples SS11 and SS14, and leachates SP02-D10.811.5, SP34-D35, and MICRO01-D4.55.5. All correlations were acceptable.

Please do not hesitate to contact me if you have comments or questions regarding this report.

Very truly yours,



Judy Harry

APPENDIX F

ASSUMPTIONS FOR REMEDIAL ALTERNATIVES

Franczyk Park Site
RAR Cost Estimate
Alternative B - Calculations

Entire Site (16.5 acres)	
Square Feet:	718,740
Thousand Square Feet:	719
Square Yards:	79,860
Avg. Soil Depth to Native (ft):	7
Approximate Total Fill Volume (ft^3):	5,031,180
Approximate Total Fill Volume (yd^3):	186,355
Fill in Tons:	279,532
Number of Bleacher Pads	8
Area of each bleacher pad (ft^2):	300
Area of Tennis/Basketball Court (ft^2):	18,600
Area of each Baseball in-field (ft^2):	10,000
Area of play area/swing areas (ft^2):	2,500
East Side Perimeter (ft):	580
West Side Perimeter (ft):	400
South Side Perimeter (ft):	1,200
Parking Lot Area (ft^2)	15,675
Parking Lot Perimeter (n,e,w sides) (ft):	375
No. of Boulders needed (6' spacing):	359

Item	Note	Length (ft)	Width (ft)	Depth/Thickness (ft)	Area (ft^2)	Pre-Total (ft^3)	Total Unit	Total
Pre-Construction Activities								
Perimeter Excavation	Excavation around site perimeter and parking lot to tie in cover system to these features	2,555	10	2	-	51,100	cy	1,893
Site Grading	Assumes a quarter of the site at average depth of 1' plus excavated perimeter material	-	-	1	179,685	179,685	cy	8,548
Cover Installation								
Clean fill	This assumes entire site except tennis/BB courts, parking lot and bleacher pads	-	-	1.5	682,065	1,023,098	cy	37,893
Topsoil	This assumes entire site except tennis/BB courts, parking lot, baseball in-fields, bleacher pads or play areas	-	-	0.5	649,565	324,783	cy	12,029
Baseball In-field soil	All three	-	-	0.5	30,000	15,000	cy	556
Sand/Gravel Mix	BB/Tennis courts sub base	-	-	1.5	18,600	27,900	cy	1,033
Seeding	All topsoil areas	-	-	-	649,565	-	acre	14.91
Sand/Gravel Mix	Bleacher Pad sub base	-	-	1.5	2,400	3,600	cy	133
Concrete for bleacher pads	Total area assumes all eight pads 6" thick	-	-	-	2,400	-	sf	2,400
Play Area Cover System								
Geotextile	Assumes two 50' x 50' areas plus a five foot overlap on each side	60	60	-	3,600	-	sy	400
Sand	Both areas	50	50	0.5	2,500	1,250	cy	46.3
Post Construction Activities								
Boulder barrier (3' x 3' x 3') ea.	Spaced 6' on center on south and east site perimeter and around north east and west perimeter of parking lot	3	3	3	-	9,698	cy	359

Entire Site (16.5 acres)	
Square Feet:	718,740
Thousand Square Feet:	719
Square Yards:	79,860
Avg. Soil Depth to Native (ft):	7
Approximate Total Fill Volume (ft^3):	5,031,180
Approximate Total Fill Volume (yd^3):	186,340
Fill in Tons:	279,510
Number of Bleacher Pads	8
Area of each bleacher pad (ft^2):	300
Area of Tennis/Basketball Court (ft^2):	18,600
Area of each Baseball in-field (ft^2):	10,000
Area of play area/swing areas (ft^2):	2,500
East Side Perimeter (ft):	580
West Side Perimeter (ft):	400
South Side Perimeter (ft):	1,200
Parking Lot Area (ft^2)	15,675
Parking Lot Perimeter (n,e,w sides) (ft):	375
No. of Boulders needed (6' spacing):	359

Item	Note	Length (ft)	Width (ft)	Depth/Thickness (ft)	Area (ft^2)	Pre-Total (ft^3)	Total Unit	Total
Pre-Removal Activities								
Hazardous Fill Removal Estimated Volume	Assumes each area is 100' x 100' and 5' deep	100	100	5	-	100,000	cy	3,704
Hazardous Fill Removal Estimated Volume	Assumes 1.5 ton/yd^3	-	-	-	-	-	ton	5,556
Demo of Tennis/Basketball court		-	-	0.5	18,600	9,300	cy	344
Demo of bleacher pads	Total area assumes all eight pads	-	-	0.5	2,400	1,200	cy	44
Groundwater Interceptor Trench								
Trench Excavation		1,100	2	6	-	13,200	cy	489
Tie-in Trench Excavations	Assumes five tie-in each 60' long x 2' wide x 6' deep	300	2	6	-	3,600	cy	133
Excavation Volume	Volume for Tie-in and trench assuming 1.5ton/cy	-	-	-	-	-	ton	933
Geotextile	To line trench assumes width of 18' (2' for bottom + (6' *2) for sidewalls + 2' overlap from each side) = 18'	1,100	18	-	19,800	-	sy	2,200
Stone for trench	Assumes trench will be filled to 2' bgs	1,100	2	4	-	8,800	cy	326
4" screened PVC cleanout piping	Assumes five 5' cleanout pipes	5	-	-	-	-	lf	25
4" Solid PVC Tie-in Piping	Assumes five tie-ins at 60' long each	60	-	-	-	-	lf	300
Clean Fill for Trench	Assumes 1.5' of clean fill will be added over entire length of trench	1,100	2	1.5	-	3,300	cy	122
Clean Fill for Tie-in Trench	Assumes five (60' long x 2' wide x 6' deep) tie-ins each filled to a depth of 0.5' bgs	300	2	5.5	-	3,300	cy	122
Cover Augmentation								
Topsoil	This assumes entire site except tennis/BB courts, parking lot, baseball in-fields, bleacher pads or play areas	-	-	0.5	649,565	324,783	cy	12,029
Seeding	All topsoil areas	-	-	-	649,565	-	acre	14.91
Play Area Cover System								
Geotextile	Assumes two 50' x 50' areas plus a five foot overlap on each side	60	60	-	3,600	-	sy	400
Sand	Both areas	50	50	0.5	2,500	1,250	cy	46.3
Post Construction Activities								
Baseball In-field soil	All three	-	-	0.5	30,000	15,000	cy	556
Sand/Gravel Mix	BB/Tennis courts sub base	-	-	0.5	18,600	9,300	cy	344
Sand/Gravel Mix	Bleacher Pad sub base	-	-	0.5	2,400	1,200	cy	44
Concrete for bleacher pads	Total area assumes all eight pads 6" thick	-	-	-	2,400	-	sf	2,400
Boulder barrier (3' x 3' x 3') ea.	Spaced six on center apart on south and east site perimeter and around north east and west perimeter of parking lot	3	3	3	-	9,698	cy	359

Franczyk Park Site
RAR Cost Estimate
Alternative D - Calculations

Entire Site (16.5 acres)	
Square Feet:	718,740
Thousand Square Feet:	719
Square Yards:	79,860
Avg. Soil Depth to Native (ft):	7
Approximate Total Fill Volume (ft^3):	5,031,180
Approximate Total Fill Volume (yd^3):	186,340
Fill in Tons:	279,510
Number of Bleacher Pads	8
Area of each bleacher pad (ft^2):	300
Area of Tennis/Basketball Court (ft^2):	18,600
Area of each Baseball in-field (ft^2):	10,000
Area of play area/swing areas (ft^2):	2,500
East Side Perimeter (ft):	580
West Side Perimeter (ft):	400
South Side Perimeter (ft):	1,200
Parking Lot Area (ft^2)	15,675
Parking Lot Perimeter (n,e,w sides) (ft):	375
No. of Boulders needed (6' spacing):	359

Item	Note	Length (ft)	Width (ft)	Depth/Thickness (ft)	Area (ft^2)	Pre-Total (ft^3)	Total Unit	Total
Pre-Removal Activities								
Hazardous Fill Removal Estimated Volume	Assumes each area is 100' x 100' and 5' deep	100	100	5	-	100,000	cy	3,704
Hazardous Fill Removal Estimated Volume	Assumes 1.5 ton/yd^3	-	-	-	-	-	ton	5,556
Demo of Tennis/Basketball court		-	-	0.5	18,600	9,300	cy	344
Demo of bleacher pads	Total area assumes all eight pads	-	-	0.5	2,400	1,200	cy	44
Demo of Asphalt Parking lot and driveway				0.5	15,675	7,838	cy	290
Site-Wide Fill Removal								
Fill Volume (assumes entire site to 7' bgs)	Volume for excavation, on-site transportation on-site/off-site loading	-	-	7	718,740	5,031,180	cy	186,340
Fill Volume (assumes entire site to 7' bgs)	Assumes 1.5 ton/yd^3	-	-	-	-	-	ton	279,510
Backfill								
Cover Material	This assumes that 70% of the cover material will be reused as backfill and assumes cover a depth of 1.6' across the entire site	-	-	1.6	718,740	1,149,984	cy	29,814
Cover Material	Assumes 1.5 ton/yd^3	-	-	-	-	-	ton	44,722
Topsoil	This assumes entire site except tennis/BB courts, parking lot, baseball in-fields, bleacher pads or play areas	-	-	0.5	649,565	324,783	cy	12,029
Baseball In-field soil	All three	-	-	0.5	30,000	15,000	cy	556
Seeding	All topsoil areas	-	-	-	649,565	-	acre	14.91
Play Area								
Sand	Two 50' x 50' areas	50	50	0.5	2,500	1,250	cy	46.3
Post Removal Activities								
Asphalt Pavement for Parking Lot		-	-	-	15,675	-	sy	1,742
Concrete for bleacher pads	Total area assumes all eight pads 6" thick	-	-	-	2,400	-	sf	2,400
Boulder barrier (3' x 3' x 3') ea.	Spaced six on center apart on south and east site perimeter and around north east and west perimeter of parking lot	3	3	3	-	9,698	cy	359

Hazardous Fill Delineation Budget

Labor

Level	ASCE Grade	Avg. Rate	Scoping Hrs	Scoping Amount	Push Probing Hrs	Push Probing Amount	Data Rev/Analysis Hrs	Data Rev/Analysis Amount	Draft Report Hrs	Draft Report Amount	Final Report Hrs	Final Report Amount	Project Totals Hrs	Project Totals Amount
Chief Engineer	VIII	46.00		$ -		$ -		$ -		$ -		$ -	0	$ -
Project Manager	VI	38.00	1	$ 38.00		$ -	1	$ 38.00	1	$ 38.00	1	$ 38.00	4	$ 152.00
Senior Scientist/Engineer	V	28.00	12	$ 336.00	4	$ 112.00	6	$ 168.00	4	$ 112.00	2	$ 56.00	28	$ 784.00
Project Scientist/Engineer	IV	23.00		$ -		$ -		$ -		$ -		$ -	0	$ -
Assistant Scientist II	II	16.00	2	$ 32.00	22	$ 352.00	12	$ 192.00	20	$ 320.00	4	$ 64.00	60	$ 960.00
CADD Technician	I	14.00		$ -		$ -		$ -	2	$ 28.00		$ -	2	$ 28.00
Technical Typist	N/A	12.00		$ -		$ -		$ -	2	$ 24.00	2	$ 24.00	4	$ 48.00
		Subtotal		$ 406.00		$ 464.00		$ 398.00		$ 522.00		$ 182.00	98	$ 1,972.00

Total Direct Labor	$ 1,972.00
Indirect Labor (1.65%)	$ 3,254.00
Fixed Fee (5%)	$ 261.00

Expenses

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Mileage	$/mi	0.36		$ -	60	$ 21.60		$ -		$ -		$ -	60	$ 21.60
Tolls	$/day	0.50		$ -	1	$ 0.50		$ -		$ -		$ -	1	$ 0.50
Fed Ex	$/ea	15.00		$ -		$ -		$ -	2	$ 30.00	2	$ 30.00	4	$ 60.00
Portable Telephone	$/wk	10.00		$ -	0.5	$ 5.00		$ -		$ -		$ -	1	$ 5.00
		Subtotal		$ -		$ 27.10		$ -		$ 30.00		$ 30.00		$ 87.00

Equipment and Supplies

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Copies	$/pg.	0.05	100	$ 5.00		$ -	250	$ 12.50	1000	$ 50.00	1500	$ 75.00	2850	$ 142.50
Film & Processing	$/roll	15.00		$ -	1	$ 15.00		$ -		$ -		$ -	1	$ 15.00
PID	$/day	100.00		$ -	1	$ 100.00		$ -		$ -		$ -	1	$ 100.00
MIE DR-2000 (2 units > 1 mo.)	$/week	1050.00		$ -		$ -		$ -		$ -		$ -	0	$ -
Report Materials	$/ea.	15.00		$ -		$ -		$ -	6	$ 90.00	6	$ 90.00	12	$ 180.00
Misc. Sampling Supplies	$/event	150.00		$ -	1	$ 150.00		$ -		$ -		$ -	1	$ 150.00
		Subtotal		$ 5.00		$ 265.00		$ 12.50		$ 140.00		$ 165.00		$ 587.50

Laboratory Costs (Includes QA/QC Samples)

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
TCLP Lead	$/smp	60.00		$ -	12	$ 720.00		$ -		$ -		$ -	12	$ 720.00
TCLP Arsenic	$/smp	60.00		$ -	12	$ 720.00		$ -		$ -		$ -	12	$ 720.00
		Subtotal		$ -		$ 1,440.00		$ -		$ -		$ -	24	$ 1,440.00

Data Validation

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Data Validation (DUSR)	lump sum	250.00		$ -		$ -	1	$ 250.00		$ -		$ -	1	$ 250.00
		Subtotal		$ -		$ -		$ 250.00		$ -		$ -		$ 250.00

Soil Probing Cost [1]

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Mobilization	$/ea.	100.00		$ -	1	$ 100.00		$ -		$ -		$ -	1	$ 100.00
Probing Equip. & Crew	$/day	750.00		$ -	2	$ 1,500.00		$ -		$ -		$ -	2	$ 1,500.00
Plastic Liners	$/ea.	2.00		$ -	40	$ 80.00		$ -		$ -		$ -	40	$ 80.00
Hole Abandonment	$/ea.	1.00		$ -	30	$ 30.00		$ -		$ -		$ -	30	$ 30.00
		Subtotal		$ -		$ 1,710.00		$ -		$ -		$ -		$ 1,710.00

Project Totals

Level / Description	Scoping Amount	Push Probing Amount	Data Rev/Analysis Amount	SI report prep Amount	Final SI/RAR Amount	Project Totals Amount
Direct Labor	$ 406.00	$ 464.00	$ 398.00	$ 522.00	$ 182.00	$ 1,972.00

Total Direct Labor	$ 1,972.00
Indirect Labor (1.65%)	$ 3,254.00
Fixed Fee (5%)	$ 261.00
Labor Subtotal	**$ 5,487.00**

Other Direct Costs										
Expenses	$ -	$ 27.10	$ -	$ 30.00	$ 30.00	0	$ 87.10
Equipment	$ 5.00	$ 265.00	$ 12.50	$ 140.00	$ 165.00	0	$ 587.50
Laboratory	$ -	$ 1,440.00	$ -	$ -	$ -	0	$ 1,440.00
Data Validation	$ -	$ -	$ 250.00	$ -	$ -	0	$ 250.00
Probing	$ -	$ 1,710.00	$ -	$ -	$ -	0	$ 1,710.00
DIRECT COSTS SUBTOTAL	$ 5.00	$ 3,442.10	$ 262.50	$ 170.00	$ 195.00		**$ 4,075.00**
					Project Total		**$ 9,600.00**

Biannual Cover Monitoring Budget

Labor

Level	ASCE Grade	Avg. Rate	Scoping/Setup Hrs	Scoping/Setup Amount	Site Visit Hrs	Site Visit Amount	Draft Report Hrs	Draft Report Amount	Final Report Hrs	Final Report Amount	Project Totals Hrs	Project Totals Amount
Project Manager	VI	38.00	1	$ 38.00		$ -	1	$ 38.00		$ -	2	$ 76.00
Senior Scientist/Engineer	V	28.00	1	$ 28.00	1	$ 28.00	4	$ 112.00	1	$ 28.00	7	$ 196.00
Project Scientist/Engineer	IV	23.00	4	$ 92.00	12	$ 276.00	16	$ 368.00	4	$ 92.00	36	$ 828.00
CADD Technician	I	14.00		$ -		$ -	2	$ 28.00	1	$ 14.00	3	$ 42.00
Technical Typist	N/A	12.00	1	$ 12.00		$ -		$ -	2	$ 24.00	3	$ 36.00
		Subtotal		$ 170.00		$ 304.00		$ 546.00		$ 158.00	51	$ 1,178.00

Total Direct Labor	$ 1,178.00
Indirect Labor (1.65%)	$ 1,944.00
Fixed Fee (5%)	$ 156.00

Expenses

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Mileage	$/mi	0.36		$ -	100	$ 36.00		$ -		$ -	100	$ 36.00
Tolls	$/day	0.50		$ -	1	$ 0.50		$ -		$ -	1	$ 0.50
Fed Ex	$/ea	15.00		$ -		$ -	2	$ 30.00	2	$ 30.00	4	$ 60.00
		Subtotal		$ -		$ 36.50		$ 30.00		$ 30.00		$ 97.00

Equipment and Supplies

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Copies	$/pg.	0.05	100	$ 5.00	100	$ 5.00	250	$ 12.50	500	$ 25.00	950	$ 47.50
		Subtotal		$ 5.00		$ 5.00		$ 12.50		$ 25.00		$ 47.50

Project Totals

Level							Project Totals	
Description	Scoping/Setup		Site Visit		Draft Report	Final Report		
		Amount		Amount		Amount		Amount
Direct Labor		$ 170.00		$ 304.00		$ 546.00		$ 158.00		$ 1,178.00

Total Direct Labor	$ 1,178.00
Indirect Labor (1.65%)	$ 1,944.00
Fixed Fee (5%)	$ 156.00
Labor Subtotal	**$ 3,278.00**

Other Direct Costs										
Expenses		$ -		$ 36.50		$ 30.00		$ 30.00	0	$ 96.50
Equipment		$ 5.00		$ 5.00		$ 12.50		$ 25.00	0	$ 47.50

Event Total	**$ 3,400.00**
Annual Total	**$ 6,800.00**
30-Year Project Total (Present Worth)	**$ 104,533.00**

Alternative B - Annual Groundwater Monitoring Budget

Labor

Level	ASCE Grade	Avg. Rate	Scoping/Setup Hrs	Scoping/Setup Amount	Sampling Hrs	Sampling Amount	Data Rev/Analysis Hrs	Data Rev/Analysis Amount	Draft Report Hrs	Draft Report Amount	Final Report Hrs	Final Report Amount	Project Totals Hrs	Project Totals Amount
Chief Engineer	VIII	46.00		$ -		$ -		$ -		$ -		$ -	0	$ -
Project Manager	VI	38.00	1	$ 38.00		$ -		$ -	1	$ 38.00	1	$ 38.00	3	$ 114.00
Senior Scientist/Engineer	V	28.00	1	$ 28.00		$ -	1	$ 28.00	2	$ 56.00	1	$ 28.00	5	$ 140.00
Project Scientist/Engineer	IV	23.00		$ -	8	$ 184.00		$ -		$ -		$ -	8	$ 184.00
Assistant Scientist II	II	16.00	4	$ 64.00	8	$ 128.00	8	$ 128.00	10	$ 160.00	4	$ 64.00	34	$ 544.00
CADD Technician	I	14.00		$ -		$ -		$ -		$ -		$ -	0	$ -
Technical Typist	N/A	12.00		$ -		$ -		$ -		$ -	2	$ 24.00	2	$ 24.00
		Subtotal		$ 130.00		$ 312.00		$ 156.00		$ 254.00		$ 154.00	52	$ 1,006.00

Total Direct Labor	$ 1,006.00
Indirect Labor (1.65%)	$ 1,660.00
Fixed Fee (5%)	$ 133.00

Expenses

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Mileage	$/mi	0.36		$ -	60	$ 21.60		$ -		$ -		$ -	60	$ 21.60
Tolls	$/day	0.50		$ -	1	$ 0.50		$ -		$ -		$ -	1	$ 0.50
Fed Ex	$/ea	15.00		$ -		$ -		$ -	2	$ 30.00	2	$ 30.00	4	$ 60.00
Portable Telephone	$/wk	10.00		$ -	0.5	$ 5.00		$ -		$ -		$ -	1	$ 5.00
		Subtotal		$ -		$ 27.10		$ -		$ 30.00		$ 30.00		$ 87.00

Equipment and Supplies

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Copies	$/pg.	0.05	25	$ 1.25		$ -	150	$ 7.50	250	$ 12.50	500	$ 25.00	925	$ 46.25
Film & Processing	$/roll	15.00		$ -	1	$ 15.00		$ -		$ -		$ -	1	$ 15.00
Horiba U-10	$/day	100.00		$ -	1	$ 100.00		$ -		$ -		$ -	1	$ 100.00
Peristaltic Pump	$/day	75.00		$ -	1	$ 75.00		$ -		$ -		$ -	1	$ 75.00
Report Materials	$/ea.	15.00		$ -		$ -		$ -	3	$ 45.00	3	$ 45.00	6	$ 90.00
Misc. Sampling Supplies	$/event	150.00		$ -	1	$ 150.00		$ -		$ -		$ -	1	$ 150.00
		Subtotal		$ 1.25		$ 340.00		$ 7.50		$ 57.50		$ 70.00		$ 476.25

Laboratory Costs (Includes QA/QC Samples)

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
TAL Metals	$/smp	155.00		$ -	8	$ 1,240.00		$ -		$ -		$ -	8	$ 1,240.00
TCL SVOCs	$/smp	155.00		$ -	8	$ 1,240.00		$ -		$ -		$ -	8	$ 1,240.00
		Subtotal		$ -		$ 2,480.00		$ -		$ -		$ -	16	$ 2,480.00

Data Validation

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Data Validation (DUSR)	lump sum	400.00		$ -		$ -	1	$ 400.00		$ -		$ -	1	$ 400.00
		Subtotal		$ -		$ -		$ 400.00		$ -		$ -		$ 400.00

Project Totals

Level / Description	Scoping/Setup Amount	Sampling Amount	Data Rev/Analysis Amount	SI report prep Amount	Final SI/RAR Amount	Project Totals Amount
Direct Labor	$ 130.00	$ 312.00	$ 156.00	$ 254.00	$ 154.00	$ 1,006.00

Total Direct Labor	$ 1,006.00
Indirect Labor (1.65%)	$ 1,660.00
Fixed Fee (5%)	$ 133.00
Labor Subtotal	$ 2,799.00

	Scoping/Setup Amount	Sampling Amount	Data Rev/Analysis Amount	Draft Report Amount	Final Report Amount	Project Totals Hrs	Project Totals Amount
Other Direct Costs							
Expenses	$ -	$ 27.10	$ -	$ 30.00	$ 30.00	0	$ 87.10
Equipment	$ 1.25	$ 340.00	$ 7.50	$ 57.50	$ 70.00	0	$ 476.25
Laboratory	$ -	$ 2,480.00	$ -	$ -	$ -	0	$ 2,480.00
Data Validation	$ -	$ -	$ 450.00	$ -	$ -	0	$ 450.00
DIRECT COSTS SUBTOTAL	$ 1.25	$ 2,847.10	$ 457.50	$ 87.50	$ 100.00		$ 3,493.00

Project Total	$ 6,300.00
30-Year Project Total (Present Worth)	$ 96,846.75

Alternative C - Annual Groundwater Monitoring Budget

Labor

Level	ASCE Grade	Avg. Rate	Scoping/Setup Hrs	Scoping/Setup Amount	Sampling Hrs	Sampling Amount	Data Rev/Analysis Hrs	Data Rev/Analysis Amount	Draft Report Hrs	Draft Report Amount	Final Report Hrs	Final Report Amount	Project Totals Hrs	Project Totals Amount
Chief Engineer	VIII	46.00		$ -		$ -		$ -		$ -		$ -	0	$ -
Project Manager	VI	38.00	1	$ 38.00		$ -		$ -	1	$ 38.00	1	$ 38.00	3	$ 114.00
Senior Scientist/Engineer	V	28.00	1	$ 28.00		$ -	1	$ 28.00	2	$ 56.00	1	$ 28.00	5	$ 140.00
Project Scientist/Engineer	IV	23.00		$ -	8	$ 184.00		$ -		$ -		$ -	8	$ 184.00
Assistant Scientist II	II	16.00	4	$ 64.00	8	$ 128.00	8	$ 128.00	10	$ 160.00	4	$ 64.00	34	$ 544.00
CADD Technician	I	14.00		$ -		$ -		$ -		$ -		$ -	0	$ -
Technical Typist	N/A	12.00		$ -		$ -		$ -		$ -	2	$ 24.00	2	$ 24.00
		Subtotal		$ 130.00		$ 312.00		$ 156.00		$ 254.00		$ 154.00	52	$ 1,006.00

Total Direct Labor	$ 1,006.00
Indirect Labor (1.65%)	$ 1,660.00
Fixed Fee (5%)	$ 133.00

Expenses

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Mileage	$/mi	0.36		$ -	60	$ 21.60		$ -		$ -		$ -	60	$ 21.60
Tolls	$/day	0.50		$ -	1	$ 0.50		$ -		$ -		$ -	1	$ 0.50
Fed Ex	$/ea	15.00		$ -		$ -		$ -	2	$ 30.00	2	$ 30.00	4	$ 60.00
Portable Telephone	$/wk	10.00		$ -	0.5	$ 5.00		$ -		$ -		$ -	1	$ 5.00
		Subtotal		$ -		$ 27.10		$ -		$ 30.00		$ 30.00		$ 87.00

Equipment and Supplies

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Copies	$/pg.	0.05	25	$ 1.25		$ -	150	$ 7.50	250	$ 12.50	500	$ 25.00	925	$ 46.25
Film & Processing	$/roll	15.00		$ -	1	$ 15.00		$ -		$ -		$ -	1	$ 15.00
Horiba U-10	$/day	100.00		$ -	1	$ 100.00		$ -		$ -		$ -	1	$ 100.00
Peristaltic Pump	$/day	75.00		$ -	1	$ 75.00		$ -		$ -		$ -	1	$ 75.00
Report Materials	$/ea.	15.00		$ -		$ -		$ -	3	$ 45.00	3	$ 45.00	6	$ 90.00
Misc. Sampling Supplies	$/event	150.00		$ -	1	$ 150.00		$ -		$ -		$ -	1	$ 150.00
		Subtotal		$ 1.25		$ 340.00		$ 7.50		$ 57.50		$ 70.00		$ 476.25

Laboratory Costs (Includes QA/QC Samples)

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
TAL Metals	$/smp	155.00		$ -	6	$ 930.00		$ -		$ -		$ -	6	$ 930.00
TCL SVOCs	$/smp	155.00		$ -	6	$ 930.00		$ -		$ -		$ -	6	$ 930.00
		Subtotal		$ -		$ 1,860.00		$ -		$ -		$ -	12	$ 1,860.00

Data Validation

Desc.	Unit	Rate	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount
Data Validation (DUSR)	lump sum	300.00		$ -		$ -	1	$ 300.00		$ -		$ -	1	$ 300.00
		Subtotal		$ -		$ -		$ 300.00		$ -		$ -		$ 300.00

Project Totals

Level								Project Totals	
Description	Scoping/Setup	Sampling	Data Rev/Analysis	SI report prep	Final SI/RAR				
	Amount	Amount	Amount	Amount	Amount			Amount	
Direct Labor	$ 130.00	$ 312.00	$ 156.00	$ 254.00	$ 154.00			$	1,006.00

Total Direct Labor	$ 1,006.00
Indirect Labor (1.65%)	$ 1,660.00
Fixed Fee (5%)	$ 133.00
Labor Subtotal	**$ 2,799.00**

Other Direct Costs														
Expenses	$ -	$ 27.10	$ -	$ 30.00	$ 30.00	0	$	87.10
Equipment	$ 1.25	$ 340.00	$ 7.50	$ 57.50	$ 70.00	0	$	476.25
Laboratory	$ -	$ 1,860.00	$ -	$ -	$ -	0	$	1,860.00
Data Validation	$ -	$ -	$ 450.00	$ -	$ -	0	$	450.00
DIRECT COSTS SUBTOTAL	$ 1.25	$ 2,227.10	$ 457.50	$ 87.50	$ 100.00		**$**	**2,873.00**

Project Total	**$ 5,700.00**
30-Year Project Total (Present Worth)	**$ 87,623.25**