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2000

WORKPLAN

FOR SITE REMEDIATION ACTIVITIES

ON THE PROPERTY LOCATED AT

104 ASHBURTON AVENUE
CITY OF YONKERS
WESTCHESTER COUNTY, NEW YORK

Date of Preparation: June 15, 2000

Revised October 18, 2000

ECOSYSTEMS STRATEGIES, INC.
60 WORRALL AVENUE
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ESI File Number: GY99143.40

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Environmental Services and Solutions
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November 15, 2000

Mr. George Heitzman
NYSDEC
50 Wolf Road
Albany, New York 12233-7010

Re: Greyston Workplan
ESI File: GY99143.40
DEC Site # V00361-3

Dear Mr. Heitzman:

This letter is prepared in response to your letter of November 14, 2000 to Mr. Brooks Thompson regarding the above-referenced Workplan and property. This letter should be considered an addendum to that Workplan and is incorporated into the Workplan by reference.

The following modification is made to Section 2.3.1 ("Conduct Community Air Monitoring Plan"):

- Monitoring for dust will be conducted using a P-5 Digital Dust Indicator, or equivalent equipment, capable of documenting the presence of dust with particle sizes up to 10 microns. Dust levels in excess of 150 micrograms per cubic meter of air will be evidence of unacceptable air quality, and proper procedures to reduce dust levels will be immediately instituted.
- The Final Remediation Services Engineering Report will include "as-built" drawings specifying the location of the GCL.

Please review this letter/addendum and contact me at (845) 452-1658 should you have any questions or require additional information.

Sincerely,

ECOSYSTEMS STRATEGIES, INC.

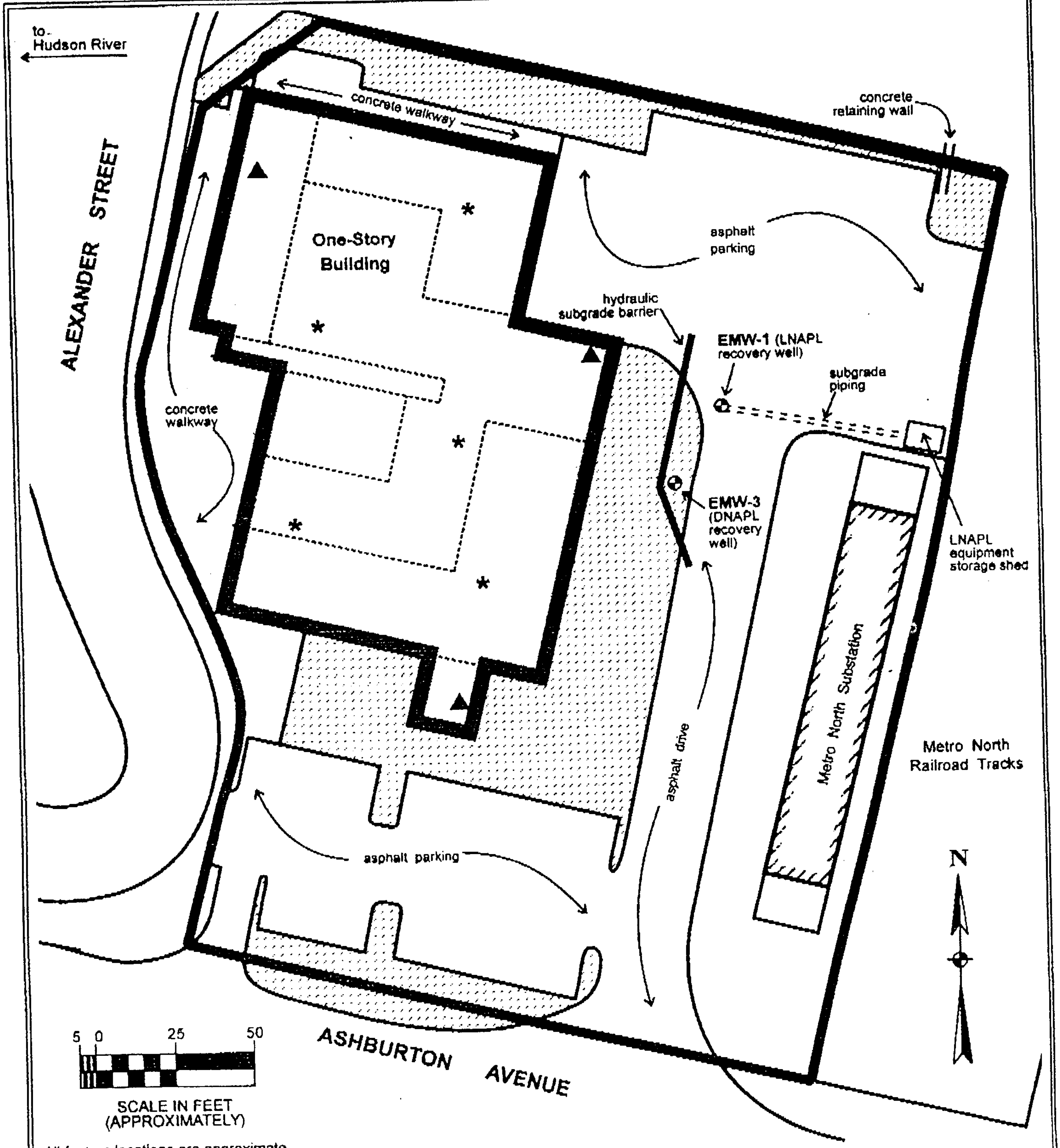
Paul H. Ciminello
President

PHC/fgs

cc: File

Ecosystems Strategies, Inc.

Environmental Services and Solutions



All feature locations are approximate.
Map based on "Survey" by Roland K. Link, P.L.L.C. (June 17, 1999); "Groundwater Elevation Contour Map" by Malcom Pirnie (July 1, 1994); and "Site Plan" by Cybul & Cybul A.I.A. Architects.

Proposed Remediation Map

104 Ashburton Avenue
City of Yonkers
Westchester County
New York

Legend:
subject property border ▬
VES monitoring point ▲
VES extraction point *
area of GCL barrier ⬭

ESI File: GY99143.30

November 2000

Scale: 1" = 45' (approximately)

Appendix A

WORKPLAN

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Date of Preparation: June 15, 2000

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Prepared By:

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, New York 12603

Prepared For:

Greyston Foundation
21 Park Avenue
Yonkers, New York 10701

The undersigned have reviewed this Workplan for Site Remediation Activities and certify to Greyston Foundation that the information provided in this document is accurate as of the date of issuance by this office.

Any and all questions or comments, including requests for additional information, should be submitted to the undersigned.

Paul H. Ciminello
President

Jefferson Akins, P.E.
Project Engineer

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this Workplan is to provide guidance on the manner in which site remediation services are provided to address known environmental conditions (see Section 1.4, below) on the property located at 104 Ashburton Avenue in the City of Yonkers, Westchester County, New York (hereafter referred to as the "Site"). It is the expressed intent of this Workplan to provide specific actions which will adequately address each identified environmental condition such that, upon completion of all activities, no adverse health impacts will result from future site re-use (see Section 1.3, below).

This Workplan will be considered FINAL when written approval is received from the NYSDEC.

1.2 Site Location and Description

The subject property is an irregularly-shaped parcel having approximately 195 feet of frontage on the northern side of Ashburton Avenue, approximately 216 feet of frontage on the eastern side of Alexander Street, and extending approximately 295 feet northward from Ashburton Avenue (see the Site Location Map included in Attachment A). The subject property is comprised of a single tax lot (City of Yonkers Tax ID: Section 2, Block 2618, Lot 1).

The northern and western portions of the subject property are comprised of unpaved, fenced-in areas overgrown with vegetation. The central eastern portion of the property is a fenced-in, macadam-paved parking lot. Near the eastern border of the subject property, a one-story, brick structure occupied by a Metro-North substation is present. A concrete retaining wall separates the subject property from adjoining railroad usages to the east. A Field Work Map is included in Attachment A of this Workplan.

1.3 Proposed Future Site Re-Use

The Site is proposed for re-use as a bakery and associated on-site parking. Future Site development plans indicate a two-story structure proposed for construction on the north central portion of the property. A preliminary Site Plan is provided in Attachment A of this Workplan.

1.4 Known Environmental Conditions of Concern

The Site has been the subject of several environmental investigations which have accurately and comprehensively documented on-site environmental conditions. Laboratory data from soil, water, and product samples collected from the Site by Ecosystems Strategies, Inc. ("ESI") were analyzed by York Analytical Laboratories, Incorporated, a New York State Department of Health, Environmental Laboratory Approval Program (ELAP) approved laboratory (ID #10854). Tables summarizing the laboratory data are included as Attachment B of this Workplan. Laboratory reports are included as Attachment C of this Workplan. Based upon laboratory data and field observations, a summary of the environmental conditions known to exist on the Site is provided below:

1. Soil samples collected from multiple depths during field work activities conducted on September 27th and 28th, 1999 indicated the presence of VOCs and PAHs at levels exceeding NYSDEC guidance values. Free petroleum product which was lighter than water (LNAPL) and free product which was heavier than water (DNAPL) were both encountered in the northeast corner of the Site, identified as Area 1 on the attached Site Features Map (Attachment A). A sample of LNAPL was identified as #4 or #6 oil. Data Table 1, located in Attachment B of this Workplan identifies VOC concentrations by sample location. Data Table 2, also located in Attachment B, identifies PAH concentrations by sample location.

   Surface soil samples were collected during subsequent field work conducted on April 26, 2000. These samples were analyzed to determine the presence or absence of the eight RCRA metals plus cyanide in on-site soils. Laboratory results indicated that Cadmium, Cyanide, Mercury, and Silver were either not detected above laboratory detection limits or were detected at concentrations below their respective action levels.

   Subsurface soil samples were also collected on April 26, 2000 to determine the presence or absence of PAHs in the unpaved, overgrown area located in the northwest quadrant of the Site.

   Laboratory analysis indicated exceedances for all PAHs with the exception of Anthracene, Benzo (g,h,i) Perylene, Dibenzo (a,h) Anthracene, and Indeno (1,2,3-cd) Pyrene.

On April 26, 2000, soil borings were extended in the vicinity of boring B-1 for the expressed purpose of delineating the extent of vertical and lateral contamination. Concentrations of contaminants found in samples submitted from boring B-1 indicate exceedances for all PAHs with the exception of Benzo(g,h,i) Perylene and Indeno (1,2,3-cd) Pyrene. Laboratory analysis of samples obtained from various depths within the boring indicated that the concentration of contaminants increased greatly with sample depth for all PAHs detected. A summary of the data obtained from boring B-1 is located in Attachment B, Table 3. Soil samples obtained from borings B-3A (1-3'), B-4A (5-6.1'), B-5A (5-7') and B-6A (5-7') for the purpose of delineating lateral contamination were not submitted for laboratory analysis. Field observations indicated evidence of gross contamination which obviated the need for laboratory verification of contamination.

2. Prior to ESI being retained to provide environmental services on the Site, groundwater sampling was conducted by Malcolm Pirnie in 1995. Incomplete results of the Malcolm Pirnie sampling were made available to ESI personnel. Laboratory results from water sampling conducted by ESI on August 31, 1999 confirmed the presence of volatile organic compounds (VOCs) and polynuclear aromatic hydrocarbons (PAHs) in on-site groundwater monitoring wells at levels exceeding NYSDEC guidance values. Comparisons of VOC and PAH concentrations between the two sampling rounds are provided in Table 4 (VOCs) and Table 5 (PAHs) of Attachment B.

On April 26, 2000, one groundwater monitoring well and one product recovery well were installed on the Site during fieldwork. A product sample was collected from the recovery well.

Five of the existing monitoring wells were purged and sampled to determine the presence or absence of chemical and petroleum contamination. All samples collected were submitted for laboratory analysis to determine the presence or absence of dissolved metals and petroleum hydrocarbons. No metals were detected above established NYSDEC action levels. Petroleum hydrocarbon data obtained from this sampling event are provided in Table 6 located in Attachment B of this Workplan. Dissolved hydrocarbons are present in all on-site monitoring wells (except MW-6) at levels exceeding NYSDEC groundwater protection levels.

On May 17, 2000, a Tidal Influence Study was conducted on the Site. Data collected during the Study supported groundwater data previously indicated during fieldwork. Groundwater flow is in a southwesterly direction toward the Hudson River, located approximately 480 feet west of the Site. Based on the direction of flow, on-site groundwater travels an estimated distance of 3,000 feet before entering the Hudson River. A Groundwater Contour Map illustrating on-site groundwater flow is included in Attachment A of this Workplan. Data indicate that tidal influence on the Site is relatively minor.

3. During the subsurface investigation conducted in September 1999, free product was encountered in boring B-1. Boring B-1 is located in the parking area approximately 80 feet from the northeast property corner. The sample collected from B-1 separated into two distinct product layers which appeared to be separated by a layer of water.

Two different products were identified in each of the layers. Laboratory analysis of the free product encountered in the top layer sample (LNAPL) obtained during the September sampling round identified the free product as #4 or #6 oil. Laboratory analysis of the lower level sample (obtained in April from the 18-20 foot depth) determined this product to be a heavy petroleum-related compound.

A second product sampling event was conducted on April 26, 2000. The product sample was collected from the base of the product recovery well designated RW-1 located approximately 6 feet northwest of soil boring B-1. The DNAPL sample collected from RW-1 confirmed previous analyses.

The subject property was historically used as a manufacturing gas and light company. Information indicates that several structures and three crude oil tanks were present on the subject property until sometime between 1917 and 1942. Historic maps show that in 1942 only a few small structures remained on the western portion of the subject property and that by 1951 only one structure (later identified as a motor oil storage shed) remained in the southwest corner of the subject property. Local building department records indicated the presence of on-site structures between 1969 and 1979. However, historical maps do not depict any on-site structures (other than the motor oil storage shed) between the years of 1951 and 1989. The present day Metro-North substation is depicted on the 1989 and later historic maps as having been built in 1987-88.

Documented LNAPL and DNAPL contamination are often present on former manufacture gas sites and are the result of raw material storage, as well as product manufacture at these sites.

2.0 PROPOSED SITE REMEDIATION SERVICES

This section of the Workplan details activities which are proposed to be conducted to address the known environmental conditions on the Site, as identified in Section 1.4, above. A Field Work Map depicting relevant Site features and conditions is provided in Attachment A of this Workplan.

For the purpose of the work detailed in these specifications, a qualified environmental consultant will be retained to oversee the provision of these specified services; this individual or firm is hereafter referred to as the On-site Coordinator ("OSC"). For the purpose of the work detailed in these specifications, the "Volunteer" is defined as Greyston Foundation, which will contract with the environmental consultant to provide the services detailed below.

2.1 General Comments

The expressed intent of the services described herein is to provide appropriate remediation and to integrate site remediation activities with site development to the extent possible. It is also the general intent to minimize the amount of contaminated soil existing to be excavated and, therefore, generated as waste. This will be accomplished by minimizing the lateral and vertical extent of excavation and to propose to re-use excavated soils for on-site fill material (under the proposed geomembrane) wherever possible.

As detailed in this Workplan, Remediation Services will consist of all remediation services conducted in conjunction with site development and prior to utilization of the proposed on-site structure, including the installation and pilot testing of product recovery wells. A detailed discussion of all proposed Remediation Services is provided in Section 2.3, below.

The Scope of Work outlined in this Workplan has been analyzed in accordance with requirements of the NYSDEC. As required, the Engineering Evaluation is provided as Attachment H of the Workplan.

2.2 Site Preparation Services

2.2.1 Qualifications of On-site Remedial Personnel

Prior to the initiation of work, the identities and qualifications of the project managers and associated staff will be supplied to the NYSDEC. The Volunteer will ensure that qualified personnel are used. All on-site staff will be appropriately trained in accordance with Occupational Safety and Health Administration (OSHA) practices (29 CFR, Part 1910). The NYSDEC will also be notified of any changes in the senior on-site personnel.

Prior to the initiation of field work, a Site Health and Safety Officer will be designated by the Volunteer, and a complete Health and Safety Plan will be prepared. Resumes of specific professionals to be used by the Volunteer will be provided to the NYSDEC. At this time, it is anticipated that Project Management and Site Safety will be provided by Paul H. Ciminello, Jefferson Akins, P.E., and Katherine J. Beinkafner, Ph.D. Catherine Monian will serve as the Quality Assurance Officer for this project. Resumes of Project Management and Site Safety personnel are included in Attachment D.

2.2.2 Health and Safety Plan

A site-specific Health and Safety Plan ("HASP") will be prepared prior to the initiation of fieldwork. This HASP will be reviewed with the appropriate subcontractors prior to the initiation of field work. All proposed work will be performed in "Level D" personal protective equipment; however, field personnel (including subcontractors) will be prepared to continue services wearing more protective levels of equipment should field conditions warrant. A copy of the HASP is included as Appendix E of this Workplan.

2.2.3 Quality Assurance/Quality Control

EQUIPMENT

Prior to the initiation of field work, all field equipment to be used during the work will be properly decontaminated in accordance with NYSDEC guidelines, and all field instruments will be properly calibrated in accordance with procedures set forth by the equipment manufacturer(s). Unless otherwise specified, a Thermal Instruments 580B photo-ionization detector (PID) will be used for site-screening of organic vapors. The 580B PID is calibrated to read parts per million calibration gas equivalents (ppm-cge) of isobutylene. Instrument calibration will be performed no more than 72 hours prior to the commencement of field work, and a written record of calibration results will be provided in the project files.

QUALITY ASSURANCE PROJECT PLAN

A site-specific Quality Assurance Project Plan ("QAPP") will be utilized during the course of the field work specified in this Workplan. The QAPP presents the procedures for completing the specific tasks detailed in Section 2.3, below. The QAPP incorporates appropriate field and laboratory methods to be utilized during the duration of the work. A copy of the Draft QAPP for this Site is provided in Attachment G of this Workplan.

2.2.4 Laboratory Quality Control

All soil samples will be collected in accordance with applicable NYSDEC guidelines and will be analyzed by a New York State Department of Health (NYSDOH) ELAP-certified laboratory using applicable NYSDEC Analytical Services Protocol (ASP) Methods. The reporting level for all analyzed soil and groundwater samples will be NYSDEC ASP Category B deliverables.

Dedicated, sterile glassware for sample collection will be provided by the laboratory for this project. One trip blank and one field blank will be supplied for the laboratory for each day of field work involving sample collection. Chain of custody forms will be completed by field personnel involved in sample collection, and completed custody forms will be provided in the Final Remediation Services Engineering Report (see Section 3.0).

Summarized below in Table 1 is the number of samples that are anticipated to be collected during this project, categorized by sample location and by analyte group. The number of samples are, at this time, estimates; field conditions may necessitate a greater or fewer number of samples being collected. A final sample chart will be included in all future reports issued to the NYSDEC.

Table 2: Laboratory Methodology

Matrix	USEPA METHOD		
	VOCs	**PAHs**	**RCRA Metals**
Soil	ASP-1 8270	ASP-2 8270	Various
Water	ASP-1 8260	ASP-2 8260	Various
Air	TO-14	TO-13	Not Applicable

2.2.5 Notifications

The NYSDEC will be notified in writing at least two weeks prior to the initiation of any of the on-site work and during the course of the field work if deemed necessary by on-site personnel. Changes to field work scheduling will be provided via facsimile or electronic transmission. All applicable local agencies will also be notified prior to the initiation of site work.

2.3 Proposed Site Remediation Services

This section of the Workplan provides a detailed description of the remedial tasks that will be conducted at the subject property. Tasks specified below will be conducted in conjunction with site development and installation of product recovery systems.

Upon successful completion of all site remediation services, the Volunteer will initiate site monitoring and system maintenance activities. These tasks are detailed in the Operations and Maintenance Plan, Section 3.0 of this Workplan.

Remediation Services are identified below.

- Implement Community Air Monitoring Plan (Section 2.3.1)
- Remove contaminated soil in the vicinity of the proposed building slab (Section 2.3.2).
- Install free-phase product recovery system (Section 2.3.3).
- Install geomembrane (Section 2.3.4).

- Install vapor barrier and vapor extraction system under proposed building slab (Section 2.3.5).

- Conduct post-construction indoor/outdoor air sampling (Section 2.3.6).

- Document site remediation services (Section 2.3.7).

2.3.1 Conduct Community Air Monitoring Plan

A Community Air Monitoring Plan will be initiated during all field work outlined in this Workplan, consistent with the Community Air Monitoring Plan, included as Attachment F to this Workplan. The implementation of this Air Monitoring Plan will document the presence or absence of specific compounds in the air surrounding the work zone and likely to migrate off-site resulting from construction activities on the Greyston site and will provide guidance on the need for implementing more stringent dust and emission controls based on air quality data. Air monitoring will be conducted for VOCs and SVOCs – compounds known to be present in on-site soils -- and for dust.

Monitoring will occur at all times that construction activities which are likely to generate emissions are occurring. Monitoring for VOCs and SVOCs will occur within 50 feet of the work zone using a PID. Recorded PID readings consistently in excess of 5 ppm will be considered evidence of unacceptable air emissions, and proper procedures to reduce emissions will be immediately instituted. Procedures may include reducing the surface area of contaminated soil being disturbed at one time, watering exposed soils to reduce fugitive odors, or stopping excavation activities.

Dust will be monitored at two locations on the Site: one downwind location at the property line and one upwind location at the property line. Specific locations will change daily, depending on the work being conducted and the direction of the wind. Monitoring for dust will be conducted using a fibrous aerosol monitor. Dust levels in excess of 50 mg/m^3 will be evidence of unacceptable air quality, and proper procedures to reduce dust levels (identified above) will be immediately instituted.

Air monitoring will be sensitive to the existing air pollution sources adjoining the Site. The Volunteer may request assistance from the NYSDEC or NYSDOH in modifying the Community Air Monitoring Plan to account for these sources.

2.3.2 Remove Petroleum-Contaminated Soil in the Vicinity of the Proposed Building Slab and in Utility Trenches

The following activities will be conducted in the event that excavation to install footings occur. Previous laboratory data support the conclusion that soils containing elevated petroleum hydrocarbons may be present within the footprint of the proposed building and within proposed utility trenches. It is the expressed intent of the Workplan to minimize the volume of soil removed from the Site as a regulated waste. This objective will be achieved by minimizing the areas to be excavated and by re-using excavated soils as on-site fill, to be placed under the proposed geomembrane. At this time, the finished floor elevation of the proposed building will be four feet above existing grade; therefore, no significant excavation of soils is anticipated within the footprint of the building, with the exception of soils removed to drive piles. A Site Plan of proposed activities is included in Attachment A of this Workplan.

Prior to and during soil disturbance activities, the proposed construction area will be monitored by a qualified environmental professional (herein referred to as the On-Site Coordinator) using a Thermal Instruments 580B PID calibrated to read parts per million calibration gas equivalents (ppm-cge) of isobutylene. Olfactory and visual indications of chemical/petroleum contamination will be noted in field logs. The OSC will be responsible for identifying any soils which, in the opinion of the OSC, may contain elevated concentrations of contaminants and should, therefore, require special handling.

Those soils identified by the OSC will be removed to the management area for characterization and off-site disposal. The OSC will also be on-site to ensure that unforeseen environmental conditions are managed in accordance with applicable federal and state environmental regulations.

Post-excavation soil samples will be collected for waste characterization purposes (the number of samples will depend on the volume of soil). Analyses will be conducted consistent with the requirements of the waste repository. Based upon existing analytical data, encountered soil will be handled as hazardous waste.

All soils excavated from utility trenches will be treated in the same manner as the soils encountered during building footprint excavation. Utility trenches (other than stormwater) will be over-excavated and partially backfilled with clean fill prior to placement of utility service lines to limit human contact with soils during possible future utility access. Current estimate of soils to be removed is 1,000 cubic yards from utility trenches.

Because of shallow depth to water table, excavated soil may have to be dewatered during excavation and may necessitate on-site treatment of encountered groundwater prior to discharge.

Soils excavated from various site locations will be immediately stockpiled on a double layer of 6-mil plastic sheeting for future disposal or on-site use. The stockpiled soil will be fully covered with 6-mil plastic sheeting during stockpiling and transport to prevent contaminated soil from escaping.

If re-use of soils will not occur, then all stockpiled soils will be removed within 30 days of excavation. All stockpiled soils will be transported from the site by a licensed hauler who will be responsible for exiting the site and traveling on a pre-determined truck route. All manifests and supporting documentation of waste disposal will be maintained by the OSC for inclusion in the Final Remediation Services Engineering Report (see Section 2.3.7).

The OSC will monitor the removal of all contaminated soil, including monitoring the trucks and establishing designated truck routes. All stockpiled soil will be deposited into lined, 30-cubic-yard receptacles and covered with plastic sheeting prior to transport to a licensed facility. Licensed vehicles will be used to transport the excavated soil to the designated licensed facility, and all soil receptacles will be covered during storage and transport. Appropriate measures will be taken to control the generation of fugitive dust from the trucks during transport. Transport of this soil will be performed by a licensed hauler, and all manifests and supporting documentation of waste disposal will be maintained by the OSC for inclusion in the Final Remediation Services Engineering Report (see Section 2.3.7).

Post-excavation soil samples will be collected from each of the walls and the base of excavations where possible. Sampling will be conducted in a manner consistent with NYSDEC guidelines. Samples will be obtained at the frequency specified in Table 1, above. Samples will be analyzed for volatile organic compounds and semi-volatile organic compounds consistent with the NYSDEC's ASP Methods 95-1 and 95-2. All laboratory analyses will be performed by a NYSDOH ELAP-certified laboratory. Appropriate chain of custody documentation will be maintained.

2.3.3 Install Free Product Recovery System

2.3.3.1 System Design and Installation

A product recovery system will be installed and maintained to remove free-phase and sinking petroleum product from on-site saturated soils located on the eastern central portion of the site (identified as Area 1 on the Selected Site Features Map, Attachment A of this Workplan). As described in previous analyses, both lighter-than-water ("LNAPL") and denser-than water ("DNAPL") product are present in this portion of the Site. Monitor wells and borings in other portions of the site do not contain measurable free product; therefore, it is concluded that free product is restricted to this east-central portion of the site. Currently, a shallow (2'-10') recovery well and a deep (from 6' to 10') cover well are located in this area for use. As stated below, a new deep recovery well will be installed as part of this Workplan; the shallow recovery well will be utilized.

Two product recovery systems will be installed on the Site: LNAPL will be removed from EMW-2R, and DNAPL will be removed from the "to-be-installed deep well" identified herein as "EMW-3. The location of these extraction points is provided on the Selected Site Features Map, Attachment A of this Workplan. It is proposed that the LNAPL removal process will utilize a preferential product-water separator system, operating on an "as-needed" basis to mechanically remove accumulated free-floating product. The DNAPL removal process will be a passive system, with accumulated product removed as warranted.

LNAPL product accumulating within the recovery well will be pumped into a 550-gallon holding tank, where excess water will be removed, treated, and discharged into the sanitary sewer, pending approval by the NYSDEC and the Westchester County Environmental Facilities Corp. Equipment necessary to effectively remove LNAPL will be determined by the Volunteer; at this time, it is anticipated that a product separator similar to the Magnum Spill Buster by Clean Earth Technology, Inc. or comparable equipment will be used. All LNAPL removal equipment not located in the extraction well will be housed in a free-standing shed. The exact location will be determined by site planning considerations but will be situated in the northeast corner of the Site. Product piping and electrical conduits will be situated below ground so as not to interfere with site usage.

A "funnel and gate" system will be employed to recover the DNAPL in the vicinity of boring B-1. Approximately 75 linear feet of tight steel sheeting will be installed immediately west and south of the deep recovery well EMW-3. In plan view (see Appendix H), the tight sheeting will be installed in an open "L" configuration such that a 50-foot section of sheeting running roughly north-south and a 25-foot wing of sheeting running generally east-southeast will create an approximate 150-degree angle. This angle or elbow will open to the northeast facing into the groundwater flow.

The sheeting shall be installed to approximately 28 feet below grade such that it penetrates the organic silty-clay layer by several feet. The top of the installed sheeting will be cut approximately three feet below grade such that the upper regime of the groundwater flow is not affected. A deep (minimum two-foot), wide-bore recovery well (EMW-3) will be installed approximately three feet east of the angled elbow of the sheeting, thus creating the "funnel and gate" system. The base of the wide-bore well will be a collection chamber, located approximately 25 feet below grade. This chamber will collect the DNAPL via gravity flow in thicknesses adequate for pumping operations.

Accumulated product will be monitored via a product thickness gauge located within the chamber. Product removal will be conducted by connecting a vacuum truck to the extraction pipe exiting the chamber (accessible through a manway at the surface). Small amounts of groundwater are anticipated to be extracted during the product removal. The collected DNAPL (and small volumes of groundwater) will be containerized and removed from the site periodically by a certified waste hauler.

A diagram showing the approximate location of the funnel and gate system is provided in Appendix H of this Workplan.

DNAPL system monitoring will be accomplished by utilizing the location of existing MW MP-5A and MP-1.

The sequence of this installation shall begin with the downgradient monitoring point then proceed to the sheet pile and end with the deep recovery well (EMW-3). Using this sequence, the location and extent of the DNAPL contamination can be confirmed using the downgradient monitoring point. Once this point has been established, then the sheet piling and deep recovery well can be accurately installed between the monitoring point and boring.

2.3.3.2 System Start-up Monitoring

Both LNAPL and DNAPL product recovery systems will be monitored on a daily basis for the first week and a weekly basis for the subsequent month to document the volume of petroleum products removed. In addition, all on-site groundwater monitoring wells will be visually inspected for the presence of free product LNAPL. MP-1 and MP-5A will be monitored for the presence of sinking petroleum product.

Appropriate adjustments to the product recovery systems and reductions in the monitoring schedule will be made according to actual encountered field and/or resulting analytical data.

Results of the system start-up will be provided to the NYSDEC in the Final Remediation Services Engineering Report with recommendations for long-term monitoring.

2.3.4 Install Geomembrane

As defined in this Workplan, the Site's cap will be comprised of the proposed on-site building (with the subgrade vapor extraction system), the surrounding paved areas, and the geomembrane, as described below. Areas of the Site not already capped via paving or construction will be fitted with a geomembrane to prohibit potential contact with subsurface contaminated soils.

The geomembrane shall have a minimum thickness of forty (40) mils for Liner Low Density Polyethylene (LLDPE) Material or sixty (60) mils if the geomembrane is comprised of a High-Density Polyethylene Liner (HDPE) material. Smooth geomembrane shall be installed across all limits of waste not covered by asphalt or building with slopes less than twenty-five percent (25%) in grade. The installation of the liner will be in accordance with manufacturer specifications.

The Installer and the OSC shall verify areas for geomembrane placement are free of debris, snow, ice, or water, and the ground surface is not frozen. Material placement shall not occur during freezing weather or when the material to be compacted is frozen, too wet, or too dry. Field work will not proceed until unsatisfactory conditions are corrected or are no longer present. The Installer shall, on every day when installation is to occur, provide written certification to the OSC that the subgrade is acceptable for geomembrane installation.

All geosynthetic material shall be visually inspected for uniformity, damage, imperfections, tears, punctures, and blisters. Any imperfection shall be immediately repaired and reinspected.

An Independent Geotextile Laboratory shall perform testing on the samples taken. These test must include at a minimum:

1) Seam Strength
2) Adjacent Geomembrane Elongation
3) Peel Adhesion
4) Separation (for High Density Polyethylene)

A sample shall be cut into one-inch wide specimens for testing. A sample shall be considered acceptable if a minimum of four (4) out of five (5) of the specimens tested pass.

2.3.5 Install Vapor Barrier and Vapor Extraction System

2.3.5.1 System Installation

As a supplemental preventative measure, a vapor barrier underlain by a vapor extraction system ("VES") will be installed under the proposed foundation for the building. The purpose of this barrier VES will be to eliminate the migration of vapors containing petroleum hydrocarbons into the building, consistent with good construction practices.

Generally, the barrier VES will consist of a minimum 10-mil plastic liner properly sealed at the interior joints underlain by a highly porous substrate (e.g., gravel) containing two-inch slotted PVC piping. All penetration through the plastic lines will be sealed. The PVC piping will be connected to vertical pipes extending above the roofline. Low-grade vacuum pumps will be connected to each vertical pipe to ensure the maintenance of vacuum under the building. Discharge points will be properly located above the roofline to minimize the likelihood of air emissions deteriously affecting indoor air quality via roof-mounted air intakes.

At this time, it is anticipated that four (4) extraction points will be required to effectively service this Site. Extraction points may be connected so that only two pumps are utilized. In addition, six monitoring points located throughout the building will be installed to confirm effective vacuum in the entire subgrade.

2.3.5.2 System Start-up

System start-up and initial testing will occur after the concrete floor has been poured. The following steps will be taken for system start-up:

1. The system will be visually inspected and documentation of system conditions will be maintained in field log books.

2. Extraction wells will be connected to vacuum pumps which will be connected to carbon filtration. The system will be operated for a minimum of 12 hours prior to data and sample collection.

3. Air samples will be collected before and after carbon filtration at each extraction point. At this time, it is anticipated that eight air samples will be collected and analyzed for semi-volatile petroleum hydrocarbons (PAHs) using ~~NIOSH Method 5515~~. These data will be used to determine the need for and extent of an air quality permit (including the need for continued air discharge treatment).

EPA
TO-13
5/5/03

4. Vacuum data (as measured in inches of water) will be collected from the six monitoring points. Sufficient vacuum will be achieved if levels greater than 0.5 inches of water are measured at each monitor well. Vacuum at levels below 0.5 inches may necessitate the installation and connection of another extraction well.

2.3.5.3 Documentation of System Effectiveness

The VES will be monitored for fourteen (14) calendar days, with monitoring consisting of measuring vacuum at all monitoring points and screening air quality emissions with a PID. At the end of this 14-day monitoring period, one air sample will be collected from the sampling port prior to any air treatment and submitted to a NYSDOH-ELAP laboratory for analysis using EPA TO-13 ~~NIOSH Method 5515~~. The presence of detectable PAHs may necessitate securing a point source air discharge permit in accordance with applicable NYSDEC regulations. The Volunteer will provide all data to the NYSDEC and will secure any required permits.

System effectiveness will be achieved if: 1) field data document continued maintenance of vacuum at levels specified in Section 2.3.5.2 above; and 2) laboratory data document air discharge PAH levels consistent with previously collected data.

2.3.6 Conduct Post-Construction Indoor/Outdoor Air Sampling

The proposed development of the Site involves the construction of a two-story structure on the northern central portion of the property. Construction of this structure may require the excavation and off-site disposal of known petroleum-contaminated soils and will involve the importation of certified clean soils to form the subgrade to the new foundation.

The Volunteer will conduct post-construction indoor and outdoor air quality sampling to document on-site air quality both within the on-site building(s) and the exterior areas. The Volunteer will consult with the NYSDEC and the NYSDOH prior to sampling. Sampling of indoor air quality will be performed in accordance with established NYSDOH protocols and will include analyses for the VOCs and PAHs that have been detected in the on-site soil (by this time impacted soils will have been removed from the site) and groundwater. (See Attachments B and C of this Workplan for the specific compounds that have been detected.)

Prior to the construction of the new building, contaminated soils may have been removed; and certified clean soil will have been placed within the excavated area, a vapor barrier will have been installed in conjunction with normal construction practices for the new building, and a subgrade VES will have been installed. These measures are designed to remove all potential on-site sources of VOC's and PAHs. Air quality sampling will then be performed to document indoor and outdoor air quality.

External air quality will be determined by collecting and analyzing five air samples, with both a sample and a duplicate sample collected at one sample location. Prior to sample location, meteorological data on wind velocity and direction will be collected to provide quality assurance to the data set. Measurable precipitation and/or average wind speed in excess of ten miles per hour will be conditions which will necessitate rescheduling of outdoor air quality sampling. The sampling event will consist of five sample locations: two upwind locations and three downwind locations. All sample locations will be shown on a site map to be provided to the NYSDEC in the Final Remediation Services Engineering Report.

Internal air quality will be determined by collecting and analyzing two air samples at locations inside the bakery. Samples will be analyzed for volatile organic compounds using USEPA Method TO-14 and for polycyclic aromatic hydrocarbons using USEPA Method TO-13.

The Volunteer may choose to develop and implement an Indoor Air Quality Plan consisting of periodic air quality testing and VES monitoring.

2.3.7 Preparation of a Final Remediation Services Engineering Report

At the conclusion of all remediation services, a written report will be prepared and submitted to the NYSDEC. At a minimum, this Final Remediation Services Engineering Report will include:

- summary of soil excavation activities, as well as “as-built” drawings showing the locations and extent of soil removal;
- laboratory data, waste disposal manifests, and other relevant supporting documentation;
- relevant field monitoring data sheets;
- photographs of site remediation activities and conditions; and
- documentation of effectiveness of installed product recovery systems.

In conjunction with this Final Remediation Services Engineering Report, any proposed modifications to the O&M Plan, as detailed in Sections 3.1 through 3.3 will be submitted to the NYSDEC.

The intent of this submittal is to provide documentation to the NYSDEC regarding the adequacy of remedial actions to date, as well as preliminary information on the effectiveness of the prospective operations and maintenance phase of site remediation. Upon review of this submitted report, the NYSDEC will provide a “No Further Action” letter substantially similar to the letter contained in Exhibit C of the Voluntary Cleanup Agreement.

3.0 PROPOSED OPERATIONS AND MAINTENANCE PLAN

For the purpose of this Agreement, Sections 3.1 through Sections 3.3 shall constitute an O&M Plan. This plan may be modified, as stated in Section 2.3.7, above. The Operations and Maintenance Program will consist of the following tasks:

- Conduct groundwater monitoring (Section 3.1)
- Operate product recovery systems (Section 3.2)
- Document site remediation activities (Section 3.3)

3.1 Conduct Groundwater Monitoring

At the completion of all soil excavation work, the remaining on-site groundwater monitoring wells will be sampled on a quarterly basis for one calendar year. All sampling will be conducted as per the requirements set forth below.

3.1.1 Sample Collection Procedures

The following procedures will be followed at each monitoring well during each sampling round:

1. Beginning at the *a priori* least contaminated well, basic climatological data (e.g., temperature, precipitation, etc.) will be recorded in log sheets.

2. The protective casing on the well will be unlocked.

3. The air in the well head will be screened for explosive gas levels and organic vapors; measurements will be recorded in log sheets.

4. The measuring tape will be decontaminated and the well's static groundwater level will be recorded. The measurement of the water surface to the top of the well casing (not protective casing) will be determined to the nearest 0.01 foot and the height of standing water in the well will be calculated.

5. From the well diameter, total well depth, and the measured depth of the standing water, the volume of standing water in the well will be calculated and recorded in log sheets.

6. A sample of groundwater will be collected for field parameter measurements. These measurements will be recorded in log sheets.

7. The well will be purged using a purging pump or dedicated bailer. The purging pump, if used, will be properly decontaminated between wells to prevent cross-contamination. Dedicated, disposable, polyethylene tubing will be used at each well. Care will be taken to minimize the amount of groundwater agitation created during purging. The actual number of well volumes to be removed during purging may vary depending upon the site characteristics, well design, and the chemicals or parameters for which analysis shall be performed. At a minimum, three well volumes to a maximum of five well volumes will be purged from each well prior to sampling. The purged volumes will be calculated by discharging the purge water into a container of known volume.

   Field parameters will be measured throughout well purging.

   If purging the well with a pump, the pump will be placed at the top of the water column and lowered as the water level decreases to minimize groundwater agitation.

   The time at the beginning and the end of purging will be recorded in log sheets.

8. Using a dedicated, disposable bailer, groundwater samples from the well will be collected (during sample collection, the bailer will not touch the ground or any object except for the well casing).

9. The groundwater sample will be immediately transferred from the bailer to the appropriate sample containers.

   All sample containers will be filled to the shoulder, approximately three-quarters full, except for those samples requiring volatile organic analyses. Samples collected for volatile organic analyses will be collected first. For the collection of volatile organic samples in VOA vials, care will be taken to ensure that there are no air bubbles in the vial after it has been capped, and the vial will be turned upside down and tapped lightly.

10. Quality control samples (e.g., field duplicates, equipment blanks, etc.) will be collected as required. A trip blank will be included in each cooler.

11. Immediately, all sample jars will be labeled, preserved if necessary, stored on ice, and the sample information recorded on field log sheets, as well as the laboratory's chain-of-custody forms.

12. The standing water level in the well after sampling will be re-measured, with levels recorded in log sheets.

13. The protective cap on the well will be replaced and locked.

14. The field sampling crew will remove the next most contaminated well, and the process will be repeated.

15. At the end of each day, all samples collected on that day will be sent to a NYSDOH-certified laboratory for analyses.

3.1.2 Proposed Groundwater Analyses

All samples will be analyzed for semi-volatile hydrocarbons (USEPA Method 8270, PAH only) and volatile organic compounds (USEPA Method 8260). All analyses will be performed by a laboratory-certified by NYSDOH to perform said tests. Data will be provided by the laboratory to the Volunteer within 15 business days of receipt of samples.

3.1.3 Proposed Closure Procedures for Groundwater Monitoring

After four quarters of groundwater data are available, these results will be submitted to the NYSDEC in a written report with all data and laboratory-provided Quality Assurance/Quality Control documentation attached. If no significant variation in the data is noted, a recommendation will be made to the NYSDEC for the cessation of groundwater sampling and well closure.

Groundwater monitoring wells will be closed upon receipt of written authorization to do so from the NYSDEC.

3.2 Monitor Free Phase Product Recovery Systems

3.2.1 LNAPL Product Recovery O & M

The LNAPL system will operate until the thickness of free product is determined to be less than 0.1 inches. At that time, the product will be measured for three months on a bi-weekly basis to document any change in product thickness. The absence of any significant change in product thickness will be considered adequate evidence of system effectiveness within the zone of recovery for that extraction point. At that time, summary documentation will be provided to the NYSDEC in support of a petition to close and remove the product recovery system. Removal will occur after written approval is received from the NYSDEC.

All piping associated with this system will be installed underground. A temporary metal shed will be erected to house all product extraction and storage equipment. Upon securing written approval from the NYSDEC, the recovery well will be properly closed and all equipment removed.

3.2.2 DNAPL Product Recovery O & M

It is the expressed intent to remove DNAPL product to the extent feasible. The project objective is to remove DNAPL until no more than 0.1 inch of product is recorded on the product level gauge in the subgrade collection chamber. At the time that 0.1 inch of product is recorded for at least one month, the DNAPL product recovery system will be considered to have successfully removed all available DNAPL, and the NYSDEC will be formally petitioned (in writing) for system closure.

Formal petitioning for system closure may occur prior to achieving the 0.1-inch "performance standard" if, in the opinion of the Volunteer's environmental engineers, insufficient DNAPL product inflow is occurring to warrant the system's continued monitoring. Product accumulation records indicating that DNAPL thickness is remaining constant at levels below the minimum volumes of "practical product recovery" will be submitted to the NYSDEC as supporting data to cease system monitoring and operation. Based on the proposed design features of the DNAPL system, (see Section 2.3.3, above), "practical product recovery" is not expected to occur when static product levels in the collection chamber are at thicknesses less than one inch. A final determination of the "practical product recovery" thickness will be provided to the NYSDEC at the time of installation (i.e., in the Final Remediation Services Engineering Report. Any petition to close the DNAPL recovery system prior to achieving the 0.1-inch performance standard will be made in writing and will require written approval from the NYSDEC.

3.3 Preparation of Final Engineering Report of Operations and Maintenance Services

Upon completion of all Operations and Maintenance services, a Final Engineering Report of Operations and Maintenance Services will be prepared. This Final Engineering Report of Operations and Maintenance Services will include all relevant data and maintenance logs (for the product removal system), as well as relevant drawings or maps reflecting locations of remedial system changes, if appropriate. This Final Engineering Report of Operations and Maintenance Services will provide conclusions regarding site integrity and the overall effectiveness of site remedial services. Upon review of this Final Engineering Report of Operations and Maintenance Services and assuming concurrence with its findings, the NYSDEC will issue a letter confirming adequate completion of O&M activities and agreeing that such activities can be terminated.

4.0 Time Schedule

Approval of the Workplan

Within 15 months after being notified by the NYSDEC that the workplan has received final approval:

- All Remediation Services will be completed and summarized in a Final Remediation Services Engineering Report in a written report.

Within 18 months after being notified by the NYSDEC that the workplan has received final approval:

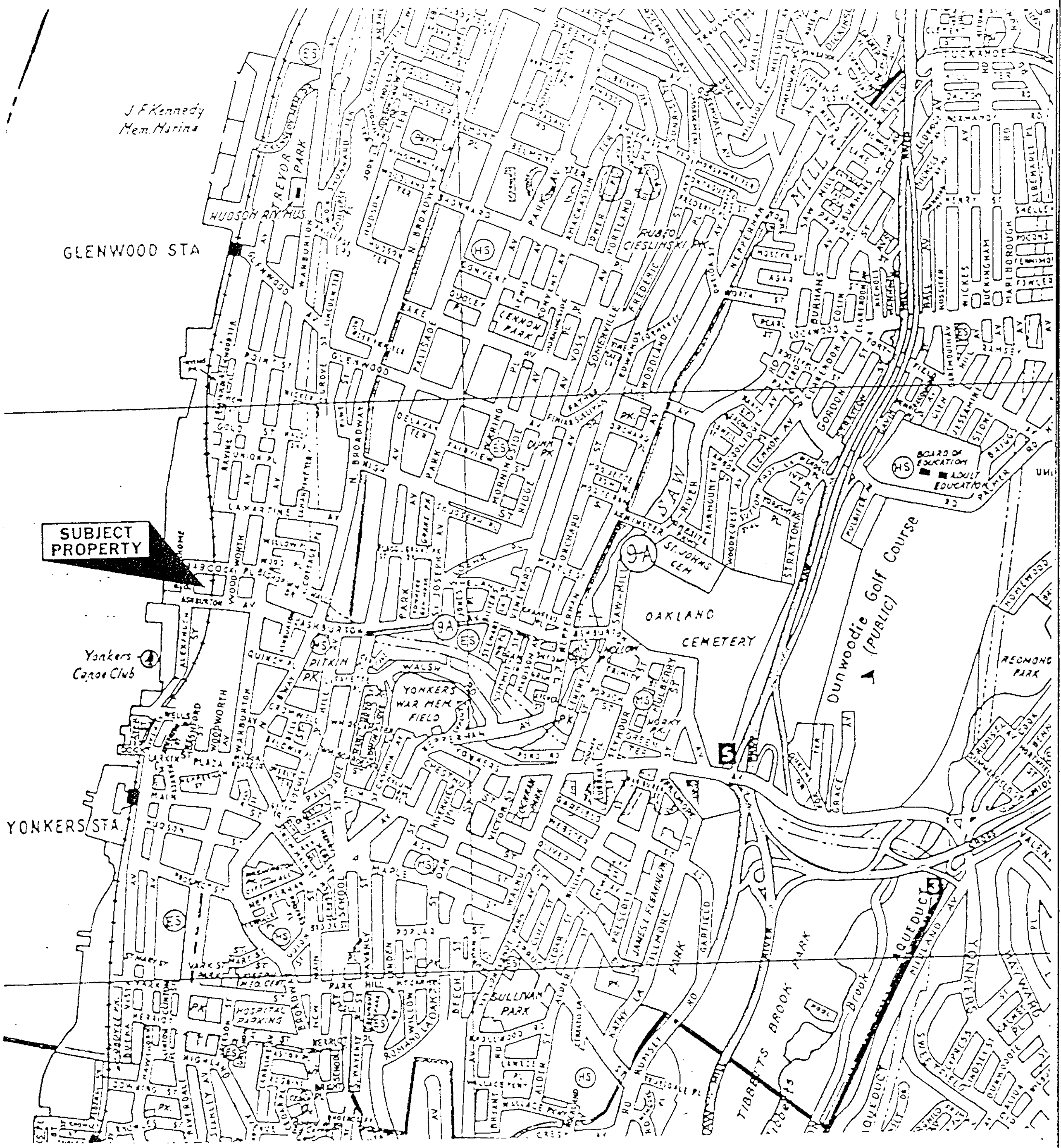
- One year of groundwater evaluation data will have been collected and provided to the NYSDEC in a written report.
- Written response will be provided by the NYSDEC regarding the adequacy of the Remediation Services.

Within 24 months after being notified by the NYSDEC that the workplan has received final approval :

- A Final Engineering Report of Operations and Maintenance Services will be submitted to the NYSDEC. This submission may be extended by mutual consent, based on the need to continue LNAPL and/or DNAPL product removal.

Attachment A

Maps



Source: DeLorme Street Atlas USA, Version 6.0

Site Location Map

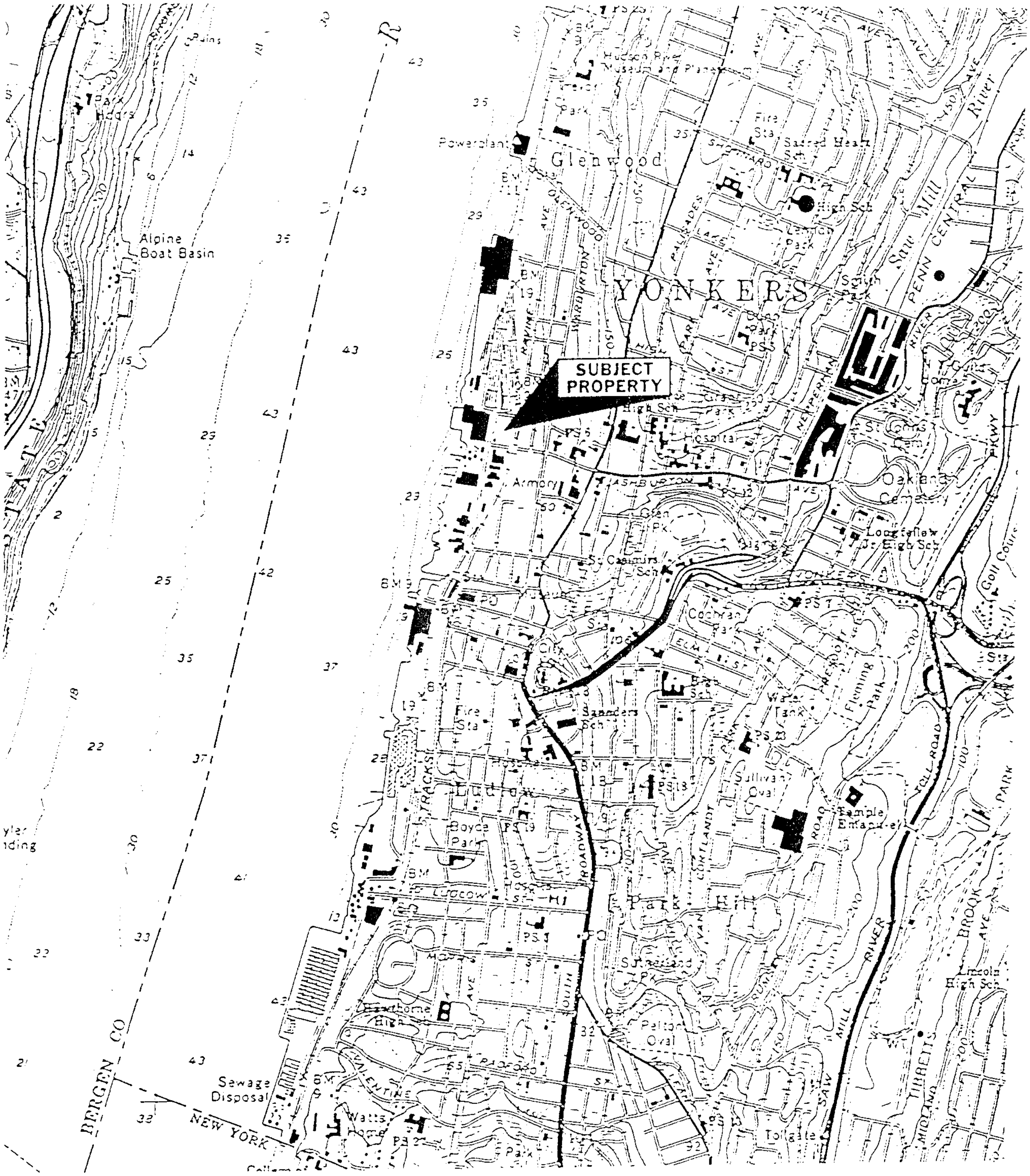
104 Ashburton Avenue
City of Yonkers, Westchester County, New York

N

ESI File: GY99143.30

Date: October 2000

Appendix A



Source: U.S. Department of the Interior Geological Survey Topographic Map of the Yonkers, NY-NJ Quadrangle, dated 1966 (photorevised 19 79)

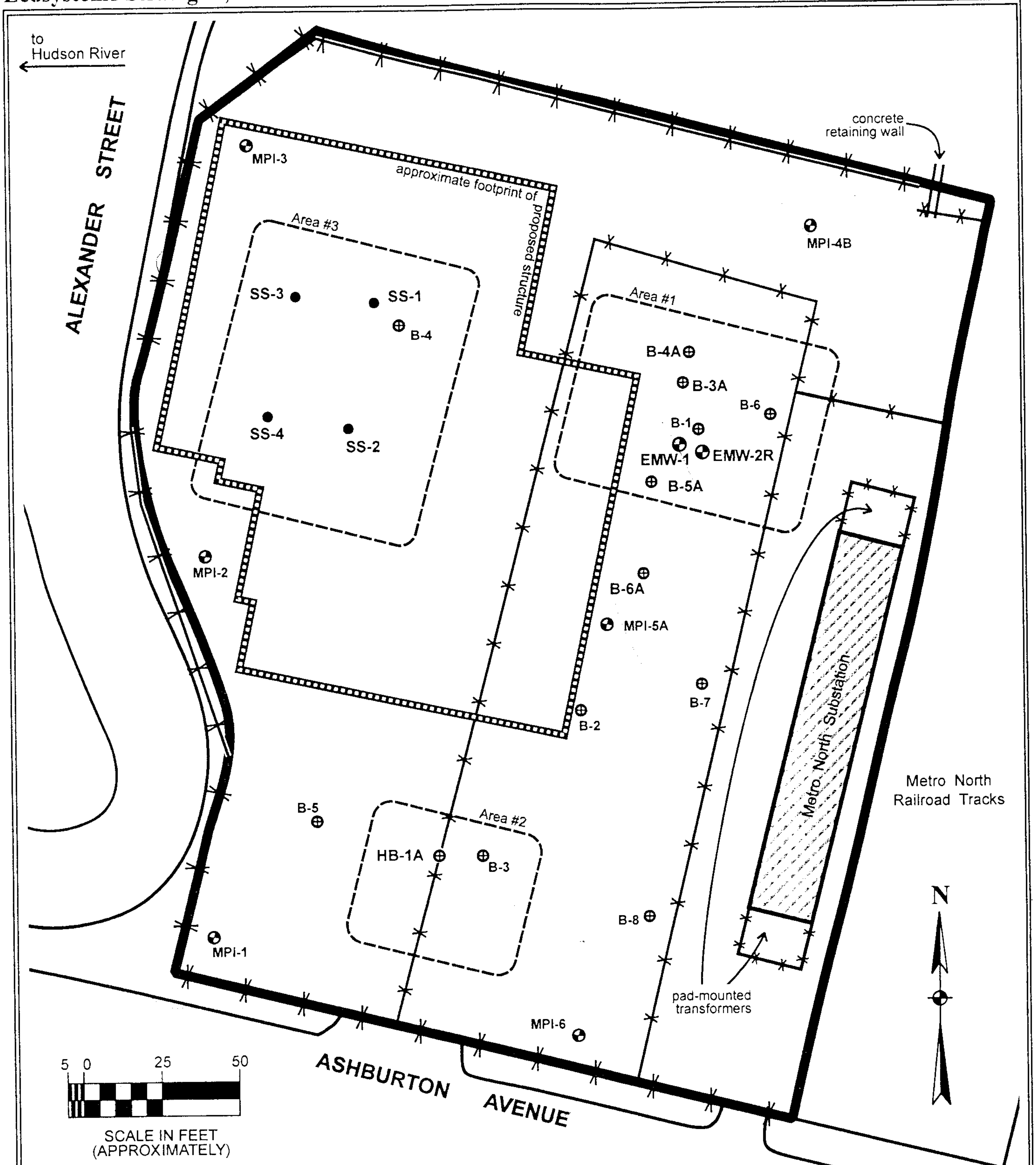
U.S.G.S. Topographic Map

104 Ashburton Avenue
City of Yonkers, Westchester County, New York

ESI File: Gt99143.30

Date: October 2000

Appendix A



All feature locations are approximate.
Map based on "Survey" by Roland K. Link, P.L.L.C. (June 17, 1999); "Groundwater Elevation Contour Map" by Malcom Pirnie (July 1, 1994); and "Site Plan" by Cybul & Cybul A.I.A. Architects (June 21, 2000).

Field Work Map

104 Ashburton Avenue
City of Yonkers
Westchester County
New York

Legend:

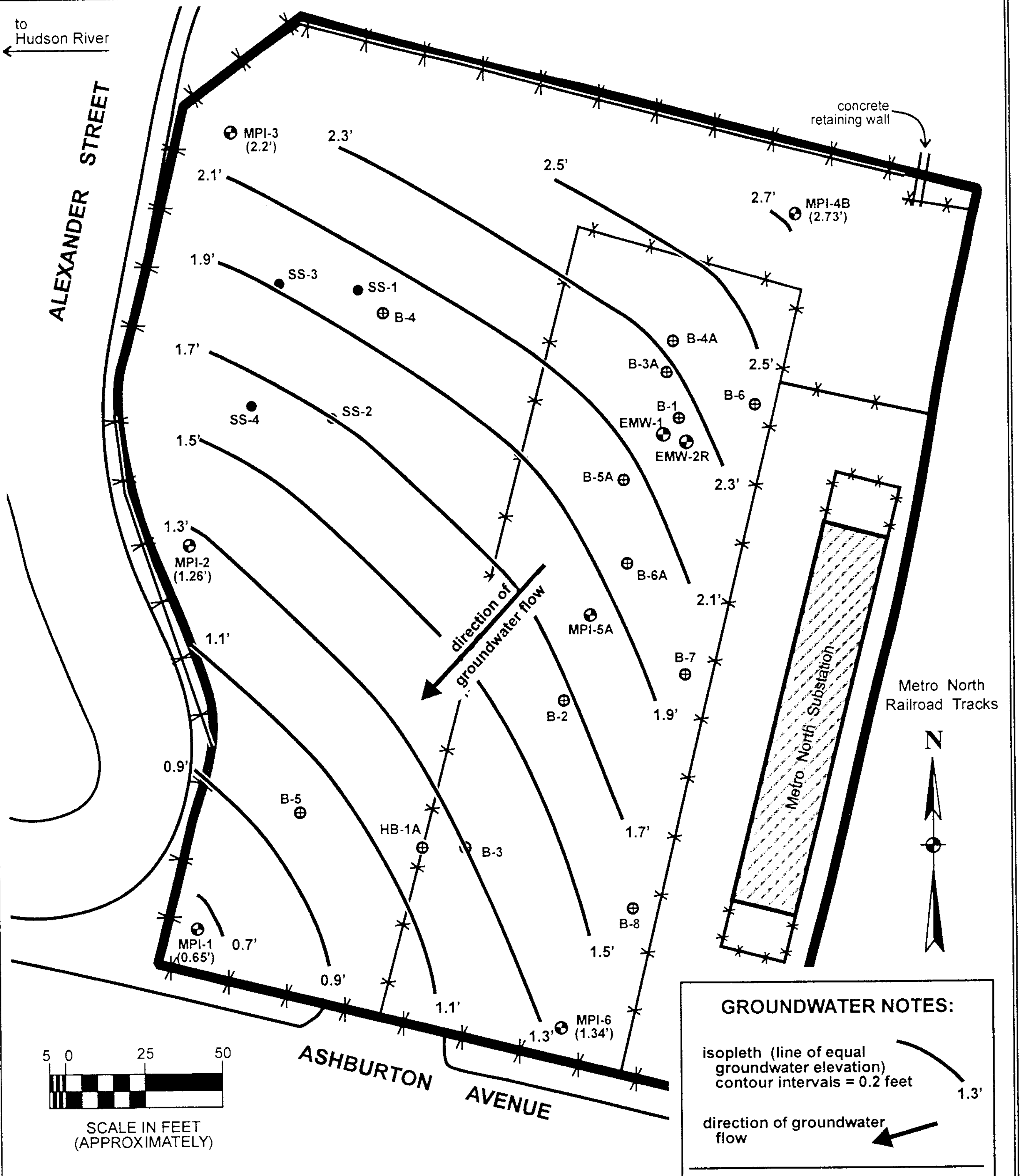
subject property border	▬	structure	▨
chain-link fence	—X—X—X—	surface soil sample	●
Area of Concern (see report)	Area #2 ⬚	soil boring	⊕
		monitoring well	⊕

ESI File: GY99143.30

October 2000

Scale: 1" = 45' (approximately)

Appendix A



GROUNDWATER NOTES:

isopleth (line of equal groundwater elevation) contour intervals = 0.2 feet 1.3'

direction of groundwater flow

All elevations are expressed in feet above mean sea level (msl).

All feature locations are approximate.
Map based Survey by Roland K. Link, P.L.L.C., dated June 17, 1999 and
Groundwater Elevation Contour Map as prepared by Malcom Pirnie, dated July 1, 1994.

Groundwater Elevation Contour Map

April 26, 2000 (1:45-2:04 pm)

104 Ashburton Avenue
City of Yonkers
Westchester County, New York

Legend:
- subject property border
- chain-link fence
- structure ▨
- monitoring well
- surface soil sample ●
- soil boring ⊕

ESI File: GY99143.30

October 2000

Scale: 1" = 45' (approximately)

Appendix A

Attachment B

Laboratory Data Summary Tables

Table 1: Summary of Detected Compounds in Water Samples - 104 Ashburton Avenue, City of Yonkers, Westchester County, New York (Results in bold exceed designated action levels. All results measured in μg/l-ppb).

		Sample Identification										
	Action Level[1]	MPI-1	MPI-2 Prev.	MPI-2 9/99	MPI-3 Prev.	MPI-3 9/99	MPI-4B Prev.	MPI-4B 9/99	MPI-5A Prev.	MPI-5A 9/99	MPI-6 Prev.	MPI-6 9/99
Volatile Organic Compounds (VOCs) with MTBE - Method 8260												
Benzene	0.7	**2**	**740**	**205**	**280**	**13**	**1,000**	**1,100**	**33**	**105**	**31**	**2**
n-Butylbenzene	5	ND	NP	**6**	NP	ND	NP	3	NP	ND	NP	ND
tert-Butylbenzene	5	ND	NP	**8**	NP	1	NP	5	NP	ND	NP	ND
Chlorobenzene	5	ND	**17**	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5	ND	NP	4	NP	ND	NP	**29**	NP	ND	NP	ND
Ethylbenzene	5	ND	**1,300**	**175**	**92**	**6**	**520**	**335**	**18**	**8**	**22**	ND
Isopropylbenzene	5	2	NP	**49**	NP	ND	NP	ND	NP	5	NP	2
Methylene Chloride	5	ND	**27**	ND	2	ND	2	ND	2	ND	ND	ND
MTBE	50	ND	NP	11	NP	ND	NP	**65**	NP	**468**	NP	ND
Naphthalene	10	ND	NP	**540**	NP	**545**	NP	ND	NP	ND	NP	ND
n-Propylbenzene	5	3	NP	**12**	NP	ND	NP	**8**	NP	2	NP	3
Toluene	5	ND	**23**	2	**8**	ND	**6**	ND	1	3	1	ND
1,2,4-Trimethylbenzene	5	ND	NP	**60**	NP	ND	NP	**60**	NP	**15**	NP	ND
1,3,5-Trimethylbenzene	5	ND	NP	**7**	NP	ND	NP	4	NP	2	NP	ND
o-Xylene	5	1	**290**	**15**	**74**	4	**89**	**43**	**6**	4	3	1
p/m-Xylene	5	ND	**480**	**7**	**80**	3	**40**	**15**	**13**	**7**	4	ND

Notes: 1. Source: NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046, revised January 24, 1994, as modified by relevant Records of Decision (RODs).

ND = Not Detected
NA = Not Analyzed
NP = Not Provided

Table 1: Summary of Detected Compounds in Water Samples - 104 Ashburton Avenue, City of Yonkers, Westchester County, New York - Continued (Results in bold exceed designated action levels. All results measured in µg/l-ppb).

		Sample Identification										
	Action Level[1]	MPI-1 Prev.	MPI-2 Prev.	MPI-2 9/99	MPI-3 Prev.	MPI-3 9/99	MPI-4B Prev.	MPI-4B 9/99	MPI-5A Prev.	MPI-5A 9/99	MPI-6 Prev.	MPI-6 9/99
Polynuclear Aromatic Hydrocarbons (PAHs) Method 8270												
Anthracene	50	3	28	ND	12	ND	14	ND	18	ND	8	ND
Fluoranthene	50	ND	19	ND	ND	ND	5	ND	4	ND	5	ND
Fluorene	50	10	75	ND	**53**	ND	**54**	11	43	ND	20	ND
Napthalene	10	3	**3,900**	**250**	**11,000**	**75**	**4,500**	ND	**3,000**	ND	**490**	ND
Phenanthrene	50	9	**100**	20	**70**	ND	59 .	ND	**71**	ND	34	ND
Pyrene	50	ND	23	ND	ND	ND	2	ND	ND	ND	6	ND
TOTAL PAHs		48	4,585	270	11,200	75	4,784	33	3,235	0	619	0

Notes: 1. Source: NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046, revised January 24, 1994, as modified by relevant Records of Decision (RODs).

ND = Not Detected
NA = Not Analyzed
NP = Not Provided

Table 2: Summary of Detected Organic Compounds in Soil Samples - 104 Ashburton Avenue, City of Yonkers, Westchester County, New York - Continued (Results in **bold** exceed designated action levels. All results measured in μg/kg-ppb).

			Sample Identification							
	Compound	Action Level^{1,2}	B-1 (10-12')	B-1 (17-19')	B-2 (10-12')	B-3 (5-7')	B-3 (20-22')	B-4 (10-12')	B-5 (4-6')	B-5 (15-17')
PAHs (Method 8270)	Acenaphthene	50,000^1	NA	NA	NA	31,000	NA	3,200	4,500	NA
	Anthracene	1,000^2	NA	NA	NA	**67,000**	NA	ND	2,700	NA
	Benzo (a) Anthracene	220^2	NA	NA	NA	**17,000**	NA	ND	ND	NA
	Benzo (b) Fluoranthene	220^2	NA	NA	NA	**9,400**	NA	ND	1,300	NA
	Benzo (k) Fluoranthene	220^2	NA	NA	NA	**17,000**	NA	ND	2,100	NA
	Benzo (g,h,i) Perylene	50,000^1	NA	NA	NA	4,700	NA	ND	ND	NA
	Chrysene	400^1	NA	NA	NA	**15,000**	NA	ND	2,500	NA
	Fluoranthene	1,000^2	NA	NA	NA	**35,000**	NA	**2,900**	ND	NA
	Fluorene	1,000^2	NA	NA	NA	**21,000**	NA	ND	2,800	NA
	Naphthalene	200^2	NA	NA	NA	**83,000**	NA	**17,000**	3,300	NA
	Phenanthrene	1,000^2	NA	NA	NA	**71,000**	NA	**4,700**	8,300	NA
	Pyrene	1,000^2	NA	NA	NA	**46,000**	NA	**3,900**	ND	NA

Notes:
1. Source: NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046, revised January 24, 1994, as modified by relevant Records of Decision (RODs).
2. Source: Spill Technology and Remediation Series (STARS) Memo (July 1993).

ND = Not Detected
NA = Not Analyzed
NE = Not Established

Table 1: Summary of RCRA Metals Plus Cyanide in Soils - April 26, 2,000 - 104 Ashburton Avenue, City of Yonkers, Westchester County, New York (All data provided in mg/kg. Concentrations shown in **bold** exceed NYSDEC established action levels.)

Metals	Background Levels [1]	Action Levels [1]	Sample Identification					
			SS-1 (1-3')	SS-2 (1-2')	SS-2 (2.5-3')	SS-3 (1-2')	SS-4 (1-2')	B-3A (1-3')
Arsenic	3.0 - 12.0	7.5[1]	**49.4**	ND	**63.8**	4.91	**84.3**	2.32
Barium	15 - 600	300[1]	196	**669**	76.6	86.3	79.0	**371**
Cadmium	0.1 - 1.0	10[1]	ND	ND	ND	ND	ND	ND
Chromium	1.5 - 40	50[1]	32.6	**154**	22.8	17.3	20.6	21.8
Lead	200 - 500	400[1]	**543**	192	**522**	184	133	**529**
Mercury	0.0001 - 0.2	1[1]	0.66	0.96	1.00	0.81	0.96	ND
Selenium	0.1 - 3.9	2[1]	ND	ND	ND	ND	ND	**3.51**
Silver	NE	NE	1.07	1.57	ND	ND	ND	ND
Cyanide	NE	NE	10.7	1.19	9.27	8.68	2.22	1.21

Notes: 1. Source: NYSDEC Technical and Administrative Guidance Memorandum #4046 (January 24, 1994) as modified by relevant NYSDEC Records of Decision (RODs)
ND = Not detected above specified detection limit
NE = Not Established
NA = Not Analyzed

F:\DATA\WPDATA\PROJECTS\1999\GY99143\GY99143-30\TOTAL METALS IN SOIL TABLE.WPD

Table 2: Summary of PAHs in Soils - April 26, 2,000 - 104 Ashburton Avenue, City of Yonkers, Westchester County, New York (All data provided in μg/kg. Concentrations shown in **bold** exceed NYSDEC established action levels.)

	Compound (Method 8270C)^3	Action Level^{1,2}	Sample Identification		
			B-1A (4-5')	B-1A (18-20')	SS-2 (2.5-3')
PAHs	Acenaphthene	400^2	35,000	680,000	13,000
	Anthracene	1,000^2	24,000	27,000	ND
	Benzo (a) Anthracene	220^2	37,000	194,000	1,700,000
	Benzo (a) Pyrene	61^2	27,000	142,000	5,600
	Benzo (b) Fluoranthene	220^2	12,000	66,000	9,200
	Benzo (k) Fluoranthene	220^2	25,000	130,000	12,100
	Benzo (g,h,i) Perylene	50,000^1	15,000	22,000	4,500
	Chrysene	400^1	41,000	210,000	1,500,000
	Dibenzo (a,h) Anthracene	14^2	2,100	5,700	ND
	Fluoranthene	1,000^2	60,000	250,000	7,700
	Fluorene	1,000^2	22,000	350,000	5,300
	Indeno (1,2,3-cd) Pyrene	3,200^1	ND	ND	4,600
	Naphthalene	200^2	48,000	1,400,000	2,300
	Phenanthrene	1,000^2	76,000	620,000	61,000
	Pyrene	1,000^2	130,000	310,000	17,000

Notes::
1. Source: NYSDEC Technical and Administrative Guidance Memorandum #4046 (TAGM) (January 24, 1994)
2. Source: Spill Technology and Remediation Series (STARS) Memo #1, July 1993
3. Any compounds not listed were not detected in any of the samples analyzed.

ND = Not Detected above specified detection limit.

Table 3: **Summary of Metals Plus Cyanide in Groundwater - April 26, 2,000 - 104 Ashburton Avenue, City of Yonkers , Westchester County, New York** All data provided in μg/l. (Concentrations shown in **bold** exceed NYSDEC established action levels.)

Metals	Action Levels[1]	SAMPLE IDENTIFICATION				
		MPI-1	MPI-2	MPI-3	MPI-4B	MPI-6
Arsenic Dissolved	25	ND	ND	ND	ND	ND
Barium Dissolved	1,000	34	62	63	144	159
Cadmium Dissolved	10	ND	ND	ND	ND	ND
Chromium Dissolved	50	ND	ND	ND	ND	ND
Lead Dissolved	50	ND	ND	ND	ND	14
Mercury Dissolved	2	ND	ND	ND	ND	ND
Selenium Dissolved	10	ND	ND	ND	ND	ND
Silver Dissolved	50	ND	ND	ND	ND	ND
Cyanide, Total	100	30	60	20	17	40

Notes: 1. Source: 6NYCRR Parts 700-705, effective September 1, 1991.
ND = Not detected above specified detection limit

Table 4: Groundwater Elevation at High Tide

Location	Depth to Groundwater (in ft. from well casing)	Monitoring Well Elevation (in ft. above mean sea level)	Groundwater Elevation (in ft. above mean sea level)
MPI-1	4.86'	3.90'	-0.96'
MPI-2	4.14'	4.80'	0.66'
MPI-3	4.66'	6.10'	1.44'
MPI-4	3.74'	5.60'	1.86'
MPI-6	2.74'	3.30'	0.56'
Depth to water measurements collected between 10:00 - 10:15 a m.			

Table 5: Groundwater Elevation at Low Tide

Location	Depth to Groundwater (in ft from well casing)	Monitoring Well Elevation (in ft above mean sea level)	Groundwater Elevation (in ft above mean sea level)
MPI-1	4.79'	3.90'	-0.89'
MPI-2	4.07'	4.80'	0.73'
MPI-3	4.68'	6.10'	1.42'
MPI-4	3.69'	5.60'	1.91'
MPI-6	2.75'	3.30'	0.55'
Depth to water measurements collected between 4:00 - 4:15 p.m.			

Attachment C

Laboratory Data Packages

YORK
ANALYTICAL LABORATORIES, INC.

RECEIVED
MAY 03 2000

Technical Report

prepared for

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Jerald A. Kaplan

Report Date: 4/28/2000
Re: Client Project ID: GY99143.21
York Project No.: 00040548

CT License No. PH-0723 New York License No. 10854 Mass. License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

Report Date: 4/28/2000
Client Project ID: GY99143.21

York Project No.: 00040548

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Jerald A. Kaplan

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 04/25/00. The project was identifed as your project "GY99143.21 ".

The analysis was conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

The results of the analysis are summarized in the following table(s).

Analysis Results

Client Sample ID			MPI-1		MPI-2	
York Sample ID			00040548-01		00040548-02	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
Silver, Dissolved	SW846-6010	mg/L	Not detected	0.005	Not detected	0.005
Arsenic, Dissolved	SW846-6010	mg/L	Not detected	0.005	Not detected	0.005
Barium, Dissolved	SW846-6010	mg/L	0.034	0.010	0.062	0.010
Cadmium, Dissolved	SW846	mg/L	Not detected	0.005	Not detected	0.005
Chromium, Dissolved	SW846-6010	mg/L	Not detected	0.005	Not detected	0.005
Mercury, Dissolved	SW-846-7470	mg/L	Not detected	0.0002	Not detected	0.0002
Lead, Dissolved	SW846-6010	mg/L	Not detected	0.005	Not detected	0.005
Selenium, Dissolved	SW846-6010	mg/L	Not detected	0.010	Not detected	0.010

Client Sample ID			MPI-3		MPI-4B	
York Sample ID			00040548-03		00040548-04	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
Silver, Dissolved	SW846-6010	mg/L	Not detected	0.005	Not detected	0.005
Arsenic, Dissolved	SW846-6010	mg/L	Not detected	0.005	Not detected	0.005
Barium, Dissolved	SW846-6010	mg/L	0.063	0.010	0.144	0.010
Cadmium, Dissolved	SW846	mg/L	Not detected	0.005	Not detected	0.005
Chromium, Dissolved	SW846-6010	mg/L	Not detected	0.005	Not detected	0.005

Client Sample ID			MPI-3		MPI-4B	
York Sample ID			00040548-03		00040548-04	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
Mercury, Dissolved	SW-846-7470	mg/L	Not detected	0.0002	Not detected	0.0002
Lead, Dissolved	SW846-6010	mg/L	Not detected	0.005	Not detected	0.005
Selenium, Dissolved	SW846-6010	mg/L	Not detected	0.010	Not detected	0.010

Client Sample ID			MPI-6	
York Sample ID			00040548-05	
Matrix			WATER	
Parameter	Method	Units	Results	MDL
Silver, Dissolved	SW846-6010	mg/L	Not detected	0.005
Arsenic, Dissolved	SW846-6010	mg/L	Not detected	0.005
Barium, Dissolved	SW846-6010	mg/L	0.159	0.010
Cadmium, Dissolved	SW846	mg/L	Not detected	0.005
Chromium, Dissolved	SW846-6010	mg/L	Not detected	0.005
Mercury, Dissolved	SW-846-7470	mg/L	Not detected	0.0002
Lead, Dissolved	SW846-6010	mg/L	0.014	0.005
Selenium, Dissolved	SW846-6010	mg/L	Not detected	0.010

Client Sample ID			SS-1 (1-3')		SS-2 (1-2')	
York Sample ID			00040548-06		00040548-07	
Matrix			SOIL		SOIL	
Parameter	Method	Units	Results	MDL	Results	MDL
Total RCRA Metals	SW846	mg/kG	---	---	---	---
Arsenic, total			49.4	1.00	Not detected	1.00
Barium, total			196	0.50	669	0.50
Cadmium, total			Not detected	0.50	Not detected	0.50
Chromium, total			32.6	0.50	154	0.50
Lead, total			543	0.50	192	0.50
Selenium, total			Not detected	1.00	Not detected	1.00
Silver, total			1.07	0.50	1.57	0.50
Cyanide, total	SM412B	mg/kg	10.7	1.00	1.19	1.00
Mercury	SW846-7471	mg/kG	0.66	0.25	0.96	0.25

Client Sample ID			SS-2 (2.5-3')		SS-3 (1-2')	
York Sample ID			00040548-08		00040548-09	
Matrix			SOIL		SOIL	
Parameter	Method	Units	Results	MDL	Results	MDL
Total RCRA Metals	SW846	mg/kG	---	---	---	---
Arsenic, total			63.8	1.00	4.91	1.00
Barium, total			76.6	0.50	86.3	0.50
Cadmium, total			Not detected	0.50	Not detected	0.50
Chromium, total			22.8	0.50	17.3	0.50
Lead, total			522	0.50	184	0.50
Selenium, total			Not detected	1.00	Not detected	1.00
Silver, total			Not detected	0.50	Not detected	0.50
Cyanide, total	SM412B	mg/kg	9.27	1.00	8.68	1.00
Mercury	SW846-7471	mg/kG	1.00	0.25	0.81	0.25

Client Sample ID			SS-4 (1-2')	
York Sample ID			00040548-10	
Matrix			SOIL	
Parameter	Method	Units	Results	MDL
Total RCRA Metals	SW846	mg/kG	---	---
Arsenic, total			84.3	1.00
Barium, total			79.0	0.50
Cadmium, total			Not detected	0.50
Chromium, total			20.6	0.50
Lead, total			133	0.50
Selenium, total			Not detected	1.00
Silver, total			Not detected	0.50
Cyanide, total	SM412B	mg/kg	2.22	1.00
Mercury	SW846-7471	mg/kG	0.96	0.25

Units Key:

For Waters/Liquids: mg/L = ppm ; ug/L = ppb For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes:

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. If dilution factor is reported at the end of the compound list, the MDL is determined by multiplying the MDL times the listed dilution factor.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.

Approved By:

Robert Q. Bradley
Managing Director

Date: 4/28/2000

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Jerald A. Kaplan

Report Date: 5/1/2000
Re: Client Project ID: GY99143.21
York Project No.: 00040549

CT License No. PH-0723 New York License No. 10854 Mass. License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

ONE RESEARCH DRIVE STAMFORD, CT 06906 (203) 325-1371 FAX (203) 357-0166

Report Date: 5/1/2000
Client Project ID: GY99143.21

York Project No.: 00040549

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Jerald A. Kaplan

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 04/25/00. The project was identifed as your project "GY99143.21 ".

The analysis was conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

The results of the analysis are summarized in the following table(s).

Analysis Results

Client Sample ID			MPI-1		MPI-2	
York Sample ID			00040549-01		00040549-02	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
Cyanide, total	EPA 335.2	mg/L	0.03	0.01	0.06	0.01

Client Sample ID			MPI-3		MPI-4B	
York Sample ID			00040549-03		00040549-04	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
Cyanide, total	EPA 335.2	mg/L	0.02	0.01	0.17	0.01

Client Sample ID			MPI-6	
York Sample ID			00040549-05	
Matrix			WATER	
Parameter	Method	Units	Results	MDL
Cyanide, total	EPA 335.2	mg/L	0.04	0.01

Client Sample ID			SS-2 (2.5-3')	
York Sample ID			00040549-06	
Matrix			SOIL	
Parameter	Method	Units	Results	MDL
Polynuclear Aromatic Hydroc.(BN)	SW846-8270	ug/kG	---	---
Acenaphthene			13000	1700
Anthracene			Not detected	1700
Benzo[a]anthracene			1700000	1700
Benzo[a]pyrene			5600	1700
Benzo[b]fluoranthene			9200	1700
Benzo[g,h,i]perylene			4500	1700
Benzo[k]fluoranthene			12100	1700
Chrysene			1500000	1700
Dibenz[a,h]anthracene			Not detected	1700
Fluoranthene			7700	1700
Fluorene			5300	1700
Indeno[1,2,3-cd]pyrene			4600	1700
Naphthalene			2300	1700
Phenanthrene			51000	1700
Pyrene			17000	1700

Units Key:

For Waters/Liquids. mg/L = ppm ; ug/L = ppb   For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes:

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. If dilution factor is reported at the end of the compound list, the MDL is determined by multiplying the MDL times the listed dilution factor.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project

Approved By:__________________ **Date:** 5/1/2000

Robert Q. Bradley
Managing Director

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Jerald A. Kaplan

Report Date: 5/4/2000
Re: Client Project ID: GY99143.21
York Project No.: 00040648

CT License No. PH-0723 New York License No. 10854 Mass. License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

Report Date: 5/4/2000
Client Project ID: GY99143.21

York Project No.: 00040648

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Jerald A. Kaplan

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 04/27/00. The project was identifed as your project "GY99143.21 ".

The analysis was conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

The results of the analysis are summarized in the following table(s).

Analysis Results

Client Sample ID			B-3A(1-3')	
York Sample ID			00040648-01	
Matrix			SOIL	
Parameter	Method	Units	Results	MDL
Total RCRA Metals	SW846	mg/kG	---	---
Arsenic, total			2.32	1.00
Barium, total			371	0.50
Cadmium, total			Not detected	0.50
Chromium, total			21.8	0.50
Lead, total			529	0.50
Selenium, total			3.51	1.00
Silver, total			Not detected	0.50
Mercury	SW846-7471	mg/kG	Not detected	0.25
Cyanide, total	SM412B	mg/kg	1.21	1.00

Units Key:

For Waters/Liquids: mg/L = ppm ; ug/L = ppb For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes:

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. If dilution factor is reported at the end of the compound list, the MDL is determined by multiplying the MDL times the listed dilution factor.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.

Approved By:

Robert Q. Bradley
Managing Director

Date: 5/4/2000

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Jerald A. Kaplan

Report Date: 5/8/2000
Re: Client Project ID: G499143.21
York Project No.: 00050037

CT License No. PH-0723 New York License No. 10854 Mass. License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

Report Date: 5/8/2000
Client Project ID: G499143.21

York Project No.: 00050037 A

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Jerald A. Kaplan

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 05/01/00. The project was identifed as your project "G499143.21 ".

The analysis was conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

The results of the analysis are summarized in the following table(s).

Analysis Results

Client Sample ID			B-1A (4-5')		B-1A (18-20')	
York Sample ID			00050037-01		00050037-02	
Matrix			SOIL		SOIL	
Parameter	Method	Units	Results	MDL	Results	MDL
Polynuclear Aromatic Hydroc.(BN)	SW846-8270	ug/kG	---	---	---	---
Acenaphthene			35000	3300	680000	3300
Anthracene			24000	3300	27000	3300
Benzo[a]anthracene			37000	3300	194000	3300
Benzo[a]pyrene			27000	3300	142000	3300
Benzo[b]fluoranthene			12000	3300	66000	3300
Benzo[g,h,i]perylene			15000	3300	22000	3300
Benzo[k]fluoranthene			25000	3300	130000	3300
Chrysene			41000	3300	210000	3300
Dibenz[a,h]anthracene			2100	3300	5700	3300
Fluoranthene			60000	3300	250000	3300
Fluorene			22000	3300	350000	3300
Indeno[1,2,3-cd]pyrene			Not detected	3300	Not detected	3300
Naphthalene			48000	3300	1400000	3300
Phenanthrene			76000	3300	620000	3300
Pyrene			130000	3300	310000	3300

Client Sample ID			SS-2 (2.5-3')	
York Sample ID			00050037-03	
Matrix			SOIL	
Parameter	Method	Units	Results	MDL
Oil Identification			See Note*	

*Note: Weathered gasoline and Weathered Fuel Oil #4 or #6.

Units Key:

For Waters/Liquids: mg/L = ppm ; ug/L = ppb   For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes:

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. If dilution factor is reported at the end of the compound list, the MDL is determined by multiplying the MDL times the listed dilution factor.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.

Approved By:______________________ **Date:** 5/8/2000

Robert Q. Bradley
Managing Director

ANAL ICAL LABORATORIES, INC.
ONE RESEARCH DRIVE
STAMFORD, CT 06906
203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

Company Name	Report To:	Invoice To:	Project ID/No.	
cosystems	Jay Kaplan	Pam	GY99143.24	Jay K Samples Collected By (Signature) Jay Kaplan Name (Printed)

ample No.	Location/ID	Date Sampled	Sample Matrix				ANALYSES REQUESTED	Container Description(s)
			Water	Soil	Air	OTHER		
	B-1 liquid	9/27/99				liquid	Product ID / PCBs (please call Jay)	1-4oz
	B-5 (4-6')	9/27/99		X			8021 / 8270-PAHs only	1-2oz / 1-4oz
	B-5 (15-17')	9/27/99		X			8021	1-2oz
	B-4 (10-12')	9/27/99		X			8021	1-2oz / 1-4oz
	B-3 (5-7')	9/28/99		X			8021 / 8270-PAHs only	1-2oz / 1-4oz
	B-3 (20-22')	9/28/99		X			8021	1-2oz / 1-4oz
	B-2 (10-12')	9/28/99		X			8021	1-2oz / 1-4oz
	B-1 (10-12')	9/28/99		X			8021	1-2oz / 1-4oz
	B-1 (17-19')	9/28/99		X			8021	1-4oz
	B-6 (2-4')	9/28/99		X			PCBs	1-4oz

ain-of-Custody Record

Bottles Relinquished from Lab by ______ Date/Time ______

Bottles Received in Field by ______ Date/Time ______

Sample Relinquished by: J K Date/Time: 9/29/99 1130

Sample Relinquished by ______ Date/Time ______

Sample Received by: R. Van Deusen Date/Time: 9-29-99 11:30

Sample Received in LAB by: Linda A. LeBlanc Date/Time: 9/29/99 12:2

mments/Special Instructions

Turn-Around Time
[✓ Standard] ____RUSH(define)________

ANALYTICAL LABORATORIES, INC.
ONE RESEARCH DRIVE
STAMFORD, CT 06906
203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

Company Name	Report To:	Invoice To:	Project ID/No.	
Ecosystems	Jay Kaplan	Pam	GY99143.21	Samples Collected By (Signature) Jay Kaplan Name (Printed)

ample No.	Location/ID	Date Sampled	Sample Matrix Water	Soil	Air	OTHER	ANALYSES REQUESTED	Container Description(s)
	B-7(2-4')	9/28/99		X			PCBs	1-4oz
	B-8(2-4')	9/28/99		X			PCBs	1-4oz

ain-of-Custody Record

Bottles Relinquished from Lab by ______ Date/Time ______
Bottles Received in Field by ______ Date/Time ______
Sample Relinquished by ______ Date/Time 9/29/99 11 30
Sample Relinquished by ______ Date/Time ______
Sample Received by R. Van Deusen Date/Time 9-29-99 11:30
Sample Received in LAB by Linda A LeBlanc Date/Time 9/29/99 1208

nments/Special Instructions
Sample B-8(2-4') not included with this batch
9/30/99

Turn-Around Time
____Standard ____RUSH(define)________

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Annette Antonucci

Report Date: 10/6/1999
Re: Client Project ID: GY 99143.21
York Project No.: 99100067

CT License No. PH-0723 New York License No. 10854 Mass. License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

Report Date: 10/6/1999
Client Project ID: GY 99143.21

York Project No.: 99100067

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Annette Antonucci

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 10/01/99. The project was identifed as your project "GY 99143.21 ".

The analysis was conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

The results of the analysis are summarized in the following table(s).

Analysis Results

Client Sample ID			B-8 (2-4')	
York Sample ID			99100067-01	
Matrix			SOIL	
Parameter	Method	Units	Results	MDL
PCB	SW846-8080	mg/Kg	---	---
PCB 1016			Not detected	0.02
PCB 1221			Not detected	0.02
PCB 1232			Not detected	0.02
PCB 1242			Not detected	0.02
PCB 1248			Not detected	0.02
PCB 1254			Not detected	0.02
PCB 1260			Not detected	0.02
PCB, Total			Not detected	0.02

Units Key:

For Waters/Liquids: mg/L = ppm ; ug/L = ppb   For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes:

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. If dilution factor is reported at the end of the compound list, the MDL is determined by multiplying the MDL times the listed dilution factor.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.

Approved By: Robert Bradley   Date: 10/6/1999
Robert Q. Bradley
Managing Director

YORK

ANALYTICAL LABORATORIES, INC.
ONE RESEARCH DRIVE
STAMFORD, CT 06906
203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

Page 1 of 1

Company Name	Report To:	Invoice To:	Project ID/No.	
EcosystemsStrategies	Annette Antonucci	Pam	GY 99143.21	J. Kaplan Samples Collected By (Signature) Jay Kaplan Name (Printed)

ample No.	Location/ID	Date Sampled	Sample Matrix				ANALYSES REQUESTED	Container Description(s)
			Water	Soil	Air	OTHER		
	B-8 (2-4')	9/28/99		X			see previous chain (PCBs)	

ain-of-Custody Record

Bottles Relinquished from Lab by ________ Date/Time ________

Bottles Received in Field by ________ Date/Time ________

Annette Antonucci
Sample Relinquished by ________ 10/1/99 Date/Time

Sample Relinquished by ________ Date/Time ________

R. Van Deusen
Sample Received by ________ 10-1-99 3:00 Date/Time

Linda A LeBlanc
Sample Received in LAB by ________ 10/1/99 1720 Date/Time

mments/Special Instructions

Turn-Around Time
____Standard ____RUSH(define)________

YORK
ANALYTICAL LABORATORIES, INC.

RECEIVED
SEP 29 1999

Technical Report

prepared for

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Annette Antonucci

Report Date: 9/9/1999
Re: Client Project ID: GY99143.21
York Project No.: 99090048 R

CT License No. PH-0723 New York License No. 10854 Mass. License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

Report Date: 9/9/1999
Client Project ID: GY99143.21

York Project No.: 99090048 R

Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie, NY 12603
Attention: Annette Antonucci

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 09/02/99. The project was identifed as your project "GY99143.20 ".

The analysis was conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

The results of the analysis are summarized in the following table(s).

Analysis Results

Client Sample ID			MPI-6		MPI-5A	
York Sample ID			99090048-01		99090048-02	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
Volatiles-8021+MTBE water	SW846-8260	ug/L	---	---	---	---
Benzene			2	1	105	1
Bromobenzene			Not detected	1	Not detected	1
Bromochloromethane			Not detected	1	Not detected	1
Bromodichloromethane			Not detected	1	Not detected	1
Bromoform			Not detected	1	Not detected	1
Bromomethane			Not detected	10	Not detected	10
n-Butylbenzene			Not detected	1	Not detected	1
sec-Butylbenzene			Not detected	1	Not detected	1
tert-Butylbenzene			Not detected	1	Not detected	1
Carbon tetrachloride			Not detected	1	Not detected	1
Chlorobenzene			Not detected	1	Not detected	1
Chloroethane			Not detected	1	Not detected	1
Chloroform			Not detected	1	Not detected	1
Chloromethane			Not detected	10	Not detected	10
2-Chlorotoluene			Not detected	1	Not detected	1
4-Chlorotoluene			Not detected	1	Not detected	1
Dibromochloromethane			Not detected	1	Not detected	1
1,2-Dibromo-3-chloropropane			Not detected	1	Not detected	1

Client Sample ID			MPI-6		MPI-5A	
York Sample ID			99090048-01		99090048-02	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
1,2-Dibromoethane			Not detected	1	Not detected	1
Dibromomethane			Not detected	1	Not detected	1
1,2-Dichlorobenzene			Not detected	1	Not detected	1
1,3-Dichlorobenzene			Not detected	1	Not detected	1
1,4-Dichlorobenzene			Not detected	1	Not detected	1
Dichlorodifluoromethane			Not detected	1	Not detected	1
1,1-Dichloroethane			Not detected	1	Not detected	1
1,2-Dichloroethane			Not detected	1	Not detected	1
1,1-Dichloroethylene			Not detected	1	Not detected	1
1,2-Dichloroethylene (Total)			Not detected	1	Not detected	1
1,2-Dichloropropane			Not detected	1	Not detected	1
1,3-Dichloropropane			Not detected	1	Not detected	1
2,2-Dichloropropane			Not detected	1	Not detected	1
1,1-Dichloropropylene			Not detected	1	Not detected	1
cis-1,3-Dichloropropylene			Not detected	1	Not detected	1
trans-1,3-Dichloropropylene			Not detected	1	Not detected	1
Ethylbenzene			Not detected	1	8	1
Hexachlorobutadiene			Not detected	1	Not detected	1
Isopropylbenzene			2	1	5	1
p-Isopropyltoluene			Not detected	1	Not detected	1
Methylene chloride			Not detected	1	Not detected	1
Naphthalene			Not detected	1	Not detected	1
n-Propylbenzene			3	1	2	1
Styrene			Not detected	1	Not detected	1
1,1,1,2-Tetrachloroethane			Not detected	1	Not detected	1
1,1,2,2-Tetrachloroethane			Not detected	1	Not detected	1
Tetrachloroethylene			Not detected	1	Not detected	1
Toluene			Not detected	1	3	1
1,2,3-Trichlorobenzene			Not detected	1	Not detected	1
1,2,4-Trichlorobenzene			Not detected	1	Not detected	1
1,1,1-Trichloroethane			Not detected	1	Not detected	1
1,1,2-Trichloroethane			Not detected	1	Not detected	1
Trichloroethylene			Not detected	1	Not detected	1
Trichlorofluoromethane			Not detected	1	Not detected	1
1,2,3-Trichlorpropane			Not detected	1	Not detected	1
1,2,4-Trimethylbenzene			Not detected	1	15	1
1,3,5-Trimethylbenzene			Not detected	1	2	1
Vinyl chloride			Not detected	10	Not detected	10
o-Xylene			1	1	4	1
p- & m-Xylenes			Not detected	1	7	1
Methyl tert-butyl ether (MTBE)			Not detected	1	468	1
Polynuclear Aromatic Hydroc.(BN)	SW846-8270	ug/L	---	---	---	---
Naphthalene			Not detected	10	Not detected	10
Anthracene			Not detected	10	Not detected	10
Fluorene			Not detected	10	Not detected	10
Phenanthrene			Not detected	10	Not detected	10
Pyrene			Not detected	10	Not detected	10
Acenaphthene			Not detected	10	Not detected	10
Benzo[a]anthracene			Not detected	10	Not detected	10
Fluoranthene			Not detected	10	Not detected	10
Benzo[b]fluoranthene			Not detected	10	Not detected	10

Client Sample ID			MPI-6		MPI-5A	
York Sample ID			99090048-01		99090048-02	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
Benzo[k]fluoranthene			Not detected	10	Not detected	10
Chyrsene			Not detected	10	Not detected	10
Benzo[a]pyrene			Not detected	10	Not detected	10
Benzo[g,h,i]perylene			Not detected	10	Not detected	10
Indeno[1,2,3-cd]pyrene			Not detected	10	Not detected	10
Dibenz[a,h]anthracene			Not detected	10	Not detected	10

Client Sample ID			MPI-4B		MPI-3	
York Sample ID			99090048-03		99090048-04	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
Volatiles-8021+MTBE water	SW846-8260	ug/L	---	---	---	---
Benzene			1100	1	13	1
Bromobenzene			Not detected	1	Not detected	1
Bromochloromethane			Not detected	1	Not detected	1
Bromodichloromethane			Not detected	1	Not detected	1
Bromoform			Not detected	1	Not detected	1
Bromomethane			Not detected	10	Not detected	10
n-Butylbenzene			3	1	Not detected	1
sec-Butylbenzene			Not detected	1	Not detected	1
tert-Butylbenzene			5	1	1	1
Carbon tetrachloride			Not detected	1	Not detected	1
Chlorobenzene			Not detected	1	Not detected	1
Chloroethane			Not detected	1	Not detected	1
Chloroform			Not detected	1	Not detected	1
Chloromethane			Not detected	10	Not detected	10
2-Chlorotoluene			Not detected	1	Not detected	1
4-Chlorotoluene			Not detected	1	Not detected	1
Dibromochloromethane			Not detected	1	Not detected	1
1,2-Dibromo-3-chloropropane			Not detected	1	Not detected	1
1,2-Dibromoethane			Not detected	1	Not detected	1
Dibromomethane			Not detected	1	Not detected	1
1,2-Dichlorobenzene			Not detected	1	Not detected	1
1,3-Dichlorobenzene			Not detected	1	Not detected	1
1,4-Dichlorobenzene			Not detected	1	Not detected	1
Dichlorodifluoromethane			Not detected	1	Not detected	1
1,1-Dichloroethane			Not detected	1	Not detected	1
1,2-Dichloroethane			29	1	Not detected	1
1,1-Dichloroethylene			Not detected	1	Not detected	1
1,2-Dichloroethylene (Total)			Not detected	1	Not detected	1
1,2-Dichloropropane			Not detected	1	Not detected	1
1,3-Dichloropropane			Not detected	1	Not detected	1
2,2-Dichloropropane			Not detected	1	Not detected	1
1,1-Dichloropropylene			Not detected	1	Not detected	1
cis-1,3-Dichloropropylene			Not detected	1	Not detected	1
trans-1,3-Dichloropropylene			Not detected	1	Not detected	1
Ethylbenzene			335	1	6	1
Hexachlorobutadiene			Not detected	1	Not detected	1
Isopropylbenzene			Not detected	1	Not detected	1

Client Sample ID			MPI-4B		MPI-3	
York Sample ID			99090048-03		99090048-04	
Matrix			WATER		WATER	
Parameter	Method	Units	Results	MDL	Results	MDL
p-Isopropyltoluene			Not detected	1	Not detected	1
Methylene chloride			Not detected	1	Not detected	1
Naphthalene			Not detected	1	545	1
n-Propylbenzene			8	1	Not detected	1
Styrene			Not detected	1	Not detected	1
1,1,1,2-Tetrachloroethane			Not detected	1	Not detected	1
1,1,2,2-Tetrachloroethane			Not detected	1	Not detected	1
Tetrachloroethylene			Not detected	1	Not detected	1
Toluene			Not detected	1	Not detected	1
1,2,3-Trichlorobenzene			Not detected	1	Not detected	1
1,2,4-Trichlorobenzene			Not detected	1	Not detected	1
1,1,1-Trichloroethane			Not detected	1	Not detected	1
1,1,2-Trichloroethane			Not detected	1	Not detected	1
Trichloroethylene			Not detected	1	Not detected	1
Trichlorofluoromethane			Not detected	1	Not detected	1
1,2,3-Trichlorpropane			Not detected	1	Not detected	1
1,2,4-Trimethylbenzene			60	1	Not detected	1
1,3,5-Trimethylbenzene			4	1	Not detected	1
Vinyl chloride			Not detected	10	Not detected	10
o-Xylene			43	1	4	1
p- & m-Xylenes			15	1	3	1
Methyl tert-butyl ether (MTBE)			65	1	Not detected	1
Polynuclear Aromatic Hydroc.(BN)	SW846-8270	ug/L	---	---	---	---
Naphthalene			Not detected	10	75	10
Anthracene			Not detected	10	Not detected	10
Fluorene			11	10	Not detected	10
Phenanthrene			Not detected	10	Not detected	10
Pyrene			Not detected	10	Not detected	10
Acenaphthene			22	10	Not detected	10
Benzo[a]anthracene			Not detected	10	Not detected	10
Fluoranthene			Not detected	10	Not detected	10
Benzo[b]fluoranthene			Not detected	10	Not detected	10
Benzo[k]fluoranthene			Not detected	10	Not detected	10
Chyrsene			Not detected	10	Not detected	10
Benzo[a]pyrene			Not detected	10	Not detected	10
Benzo[g,h,i]perylene			Not detected	10	Not detected	10
Indeno[1,2,3-cd]pyrene			Not detected	10	Not detected	10
Dibenz[a,h]anthracene			Not detected	10	Not detected	10

Client Sample ID			MPI-2	
York Sample ID			99090048-05	
Matrix			WATER	
Parameter	Method	Units	Results	MDL
Volatiles-8021+MTBE water	SW846-8260	ug/L	---	---
Benzene			205	1
Bromobenzene			Not detected	1
Bromochloromethane			Not detected	1
Bromodichloromethane			Not detected	1
Bromoform			Not detected	1

Client Sample ID			MPI-2	
York Sample ID			99090048-05	
Matrix			WATER	
Parameter	Method	Units	Results	MDL
Bromomethane			Not detected	10
n-Butylbenzene			6	1
sec-Butylbenzene			Not detected	1
tert-Butylbenzene			8	1
Carbon tetrachloride			Not detected	1
Chlorobenzene			Not detected	1
Chloroethane			Not detected	1
Chloroform			Not detected	1
Chloromethane			Not detected	10
2-Chlorotoluene			Not detected	1
4-Chlorotoluene			Not detected	1
Dibromochloromethane			Not detected	1
1,2-Dibromo-3-chloropropane			Not detected	1
1,2-Dibromoethane			Not detected	1
Dibromomethane			Not detected	1
1,2-Dichlorobenzene			Not detected	1
1,3-Dichlorobenzene			Not detected	1
1,4-Dichlorobenzene			Not detected	1
Dichlorodifluoromethane			Not detected	1
1,1-Dichloroethane			Not detected	1
1,2-Dichloroethane			4	1
1,1-Dichloroethylene			Not detected	1
1,2-Dichloroethylene (Total)			Not detected	1
1,2-Dichloropropane			Not detected	1
1,3-Dichloropropane			Not detected	1
2,2-Dichloropropane			Not detected	1
1,1-Dichloropropylene			Not detected	1
cis-1,3-Dichloropropylene			Not detected	1
trans-1,3-Dichloropropylene			Not detected	1
Ethylbenzene			175	1
Hexachlorobutadiene			Not detected	1
Isopropylbenzene			49	1
p-Isopropyltoluene			Not detected	1
Methylene chloride			Not detected	1
Naphthalene			540	1
n-Propylbenzene			12	1
Styrene			Not detected	1
1,1,1,2-Tetrachloroethane			Not detected	1
1,1,2,2-Tetrachloroethane			Not detected	1
Tetrachloroethylene			Not detected	1
Toluene			2	1
1,2,3-Trichlorobenzene			Not detected	1
1,2,4-Trichlorobenzene			Not detected	1
1,1,1-Trichloroethane			Not detected	1
1,1,2-Trichloroethane			Not detected	1
Trichloroethylene			Not detected	1
Trichlorofluoromethane			Not detected	1
1,2,3-Trichlorpropane			Not detected	1
1,2,4-Trimethylbenzene			60	1
1,3,5-Trimethylbenzene			7	1
Vinyl chloride			Not detected	10

Client Sample ID			MPI-2	
York Sample ID			99090048-05	
Matrix			WATER	
Parameter	Method	Units	Results	MDL
o-Xylene			15	1
p- & m-Xylenes			7	1
Methyl tert-butyl ether (MTBE)			11	1
Polynuclear Aromatic Hydroc.(BN)	SW846-8270	ug/L	---	---
Naphthalene			250	10
Anthracene			Not detected	10
Fluorene			20	10
Phenanthrene			20	10
Pyrene			Not detected	10
Acenaphthene			66	10
Benzo[a]anthracene			Not detected	10
Fluoranthene			Not detected	10
Benzo[b]fluoranthene			Not detected	10
Benzo[k]fluoranthene			Not detected	10
Chyrsene			Not detected	10
Benzo[a]pyrene			Not detected	10
Benzo[g,h,i]perylene			Not detected	10
Indeno[1,2,3-cd]pyrene			Not detected	10
Dibenz[a,h]anthracene			Not detected	10

Units Key:

For Waters/Liquids: mg/L = ppm ; ug/L = ppb For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes:

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. If dilution factor is reported at the end of the compound list, the MDL is determined by multiplying the MDL times the listed dilution factor.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.

Approved By: Robert Q. Bradley **Date:** 9/9/1999

Robert Q. Bradley
Managing Director

RHA

YORK
TICAL LABORATORIES, INC.
ONE RESEARCH DRIVE
STAMFORD, CT 06906
325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

Page 1 of 1

mpany Name	Report To:	Invoice To:	Project ID/No.	
stems Strategies	Annette Antonucci	Pam	~~GY99143.20~~ GY99148.21	Samples Collected By (Signature) Jay Kaplan Name (Printed)

ple No.	Location/ID	Date Sampled	Sample Matrix Water	Soil	Air	OTHER	ANALYSES REQUESTED	Container Description(s)
	~~MW-1~~ mp1-6	8/31/99	X				8021	2 VOA VIALS
	~~MW-2~~ mp1-5A		X				8021	2 VOA VIALS
	~~MW-3~~ mp1-4B		X				8021	2 VOA VIALS
	~~MW-4~~ mp1-3		X				8021	2 VOA VIALS
	~~MW-5~~ mp1-2		X				8021	2 VOA VIALS
	~~MW-1~~ mp1-6		X				8270 PAHs ONLY	1 L Amber
	~~MW-2~~ mp1-5A		X				8270 PAHs ONLY	1 L Amber
	~~MW-3~~ mp1-4B		X				8270 PAHs ONLY	1 L Amber
	~~MW-4~~ mp1-3		X				8270 PAHs ONLY	1 L Amber
	~~MW-5~~ mp1-2		X				8270 PAHs ONLY	1 L Amber

ain-of-Custody Record

Bottles Relinquished from Lab by	Date/Time	Annette Antonucci Sample Relinquished by	9/2/99 Date/Time	R. Van Deusen Sample Received by	9-2-99 11:30 Date/Time
Bottles Received in Field by	Date/Time	Sample Relinquished by	Date/Time	[illegible] Sample Received in LAB by	9/2/99 1800 Date/Time

omments/Special Instructions

Turn-Around Time

____ Standard ____ RUSH(define)________

Attachment D

ESI Staff Resumes

PAUL H. CIMINELLO

PRESIDENT

EDUCATION

Master of Environmental Management, 1986
School of the Environment, Duke University, Durham, North Carolina

Master of Arts in Public Policy Sciences, 1986
Institute of Policy Sciences and Public Affairs, Duke University, Durham, North Carolina

Bachelor of Arts, 1980
Tufts University, Medford, Massachusetts

CERTIFICATIONS AND TRAINING

NJ Dept. of Environmental Protection Licensed Subsurface Evaluator (License Number: 0014686)
NYS Dept. of Labor Certified Asbestos Building Inspector (Cert. Number: AH92-14884)
Connecticut Department of Environmental Protection Interim Environmental Professional (IEP)
NYS Department of State, Division of Licensing Services, Real Estate Instructor
In compliance with OSHA Hazardous Materials Safety (29 CFR 1910) requirements.

PROFESSIONAL EXPERIENCE

President, Ecosystems Strategies, Inc., Poughkeepsie, New York 1992 to present

Coordinates corporate strategic planning, financial management and marketing activities. Oversees corporate work on state and federal superfund sites and manages education/training services. Responsible for technical services in areas of pollution prevention, contaminant delineation and site remediation. Major recent projects of relevance include:

- Preparation of RI/FS at former industrial site in Westchester County, NY. Document has been reviewed and approved by the NYJDEC and field work for site investigation is currently on-going. Work to date has included public hearings, subcontractor specification preparation, extensions of borings, installation of ground water monitoring wells and sample collection.
- RI/FS of site currently under consideration for inclusion on NYS "Superfund" list. Property is former metal recycling/scrapyard including car-crushing operation. Consent order based on preliminary findings is currently being negotiated.
- Pollution prevention assessments of two regional hospitals in New York (including medical, radiological and toxicological laboratories), proposing management and structural changes which are anticipated to result in net annual savings exceeding $50,000 per site.
- Environmental compliance Audit of major (one million + square feet) medical complex in New York City, including assessment of laboratory discharges, radioactive/medical waste storage/disposal practices and chemical handling procedures.
- Preparation of environmental policies for regional lending institution. Designed all required Bank forms and conducted seminars to train Bank personnel. Provide on-going environmental assessment and guidance for Bank ORE and loan applications.
- Investigation, contamination delineation and remediation of PCB contaminated soil at former electronics manufacturing site. Coordinated remediation with site reuse.
- Completion of RI/FS of commercial property in Dutchess County contaminated with PCB. Coordinated site closure activities, including communication with involved regulatory agencies.
  Integration of site remediation services at Former Major Oil Storage Facility (MOSF) with site redevelopment in Dutchess County, New York. Installation of groundwater remediation system concurrent with site construction activities.

Senior Hazardous Waste Specialist, U.S. Hydrogeologic, Inc., Poughkeepsie, New York 1986 to 1992

Supervisor for corporate hazardous and solid waste investigatory and remedial services. Major projects included:

- Coordination of subsurface investigations at a New York State Superfund site (former industrial facility); project manager in charge of site reclassification (delisted as of January, 1991).
- Coordination of petroleum storage tank management plan for Dutchess County (NY) Department of Public Works, including an assessment of regulatory compliance, product utilization and physical conditions of more than 100 tanks at over 20 facilities.
- Environmental compliance Audit of 42,000-square foot printing facility with specific remediations for solvent handling/disposal, inks storage and metal recovery processes.

Adjunct Professor, Dutchess (NY) Community College, Poughkeepsie, New York 1991 to 1992

Courses: Macroeconomics, Environmental Economics

Policy Intern, Southern Growth Policies Board, North Carolina 1985

Prepared several in-depth and short analyses of environmental and economic issues, with specific concern for their impact on Southern state policies. Analyses included: hazardous waste facility siting policies and environmental impacts of "high tech" industries on host communities.

Research Assistant, University of Oregon, Eugene, Oregon 1983

Analyzed (with Dr. John Baldwin, Chairman of the Department of Planning, Public Policy and Management, U. of Oregon) the "Oregon Riparian Tax Incentive Program". Designed survey, conducted interviews and analyzed data. Summary paper with programmatic recommendations, was presented at the Annual Conference of the National Association of Environmental Educators.

RELATED EXPERIENCE

Research Assistant, School of the Environment, Duke University, North Carolina 1986

Assisted in the design and evaluation of risk assessment models to estimate the impact of landfill leachate on human health. Monte Carlo simulation and pollutant transport models used in the analyses.

Research Assistant, USDA Forest Service, Duke University, North Carolina 1985

Collected economic data and assisted in statistical analyses for a study isolating research as a variable in timber production functions.

Research Assistant, School of the Environment, Duke University, North Carolina 1984

Preliminary research on the use of mathematical models by water resource administrators.

PRESENTATIONS

- "Environmental Risks in Lending" Training Session for Pawling Savings Bank employees, December 18 and 19, 1989; and July 1, 1993.
- "Identifying Environmental Concerns in Appraisals", Workshops for Lakewood Appraisal Corporation, October, and November, 1989 and April, 1990.
- "State and Local Groundwater Protection Strategies", Annual meeting of the New York State Association of Towns, February, 1990.

- "Environmental Audits on Orchards and Agricultural Properties", Resource Education Institute, Inc., Real Estate Site Assessment and Environmental Audits Conference, December 4, 1990.
- "Environmental Audits on Orchards and Agricultural Properties", National Water Well Association Annual Conference, July 29-31, 1991.
- "Principles of Environmental Economics for Ground Water Professionals", National Groundwater Association Outdoor Action Conference, May 27, 1993.
- "Impact of Environmental Liabilities on Real Estate Transactions", a NYS Department of Education approved course for licensed real estate professionals, March 1995; April 1995; May 1995; October 1995.
- "Brownfields Redevelopment in New York: A Discussion of Two Case Studies", New England Environmental Conference 1996, March, 1996.
- "Quantifying Environmental Liabilities", a NYS Department of Education approved course for licensed real estate professionals, March 1997.

ARTICLES

Ciminello, P. 1993. A Primer on Petroleum Bulk Storage Tanks and Petroleum Contamination of Property. ASHI Technical Journal Volume 3, No. 1

Ciminello, P. 1991. Environmental Audits on Orchard and Other Agricultural Properties. Proceedings of the National Water Well Association Annual Conference.

Ciminello, P. 1991. Property Managers Should Carefully Examine Current Fuel Storage Practices. NYS Real Estate Journal Vol. 3, No. 9

Ciminello, P. 1991. New DEC Regulations Affect Development of Agricultural Lands. NYS Real Estate Journal Vol. 3, No. 6

Ciminello, P., Hodges-Copple, J. 1986. Managing Toxic Risks From High Tech Manufacturing. Growth and Environmental Management Series (Southern Growth Policies Board)

Ciminello, P. 1986. State Assistance in Financing Water Treatment Facilities. Growth and Environmental Management Series (Southern Growth Policies Board)

Ciminello, P. 1985. Plants Amid Plantings: The Future Role of Environmental Factors in Business Climate Ratings. Southern Growth ALERT (Southern Growth Policies Board)

Ciminello, P. J. Baldwin, N. Duhnkrack. 1984. An Incentive Approach to Riparian Lands Conservation. Monographs in Environmental Education and Environmental Studies (North American Association of Environmental Educators)

PROFESSIONAL AFFILIATIONS

American Water Resources Association
National Groundwater Association
Hazardous Materials Control Research Institute
American Chemical Society

ADDITIONAL INFORMATION

Member, Dutchess County (NY) Youth Board (1987-1992); Chairman, 1992
Member, City of Poughkeepsie (NY) School Dist. Ad Hoc Committee on Teen Parents & Pregnancy Prevention (1991)
Member, City of Poughkeepsie School District Budget Advisory Committee (1994 to present)
Member, City of Poughkeepsie PTA and Middle School Building Level Team

JEFFERSON AKINS, P.E.

Project Engineer/Environmental Engineer

EDUCATION

Bachelors of Science, Civil Engineering 1987
Lafayette College, Easton, Pennsylvania

License No. NY69679

PROFESSIONAL EXPERIENCE

Mr. Akins began his professional career as a staff engineer for a consulting engineering firm in Riverside, New Jersey. There he worked on a variety of projects, including site and civil design, primarily in residential and commercial development, working with both state and federal agencies.

Mr. Akins then took a position as a Senior Engineer at an engineering firm in Dutchess County, New York. Employed there for eight years, his responsibilities were diverse, although his emphasis was in solid waste management. He designed closures for aging municipal facilities and new private landfills, using geosynthetics and geotechnical components. He performed field engineering, construction oversight, and contract management for the same. He has orchestrated waste quality monitoring programs, as well as worked as the Town and Planning Board engineer for several municipalities. In addition, Mr. Akins has a strong background in hydrologic and hydraulic design/modeling drainage and sanitary design experience.

SELECT PROJECT EXPERIENCE

Village of Irvington Waterfront Investigation/Design, Westchester County, NY (NYSDEC Brownfields Site)

Specified and supervised soil boring program preliminary to steel sheet bulkhead design in a marine environment. Integrated soil investigation with environmental health and safety aspects of non-hazardous brownfields conditions. Specified laboratory analysis of undisturbed and disturbed soil samples to qualify site conditions and provide design parameters for steel sheet bulkhead design. Designed steel sheet pile bulkhead.

Stanford Landfill, Town of Stanford, Dutchess County, NY

Design of geosynthetic and soil capping system for municipal sanitary landfill. Slope stability analysis of geosynthetic and soil components on steep grades. Specify soil parameters based on slope stability analysis. Developed detailed soil quality control and quality assurance program for borrow source and material qualification.

Beacon Waterfront Foundation Analysis, City of Beacon, Dutchess County, NY

Specified and supervised Ground Penetrating Radar and soil boring program for design of foundations for low-rise commercial structures. Specified laboratory analysis of collected soil samples for design parameter quantification. Designed shallow and deep foundation systems for low-rise buildings.

Municipal Landfill Closure with Clay Capping System, Town of Gardiner, Ulster County, NY

Design and construction management of sanitary landfill closure using low permeability (clay) soil capping system. Facilitated cost-effective search for local borrow source of adequate quality, low permeability soils. Designed and instituted exceptionally detailed quality assurance/quality control testing program involving quantification of moisture-density-permeability relationships for soils of variable nature. Modified field handling, placement, and compaction methods to achieve state mandated permeability requirements for constructed soil capping system. Engineered drainage and slope stability design involving extreme conditions (3H: 1V grades for 100-foot vertical drop slope) for ensured long service life of capping system.

Town Engineer, Town of Clinton, Dutchess County, NY

Responsible for roadway re-design and intersection realignment as part of the Town's highway improvement program. Full depth replacement of Town roadway with plan preparation, bid document preparation, contract management, and inspection.

NYSTA Stewart International Airport Access Connection, Orange County, NY

Designed the stormwater management systems for the connection to the New York State Thruway Authority (I-84). Hydrologic and hydraulic modeling and design for various sized closed drainage systems, as well as routing and analysis of an on-site dam. TR-55, TR-20, and HEC-1/2 methodologies employed for hydrologic/hydraulic design.

Paraco Gas Corporation, Highway Permit and Site Plan, Dutchess County

Negotiated a special highway permit for an LPG storage and distribution facility. Project management responsibilities included highway and entrance design. NYSDOT interface on non-standard issues and Site Plan preparation. Mr. Akins met with the client and the approving agency to compromise a solution for the entrance permit.

NYSDOT Route 94 Rehabilitation, New Windsor, Orange County

Subconsultant for highway realignment in heavily congested section of Orange County. Responsible for utility location/relocation, stormwater management analysis and design, Maintenance and Protection of Traffic (MPT), and interface with all involved parties.

Taconic Farms, Germantown, Columbia County, NY

Designed foundation system for light industrial agri-business operations in variable soil conditions

Floodplain Application, Otisville Correctional Facility WWTP, Ulster County, NY

Designed bank stabilization for scour protection and erosion control aspects of expanded wastewater treatment plant facility located within flood plain.

Municipal (East Fishkill) Water Storage Facility, Dutchess County, NY

Specified and supervised soil boring program to determine depth to groundwater, bedrock, and soil profiles for proposed 200,000-gallon standpipe. Ring foundation design integrated with standpipe manufacturer's requirements.

Rehabilitation of Dam Structure, Salt Point Mill Dam, Dutchess County, NY

Inspection, dam stability, analysis, and design of constructed improvements for 200-year-old historic laid-up stone mill dam. Rehabilitative measures employed included spillway diversion grouting program for repair of existing stone structure and prevention of through-structure seepage, as well as installation of 100-foot long, cast-in-place crest.

CATHERINE L. MONIAN

ENVIRONMENTAL SITE ASSESSMENT COORDINATOR, PROJECT MANAGER

EDUCATION

Bachelor of Arts, Biology, with departmental honors, May 1991
Vassar College, Poughkeepsie, New York

CERTIFICATIONS AND TRAINING

OSHA Hazardous Waste Site Operations and Emergency Response Training consistent with the requirements of 29 CFR 1910.120 (e)

PROFESSIONAL EXPERIENCE

Environmental Site Assessments Coordinator, Ecosystems Strategies, Inc., Poughkeepsie, NY 1997 - present

Coordinator for all corporate environmental site assessments conducted at Ecosystems Strategies, Inc. Responsibilities include the delegation of specific project tasks, the daily coordination of project scheduling, and the review of assessments to maintain document quality control and to ensure that all reports are prepared in accordance with applicable guidelines in a timely manner.

Project Manager - Phase II, SEQR, and Remediation Projects, Ecosystems Strategies, Inc., 1994 - present

Project Manager for SEQR work, Phase II environmental investigations, and remediation projects. Responsibilities include the coordination and implementation of investigative and remedial activities on hazardous waste and regulated waste contaminated sites. Major projects have included:

- Phase I environmental assessment and Phase II investigation of former gasoline station located in Brooklyn, New York. Identified potential areas of petroleum contamination through review of historic records and delineated subsurface soil and groundwater contamination through subsurface exploration, the extension of borings and the installation of groundwater monitoring wells. Interpreted laboratory analyses and assessed options for site remediation.

- City of New York Environmental Quality Review Environmental Assessment Statement for city-owned, 300,000 square foot property located in lower Manhattan. Generated worst-case development scenario to determine potential impacts to resources.

- Remediation of former metal processing facility. Identified areas requiring remediation, and coordinated the removal of chemical (acids) bulk storage tanks and piping networks, the disposal of accumulated wastewater, and the closure of waste neutralization pits. Work was conducted in conjunction with site re-development.

- Provision of SEQR assistance to a private developer for conversion of 500,000 square foot warehouse to retail space in Yonkers, New York. Conducted SEQR-supporting technical assessments in water and air quality, asbestos and noise, prepared relevant sections of the DEIS, and provided assistance in general planning and zoning issues.

- Preparation of NYSHFA SEQR Environmental Assessment Form for the renovation of 410,000 square feet of residential apartment units and the construction of additional buildings in Suffolk County, New York. Conducted technical assessment services required by the Lead Agency to make a Determination of Significance.

- Phase I environmental assessment and subsequent Phase II investigation of 1,400-acre undeveloped forest area. Identified historic areas of debris deposition through review of aerial photographs and oversaw subsurface evaluation of an illegal dump area for potential impacts.

Project Manager - Environmental Site Assessments, Ecosystems Strategies, Inc., Poughkeepsie, NY 1992 - present

Project Manager for corporate Phase I environmental assessments and services which provide information on a designated area's environmental status. Responsibilities include the coordination and preparation of assessments and the analysis of facility protocols for compliance with applicable regulations. Major projects have included:

- Phase I environmental assessment for an 85-acre industrial/manufacturing area in Westchester County. Assessment was prepared for urban renewal project. Included in the area assessed were a low-level radioactive waste disposal facility, multiple petroleum bulk storage facilities, multiple junkyards, a recycling and wood chipping facility, a large industrial plant, and a propane storage and distribution facility.
- Phase I environmental assessment for a 1,200,000 square foot medical campus. Work performed included a comprehensive review of medical, hazardous, and solid waste storage and disposal practices for compliance with applicable local, state, and federal regulations.
- Spill Prevention, Control and Countermeasures Plans and Installation Spill Contingency Plans for four Army National Guard facilities. Work included assessments of each facility's total petroleum bulk storage and hazardous materials inventories and determination of compliance with respect to applicable state and federal regulations. Provided guidance on necessary modifications and provided protocols for petroleum and hazardous materials management and spill response procedures.

Research Technician, Vassar College, Poughkeepsie, New York 1991-1993

Investigated the effects of estrogen and anti-estrogens on food intake and body weight gain in rats, and the expression of *c-fos* in rat hypothalamus. Responsibilities included animal surgery, designing and conducting immunocytochemical and cytosol binding assays, histological procedures as well as managing daily laboratory operations.

Pew Fellow, MDI Biological Laboratory, Salsbury Cove, Maine 1991

Investigated the role of catechol oxidase in the formation of skate egg capsules and helped develop an affinity chromatography system for proteolytic enzymes. Techniques performed included SDS and activity gel electrophoresis, spectrophotometric enzyme and protein assay, gel filtration, affinity chromatography, preparation of cell lysates, and handling of marine organisms.

PUBLICATIONS AND ABSTRACTS

Straus, J.W., Monian, C.L., and Cox, D.L. (1993) Nidamental gland catechol oxidase in the little skate (*Raja erinacea*): latency caused by an endogenous low molecular weight factor. *Comp. Biochem. Physio.* **105B**, 117-122.

Straus, J.W., Monian, C.L. and Cox, D.L. (1992) Catechol oxidase latency in nidamental gland extracts from the little skate (*Raja erinacea*). *Bull. Mt Desert Island Biol. Lab.* **31**, 24-26.

Gray, J., Monian, C., Seaman, R., Bogdany, J., and Bialy, T. (1993) Calmodulin antagonists: Effects on anti-estrogen binding in brain, food intake, and body weight. *Society for Neuroscience Annual Meeting, Washington, D.C.*

Monian, C.L. and Mayne, J. (1990) Partial characterization of two MDCK cell mutants that are defective in VSV G-protein maturation. *Undergraduate Research Summer Institute, Vassar College, Poughkeepsie, New York.*

INTERESTS

Member of American Association of University Women (AAUW) (1994-present)
Program Co-Chair for Poughkeepsie Branch of AAUW (1995-1999)
Member of AAUW Manderley Literary Society (1994-present)
Mentor for High School Student Participating in Eleanor Roosevelt Center at Valkill's Leadership Program (1997)

Ecosystems Strategies, Inc. *Environmental Services and Solutions*

KATHERINE J. BEINKAFNER, PH.D., CPG

SENIOR HYDROGEOLOGIST

EDUCATION

Bachelor of Arts (Geology), Master of Arts (Geology) 1961-1965
S.U.N.Y. at New Paltz, New Paltz, New York

Geophysics, 1965-1966
Rensselaer Polytechnic Institute, Troy, New York

Master of Science (Physics), 1968-1969
University of Pennsylvania, Philadelphia, Pennsylvania

Ph.D. (Geology), 1977-1980
Syracuse University, Syracuse, New York

CERTIFICATIONS AND TRAINING

Petroleum Geologist Number 2683 by American Association of Petroleum Geologists
Professional Geological Scientist Number 6611 by American Institute of Professional Geologists

Environmental Regulatory Compliance, HazMat
QA, Senior Review, Expert Testimony
Surface and Borehole Geophysics
Groundwater, Hydrology, and Wetland Studies
Computer Modeling of Groundwater Systems
Risk Assessment of Subsurface Contaminants

PROFESSIONAL EXPERIENCE

Sr. Hydrogeologist, Ecosystems Strategies, Inc.,Poughkeepsie, New York	1994-present
Sr. Hydrogeologist, EA Engineering, Newburgh, New York	1991-1993
Sr. Hydrogeologist, Dames & Moore, Pearl River, New York	1989-1991
Adjunct Professor, Rutgers, The State University of New Jersey, Newark, Newark, New Jersey	Fall 1987
Senior Consulting Hydrogeologist, Milton Chazen Engineering Assoc., Poughkeepsie, NY	1986-1987
Senior Reservoir Geologist, Lawrence-Allison West, Casper, Wyoming	1984-1986
Dipmeter Consultant, Terrasciences, Inc., Lakewood, Colorado	1985
Senior Development Geologist, Sohio Petroleum Company, San Francisco, California	1980-1984
Summer Geologist, ARCO Oil and Gas Company, Midland, Texas	1979
Consulting Petroleum Geologist, Kirby Exploration Co., Houston, Texas	1979
Adjunct Teaching Geologist, College of St. Rose, Albany, New York	1975
Scientist (Oil & Gas Geology), Geological Survey, New York State Museum & Science Service State Education Dept., Albany, New York	1972-1979
Junior Scientist (Oil & Gas Geology), Geological Survey, New York State Museum & Science Service State Education Dept., Albany, New York	1969-1972
Physics Teacher, Franklin D. Roosevelt High School	1966-1968

SELECTED PROJECT EXPERIENCE

LANDFILLS

- Youmans Flats Landfill, Bear Mountain State Park: Conducted hydrogeological investigation and prepared Closure Investigation Report. Field work involved installation of monitoring wells, aquifer testing, explosive gas survey, gas vent sampling, vector investigation, and sampling of monitoring wells, leachate seeps, and surface waters.

- Prepared maps and cross sections showing groundwater quality contravening New York State Groundwater standards.

- Hydrogeologic Investigations for Town of New Paltz and Lumberland Landfills: Conducted similar investigations for compliance with Part 360 regulations.

- Town of New Windsor Landfill: Based on hydrogeologic data, prepared load calculations for leachate collection system for Part 360 closure of landfill with hazardous waste.

HAZARDOUS WASTE

- Senior review for Remedial Investigation of a chemical plant (Superfund Site) in Skaneatales Falls, New York. Hydrogeologic setting is carbonate bedrock with contaminants migrating offsite from a chemical waste landfill. Designed and reviewed seismic refraction survey to define buried valleys in bedrock surface. Researched literature for Feasibility Study and alternate remedial actions.

- Several NYS Superfund Sites including IBM, East Fishkill; Fair Rite Products, Wallkill; and InterCeram/Ceramix near Middletown: Supervising Field Geologist, drilling and installation of 40 monitoring wells at a manufacturing plant with volatile organics in the overburden and bedrock, C and D levels of protection. Aquifer testing and analysis.

- Preparation of Remedial Investigation Reports.

PETROLEUM SPILLS

- Expert witness, preparation of testimony for lawsuits involving oil spills and groundwater contamination, remediation of Superfund sites, and environmental reviews for construction projects.

- Senior review of remedial design of a combination air sparging and vacuum extraction system for removal of hydrocarbon contaminants at a large petroleum terminal in Brooklyn. Site is a demonstration project for EPA.

- For one gas station in a cluster of stations in proximity to MTBE contamination of public water supply wells in Liberty, NY; conducted hydrogeologic investigation and prepared testimony for public hearings and potential legal proceedings.

RADIOACTIVE WASTE

- West Valley Demonstration Project, DOE & NYS Radioactive Waste Storage Facilities: Sr. Project Geologist, development of groundwater monitoring plan for ten solid waste management units and three water-bearing stratigraphic units for RCRA and DOE compliance. Also preparation of bid specification documents for monitoring well installation.

- For Martinsville, Illinois Proposed Site: Task Manager, preparation of site characterization chapters of license application for Low Level Radioactive Waste Disposal Facility encompassing topics of geomorphology, stratigraphy, structural geology, seismicity, groundwater, hydrology, and geotechnical evaluation.

COMPUTER MAPPING & GROUNDWATER FLOW MODELS

- Groundwater modeler, development of computer model of three dimensional groundwater flow system at Sharkey Landfill, New Jersey, a Superfund Site, for remedial design.

- Task Manager, groundwater modeling of radionuclide transport in support of pathway analysis and dose calculations for a Low Level Radioactive Waste Disposal Facility, proposed Martinsville, Illinois site.

- IBM, East Fishkill: Project Manager, aquifer characterization and contaminant flow at a Research and Facility involving collection and compilation of stratigraphic, structural geology, water level, and water quality data (from borings, monitoring wells, supply wells, outcrops, and water samples) using dBASE 3. software to allow input of database into AutoCAD for mapping, cross sections, and flow model development. Interpretation of flow systems in imbricate thrust sheets with fracture zones and incorporation into a 3-D model of contaminant flow.

- Naval Petroleum Reserve #3 (Teapot Dome) Wyoming: Development of 3-D numerical computer models for petroleum production in sandstone and fractured reservoirs.

- Integrated geophysical well log analysis and mapping packages with custom software to generate data arrays for porosity, permeability, net pay, geologic structures, fluids, and phases. Taught in-house courses in use of computer programs for interpretation and analysis of geophysical borehole logs and three dimensional mapping of petroleum-trapping geologic structures.

- New York State Geological Survey, Staff Geologist: Responsible for petroleum exploration well data. Conducted subsurface stratigraphic studies using well logs and computer mapping.

TEACHING

- Adjunct Professor, taught groundwater hydrology course at Rutgers University at Newark, for undergraduate and graduate students.

- Naval Petroleum Reserve #3: Taught in-house courses in use of computer programs for interpretation and analysis of geophysical borehole logs and three dimensional mapping of petroleum-trapping geologic structures.
- Development of geologic software for computer processing and graphic interpretation of dipmeter well logs for exploratory wells. Training course development and presentation to groups of petroleum engineers and geologists (one and two week classes). Dipmeter allows the interpretation of three dimensional structures by extrapolating changes in bedding orientation detected in microresistivity logging of boreholes.

- At EA Engineering, senior hydrogeologist in Waste Management Division. Taught in-house courses in slug testing, use of simple computer flow models, sampling at hazardous waste sites.
- Conducted seminars on landfill siting and closure requirements for local governments.

WATER RESOURCE DEVELOPMENT

- Town of Wallkill: Senior review for geophysical investigation of potential municipal water supply along the Wallkill River in Orange County, NY. Supervised field installation, pump testing, and sampling of 12 inch diameter wells. Provided senior review for final report recommending usage of a one million gallon per day well with backup well.
- Field supervision, testing, reporting, quality assurance review for numerous water supply projects in Ulster, Dutchess, and Orange County. Familiar with several computer programs and analog techniques for aquifer analysis of pumping tests in confined and unconfined aquifers.

BOREHOLE GEOPHYSICS

- For two PCB contaminated sites at Fort Edward and Hudson Falls, NY: Dr. Beinkafner provided borehole geophysics logging services in monitoring wells and production wells.
- Log interpretation indicated the presence of several imbricate thrust sheets and hydraulic conductive fracture zones.

PUBLICATIONS AND ABSTRACTS

Beinkafner, K. J. (1984) Decollement Tectonics of the Allegheny Plateau in Southern New York State: Geol. Soc. Amer. Abstr. Programs, v. 16, no. 1, p. 2.

Beinkafner, K. J. (1984) Computer Processing of Dipmeter Log Data: Enhancement of a Subsurface Exploration Tool: Proceedings of the 27th International Geological Congress, Moscow, USSR, August 1984.

Beinkafner, K. J. (1984) Mapping of Seismic Reflectors in Southern New York: Compensation for Velocity Anomalies in Glacial Overburden: Amer. Assn. of Petrol. Geol. Bull., v. 68

Beinkafner, K. J. (1983) Tracing the Sole of a Thrust through Thick and Thin of the Salina Group (Upper Silurian): Decollement Tectonics of the Southern Tier: New York: Amer. Assn. Petrol. Geol. Bull., v. 67, p. 1452.

Beinkafner, K. J. (1983) Deformation of the Silurian and Devonian Rocks of the Southern Tier, New York State: Syracuse University unpublished Ph.D. dissertation, 333 pages, 12 plates.

Beinkafner, K. J. (1983) Terminal Expression of Decollement in Chautauqua County, New York: Northeastern Geology, v. 4, no. 3, p. 1-12.

Beinkafner, K. J. (1983) Southern Tier, New York: Compendium of Subsurface Geology: edition, privately published and distributed, 350 pages, 12 plates, 30 tables, 127 figures.

Beinkafner, K. J. (1982) Structural Revelations from Seismic Interpretations, Southern Tier, New York: Amer. Assn. Petrol. Geol. Bull., v. 66, p. 1164-1165.

Beinkafner, K. J. (1981) Quantitative Analyses of the Herkimer Formation (Upper Silurian) in the Subsurface of Central New York State: New York State Museum and Science Service Bulletin 437, 31

Beinkafner, K. J. (1980) Quantitative Biostratigraphy of the Trenton Group (Middle Ordovician) using Conodont Occurrences in New York, Ontario, and Quebec: Proceedings of the Second Northeastern Women's Geoscientist Conference, St. Lawrence University, Canton, NY, p. 10-31.

Beinkafner, K. J. (1975) Statistical Probability of Finding Gas-Bearing Reefs in the Onondaga Formation Edgecliff Member in New York State: Amer. Assn. Petrol. Geol. Bull., v. 59, no. 5, p. 1734.

Connola, D. P. and Beinkafner, K. J. (1976) Large Outdoor Cage Tests with Eastern White Pine being Tested in Field Plots for White Pine Weevil Resistance: 23rd Northeastern Forest Tree Improvement Conference, Rutgers University, New Brunswick, New Jersey, p. 56-64.

Kreidler, W. L., Van Tyne, A. M., and Jorgensen, K. M. (1972) Deep Wells in New York State: New York State Museum and Science Service Bulletin 418A, 335 p., 3 plates.

Van Tyne, A. M., Beinkafner, K. J. and Knapp, S. M. (1980) Deep Wells of New York State: New York State Museum and Science Service Bulletin 418B, 237 p., 3 plates.

PROFESSIONAL AFFILIATIONS

American Association of Petroleum Geologists
American Institute of Professional Geologists
Association for Women Geoscientists
Computer Oriented Geological Society
Geological Society of America
International Association for Mathematical Geology
National Water Well Association
Society of Economic Paleontologists and Mineralogists
Society of Professional Well Log Analysts

PROFESSIONAL HONORS

Fellow of Geological Society of America

JERALD A. KAPLAN

PROJECT MANAGER

EDUCATION

Bachelor of Science: Environmental Science, December 1994
Southampton College of Long Island University, Long Island

CERTIFICATIONS AND TRAINING

OSHA Hazardous Waste Site Operations and Emergency Response Training consistent with the requirements of 29 CFR 1910.120 (e)
Control of Hazardous Energy (lock out-tag out)
Electrical Safety Related Work Practices

PROFESSIONAL EXPERIENCE

Project Manager, Environmental Remediation Services, Ecosystems Strategies, Inc., Poughkeepsie, N.Y. 1998 - present

Project Manager for Phase II technical environmental investigations and remedial projects. Responsibilities include managing petroleum tank removals, coordinating Phase II investigative and remediation procedures, preparing technical reports, assisting with the design and overseeing the installation of remedial systems, and collection of material, soil, and water samples.

Field Technician, Ecosystems Strategies, Inc. 1997

Prepared environmental site assessments and other technical investigations to provide information on a designated area's environmental status. Responsibilities included preparing site assessments; drafting technical reports; screening state, federal and local databases; and conducting qualitative and quantitative analyses for State Environmental Quality Review Environmental Impact Statement investigations.

Industrial Technician , CDI Corp. under contract with IBM, East Fishkill, N.Y. 1996

Fluoride and heavy metal treatment plant operation. Effectively identified and handled hazardous materials. Maintained equipment used in hazardous waste treatment. Responsibilities also included maintenance and repair of Applikon analysis monitors. Operated, calibrated and troubleshoot monitoring instruments. Troubleshooted and repaired fluid transfer systems: pumps, motors. Organized and maintained records for equipment and treatment data. Maintained inventory of repair supplies, and chemical reagents.

Crew Manager/Company Representative, Hampton Shore Construction, Inc., Southampton, N.Y. 1993 -1995

Responsible for most phases of construction, and maintenance

COURSE WORK

Hydrology, Environmental Chemistry, Resource Management, Physical Geology, Organic Chemistry, Environmental Impact Assessment, Statistics, Calculus, Scientific & Technical Writing

RELATED SKILLS

- Skilled with chemistry and biology lab techniques and equipment
- Troubleshooting and repair of mechanical and electrical systems
- Proficient with computer operation and troubleshooting
- Skilled with arc, mig, soldering, and brazing weld techniques
- Computer: MS Windows 95, Microsoft Office, Word Perfect 6.1, Internet, Flow Net and PRZM, Lotus 1-2-3

Attachment E

Health & Safety Plan

To Be Submitted

Attachment F

Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN

(Non-intrusive Activities)

Real-time air monitoring for volatile compounds and particulate levels at the perimeter of the work area is necessary. The plan must include the following:

- Volatile organic compounds must be monitored at the downwind perimeter of the work area on a continuous basis. If total organic vapor levels exceed 5 ppm above background, work activities must be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. All readings must be recorded and be available for State (DEC and DOH) personnel to review.

- Particulates should be continuously monitored upwind, downwind, and within the work area at temporary particulate monitoring stations. If the downwind particulate level is 150 $\mu g/m^3$ greater than the upwind particulate level, then dust suppression techniques must be employed. All readings must be recorded and be available for State (DEC and DOH) personnel to review.

Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities will be halted and monitoring continued. If the vapor level decreases below 5 ppm above background, work activities can resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided:

- the organic vapor level 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

- more frequent intervals of monitoring, as directed by the Safety Officer, are conducted.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shut down. When work shutdown occurs, downwind air monitoring, as directed by the Safety Officer, will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

Major Vapor Emission

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted.

If, following the cessation of the work activities or as a result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone).

If efforts to abate the emission source are unsuccessful and if the following levels persist for more than 30 minutes in the 20-foot zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect:

- if organic vapor levels are approaching 5 ppm above background.

However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background.

Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts, as listed in the Health and Safety Plan of the Work Plan, will go into effect.
2. The local police authorities will immediately be contacted by the Safety Officer and advised of the situation.
3. Frequent air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer.

Attachment G

Quality Assurance Project Plan

To Be Submitted

Attachment H

Engineering Evaluation

APPENDIX H

ENGINEERING EVALUATION

for the

SITE CLOSURE ACTIVITIES

on the property located at

104 ASHBURTON AVENUE
CITY OF YONKERS
WESTCHESTER COUNTY, NEW YORK

prepared by

DEWKETT ENGINEERING, P.C.
187 EAST MARKET STREET
RHINEBECK, NEW YORK 12572-1727
(914/845) 876-5250

dated August 8, 2000
rev. October 4, 2000

TABLE OF CONTENTS

FIGURES

1.0 Introduction:

This Engineering Evaluation is provided for the subject parcel as part of the voluntary clean-up agreement proposed to New York State as defined in the June 2000 Work Plan prepared by Ecosystems Strategies Inc. (ESI). This report identifies the contamination present at the 104 Ashburton Avenue site and demonstrates the remedy proposed for the agreement. The remedy is critiqued according to 6 NYCRR Part 375-1.10(c) factors, these being elaborated upon in Section 4.0 of this evaluation.

1.1 Site History:

A review of historical information indicates that the 104 Ashburton Avenue property was once part of a larger gas manufacturing facility. Creosote is a common by-product of the gas manufacturing process. Historical information noted in the draft Work Plan indicated buildings and storage tanks associated with the gas manufacturing process as having existed on the property between 1917 and 1942 (actual manufacturing is noted on the map as having occurred on a nearby property to the east of the Metro-North right-of-way). Mapping from 1942 showed that only a few small structures to remain on the site and from 1951 to 1989, only one small shed is to have existed on-site. A Metro-North substation was reportedly constructed along the eastern side of the property during the 1987-8 calendar years. From this information, it appears that the present contamination may have been a result of industrial and/or commercial operations that occurred on-site more than fifty years ago during the gas manufacturing site use.

2.0 Proposed Future Site Re-use:

This site is proposed for re-use as a bakery with on-site parking and associated commercial amenities. The bakery is to be a one (1) story structure with a partial mezzanine level installed on a pile and cap foundation system to be located at the northwestern portion of the site. A preliminary site plan having been provided within Attachment A of the proposed Work Plan.

The parcel is located within a section of the City of Yonkers that is zoned for commercial and industrial development. This section of the City of Yonkers has centralized utilities inclusive of; potable water service, sanitary sewer and electric.

As part of the re-use of the site, the contamination shall be managed in the following manner during and after construction of the proposed bakery. After establishing a Health and Safety Plan (HASP) and designating a Site Health and

Safety Officer, the environmental protocols shall be reviewed with the subcontractors prior to initiation of any work on the site. A Quality Assurance Project Plan (QAPP) will be generated for this specific site which defines the laboratory and field analytical procedures used to confirm the presence or absence of contaminants in the construction or post-construction work environments. An ELAP certified laboratory shall be appointed for the laboratory analytical work. Table 1 of section 2.3 of the Work Plan defines the types and frequency of testing to be conducted.

A brief review the work proposed for the site, described in more detail within the Work Plan, is as follows:

- Excavation and relocation of contaminated soil in the vicinity of the proposed building foundation and utility trenches unless significant levels of contamination warrants removal. Note that the proposed pile and cap foundation shall greatly limit the amount of contaminated soils requiring management as compared to a in-ground mat or spread foot foundation system.
- Implement a Community Air Monitoring Plan.
- Install and operate the groundwater product recovery system.
- Grading of the subgrade soils and installation of a geomembrane barrier system (inclusive of subgrade drainage system) across surfaces not receiving asphaltic or cementious concrete surfaces, inclusive of the building footprint.
- Installation of a vapor barrier system under the foot print of the proposed building.
- Implement a post-construction indoor/outdoor air sampling.
- Implement a groundwater monitoring program.
- Document site remediation services and provide analytical reporting as appropriate.

2.1 Subsurface Environment:

Numerous borings were conducted throughout the site to profile the subgrade soil conditions as well as to identify the horizontal and vertical extent of the contamination present. Boring logs are included in Appendix I of the Work Plan. The borings indicated that the subgrade soils generally consist of gravelly sands and silty sands extending from the surface to a depth of thirteen to seventeen (13-17) feet below grade. A lens of highly organic silt and peat was encountered at depths of between sixteen (16) and eighteen (18) feet in various borings. A second sandy alluvium was encountered below the organic silt/peat lens that extended to depths of approximately twenty-three (23) feet below grade. An organic silt with traces of clay was encountered below this second sandy deposit with this silty-clay continuing to where borings were terminated.

3.0 Proposed Environmental Remediation:

As described within the Work Plan, creosote and weathered petroleum products were discovered during the soil sampling conducted on September 27 and 28, 1999 by Ecosystems Strategies (ESI). The levels of VOCs and PAHs exceeded the NYSDEC guidance values thus necessitating remediation as part of the proposed site re-use. Further soil investigations conducted on April 26, 2000 noted the contamination to be horizontally located in the vicinity of boring B-1 located in the northeastern quadrant (termed Area #1 within the Work Plan) of the parcel. Borings and soil sampling conducted throughout the site indicated the contamination to be vertically contained by the lowermost organic silty-clay. The depth to groundwater is relatively shallow throughout the site and was found to be minimally influenced by tidal affects from the Hudson River. A northeast to southwest gradient to the groundwater, in the direction of the Hudson River located approximately four hundred and eighty (480) feet from the site, was determined through the investigations of ESI and others.

Light non-aqueous phase liquid (LNAPL) was encountered in the northeastern quadrant of the site but did not appear to have migrated beyond this northeastern area of the parcel. Water and soil sampling conducted along the southern and western site boundaries did not indicate that this free product had migrated off-site. Similarly, the dense non-aqueous phase liquid (DNAPL) contamination was found exclusively in the same northeastern quadrant of the parcel and was not noted to have migrated off-site.

The Work Plan proposes to employ a Groundwater Product Recovery System to remove the noted contaminants as described in section 2.3.3 of the Work Plan. This approach will employ two (2) product recovery systems installed in the vicinity of boring B-1 to remove the LNAPL and DNAPL contamination.

A four inch (4") diameter shallow recovery well (designated EMW-2R) has been installed to collect the LNAPL from the surface of the water table via a pump and sensor system. The pump within EMW-2R will be operated to skim off the free product from the water table using a system equivalent to the Magnum Spill Buster system manufactured by Clean Earth Technologies. Collected groundwater will be transferred to a holding tank for later separation from free water after which time the LNAPL will be containerized and removed from the site by a licensed waste hauler. The free water left behind after removal of the LNAPL shall be treated and discharged into the City of Yonkers sanitary sewer system for treatment as non-hazardous waste pending approval by the NYSDEC and the Westchester County Environmental Facilities Corporation.

A "funnel and gate" system will be employed to recover the DNAPL in the vicinity of boring B-1 immediately east of the proposed building. Approximately seventy-five linear feet (75') of tight steel sheeting will be installed immediately west and south of the deep recovery well EMW-3. In plan view, the tight sheeting will be installed in an open "L" configuration such that a fifty foot (50') section of sheeting running roughly north-south and a twenty-five foot (25') wing of sheeting running generally east-southeast will create an approximate one hundred and fifty (150) degree angle. This angle or elbow will open to the northeast facing into the groundwater flow. The sheeting shall be installed to approximately twenty-eight feet (28') below grade such that it penetrates the organic silty-clay layer by several feet. The top of the installed sheeting will be cut approximately three feet (3') below grade such that upper regime of the groundwater flow is not affected.

Refer to the Remediation Improvements Plan attached to this Evaluation for locations of the proposed product recovery systems within the subject property and in relation to the proposed building.

The deep recovery well (EMW-3) will be installed approximately three (3) feet east of the angled elbow of the tight steel sheeting. EMW-3 shall be a thirty foot (30') deep, twenty-four inch (24") diameter well. This well shall be screened from ten (10) to twenty-five (25) feet below grade with 0.100 inch slots to maximize the capture zone for the DNAPL recovery within the sandy soil lens located above the silty-clay layer. A five foot (5') section of solid wall pipe and end cap shall be installed below the screened section to function as a sump for collection of the DNAPL. The terminus of the deep recovery well will be installed through the second gravelly sand layer such that the sump created by the solid wall pipe section is installed within the organic silty-clay layer. The large screen section within the sandy soils and the depressed sump location will act to collect the DNAPL via gravity flow in thicknesses adequate for pumping operations. A three inch (3") diameter solid wall pipe shall be installed from the finished grade (inside a manway access) to within one inch (1") from the bottom of the sump of the 24" diameter recovery well. This three inch solid wall pipe shall allow a vacuum truck to make connection and evacuate the collected DNAPL within the sump.

A product thickness gauge/sensor shall be used to monitor the level of DNAPL accumulating within the deep recovery well sump. Monitoring of the recovery well shall be on a daily basis for the first week after installation and then weekly for the subsequent month. A vacuum truck shall be used on an as-needed basis depending on the results of the sump monitoring. Recovered DNAPL will be containerized and removed from the site periodically by a certified waste hauler. Appropriate adjustments to the frequency of product recovery and modifications to the monitoring program will be affected according to the actual field conditions noted through the monitoring program.

The LNAPL product recovery system will be operated until approximately 0.1

inches of product is found in the shallow recovery well. The DNAPL product recovery will be continued until a practical, stabilized recovery level of less than one inch is noted in the deep recovery well sump. Existing monitoring wells MP I-2 and MP I-5A downgradient of the recovery wells will be used to monitor the performance of product removal and to confirm that contaminants are not migrating west or south, past the sheeting and recovery wells.

The sequence of this installation shall begin with the sheet pile which is to be installed parallel to and three feet (3') due east from the easternmost wall of the proposed building, less the angled portion of the sheeting south of this parallel section. Once the sheet piling has been completely installed, then the twenty-four inch (24") deep recovery well (EMW-3) will be installed. As noted previously, the existing well EMW-2R shall be used for the LNAPL recovery and EMW-1 shall not be employed for product recovery.

During re-use construction, any contaminated soils excavated as part of utility or foundation system installations will remain on site. As mentioned previously, a geomembrane barrier system will be installed across all portions of the site not covered by asphaltic and/or cementious concrete pavements to preclude exposure to the contaminants. This vertical isolation during the product recovery will ensure that the local environment is protected during the remedial operations.

4.0 Evaluation of Environmental Remediation:

Factors listed in 6 NYCRR Part 375-1.10(c) are used qualify the remedial measures proposed. The proposed remedy addresses the factors noted in 375-1.10 (c) as discussed below :

4.1 Protection of Human Health and the Environment:

Does the proposed remedy achieve each of the remedial action objectives? The groundwater product recovery system will remove the light and dense non-aqueous phase liquids associated with the contamination to the degree defined in the Work Plan. The contamination is relatively localized, considering the time that the site has sat abandoned and the lack on contaminant migration, so the one shallow and one deep recovery well should prove sufficient to recover the LNAPL and DNAPL products from the soil-groundwater matrix.

Identify any special issues regarding protection of human health and the environment not addressed above. In addition to the groundwater product recovery system, the site shall be capped with an impervious barrier system. All areas not covered by the proposed building or paved (cementious or asphaltic concrete) surfaces shall be covered with a geomembrane liner system. A forty (40) mil very low density polyethylene (VLDPE) or a sixty (60) mil high density polyethylene (HDPE) liner shall be installed under the subgrade, graded to drain to a subsurface drainage system such that a significant hydraulic head does not occur above the liner system. The geomembrane will preclude any contact with the contaminants or contaminated subgrade soils.

The proposed bakery building shall use a pile and cap foundation system thereby greatly limiting excavation and exposure to contaminated soils. The interstitial space under the building shall be vented to atmosphere using a mechanical system to prevent the possibility of vapors being inducted into spaces frequented by workers within the building. In addition to the mechanical venting system, a vapor barrier shall be employed along the underside of the concrete foundation which, aside from preventing moisture migration through the floor of the building, will prohibit vapors being inducted into the bakery. All excavations performed during the site development (i.e. - foundation construction, utility trenching, etc.) shall be monitored using a photo ionization detector (PID) in order to note the presence of any vaporous volatile organic compounds. Action levels and contingency measures will have been defined within the HASP.

This section of Yonkers is served by public water supply therefore exposure to groundwater contact for the areas of concern is effectively precluded. Central sanitary services are also provided by the municipality therefore any exposure to subgrade contamination is greatly reduced if not wholly improbable.

4.2 Standards, Criteria & Guidance:

List all of the major SCGs for the site. Site investigations to date have determined creosote, its derivatives and weathered fuel oils to be the primary contaminants of the site. Action levels for these light non-aqueous phase liquids (LNAPLs) and dense non-aqueous phase liquids (DNAPLs) discovered during the site investigation are defined Attachment B of the Work Plan.

The proposed groundwater product recovery system will result in recovery of the chemical contaminants noted to the thresholds described within the draft Work Plan. Capping the site and instituting a groundwater monitoring plan will address groundwater contamination by noting the absence of any increase in contaminants over time.

4.3 Short-term Effectiveness and Impacts:

Identify risks to the community, workers and the environment that would result from the carrying out of the proposed remedy. How will these risks be controlled? How reliable/effective are the controls? The groundwater product recovery system by its simplified construction and operational guidelines greatly limits the exposure of workers during remediation as well as to the community at large during its operation. The limited soil excavations proposed for the site and the lack of intensive material handling associated with the recovery system severely limits exposure to humans and the ecological environment by soil, water or air. Polyethylene encapsulation, along the placement surfaces and across all temporary stockpiles, will limit fugitive dust conditions. This form of contaminated soil management is quite common to the industry and is very reliable in isolating the materials from weather and the environment.

Monitoring of all excavations for vaporous compounds in worker air space shall prevent hazardous work environments. Also the handling time for any contaminated soils shall be minimized to the greatest extent practicable. The post-construction venting of the soil/foundation interface will preclude vapors being introduced into human work space. Additionally the Community Air Monitoring Program will provide assurance that the environment local to the site is not impact during or after construction. These construction monitoring measures and the foundation venting system are somewhat common remediative practices. The equipment employed is very reliable and effective in detecting and/or venting vapors.

Will the proposed remedy achieve the remedial action objectives (RAOs) in less than two (2) years? The contamination is quite localized within the site and has not migrated as noted in the site investigation, however, the quantity of contaminants present is indeterminant at this time. The recovery rate will vary relative to the "product recharge" rate of the shallow and deep recovery wells. The recovery rates are indeterminant thus the total remedial time can not be accurately forecasted until the system is operated long enough to empirically define the "product recovery" rate. It is anticipated that the LNAPL recovery can be completed within the two (2) year period although though the DNAPL recovery may take more than this period of time. It should be noted that there is no constraint of the future operation of the product recovery system from the construction or post-construction use of the site. The existence of central utilities and isolation of the subgrade from human and ecological contact significantly reduces the impact of these indeterminant considerations. Also the lack of migration of the contamination reduces or precludes any impact to the surrounding community.

4.4 Long-term Effectiveness and Performance:

Is the proposed remedy permanent or does it rely on containment? The groundwater product recovery system shall effectively remove the contamination. There will be very minor residual contaminants in the soil-groundwater matrix though post-remedial monitoring will determine if the recovery system may need to be reactivated or if the performance standards are maintained after recovery. If the residual level of contamination is determined to be excessive, then the recovery wells could potentially be employed as avenues for introducing bioremediative or other cleanup actions. The capping system shall isolate any residue from human and ecological contact. In this method, the remedy is permanent with a capping system in place during and after the remediation process also providing containment.

Will the ability of the remedy to achieve the RAOs lessen over time? If there is uncertainty, describe the factors involved. It is anticipated that there will be a decline in the quantity of product removed over time but the remedial action objectives should be attained via the product recovery system defined herein and within the Work Plan. As discussed previously, the total time for remediation is indeterminant at this time.

After completion, will there be any significant threats, exposure pathways, or risks to the community or environment from the remaining wastes or treated residuals? As noted, there will be very minor residual contamination remaining once the system closure level is achieved, however, this does not represent a significant threat to humans or the environment. Considering that the contamination within vacant and unremediated site has not migrated over the past few decades, it is highly unlikely that any residual contamination will migrate or pose a threat to the human community or environment. The site is served by centralized utilities, exposure due to migrating residual contaminants in the groundwater appears highly unlikely. Coupled with this is the installation of the capping system whereby the geosynthetic cap, asphaltic or cements surfaces will prevent direct contact with the subgrade soils. The containerized LNAPL and DNAPL removed by licensed hauler shall be delivered to a permitted treatment facility with appropriate waste handling and tracking forms maintained.

4.5 Reduction of Toxicity, Mobility or Volume

By media, how much of the contamination will be treated? Will the process be complete or partial (quantify)? Is the treatment process reversible? Will the mobility of contaminants be reduced? Describe the uncertainties. No media will be used to treat the LNAPL or DNAPL contamination. The question as to the reversibility of the treatment process appears irrelevant for the proposed product recovery system. LNAPL contamination will be removed until a level of 0.1 inches of product is noted in the LNAPL recovery well. DNAPL will be recovered until a practical recovery level of less than one inch (1") stabilizes over time within the sump of the deep recovery well. As previously mentioned, the volume of LNAPL and/or DNAPL ultimately removed from the site by the recovery systems is unknown as a definitive volume of contamination is not quantified. The plan view area of contamination however is very small and is vertically bounded by the organic silty-clay layer therefore the degree of uncertainty is only time relevant, that is, how long it may take to reach the performance standard levels.

As for the mobility of the contaminants, the lack of mobility during the many decades that the site has sat idle strongly suggests that future mobility will not be an issue of concern. Monitoring during and after remedial measures will confirm this quantification and contingency options are available using the recovery wells themselves.

It is anticipated that less than one thousand (1,000) tons of contaminated soil will need to be managed during the project. This volume of soil shall be generated through the limited excavations associated with the foundation and utility installations. It is expected that the majority of the contaminated soils handled during construction shall not exhibit significant levels of contamination such that removal is then warranted.

4.6 Implementability

What are the potential construction and O&M difficulties? How would these difficulties be overcome? Are services and materials readily available (consider long-term O&M also)? Product recovery systems of this nature have been utilized at similar sites with favorable results. The use of tight sheeting and a sump area for the DNAPL recovery system is being employed to overcome pumping difficulties related to the viscous nature of the DNAPL. These is, as with most sites, a certain non-homogeneity to the subsurface soils, namely that the depth to the organic silt-clay varies somewhat. This non-homogeneity is to be expected however and the depth of tight sheeting is set such that the sheeting will penetrate several feet into the silty-clay layer. The site is relatively small in size and locating a pump house for the LNAPL holding tank may be tight but only a small amount of space is required. The DNAPL is to be handled directly by the vacuum truck at the deep well head so limited space is required for this recovery system. As an option, Metro-North has alluded to their allowing the LNAPL holding tank to be housed on the substation site though this need will be determined during final site design. Services and materials for the product recovery systems are readily available and no difficulties are anticipated with these issues. The operation of the recovery system can occur over as long a period as necessary without impacting the proposed re-use of the site or visa versa.

Any problems with coordinating with other agencies (e.g. - obtaining approvals/permits)? The NYSDEC and Westchester County Facilities Corporation shall need to review and approve the disposal of the free waters from the LNAPL and DNAPL storage tanks. The use of an oil/water separator and an activated carbon system to process the free water prior to discharge to the wastewater treatment plant is likely to dispel any concerns of the wastewater treatment authority. As an option, the treated free water could also be pumped and hauled by a licensed hauler to other treatment facilities should the City deny the acceptance of the wastewater.

Air permits for the foundation mechanical venting system shall need to be approved by both the NYSDEC and the Westchester County Department of Health. Coordinating these air permits considering the precautionary nature of the venting system does not appear to be a significant problem in the overall process.

4.7 Cost

Discuss cost-effectiveness. Provide a sensitivity analysis or discuss special considerations as appropriate. As mentioned, the areal extent of the LNAPL and DNAPL contamination is relatively small on the subject parcel. The cost of installing the two (2) recovery wells, small quantity of tight sheeting, holding tanks, storage shed and associated appurtenances is relatively small compared to proprietary management methods that often are only cost effective only for larger sites. Certainly excavation and treatment of the soil matrix and backfill operations considering the depths involved precludes such a solution path. The product recovery well system therefore appears best suited to the site and conditions present.

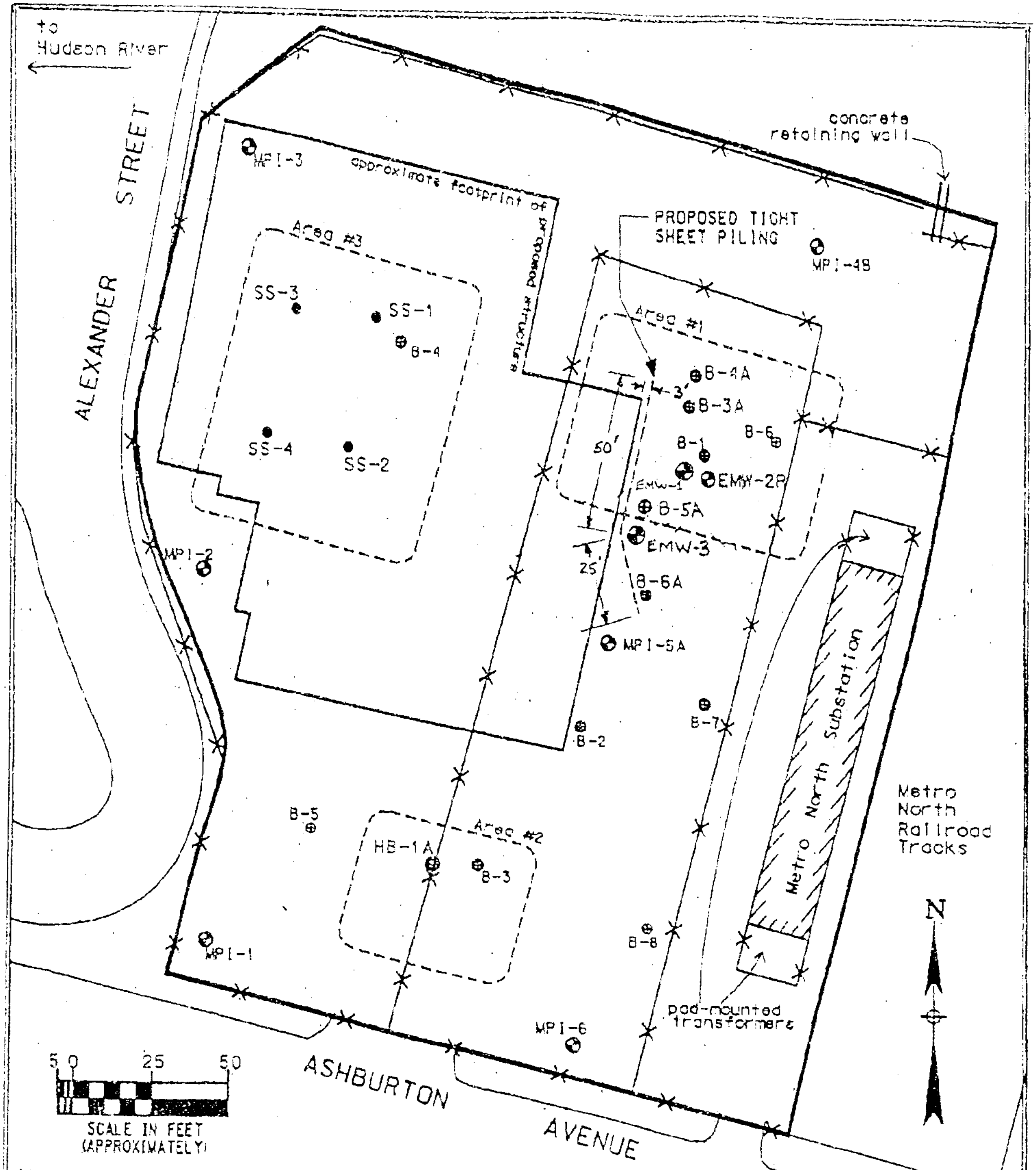
4.8 Community Acceptance

Identify any major issues raised and summarize the Volunteer's position on these. No major issues of public concern have surfaced through the course of the project to date. It is likely that the re-use of a parcel zoned for commercial/industrial development while remediating and containing the contamination present will meet public acceptance without significant issue.

5.0 Conclusion

The remedial measures proposed in the Work Plan appear well suited to the site conditions and contaminants present. The approach is quite simple and straight forward which leads to a high anticipated success rate in attaining the remedial action objectives in a cost-effective and efficient manner.

F:\2000\2k015.000\REPORTS\Appendix H - Engineeing Evaluation 100400.wpd



All feature locations are approximate.
Map based on "Survey" by Roland K. Link, P.L.L.C. (June 17, 1999); "Groundwater Elevation Contour Map" by Malcom Pirnie (July 1, 1994); and "Site Plan" by Cybul & Cybul A.I.A. Architects (June 21, 2000).

Remediation Improvements Plan
104 Ashburton Ave.
City of Yonkers
Westchester County
New York

Legend:
subject property border ▬▬
chain-link fence —×——×—
Area of Concern (see report) Area #2
structure ▨
surface soil sample ●
soil boring ⊕
monitoring well ⊕

Dewkett # 2K015.000
Scale: 1" = 45' (approx.)
Appendix H OCT 2000
DEWKETT ENGINEERING

Attachment I

Boring Logs

SY 99143.30

SOILTESTING, INC.

TO ..... Ecosystems Strategies
ADDRESS ..... 60 Worrall Avenue - Poughkeepsie, New York 12603
DATE April 28, 2000
SITE LOCATION ..... 143 Ashburton Avenue - Yonkers, New York
REPORT SENT TO ..... Jay Kaplan
SAMPLES SENT TO ..... Picked up @ site by client

140 Oxford Road
Oxford, Connecticut 06478
203-888-4531

Branch Office:
White Plains, New York 10607
914-946-4850

JOB NO. 5847

SOILTESTING, INC.

140 OXFORD RD.
OXFORD, CT 06478
CT (203) 888-4531
NY (914) 946-4850

CLIENT: Ecosystems Strategies

PROJECT NO. E39-5847-00

PROJECT NAME 143 Ashburton Avenue

LOCATION Yonkers, New York

SHEET 1 OF 1
HOLE NO. HB-1A

BORING LOCATIONS as directed

OFFSET

DATE START 4-25-00
DATE FINISH 4-25-00
SURFACE ELEV.
GROUND WATER ELEV.

FOREMAN - DRILLER RD/dj

INSPECTOR

GROUND WATER OBSERVATIONS
AT 3' FT AFTER 0 HOURS
AT __ FT AFTER __ HOURS

	CASING	SAMPLER	CORE BAR
TYPE	HSA	SS	
SIZE I.D.	4 1/4"	1 3/8"	
HAMMER WT.		140#	BIT
HAMMER FALL		30"	

DEPTH	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE Type	SAMPLE PEN	SAMPLE REC	SAMPLE DEPTH @ BOT	BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6	6 - 12	12- 18	CORING TIME PER FT (MIN)	DENSITY OR CONSIST / MOIST	STRATA CHANGE DEPTH / ELEV	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		1	ss	24"	12"	3'0"	18	13			wet	3"	ASPHALT
							9	7			compact		Brn F-M SAND,lit silt,tr F-gravel
		2	ss	24"	10"	5'0"	8	5			wet		
5							23	6			compact		SAME
		3	ss	24"	10"	7'0"	3	4			wet		
							3	4			loose		Brn F-C SAND,sm F-C gravel,lit silt
		4	ss	24"	10"	9'0"	1	2			wet		
							1	2			loose		Blk F-SAND & SILT,tr clay
10		5	ss	24"	12"	11'0"		1			wet		
							18	2			compact	11'0"	Brn F-SAND & SILT,lit F-M gravel,tr clay E.O.B.
15													
20													
25													
30													
35													E.O.B. 11'0"
40													

GROUND SURFACE TO ________ FT. USED ______________ CASING THEN _______ CASING TO _______ FT.

HOLE NO HB-1A

= AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
/OR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER
PORPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND 35 - 50%

C = COARSE
M = MEDIUM

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NY (914) 946-4850

CLIENT: Ecosystems Strategies
PROJECT NO. E39-5847-00
PROJECT NAME 143 Ashburton Avenue
LOCATION Yonkers, New York

SHEET 1 OF 1
HOLE NO. SS-1
BORING LOCATIONS as directed
OFFSET
DATE START 4-25-00
DATE FINISH 4-25-00
SURFACE ELEV.
GROUND WATER ELEV.

FOREMAN - DRILLER RD/dj
INSPECTOR

GROUND WATER OBSERVATIONS
AT none FT AFTER 0 HOURS
AT __ FT AFTER __ HOURS

	CASING	SAMPLER	CORE BAR
TYPE	HSA	SS	
SIZE I.D.	4 1/4"	1 3/8"	
HAMMER WT.		140#	BIT
HAMMER FALL		30"	

DEPTH	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE Type	SAMPLE PEN	SAMPLE REC	SAMPLE DEPTH @ BOT	BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6	6 - 12	12- 18	CORING TIME PER FT (MIN)	DENSITY OR CONSIST / MOIST	STRATA CHANGE DEPTH / ELEV	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
												3"	ASPHALT
		1	ss	24"	12"	3'0"	9	18			dry		Brn F-C SAND,sm F-C gravel,tr silt
							12	9			dense	3'0"	E.O.B.
5													
10													
15													
20													
5													
30													
5													E.O.B. 3'0"
40													

GROUND SURFACE TO ________ FT. USED ____________ CASING THEN ______ CASING TO ______ FT.

HOLE NO SS-1

= AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
OR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER
C = COARSE
M = MEDIUM
PORPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND

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NY (914) 946-4850

CLIENT: Ecosystems Strategies

SHEET 1 OF 1
HOLE NO. SS-2

PROJECT NO. E39-5847-00

PROJECT NAME 143 Ashburton Avenue

LOCATION Yonkers, New York

BORING LOCATIONS as directed

OFFSET

FOREMAN - DRILLER RD/dj

NSPECTOR

GROUND WATER OBSERVATIONS
AT none FT AFTER 0 HOURS
AT __ FT AFTER __ HOURS

	CASING	SAMPLER	CORE BAR
TYPE	HSA	SS	
SIZE I.D.	4 1/4"	1 3/8"	
HAMMER WT.		140#	BIT
HAMMER FALL		30"	

DATE START 4-25-00
DATE FINISH 4-25-00
SURFACE ELEV.
GROUND WATER ELEV.

DEPTH	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE Type	SAMPLE PEN	SAMPLE REC	SAMPLE DEPTH @ BOT	BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6	6 - 12	12 - 18	CORING TIME PER FT (MIN)	DENSITY OR CONSIST / MOIST	STRATA CHANGE DEPTH / ELEV	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
												3"	ASPHALT
		1	ss	24"	18"	3'0"	25	10			dry		Brn F-C SAND,sm F-C gravel,tr silt
							7	5			compact	3'0"	E.O.B.
5													
0													
15													
20													
5													
30													
5													E.O.B. 3'0"
40													

GROUND SURFACE TO ______ FT. USED __________ CASING THEN ______ CASING TO ______ FT.

HOLE NO SS-2

= AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
OR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER
C = COARSE
M = MEDIUM
PORPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND 35 - 50%

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NY (914) 946-4850

CLIENT: Ecosystems Strategies

PROJECT NO. E39-5847-00

PROJECT NAME 143 Ashburton Avenue

LOCATION Yonkers, New York

SHEET 1 OF 1

HOLE NO. SS-3

BORING LOCATIONS as directed

OFFSET

DATE START 4-25-00

DATE FINISH 4-25-00

SURFACE ELEV.

GROUND WATER ELEV.

FOREMAN - DRILLER RD/dj

INSPECTOR

GROUND WATER OBSERVATIONS

AT none FT AFTER 0 HOURS

AT __ FT AFTER __ HOURS

	CASING	SAMPLER	CORE BAR
TYPE	HSA	SS	
SIZE I.D.	4 1/4"	1 3/8"	
HAMMER WT.		140#	BIT
HAMMER FALL		30"	

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)			CORING TIME PER FT (MIN)	DENSITY OR CONSIST / MOIST	STRATA CHANGE DEPTH / ELEV	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		NO	Type	PEN	REC	DEPTH @ BOT	0 - 6	6 - 12	12 - 18				
												3"	ASPHALT
		1	ss	24"	12"	3'0"	8	11			dry		Brn F-M SAND,sm silt,lit F-C gravel
							37	20			dense	3'0"	E.O.B.
5													
10													
15													
20													
25													
30													
5													E.O.B. 3'0"
40													

GROUND SURFACE TO ________ FT. USED ______________ CASING THEN _______ CASING TO _______ FT.

HOLE NO SS-3

= AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST

OR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS

SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER

C = COARSE

M = MEDIUM

PORPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME

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CLIENT: Ecosystems Strategies

PROJECT NO. E39-5847-00

PROJECT NAME 143 Ashburton Avenue

LOCATION Yonkers, New York

SHEET 1 OF 1

HOLE NO. SS-4

BORING LOCATIONS as directed

OFFSET

DATE START 4-25-00

DATE FINISH 4-25-00

SURFACE ELEV.

GROUND WATER ELEV.

FOREMAN - DRILLER RD/dj

INSPECTOR

GROUND WATER OBSERVATIONS
AT none FT AFTER 0 HOURS
AT __ FT AFTER __ HOURS

	CASING	SAMPLER	CORE BAR
TYPE	HSA	SS	
SIZE I.D.	4 1/4"	1 3/8"	
HAMMER WT.		140#	BIT
HAMMER FALL		30"	

DEPTH	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE Type	SAMPLE PEN	SAMPLE REC	SAMPLE DEPTH @ BOT	BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6	6 - 12	12 - 18	CORING TIME PER FT (MIN)	DENSITY OR CONSIST / MOIST	STRATA CHANGE DEPTH / ELEV	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
												3"	ASPHALT
		1	ss	24"	12"	3'0"	16	18			dry dense	3'0"	Brn F-M SAND,sm F-M gravel,tr silt,tr brick frags E.O.B.
							18	19					
5													
10													
15													
20													
25													
30													
5													E.O.B. 3'0"
0													

GROUND SURFACE TO ________ FT. USED ____________ CASING THEN ________ CASING TO ________ FT.

HOLE NO SS-4

= AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
OR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER
C = COARSE
M = MEDIUM
PORPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND 35 - 50%

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PROJECT NO. E39-5847-00

PROJECT NAME 143 Ashburton Avenue

LOCATION Yonkers, New York

SHEET 1 OF 1

HOLE NO. B-3A

BORING LOCATIONS as directed

OFFSET

DATE START 4-26-00

DATE FINISH 4-26-00

SURFACE ELEV.

GROUND WATER ELEV.

OREMAN - DRILLER RD/dj

INSPECTOR Jay Kaplan

GROUND WATER OBSERVATIONS

AT 3' FT AFTER 0 HOURS

AT __ FT AFTER __ HOURS

	CASING	SAMPLER	CORE BAR
TYPE	HSA	SS	
SIZE I.D.	4 1/4"	1 3/8"	
HAMMER WT.		140#	BIT
HAMMER FALL		30"	

DEPTH	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE Type	SAMPLE PEN	SAMPLE REC	SAMPLE DEPTH @ BOT	BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6	6 - 12	12- 18	CORING TIME PER FT (MIN)	DENSITY OR CONSIST / MOIST	STRATA CHANGE DEPTH / ELEV	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
												3"	ASPHALT
		1	ss	24"	10"	3'0"	8	7			wet		Brn F-M SAND,sm F-C gravel,tr silt
							26	24			dense		
		2	ss	24"	12"	5'0"	9	10			wet		SAME
5							45	30			v-dense		
		3	ss	15"	12"	6'3"	20	40			wet		Brn F-M SAND & F-C GRAVEL,lit silt,
							50/3				v-dense	6'3"	brick frags E.O.B.
10													
5													
20													
5													
30													
5													E.O.B. 6'3"

GROUND SURFACE TO ________FT. USED ______________CASING THEN ________ CASING TO ______FT.

HOLE NO B-3A

= AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST

OR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS

SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER

C = COARSE

M = MEDIUM

PORPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND =35 - 50%

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CLIENT: Ecosystems Strategies

SHEET 1 OF 1

HOLE NO. B-4A

PROJECT NO. E39-5847-00

PROJECT NAME 143 Ashburton Avenue

OREMAN - DRILLER RD/dj

LOCATION Yonkers, New York

BORING LOCATIONS as directed

INSPECTOR Jay Kaplan

OFFSET

GROUND WATER OBSERVATIONS
AT 3' FT AFTER 0 HOURS
AT __ FT AFTER __ HOURS

	CASING	SAMPLER	CORE BAR
TYPE	HSA	SS	
SIZE I.D.	4 1/4"	1 3/8"	
HAMMER WT.		140#	BIT
HAMMER FALL		30"	

DATE START 4-26-00
DATE FINISH 4-26-00
SURFACE ELEV.
GROUND WATER ELEV.

DEPTH	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE Type	SAMPLE PEN	SAMPLE REC	SAMPLE DEPTH @ BOT	BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6	6 - 12	12- 18	CORING TIME PER FT (MIN)	DENSITY OR CONSIST MOIST	STRATA CHANGE DEPTH ELEV	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		1	ss	20"	10"	2'8"	8	17			dry	3"	ASPHALT
							17	50/2			dense		BRICK FRAGS
		2	ss	24"	10"	5'0"	8	14			wet		Brn F-M SAND,sm silt,lit F-C gravel
5							14	19			compact		
		3	ss	13"	10"	6'1"	63	14			wet		Brn F-M SAND,sm silt,lit F-C gravel
							50/1				v-dense	6'1"	E.O.B.
0													
5													
20													
5													
30													E.O.B. 6'1"

ROUND SURFACE TO ______ FT. USED ____________ CASING THEN ______ CASING TO ______ FT.

HOLE NO B-4A

AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
R = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS
S = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER
C = COARSE
ORPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND
M = MEDIUM

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140 OXFORD RD.
OXFORD, CT 06478
CT (203) 888-4531
NY (914) 946-4850

CLIENT: Ecosystems Strategies

SHEET 1 OF 1
HOLE NO. B-5A

PROJECT NO. E39-5847-00

PROJECT NAME 143 Ashburton Avenue

LOCATION Yonkers, New York

BORING LOCATIONS as directed

OREMAN - DRILLER RD/dj

NSPECTOR Jay Kaplan

GROUND WATER OBSERVATIONS
T 3' FT AFTER 0 HOURS
T __ FT AFTER __ HOURS

	CASING	SAMPLER	CORE BAR
TYPE	HSA	SS	
SIZE I.D.	4 1/4"	1 3/8"	
HAMMER WT.		140#	BIT
HAMMER FALL		30"	

OFFSET
DATE START 4-26-00
DATE FINISH 4-26-00
SURFACE ELEV.
GROUND WATER ELEV.

DEPTH	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE Type	SAMPLE PEN	SAMPLE REC	SAMPLE DEPTH @ BOT	BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6	6 - 12	12 - 18	CORING TIME PER FT (MIN)	DENSITY OR CONSIST / MOIST	STRATA CHANGE DEPTH / ELEV	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
												3"	ASPHALT
		1	ss	24"	10"	3'0"	8	12			wet		Brn F-C SAND,sm F-C gravel,tr silt
							14	17			compact		
		2	ss	24"	8"	5'0"	8	10			wet		
5							12	26			compact		SAME
		3	ss	24"	10"	7'0"	8	17			wet		Brn F-M SAND,sm F-C gravel,tr silt
							17	24			dense	7'0"	E.O.B.

E.O.B. 7'0"

ROUND SURFACE TO ______FT. USED ____________CASING THEN ______ CASING TO ______FT.

HOLE NO B-5A

AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
R = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS
S = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER
ORPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND =35 - 50%

C = COARSE
M = MEDIUM

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CLIENT: Ecosystems Strategies
PROJECT NO. E39-5847-00
PROJECT NAME 143 Ashburton Avenue
LOCATION Yonkers, New York

SHEET 1 OF 1
HOLE NO. B-6A
BORING LOCATIONS as directed
OFFSET
DATE START 4-26-00
DATE FINISH 4-26-00
SURFACE ELEV.
GROUND WATER ELEV.

OREMAN - DRILLER RD/dj
INSPECTOR Jay Kaplan

GROUND WATER OBSERVATIONS
AT 3' FT AFTER 0 HOURS
AT __ FT AFTER __ HOURS

	CASING	SAMPLER	CORE BAR
TYPE	HSA	SS	
SIZE I.D.	4 1/4"	1 3/8"	
HAMMER WT.		140#	BIT
HAMMER FALL		30"	

DEPTH	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE Type	SAMPLE PEN	SAMPLE REC	SAMPLE DEPTH @ BOT	BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6	6 - 12	12- 18	CORING TIME PER FT (MIN)	DENSITY OR CONSIST / MOIST	STRATA CHANGE DEPTH / ELEV	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		1	ss	24"	10"	3'0"	5	18			wet	3"	ASPHALT
							12	10			dense		Brn F-M SAND,sm F-C gravel,tr silt,brick frags
		2	ss	24"	6"	5'0"	6	16			wet		SAME
5							5	8			compact		
		3	ss	24"	8"	7'0"	5	4			wet		Brn F-C SAND,sm F-C gravel,lit silt
							4	5			loose	7'0"	E.O.B.
10													
15													
20													
5													
30													
5													

E.O.B. 7'0"

GROUND SURFACE TO ________FT. USED ______________CASING THEN _______ CASING TO ______FT.

HOLE NO B-6A

= AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
OR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS
S = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER
C = COARSE
M = MEDIUM
PORPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND =35 - 50%

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CLIENT: Ecosystems Strategies

SHEET 1 OF 1

HOLE NO. EMW-1

PROJECT NO. E39-5847-00

PROJECT NAME 143 Ashburton Avenue

BORING LOCATIONS as directed

ОREMAN - DRILLER RD/dj

LOCATION Yonkers, New York

INSPECTOR Jay Kaplan

OFFSET

GROUND WATER OBSERVATIONS
AT 3' FT AFTER 0 HOURS
AT __FT AFTER __ HOURS

	CASING	SAMPLER	CORE BAR
TYPE	HSA	SS	
SIZE I.D.	4 1/4"	1 3/8"	
HAMMER WT.		140#	BIT
HAMMER FALL		30"	

DATE START 4-25-00
DATE FINISH 4-25-00
SURFACE ELEV.
GROUND WATER ELEV.

DEPTH	CASING BLOWS PER FOOT	SAMPLE NO	Type	PEN	REC	DEPTH @ BOT	BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6	6 - 12	12- 18	CORING TIME PER FT (MIN)	DENSITY OR CONSIST / MOIST	STRATA CHANGE DEPTH / ELEV	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		1	ss	24"	12"	3'0"	5	10				3"	ASPHALT
							9	10			wet compact		Brn F-M SAND,sm F-M gravel,lit silt
		2	ss	24"	12"	5'0"	6	7					
5							7	6			wet compact		SAME; brick frags
		3	ss	24"	14"	7'0"	8	20					
							30	50			wet dense		Brn F-C SAND,sm F-M gravel,wood frags
		4	ss	24"	10"	10'0"	1	2					
10							2	1			wet loose		Brn F-M SAND,sm F-M gravel,tr silt
		5	ss	24"	8"	12'0"	1	2					
							3	5			wet loose		SAME
		6	ss	24"	8"	14'0"	4	6					
							5	4			wet compact		SAME
15		7	ss	24"	10"	16'0"	3	2					
							1	2			wet loose		Brn F-C sand,sm F-M gravel,tr silt
		8	ss	24"	18"	18'0"	2	2					
							3	5			wet medium		Brn ORGANICS (peat)
		9	ss	24"	14"	20'0"	5	2					
20							2	3			wet soft		SAME
		10	ss	24"	12"	22'0"	1	2					
							3	5			wet medium	22'0"	Brn ORGANICS (peat) & SILT E.O.B.
25													
30													
5													E.O.B. 22'0"

ROUND SURFACE TO ________FT. USED ______________CASING THEN ________ CASING TO ________FT.

HOLE NO EMW-1

= AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
OR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS
S = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER
C = COARSE
M = MEDIUM
F = FINE
PORPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND =35 - 50%

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140 OXFORD ROAD - OXFORD, CONN. 06478-1943

GEOTECHNICAL / ENVIRONMENTAL SUBSURFACE INVESTIGATIONS - Test Borings - Core Drilling
Monitoring Wells - Recovery Wells - Direct Push/Probe Sampling

MONITOR WELL INSTALLATION DETAIL

Client: Ecosystems Strategies

Job #: E39-5847-00

MONITOR WELL # EMW-1

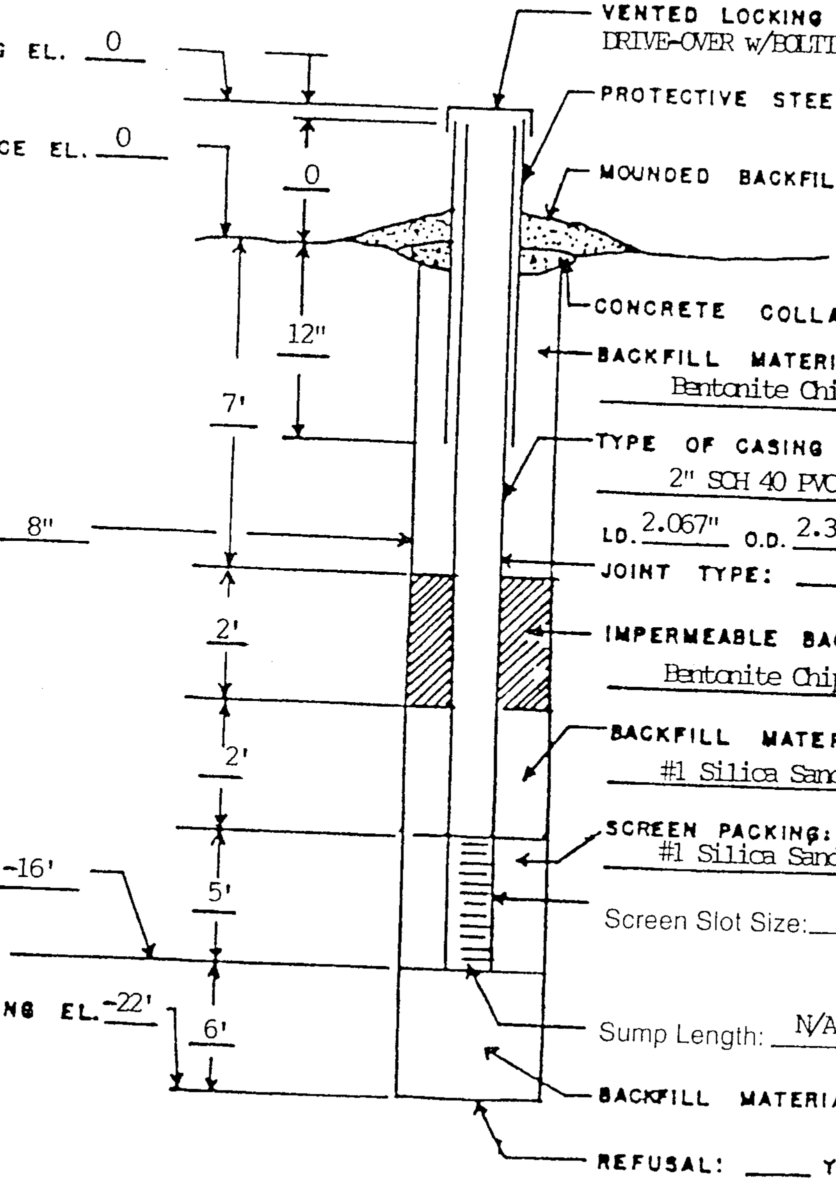
TOP OF CASING EL. 0

GROUND SURFACE EL. 0

BOREHOLE DIA. 8"

WELL POINT EL. -16'

BOTTOM OF BORING EL. -22'



VENTED LOCKING STEEL CAP: ___ YES _X_ NO
DRIVE-OVER w/BOLTING COVER _X_ YES ___ NO

PROTECTIVE STEEL CASING: _X_ YES ___ NO

MOUNDED BACKFILL: ___ YES _X_ NO

CONCRETE COLLAR: _X_ YES ___ NO

BACKFILL MATERIAL: Bentonite Chips

TYPE OF CASING & SCREEN: 2" SCH 40 PVC

I.D. 2.067" O.D. 2.375"

JOINT TYPE: thd'd F.J.

IMPERMEABLE BACKFILL: Bentonite Chips

BACKFILL MATERIAL: #1 Silica Sand

SCREEN PACKING: #1 Silica Sand

Screen Slot Size: #10

Sump Length: N/A'

BACKFILL MATERIAL: Formation

REFUSAL: ___ YES _X_ NO

Materials Used:

Screen (PVC) 10'
Riser (PVC) 15'
Plug (PVC) (1)
Slipcap (PVC)
Silica Sand 300#
Powdered Bentonite

Bentonite Pellets
Bentonite Chips 2 bags
Concrete Mix 1 bag
Portland

Locking Exp Plug (1)
Lock
D/O (1) "

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CLIENT: Ecosystems Strategies

SHEET 1 OF 1
HOLE NO. EMW-2R

PROJECT NO. E39-5847-00

PROJECT NAME 143 Ashburton Avenue

REMAN - DRILLER RD/dj

LOCATION Yonkers, New York

BORING LOCATIONS as directed

INSPECTOR Jay Kaplan

OFFSET

GROUND WATER OBSERVATIONS
AT 3' FT AFTER 0 HOURS
AT __ FT AFTER __ HOURS

	CASING	SAMPLER	CORE BAR
TYPE	HSA	SS	
SIZE I.D.	6 5/8"	1 3/8"	
HAMMER WT.		140#	BIT
HAMMER FALL		30"	

DATE START 4-26-00
DATE FINISH 4-26-00
SURFACE ELEV.
GROUND WATER ELEV.

CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE Type	SAMPLE PEN	SAMPLE REC	SAMPLE DEPTH @ BOT	BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6	6 - 12	12 - 18	CORING TIME PER FT (MIN)	DENSITY OR CONSIST / MOIST	STRATA CHANGE DEPTH / ELEV	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
											6"	ASPHALT
										wet		Brn F-M SAND,sm F-C gravel,lit silt
												BOULDER
										wet		Brn F-M SAND,sm F-C gravel,lit silt
											10'0"	E.O.B.
												E.O.B. 10'0"

OUND SURFACE TO ______ FT. USED ____________ CASING THEN ______ CASING TO ______ FT.

HOLE NO EMW-2R

AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
= WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS
SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER
RPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND =35 - 50%

C = COARSE
M = MEDIUM
F = FINE

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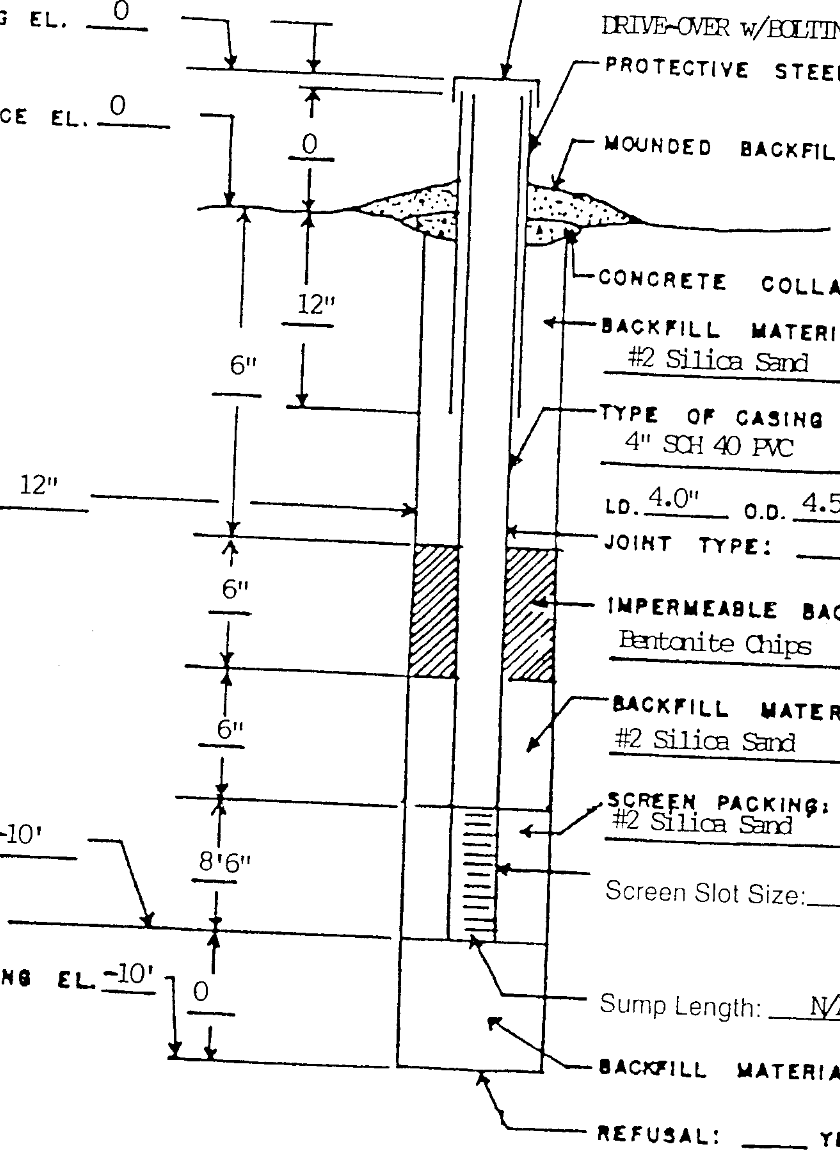
GEOTECHNICAL / ENVIRONMENTAL SUBSURFACE INVESTIGATIONS - Test Borings - Core Drilling
Monitoring Wells - Recovery Wells - Direct Push/Probe Sampling

MONITOR WELL INSTALLATION DETAIL

MONITOR WELL # EMW-2R

Client: Ecosystems Strategies

Job #: E39-5847-00



TOP OF CASING EL. 0

GROUND SURFACE EL. 0

BOREHOLE DIA. 12"

WELL POINT EL. -10'

BOTTOM OF BORING EL. -10'

VENTED LOCKING STEEL CAP: ___ YES X NO

DRIVE-OVER w/BOLTING COVER X YES ___ NO

PROTECTIVE STEEL CASING: X YES ___ NO

MOUNDED BACKFILL: ___ YES X NO

CONCRETE COLLAR: X YES ___ NO

BACKFILL MATERIAL: #2 Silica Sand

TYPE OF CASING & SCREEN: 4" SCH 40 PVC

I.D. 4.0" O.D. 4.5"

JOINT TYPE: thd'd F.J.

IMPERMEABLE BACKFILL: Bentonite Chips

BACKFILL MATERIAL: #2 Silica Sand

SCREEN PACKING: #2 Silica Sand

Screen Slot Size: #20

Sump Length: N/A'

BACKFILL MATERIAL: N/A'

REFUSAL: ___ YES X NO

Materials Used:

Screen	(PVC) 10'
Riser	(PVC) 5'
Plug	(PVC) (1)
Slipcap	(PVC)
Silica Sand	500#
Powdered Bentonite	

Bentonite Pellets
Bentonite Chips 2 bags
Concrete Mix 1 bag
Portland

Locking Exp Plug (1)
Lock
D/O (1) "
S/U -

BORING LOG

B-1

Date: September 27, 1999
Driller: J. DeAngelis, Jr.
Drill Rig: CME-75 Truck Unit
Sampler (i.d.): 1-3/8"
Hammer Wt: 140# Auto-Hammer
Casing (i.d.): 2-1/4" HSA
Water: 2'-3"

Client: Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie NY 12603-2332

Project Location: Ashburton Ave., Yonkers NY

Log ID No.: 99074-01

LEGEND

FILL	ROCK
ORGANIC	TILL
SUBSOIL	RISER w/CEMENT
SILT	RISER w/SAND
CLAY	RISER w/BENTONITE
GRAVEL	SCREEN w/SAND
WATER: ▼	SPT

Sample Depth	Blows Counts per 6"				Moisture	Water	Changes	Color	DESCRIPTION OF FINDINGS	Elev.	General	No.	Pen.	Rec.
0' to 2'	8	15	8	6	Damp		2"	(bl)	ASPHALT			1	24"	21"
						▼	6"	(br)	SAND, little Gravel		FILL			
2' to 4'	4	8	12	8	Wet			d.(br)	SAND, some Soot, little Stone, Brick fragments			2	24"	18"
5' to 7'	2	2	5	2	Wet			(bl)	SAND, Soot, Slag, Wood, Stone fragments - Oil Product			3	24"	12"
10' to 12'	1	1	0	1	Wet				SAND, little Brick fragments - odor			4	24"	17"
							14'-0"							
15' to 17'	1	1	0	1	Moist			(og)	ORGANIC SILT, little Sand, Peat fibers		ORGANICS	5	24"	16"
							16'-0"	d.(br)	PEAT (fiberous)					
17' to 19'	1	0	0	1	Moist							6	24"	21"
							19'-0"							

End of Exploration @ 19'-0"

BORING LOG

B-2

Date: September 27, 1999
Driller: J. DeAngelis, Jr.
Drill Rig: CME-75 Truck Unit
Sampler (I.D.): 1-3/8"
Hammer Wt: 140# Auto-Hammer
Casing (I.D.): 2-1/4" HSA
Water: 2'-0"

Client: Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie NY 12603-2332

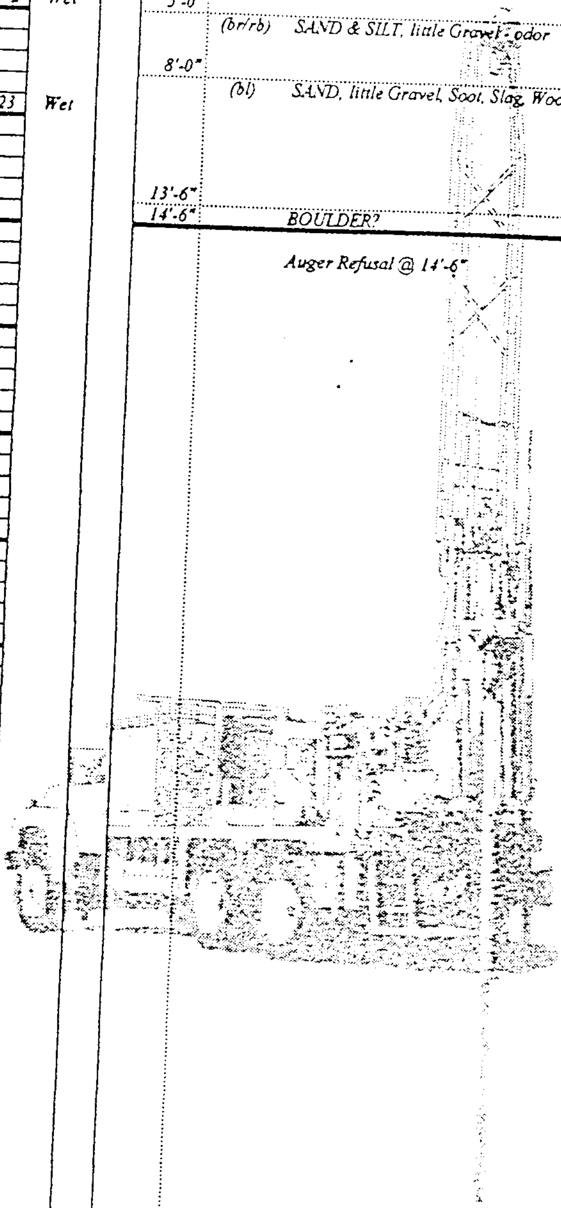
Project Location: Ashburton Ave., Yonkers NY

Log ID No: 99074-02

LEGEND

FILL
ORGANIC
SUBSOIL
SILT
CLAY
GRAVEL
WATER: ▼

ROCK
TILL
RISER w/CEMENT
RISER w/SAND
RISER w/BENTONITE
SCREEN w/SAND
SPT



Sample Depth	Blows Counts per 6"				Moisture	Water	Changes	Color	DESCRIPTION OF FINDINGS	Elev.	General	No.	Pen.	Rec.	
0' to 2'	12	5	6	4	Damp		3"	(bl)	ASPHALT						
2' to 4'	2	2	3	2	Wet	▼		(bl)	SAND, Soot, Cinders, Slag		FILL	1	24"	18"	0'
5' to 7'	3	4	3	2	Wet		5'-0"					2	24"	20"	
								(br/rb)	SAND & SILT, little Gravel - odor			3	24"	21"	5'
							8'-0"								
10' to 12'	5	10	4	23	Wet			(bl)	SAND, little Gravel, Soot, Slag, Wood			4	24"	6"	10'
							13'-6"								
							14'-6"		BOULDER?						
									Auger Refusal @ 14'-6"						15'
															20'
															25'
															30'
															35'
															40'
															45'
															50'
															55'
															60'
															65'
															70'
															75'

BORING LOG

B-3

Date: September 28, 1999
Driller: J. DeAngelis, Jr.
Drill Rig: CME-75 Truck Unit
Sampler (I.D.): 1-3/8"
Hammer Wt: 140# Auto-Hammer
Casing (I.D.): 2-1/4" HSA
Water: 1'-6"

Client: Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie NY 12603-2332

Project Location: Ashburton Ave., Yonkers NY

Log ID No: 99074-03

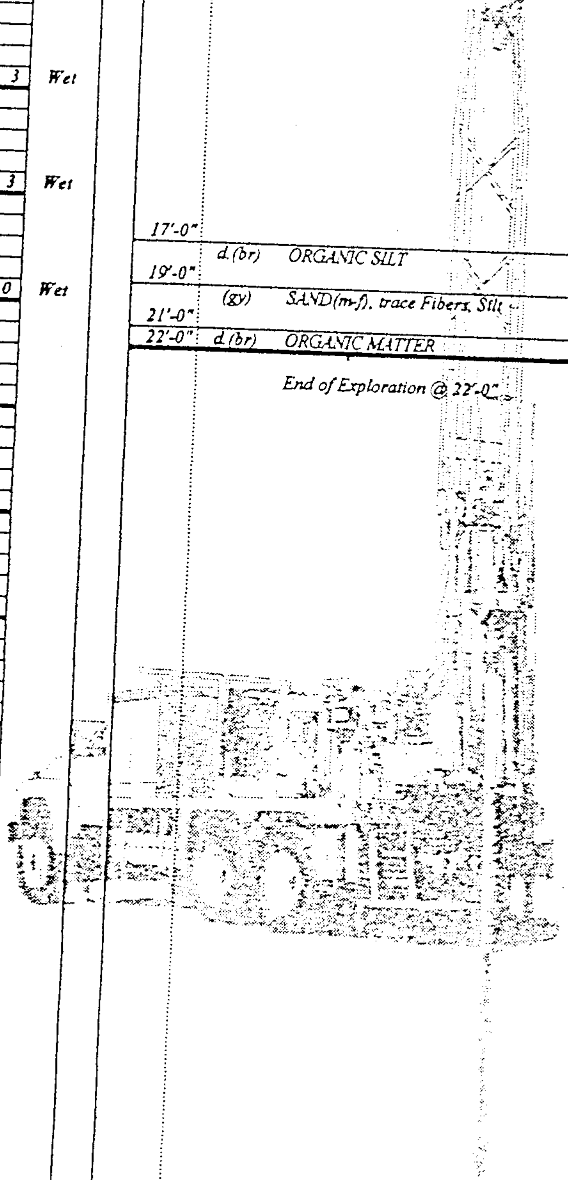
LEGEND

FILL	▥	▨	ROCK
ORGANIC	■	▩	TILL
SUBSOIL	■		RISER w/CEMENT
SILT	▤		RISER w/SAND
CLAY	▤		RISER w/BENTONITE
GRAVEL	• • •		SCREEN w/SAND
WATER:	▼		SPT

Sample Depth	Blows Counts per 6"				Moisture	No.	Pen.	Rec.
0' to 2'	6	3	4	3	Damp	1	24"	14"
2' to 4'	3	2	2	2	Wet	2	24"	12"
5' to 7'	6	3	3	6	Wet	3	24"	6"
10' to 12'	6	4	4	3	Wet	4	24"	6"
15' to 17'	4	3	4	3	Wet	5	24"	1"
20' to 22'	1	0	1	0	Wet	6	24"	18"

Water	Changes	Color	DESCRIPTION OF FINDINGS	Elev.	General
▼	2"	(bl)	ASPHALT		
		(br/bl)	SAND, little Gravel, Coal, Soot		FILL
		(bl)	SAND, Cinders, Soot		
			SLUDGE, Wood - creosote odor		
	17'-0"	d.(br)	ORGANIC SILT		ORGANICS
	19'-0"	(gy)	SAND(m-f), trace Fibers, Silt		ALLUVIUM
	21'-0"				
	22'-0"	d.(br)	ORGANIC MATTER		ORGANICS

End of Exploration @ 22'-0"



BORING LOG

B-4

Date: September 27, 1999
Driller: J. DeAngelis, Jr.
Drill Rig: CME-75 Truck Unit
Sampler (I.D.): 1-3/8"
Hammer Wt.: 140# Auto-Hammer
Casing (I.D.): 2-1/4" HSA
Water: 3'-6"

Client: Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie NY 12603-2332

Project Location: Ashburton Ave., Yonkers NY

Log ID No.: 99074-04

LEGEND

FILL	▥	▨	ROCK
ORGANIC	■	▩	TILL
SUBSOIL	■		RISER w/CEMENT
SILT	▤		RISER w/SAND
CLAY	▤		RISER w/BENTONITE
GRAVEL	⁘		SCREEN w/SAND
WATER:	▼		SPT

Sample Depth	Blow Counts per 6"				Moisture	Water	No.	Pen.	Rec.
0' to 2'	6	6	6	7	Damp		1	24"	20"
2' to 4'	4	11	8	7	Moist	▼	2	24"	21"
5' to 7'	3	3	2	1	Wet		3	24"	18"
7' to 9'	0	1	3	2	Wet		4	24"	16"
10' to 12'	2	1	2	2	Wet		5	24"	19"
15' to 17'	1	1	1	1	Wet		6	24"	20"
20' to 22'	0	0	1	1	Wet		7	24"	21"
25' to 27'	1	1	1	1	Wet		8	24"	17"
30' to 32'	0	0	0	0	Wet		9	24"	24"

Changes	Color	DESCRIPTION OF FINDINGS	Elev.	General
2"	(bl)	ASPHALT		
	(br/bl)	SAND, little Organic silt, Stone, Coal fragments		FILL
	(bl)	SAND, Coal fragments - odor		
		SAND, little Silt, Coal, Soot - odor		
13'-0"	(og)	ORGANIC SILT, some Clay, trace Shells		ORGANICS
15'-6"	d.(br)	PEAT (fiberous), little (og)Organic Silt		
18'-0"	(og)	ORGANIC SILT, some Sand, Peat fibers		
22'-0"	(gy)	SAND(c-f)		ALLUVIUM
26'-0"	d.(gy)	SAND, some Organic Silt, Fibers		ORGANICS
	(og)	ORGANIC SILT, little Clay, Fibers		
32'-0"				

End of Exploration @ 32'-0"

0' 5' 10' 15' 20' 25' 30' 35' 40' 45' 50' 55' 60' 65' 70' 75'

BORING LOG

B-5

Date: September 27, 1999
Driller: J. DeAngelis, Jr.
Drill Rig: CME-75 Truck Unit
Sampler (I.D.): 1-3/8"
Hammer Wt: 140# Auto-Hammer
Casing (I.D.): 2-1/4" HSA
Water: 3'-0"

Client: Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie NY 12603-2332

Project Location: Ashburton Ave., Yonkers NY

Log ID No: 99074-05

LEGEND

FILL	▥	▨	ROCK
ORGANIC	■	▩	TILL
SUBSOIL			RISER w/CEMENT
SILT	▤		RISER w/SAND
CLAY			RISER w/BENTONITE
GRAVEL	• • •		SCREEN w/SAND
WATER:	▼	▯	SPT

Sample Depth	Blows Counts per 6"				Moisture	Water
0' to 2'	11	12	7	9	Damp	
2' to 4'	10	8	5	6	Wet	▼
4' to 6'	8	3	3	2	Wet	
6' to 8'	2	1	1	2	Wet	
8' to 10'	1	1	0	1	Wet	
15' to 17'	2	1	1	2	Moist	
20' to 22'	1	0	1	1	Wet	
25' to 27'	0	1	1	1	Wet	
30' to 32'	0	1	1	1	Wet	
35' to 37'	0	0	1	1	Wet	
40' to 42'	0	0	0	3	Wet	
45' to 47'	3	3	4	5	Moist	
50' to 52'	2	3	4	6	Moist	
60' to 62'	2	2	3	3	Wet	

Changes	Color	DESCRIPTION OF FINDINGS	Elev.	General
2"	(bl)	ASPHALT		
4"	(br)	SAND, some Gravel		FILL
	(bl)	SAND, little Organic Silt, Coal, Cinders		
	(br/gy)	SILT, some Sand, Slag - odor		
		SAND, little Gravel, Cinders - odor		
		SILT, little Clay, Sand, trace Gravel		
12'-0"	(og)	ORGANIC SILT, some Sand, Clay		ORGANICS
15'-6"				
16'-9"	d.(br)	PEAT (fiberous), little (og)Organic Silt		
	(gy)	SAND(c-f), trace Peat fibers		ALLUVIUM
21'-0"	d.(br)	ORGANIC SILT, little Peat fibers		
23'-0"				ORGANICS
	(gy)	SAND(m-f)		ALLUVIUM
26'-0"	(og)	ORGANIC SILT, little Clay, Peat fibers		ORGANICS
	(gy)	ORGANIC SILT, some Clay, little Shell particles		
		ORGANIC SILT, little Sand(f), Clay, Shells		
45'-0"	(rb/m)	SILT, little Clay		FINES
		SILT, some Clay, layered w/Clay		
60'-6"				
62'-0"	(rb)	SAND(m-f)		OUTWASH

End of Exploration @ 62'-0"

No.	Pen.	Rec.	
1	24"	18"	0'
2	24"	15"	
3	24"	16"	5'
4	24"	14"	
5	24"	18"	
			10'
6	24"	22"	15'
7	24"	22"	20'
8	24"	24"	25'
9	24"	24"	30'
10	24"	24"	35'
11	24"	24"	40'
12	24"	18"	45'
13	24"	22"	50'
			55'
14	24"	21"	60'
			65'
			70'
			75'

BORING LOG

B-6

Date: September 28, 1999
Driller: J. DeAngelis, Jr.
Drill Rig: CME-75 Truck Unit
Sampler (I.D.): 1-3/8"
Hammer Wt.: 140# Auto-Hammer
Casing (I.D.): 2-1/4" HSA
Water: 2'-0"

Client: Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie NY 12603-2332

Project Location: Ashburton Ave., Yonkers NY

Log ID No.: 99074-06

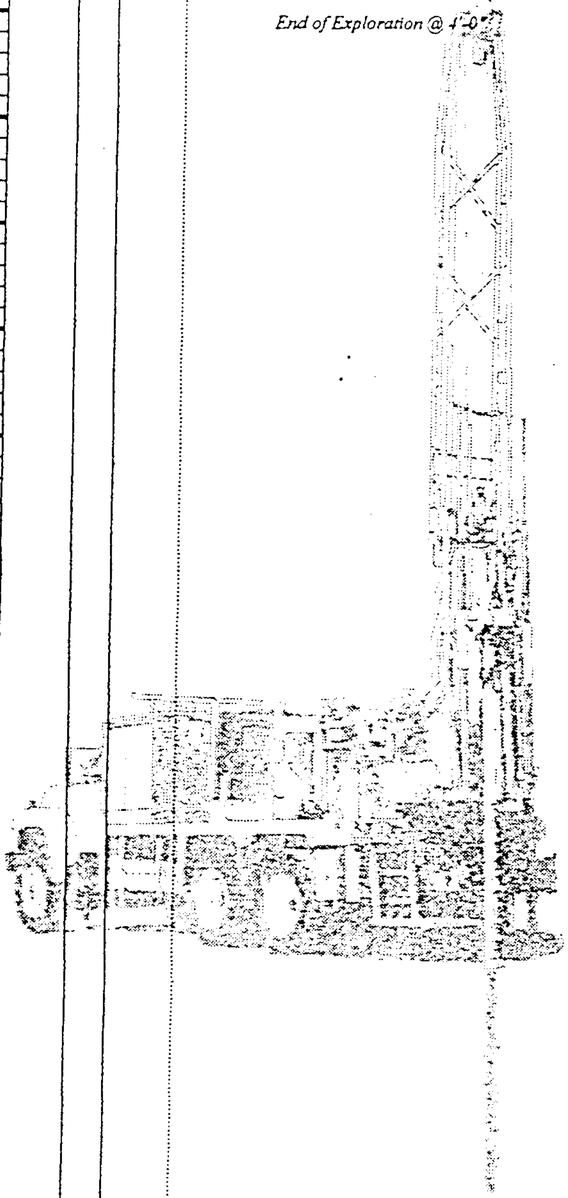
LEGEND

FILL	▥	▨	ROCK
ORGANIC	■	▩	TILL
SUBSOIL	■	▯	RISER w/CEMENT
SILT	▤	▯	RISER w/SAND
CLAY	▤	■	RISER w/BENTONITE
GRAVEL	⁘	▤	SCREEN w/SAND
WATER:	▼	▯	SPT

Sample Depth	Blows Counts per 6"				Moisture	Water	Changes	Color	DESCRIPTION OF FINDINGS	Elev.	General	No.	Pen.	Rec.
0' to 2'	8	4	5	4	Damp		2"	(bl)	ASPHALT		FILL	1	24"	12"
						▼	6"	(gy)	SAND, little Stone					
2' to 4'	4	7	7	4	Wet			(br/bl)	SAND, some Brick, Slag, Soot, Cinders - odor			2	24"	13"
							4'-0"							

End of Exploration @ 4'-0"

0' 5' 10' 15' 20' 25' 30' 35' 40' 45' 50' 55' 60' 65' 70' 75'



BORING LOG

B-7

Date: September 23, 1999
Driller: J. DeAngelis, Jr.
Drill Rig: CME-75 Truck Unit
Sampler (I.D.): 1-3/8"
Hammer Wt.: 140# Auto-Hammer
Casing (I.D.): 2-1/4" HSA
Water: 2'-0"

Client: Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie NY 12603-2332

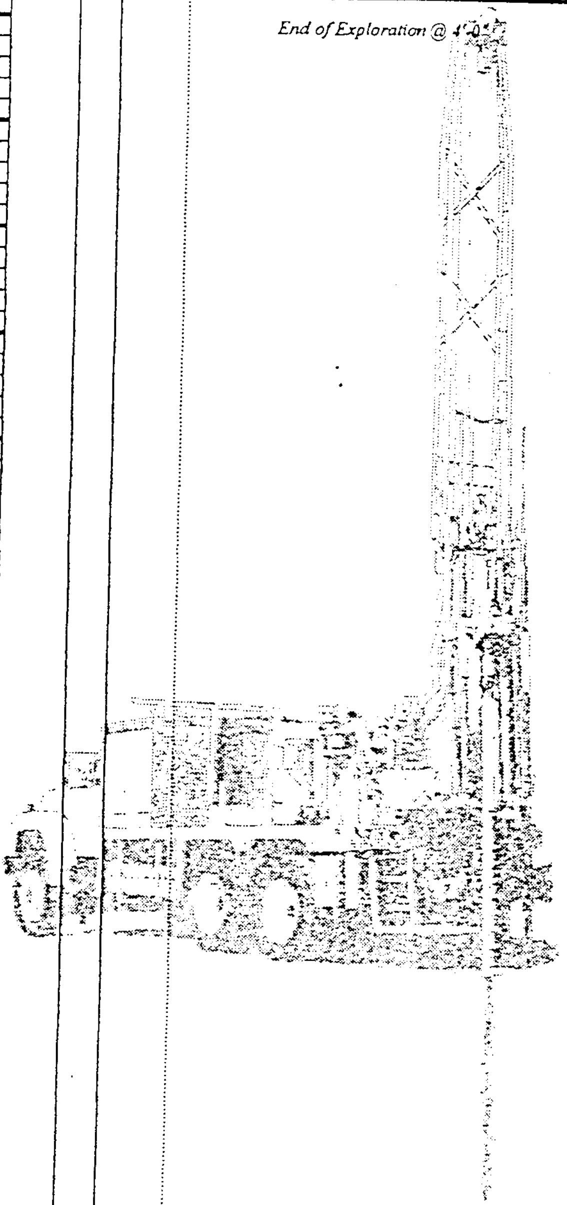
Project Location: Ashburton Ave., Yonkers NY

Log ID No.: 99074-07

LEGEND

FILL	ROCK
ORGANIC	FILL
SUBSOIL	RISER w/CEMENT
SILT	RISER w/SAND
CLAY	RISER w/BENTONITE
GRAVEL	SCREEN w/SAND
WATER: ▼	SPT

Sample Depth	Blows Counts per 6"				Moisture	Water	Changes	Color	DESCRIPTION OF FINDINGS	Elev.	General	No.	Pen.	Rec.	
0' to 2'	12	19	12	4	Dry		2"	(bl)	ASPHALT		FILL	1	24"	23"	0'
						▼		(gy)	CONCRETE fragments, little Sand						
2' to 4'	30	61	19	6	Wet							2	24"	6"	
							4'-0"								
									End of Exploration @ 4'-0"						5'
															10'
															15'
															20'
															25'
															30'
															35'
															40'
															45'
															50'
															55'
															60'
															65'
															70'
															75'



BORING LOG

B-8

Date: September 28, 1999
Driller: J. DeAngelis, Jr.
Drill Rig: CME-75 Truck Unit
Sampler (I.D.): 1-3/8"
Hammer Wt.: 140# Auto-Hammer
Casing (I.D.): 2-1/4" HSA
Water: 2'-0"

Client: Ecosystems Strategies, Inc.
60 Worrall Avenue
Poughkeepsie NY 12603-2332

Project Location: Ashburton Ave., Yonkers NY

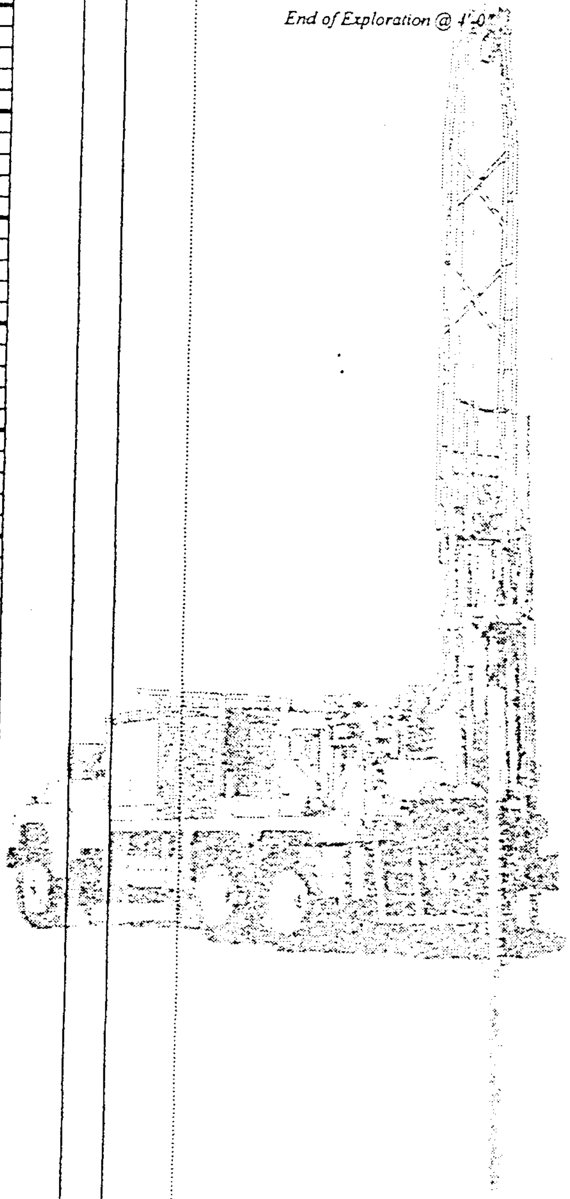
Log ID No.: 99074-08

LEGEND

FILL ▥ | ROCK ▨
ORGANIC ■ | TILL ▩
SUBSOIL ■ | RISER w/CEMENT
SILT ▤ | RISER w/SAND
CLAY ▤ | RISER w/BENTONITE
GRAVEL • • | SCREEN w/SAND
WATER: ⊻ | SPT

Sample Depth	Blows Counts per 6"				Moisture	Water	Changes	Color	DESCRIPTION OF FINDINGS	Elev.	General	No.	Pen.	Rec.
0' to 2'	16	13	10	5	Damp		2"	(bl)	ASPHALT		FILL	1	24"	21"
						⊻		(bl)	SAND, little Silt, Soot, Stone, Slag					
2' to 4'	4	4	3	2	Wet							2	24"	20"
							4'-0"							

End of Exploration @ 4'-0"



0' 5' 10' 15' 20' 25' 30' 35' 40' 45' 50' 55' 60' 65' 70' 75'