REMEDIAL INVESTIGATION WORKPLAN

Prepared for the

Haverstraw Harbors Site
Dr. George W. Girling Drive
Village Of Haverstraw
Rockland County, New York

NYSDEC Brownfields Program Site: C344060

NYSDEC Spill Files: 9811999, 0001146, and 0411778

May 2006
Revised July 2006

ESI File: GH9964.42

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Prepared By:

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The undersigned have reviewed this draft Remedial Investigation Workplan and certify to Harbors Haverstraw, LLC 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.

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President

Robert M. Capowski, P.E.
Project Engineer (Lic. #081444)

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this Draft Remedial Investigation Workplan (RIWP) is to: 1) summarize environmental investigative and interim remedial fieldwork previously performed by Ecosystems Strategies, Inc. (ESI) on the "Haverstraw Harbors Site" (hereafter referred to as the "Site"); and, 2) provide guidance on the manner in which additional site investigative services will be conducted, in order to address known and suspected on-site environmental conditions (see Section 1.3, below). It is the intent of this RIWP that, upon completion of all investigative activities, generated environmental data will be sufficient for the submission of a completed Remedial Investigation Report (RIR) and a Remedial Workplan (RWP) with an alternatives analysis to the New York State Department of Environmental Conservation (NYSDEC).

This RIWP is submitted to the NYSDEC in a "Draft" version and will not be consider "Final" until specific comments made by the NYSDEC and by the New York State Department of Health (NYSDOH) are incorporated into this document.

1.2 Site Location and Description

The Site is comprised of the following contiguous properties located on Dr. George W. Girling Drive ("Girling Drive"), in the Village of Haverstraw, Rockland County, New York:

- The former Rockland Fuel Oil Company (Rockland Fuel) property, Tax ID: Section 27.14, Block 1, Lot 5.1, located at the southeastern portion of the Site;
- A portion of the former Keahon property, Tax ID: Section 27.62, Block 2, Lots 7.1 and 7.2, located at the northeastern portion of the Site; and,
- The Village of Haverstraw Department of Public Works ("DPW") properties, Tax ID: Section 27.62, Block 2, Lots 8 and 12, located at the western portion of the Site.

The Rockland Fuel and Keahon parcels are located at the eastern end of Girling Drive, along the western shoreline of the Hudson River. The DPW parcels are located on both the northern and southern sides of Girling Drive (Lot 12 also has frontage on West Street). Site Location and Tax Maps are provided as Figures 1, 2, and 3, and an Existing Site Features Map is provided as Figure 4, in Attachment A.

The Rockland Fuel parcel (a former major oil storage facility [MOSF]) contains the Participant's temporary sales office and paved parking areas, and the Keahon parcel (a former concrete plant) contains a paved parking lot. The northern portion of the DPW parcel (a former wastewater treatment plant) is utilized as a maintenance yard and contains two, small one-story brick pump houses, a salt/gravel shed, and two aboveground storage tanks (diesel fuel and gasoline) with a fuel pump. The southern portion of the parcel contains a one-story, metal garage utilized for vehicle maintenance activities (Lot 8), and a landscaped area (Lot 12), which contains a 3,000-gallon underground storage tank (UST) supplying heating oil to the garage.

The Site is relatively level with surface elevations of approximately 10 feet above mean sea level (msl). Groundwater has been previously encountered at elevations of approximately 3 to 9 feet above msl; given the proximity of the Hudson River, groundwater depth and direction of flow are likely to be tidally influenced.

The Site is proposed for re-use as a residential development at the completion of remedial activities. The start of site development/construction activities is planned for November 2006 (at the southwestern portion of the Site), with project completion anticipated in 2008. A Preliminary Site Plan is provided as Figure 5 in Attachment A.

1.3 Known Environmental Conditions of Concern

On-site environmental conditions are documented in the following reports issued by ESI:

- Phase I Environmental Site Assessment (Phase I ESA) dated February 5, 1999, performed on the Keahon and Rockland Fuel parcels;
- Combined Phase I – Phase II Environmental Site Assessment (Phase I/II ESA) dated June 4, 1999, performed on the Rockland Fuel and northern DPW properties;
- Summary Report of Remedial Activities dated August 2003, documenting removal of solvent contaminated soil at the Rockland Fuel property;
- Tank Closure Site Assessment (TCSA) dated August 2003, documenting removal of aboveground storage tanks (ASTs) and related equipment at the former Rockland Fuel MOSF;
- Letter Reports documenting sampling of on- and off-site monitoring wells (Status of Groundwater Quality at Rockland Fuel Oil Corporation Site dated April 23, 2002, and Letter Report of Groundwater Sampling dated February 24, 2004);
- Tank Closure Report dated February 2, 2005, documenting tank and soil removal activities at the southern DPW parcel; and,
- Summary Report of Subsurface Investigation dated August 2005, documenting additional investigative activities conducted at the northern DPW parcel and an initial investigation of subsurface conditions at the southern DPW parcel.

Relevant excerpts from previous environmental reports are provided in Attachment B of this RIWP. Figure 6 in Attachment A illustrates previous soil and groundwater sampling locations.

Keahon Parcel

The Keahon property is the site of a former concrete manufacturer, which contained six petroleum ASTs (including an 8,000-gallon fuel oil tank and a 2,500-gallon gasoline tank) and three fuel pumps, located within a concrete secondary containment on the northeastern portion of the Site (PBS Facility ID: 3-990485).

A subsurface investigation conducted in December 1998 (documented in the Phase I ESA) included the excavation of fourteen test pits. Petroleum odors and stained soils were encountered at the soil/water interface in several areas, and elevated concentrations of VOCs were documented in soils located in the vicinity of the ASTs, near the Rockland Fuel parcel. Peak VOC concentrations were detected downgradient from the petroleum storage area. No significant metal concentrations were detected in soil samples. A spill event (#9811999) was reported to the NYSDEC in December 1998.

The vertical and lateral extent of the petroleum contamination has not been determined at the Keahon parcel. Contamination encountered at the southern portion of the parcel is most likely attributable to the historic on-site use, storage and release of petroleum products but may potentially be attributable to releases from the former Rockland Fuel MOSF.

The Participant subsequently removed all ASTs from the Keahon property; no confirmatory testing, however, has been completed at the former tank locations. The property is currently covered by an asphalt parking lot, which is effectively serving as a protective barrier layer.

Rockland Fuel Parcel

The Rockland Fuel property is the site of a former MOSF (PBS Facility ID: 3-1700), which contained fourteen ASTs (total storage capacity of approximately 2,500,000 gallons) located within a secondary containment, and several on-site structures, including a fueling rack. Stormwater from the secondary containment, the fueling rack, and a fuel unloading area was directed to a 1,000-gallon oil-water separator (OWS), which discharged directly to a drainage swale on the southern side of the property (SPDES Permit: NY-0234796).

A subsurface investigation conducted in May 1998 (see the Phase I/II ESA) documented the presence of elevated concentrations of VOCs (both chlorinated and aromatic), PAHs, and metals (cadmium, chromium, lead, and selenium) in on-site soils. Petroleum contamination was determined to extend from near the surface to the soil/groundwater interface. Approximately 2,000 cubic yards of petroleum-impacted soils were estimated to be present at the Rockland Fuel site. A spill event (#0001146) was reported to the NYSDEC in April 2000.

Sampling of four (previously existing) on-site monitoring wells in 1998 documented field evidence of contamination and elevated concentrations of MTBE and BTEX (including related compounds) in on-site groundwater. Subsequent sampling in 2002 (see the Status of Groundwater Quality at Rockland Fuel Oil Corporation Site report) indicated an overall increase in VOC concentrations. Sampling of three on-site wells in 2004 (one previously existing well and two replacement wells) documented elevated concentrations of MTBE and BTEX in only one well, suggesting that groundwater contamination was decreasing over time (Letter Report of Groundwater Sampling).

The vertical and lateral extent of petroleum and metal contamination has not been determined at the Rockland Fuel parcel. ESI supervised the removal of all on-site ASTs and associated features in 2003 (see the TCSA); no confirmatory testing, however, has been completed at the former tank locations. The property is currently covered by a temporary sales office, an asphalt parking lot, and imported soils, which are effectively serving as a protective barrier layer.

Department of Public Works Properties

Northern DPW Parcel

The northern DPW parcel site is the site of a former wastewater treatment plant, which is currently utilized as a maintenance yard. A limited subsurface investigation conducted in May 1998 (Phase I/II ESA) documented low levels of VOCs and PCBs, and slightly elevated metals concentrations (chromium, mercury, and selenium), in on-site soils. Additional investigative work conducted in June and July 2005 (Summary Report of Subsurface Investigation) confirmed the presence of limited, low-grade VOC, PAH, and metal contamination, and documented low-grade VOC contamination in soil gas samples collected beneath the slab of the eastern pump house. Sampling has not been conducted inside the western pump house or in the immediate vicinity of the on-site PBS tanks and fuel pump. No groundwater monitoring has been conducted.

Southern DPW Parcel

The southern DPW parcel contains a vehicle maintenance garage and a 3,000-gallon fuel oil UST. An inactive 1,000-gallon UST was removed from the western portion of the parcel in January 2005 (Tank Closure Report). Surrounding soils at the soil/groundwater interface were impacted by petroleum and a spill event (#0411778) was reported to the NYSDEC in February 2005. Excavated soils were temporarily stockpiled and were subsequently disposed of off-site at a licensed repository. The vertical and horizontal extent of the spill has not been delineated and groundwater quality has not been assessed. A single boring extended downgradient of the 3,000-gallon UST (July 2005) documented significant PAH contamination (likely to be associated with the spill event); no other environmental investigations have been conducted in the immediate vicinity of the active tank.

The garage is located downgradient of the former 1,000-gallon UST and contains several floor drains, which may have been impacted by historic site activities. Soil and soil-gas testing conducted in July 2005 (Summary Report of Subsurface Investigation) documents low-level VOC impacts beneath the building's concrete slab.

1.4 Completed Interim Remedial Measures

The following interim environmental response actions have already been completed:

- All petroleum bulk storage tanks and associated piping on the Rockland Fuel and Keahon properties have been removed (see the TCSA). Post-removal sampling was not conducted at the time the tanks were removed.
- All structures (buildings, containment systems, and the oil-water separator) on the Rockland Fuel and Keahon properties have been demolished.
- Soil contaminated with chlorinated solvents has been removed from the Rockland Fuel parcel and has been disposed of off-site (see the Summary Report of Remedial Activities).
- A temporary cap (asphalt and imported soil) has been placed on the Rockland Fuel and Keahon parcels in conjunction with interim site development activities (construction of a sales office and parking lot). The sales office has been equipped with a vapor barrier and a subslab depressurization system to prevent vapors from entering the occupied structure.
- Three additional groundwater-monitoring wells (RMW-4, RMW-5, and RMW-A-replacement) were installed at the Rockland Fuel parcel. Available wells were sampled in 1999, 2002, and 2004.
- A 1,000-gallon abandoned fuel oil UST was removed from the southern DPW parcel in January 2005.

2.0 PROPOSED SITE INVESTIGATION SERVICES

This section of the RIWP details proposed environmental investigative activities. Selected Site Features and Proposed Fieldwork maps, depicting relevant Site features and proposed fieldwork locations, are provided in Attachment A. All proposed work will be conducted according to a site specific Health and Safety Plan, provided as Attachment C.

Ecosystems Strategies, Inc. (hereafter referred to as the On-Site Coordinator, "OSC") has been retained to oversee the provision of the environmental investigative services specified in this RIWP. The "Participant" (as specified in the BCP agreement) is defined as Harbors Haverstraw, LLC, which will contract with the OSC and other environmental contractors as necessary to provide the services detailed below.

2.1 Overview of Proposed Services

The purpose of this RIWP is to provide guidance on the manner in which additional site investigative services will be conducted, in order to address known and suspected on-site environmental conditions (see Section 1.3, above). It is the expressed intent of this RIWP that, upon completion of all investigative activities, generated environmental data will be sufficient for the submission of a completed RIR, and a RWP with an alternatives analysis, according to the requirements of the NYSDEC BCP.

The following specific tasks will be completed at the Site (see Figure 7, Attachment A):

1) Extension of approximately seventy (70) to eighty (80) soil borings throughout the Site, including in on-site structures and at selected off-site locations (Section 2.3.2). Surface and subsurface soils will be sampled, as appropriate, and submitted for laboratory analysis of contaminants of concern in order to document Site integrity (Section 2.3.3). Soil sampling protocols will include confirmatory sampling in all former and current petroleum bulk storage areas;

2) Additional collection of soil gas samples from borings extended near the western pump house, and from borings located in proposed building locations (Section 2.3.4);

3) Completion of approximately eleven (11) borings as permanent, shallow overburden monitoring wells (Section 2.3.5), capable of providing reliable groundwater quality data throughout the investigative, remedial, and post-remedial phases of the Project;

4) Collection and laboratory analysis of groundwater samples, in order to document the integrity of on-site groundwater resources (Section 2.3.5); and,

5) Collection of sediment and water samples from the Hudson River, in order to document any impacts to the river from historic on-site activities (Section 2.3.6).

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 Participant will ensure that qualified contractors 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. Resumes of specific professionals to be used by the Participant are included in Attachment E. Prior to the initiation of fieldwork, a Site Health and Safety Officer will be designated by the Participant, and a complete Health and Safety Plan will be provided (see Section 2.2.2, below).

2.2.2 Health and Safety Plan

A site-specific Health and Safety Plan (HASP), incorporating a Community Health and Safety Plan, will be reviewed with site personnel and subcontractors prior to the initiation of specific fieldwork where contaminated media are likely to be encountered. All proposed work will be performed in "Level D" personal protective equipment. 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 Attachment C of this RIWP. Unless determined otherwise, the OSC will provide staff to serve as the project's Health and Safety Officer.

2.2.3 Quality Assurance / Quality Control

Equipment

Prior to the initiation of fieldwork, 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 MiniRAE 2000 (Model PGM 7600) photo-ionization detector (PID) will be used for site-screening of organic vapors. The PID is calibrated to read parts per million calibration gas equivalents (ppm-cge) of isobutylene. Instrument calibration will be performed no more than 24 hours prior to the commencement of fieldwork, and a written record of calibration results will be provided in the project files.

Laboratory

All samples will be collected in accordance with applicable NYSDEC guidelines and will be submitted to a New York State Department of Health (NYSDOH) ELAP-certified laboratory using appropriate chain of custody procedures. Dedicated, laboratory supplied glassware will be used for sample collection. One trip blank and one field blank will be supplied for each day of fieldwork involving sample collection. Field personnel will complete all chain of custody forms.

Laboratory reports will include detailed Quality Assurance/Quality Control (QA/QC) analyses, which will be provided in the final RIR (Section 2.3.7). Category B deliverables, as defined in the analytical services protocol (ASP), will be submitted for confirmatory and final delineation samples (Category A or Category Spills laboratory data deliverables may be submitted for analyses conducted at underground storage tank locations). In addition, a Data Usability Summary Report (DUSR) will be prepared by a third, independent party, which maintains NYSDOH ELAP CLP Certification. Data validation by an independent validator will be conducted on a minimum of 20% of all samples analyzed. More samples will be subject to validation, if considered warranted by the independent validator.

2.2.4 Fieldwork Monitoring

An assessment of subsurface soil characteristics, including soil type, the presence of foreign materials, and field and/or instrument indications of contamination (e.g., staining, odors, PID readings) will be made by the OSC. The OSC will be responsible for identifying any soils that in the opinion of the OSC may contain elevated concentrations of contaminants that warrant special handling. Those soils identified by the OSC will be removed to a specified soil stockpiling area for characterization and proper disposition. The OSC will monitor the removal of all contaminated soil, including monitoring the trucks and establishing the designated truck routes. The OSC will also ensure that any unforeseen environmental conditions are managed in accordance with applicable federal and state regulations.

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 fieldwork if deemed necessary by on-site personnel. Changes to fieldwork scheduling will be provided via facsimile transmission and/or email. All applicable local agencies will also be notified prior to the initiation of site work.

Prior to the implementation of any of the investigative tasks outlined in Section 2.3, below, a request for a complete utility markout of the subject property will be submitted as required by New York State Department of Labor regulations. Confirmation of underground utility locations will be secured, and a field check of the utility markout will be conducted prior to the initiation of work. Any utilities on the Site will be protected (as necessary) by the contractor or owner.

2.3 Proposed Site Investigation Services

This section of the RIWP provides a detailed description of the procedural and investigative tasks that will be conducted at the subject property.

2.3.1 Conduct Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP, see Attachment D) will be initiated during all ground intrusive activities, and during any other fieldwork that is reasonably likely to generate significant dust or vapors. The implementation of this Plan will document the presence or absence of specific compounds in the air surrounding the work zone, which may migrate off-site due to fieldwork activities. This plan provides 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 for dust.

Monitoring for VOCs will occur within 50 feet of the work zone using a PID. Recorded PID readings in excess of 5 ppm will be considered evidence of unacceptable air emissions and proper procedures to reduce emissions will be immediately instituted. Ameliorative 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 three locations on the Site: two downwind locations 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 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 ug/m^3 will be evidence of unacceptable air quality, and proper procedures to reduce dust levels (identified above) will be immediately instituted by the contractor.

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

2.3.2 Extension of Soil Borings

Approximately seventy (70) to eighty (80) soil borings will be extended throughout the Site, including, as warranted, in on-site structures and at portions of the adjoining property to the south (the "Site A" construction site). Borings will be extended (at a minimum) to the soil/groundwater interface using mechanized and/or hand-held equipment or until refusal (drills will be utilized, as necessary, to breach concrete slabs). Borings to be completed as monitoring wells will be extended using a hollow-stem auger; all other borings will utilize direct push sampling technology. Boring equipment will be capable of collecting soil cores at discreet intervals and will utilize disposable acetate sleeves to prevent cross contamination. All equipment will be properly

decontaminated according to NYSDEC guidelines. If necessitated by encountered field conditions, mechanized equipment will be utilized to extend test pits in lieu of borings (subject to NYSDEC approval).

Recovered soil cores and drill tailings will be containerized (disposal of soil materials will be based on the results of laboratory analysis and consultation with NYSDEC personnel). All stored materials will be properly secured and covered to avoid runoff and prevent unauthorized access. Sampling and disposal of this material will be documented in the final RIR (Section 2.3.7).

The exact locations of all soil borings will be determined in the field in consultation with NYSDEC representatives. Boring locations will be measured to the nearest 0.5-foot relative to a permanent fixed on-site marker, and will be recorded in logbooks for inclusion in all final maps. A Proposed Fieldwork Map showing anticipated boring locations is provided in Attachment A.

2.3.3 Soil Sampling

2.3.3.1 General Protocols

All encountered soils will be properly characterized in the field and findings will be recorded in logbooks. Material selected for sampling will be obtained in a manner consistent with NYSDEC sample collection protocols. Decontaminated stainless steel trowels and dedicated gloves will be used at each sample location to place the material into laboratory-supplied glassware. Prior to and after the collection of each material sample, the sample collection instrument will be properly decontaminated to avoid cross-contamination between samples.

Soils selected for sampling purposes will be collected from discreet two-foot core intervals, or (if necessary) will be grab samples from soils exposed in test pits. Soil sampling will be biased towards surface soils (0 to 2 inches below ground surface after removal of the vegetative cover), soils at the groundwater interface, and any soils with elevated PID readings, unusual odors, discoloration, or; any other field evidence of contamination.

All sample containers will be placed in a cooler and will be continuously maintained at cold temperatures prior to transport to a New York State Department of Health-certified laboratory for chemical analyses. Appropriate chain of custody procedures will be followed.

2.3.3.2 Sampling Protocols in AST Areas

Surface soils in the vicinity of former ASTs located on the Rockland Fuel and Keahon parcels have been covered by imported fill materials. The integrity of this barrier layer will be documented by collecting one soil sample (minimum depth of six inches) per 5,000 cubic yards of material. Soils located immediately beneath the barrier layer will be sampled (as practicable) using the procedures outlined below, which will be utilized at existing AST locations (located on the northern DPW parcel).

A minimum of at least two soil samples will be collected to detect surface contamination around the base of each of the former or existing tanks. Sample locations will include any areas of expected contamination (e.g., areas of observed overt evidence of contamination, low areas where spills may have accumulated, etc), and additional samples will be collected (as necessary) in order to ensure that there is at least one sample per 100 linear feet of tank circumference. Samples will be collected from a minimum depth of six inches below original grade surface. At least one boring will be extended near each former tank location. Borings will be located within two feet of the current or former tank, and split-spoon soil cores will be collected in continuous increments to four feet below the current watertable (or deeper, as appropriate). Soil samples exhibiting the greatest indications of apparent contamination will be submitted for analysis.

2.3.3.3 Sampling Protocols at Existing 3,000-gallon UST

Four soil samples will be collected from around the 3,000-gallon UST located on the southern DPW parcel. Samples will be collected within two feet of the tank with one sampling location located at each end, and additional sampling locations located along the length of the entire tank. Samples will be collected as close as possible to the tank (no samples will be collected from further than five feet from the tank). The sampling depth will be 0 to 2 feet below the tank bottom, or at one foot above to one foot below the current water table surface if the tank is within the saturated zone. Additional soil cores may be extended, should field conditions warrant.

2.3.3.4 Sampling Protocols at Former 1,000-gallon UST Location

Soils in the vicinity of the former UST located on the southern DPW parcel have been partially investigated (Tank Closure Report), including sampling of the excavation walls and tank invert. Additional sampling will be conducted to fully delineate the vertical and horizontal extent of soil contamination. Sampling will include (as necessary) off-site soils located on the adjoining property to the south (the Site "A" construction site), soils located beneath Girling Drive to the north, and soils located beneath the adjoining Garage to the east.

2.3.3.5 Sampling Protocols at Former Oil-Water Separator Location

Soils in the vicinity of the former OWS at the Rockland Fuel parcel will be sampled to document the presence or absence of contamination. Four borings will be extended to a depth of twelve feet (The OWS was eight feet) and one soil sample will be collected and analyzed for each boring. Additional borings may be warranted if a defined area of contamination is encountered.

2.3.3.6 Sampling Protocols at Garage Floor Drains

Soils in the vicinity of the garage floor drains have been partially investigated (Summary Report of Subsurface Investigation). Sampling will be conducted to further investigate potential subsurface VOC contamination and to delineate the extent of impacts from spill #0411778. Sampling will be conducted near the terminus of the drains, if the drains are determined to discharge directly to on-site subsurface soils (e.g., to a drywell).

2.3.3.7 Sampling Protocols for All Other Areas

Randomly selected samples will be located throughout all other portions of the Site to document site conditions and to determine the presence or absence of contamination at the groundwater interface. Borings will be extended to a depth sufficient to encounter the groundwater interface (estimated at between six and twelve feet below surface grade).

2.3.3.8 Sample Submission

Samples Selected for General Site Screening

At least one sample from each boring will be analyzed for priority pollutant metals, and all locations with elevated PID readings (greater than five times background) will be analyzed for USEPA Target Compound List (TCL) VOCs (plus 10). At least 25 percent of samples (biased to samples having the highest VOC screening level and/or visual discoloration) will be analyzed for TCL VOCs (plus 10), TCL semi-volatile organic compounds (SVOCs, plus 20), PCBs (USEPA Method 8082), pesticides (USEPA Method 8081), and USEPA Target Analyte List (TAL) metals.

Samples Collected from Imported Soil Cover Near Sales Center

Cover soils in the vicinity of the sales center (near former AST locations on the Rockland Fuel and Keahon parcels) will be submitted for laboratory analysis of VOCs (USEPA Method 8260), SVOCs (USEPA Method 8270), PCBs (USEPA Method 8082), pesticides (USEPA Method 8081), herbicides (USEPA Method 8151), and TAL metals. TCLP analyses will be performed for those compounds documented at concentrations greater than 20 times the maximum contaminant level as specified in 40 CFR Part 261.

Samples Collected at Locations of Storage Tanks, Floor Drains, and the Former OWS

Soil samples will be submitted for laboratory analysis of VOCs (USEPA Method 8260), PAHs (USEPA Method 8270), PCBs (USEPA Method 8082) and total weight RCRA metals. TCLP analyses will be performed for those compounds documented at concentrations greater than 20 times the maximum contaminant level as specified in 40CFR Part 261.

Samples Collected at Location of 1,000-gallon UST Spill Event (Southern DPW Parcel)

Soil samples selected for spill delineation will be submitted for laboratory analysis of VOCs (USEPA Method 8260) and PAHs (USEPA Method 8270). Additional analyses will be conducted on selected samples to satisfy the need for general site screening.

2.3.4 Soil Gas Sampling

A soil gas survey will be completed near the foundation slab at the western pump house, as well as within the footprints of proposed new residential facilities. It is anticipated that two borings will be extended near the pump house and that three borings will be extended beneath each of the proposed buildings.

2.3.4.1 Pre-Sampling Building Inventory and Inspection

For all soil gas sampling conducted within structures (and for any indoor air sampling, if such sampling is required by the NYSDEC), a building inspection will be conducted in order to 1) inventory any on-site products or equipment that may interfere or influence the sampling, and 2) evaluate the condition of the building and the foundation slab to identify any defects that may affect the proposed sampling or act as preferential pathways.

2.3.4.2 Sampling Methodology

A tracer gas (e.g., helium) will be used at all soil-gas sampling locations to verify that adequate sampling techniques are being implemented (i.e. to verify the absence of significant infiltration of outside air), in accordance with methodology specified in NYSDOH draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York (February 2005). Continued use of the tracer gas may be waived based upon verification of methodology effectiveness, after consultation with NYSDEC personnel.

A hollow, 1.5" steel rod with an expendable tip will be placed in each boring, the expendable tip will be removed from the rod, and an air-stone attached to ¼" Teflon tubing will be inserted into the rod and lowered to the invert of the boring. The rod will be removed and clean silica sand will be used to fix the air-stone in place. The boring will then be sealed using a non-VOC containing caulk, in order to prevent the infiltration of surface air. Each soil-gas boring will be sufficiently purged using a GilAir 3 air-sampling pump. Soil-gas samples will be collected into Summa canisters following purging and will be submitted for laboratory analysis of VOCs (USEPA Method TO-15, detection limit 1 mcg/m^3). Purging and sampling flow rates will not exceed 0.2 liters/minute.

2.3.5 Groundwater Monitoring

Eleven soil boreholes are proposed to be completed as new, shallow overburden groundwater monitoring wells [note: existing on-site monitoring wells may be used in lieu of new wells if such wells can be located, are found to be in good condition, and are acceptable to the NYSDEC]. A Proposed Fieldwork Map showing anticipated well locations is provided in Attachment A.

2.3.5.1 Installation of Proposed Monitoring Wells

All monitoring wells will be constructed of two-inch PVC casing with 0.1-inch slotted PVC well screening across the water table. No glue will be used to thread the casing lengths. The wells will be constructed such that a minimum of 2.0 foot of screening will extend above the water table and approximately 8.0 feet of screening will extend below the water level. The annular space between well screen and the borehole will be backfilled with clean #1 silica sand to a depth of one to two feet above the well screen. A one-foot thick bentonite seal will be poured down the borehole above the sand pack and allowed to hydrate before grouting the remaining annular space with cement. Note: the length of the PVC screen, sand filter, and bentonite seal may be reduced (in that order) in order to accommodate a shallow water table. A locked cap with vent will be installed at the top of the PVC riser.

Wells will be completed as either stickup or drive-over wells, according to site conditions, and will be protected by locked, metal casings. All monitoring wells will be surveyed vertically to the nearest 0.01 foot and horizontally to an accuracy of one-tenth of a second latitude and longitude. The surveyed measurements will be referenced to the North American Datum of 1983 (NAD83) and National Geodetic Vertical Datum of 1929 (NGVD29). Well locations and all other surveyed data will be provided in the final RIR on a certified map prepared by a State certified surveyor. The survey will document the vertical elevations of the top of the casing pipe and the ground surface elevation adjacent to each well.

Well construction logs showing components and details of well casing, well screen, filter pack, annular seal, and associated items will be provided in the final report.

2.3.5.2 Monitoring Well Development

Subsequent to installation, the wells will be developed with a properly decontaminated mechanical pump and dedicated polyethylene tubing in order to clear fine-grained material that may have settled around the well screen and to enhance the natural hydraulic connection between the well screen and the surrounding soils. Prior to development, the monitoring well casing will be opened and the well column immediately screened with a PID to document the presence of any volatile organic vapors. Water removed from the monitoring well will be visually inspected for indications of petroleum contamination. Well water removed in the course of development will be containerized (disposal of collected groundwater will be based on the results of laboratory analysis).

Well development will begin at the top of the saturated portion of the screening to prevent clogging of the pump within the casing. The pump will be raised and lowered one to two feet within various portions of the screened interval to force water back and forth through the screen. Repeated surging and pumping at intervals of less than five feet will be performed to the bottom of the screen until the discharged water appears clear. Upon completion, the pump assembly will be removed while the pump is still running to avoid discharge of purged water back into the well. The well will be considered developed when turbidity is determined to be less than 50 NTUs.

2.3.5.3 Groundwater Well Sampling

Groundwater samples will be collected during site investigative activities, and at subsequent quarterly intervals until such monitoring is deemed unnecessary by the NYSDEC. Provided below is a description of the proposed sampling protocol. All relevant data will be recorded in field logbooks:

1. Basic climatological data (e.g., temperature, precipitation, etc.) will be noted;

2. The protective casing on the well will be unlocked and the air in the wellhead will be screened for organic vapors using the PID;

3. The well's static water level will be measured to the nearest 0.01 foot relative to the top of the PVC casing using a decontaminated water level meter;

4. The volume of standing water in the well will be calculated (using well diameter, total well depth, and the measured depth of the standing water) to determine the amount of water to be purged from the well prior to sampling;

5. The well will be purged a minimum of three well volumes using a properly decontaminated mechanical pump and dedicated polyethylene tubing, or by hand using dedicated, disposable bailers. The purged volumes will be calculated by discharging the well water into a container of known volume. Purged water will be containerized, as necessary. The time at the beginning and the end of purging, and all observations (e.g., turbidity, odor, presence of a sheen, etc.) will be recorded;

6. The presumed least contaminated monitoring well will be sampled first, and sampling shall progress from the least contaminated monitoring well to the most contaminated well. Groundwater samples will be collected from the well using a dedicated, disposal bailer in accordance with procedures outlined according to NYSDEC protocol. During sample collection, the bailer will not touch the ground or any object except for the well casing);

7. The sampling of groundwater for metals analysis will occur when low turbidity conditions are attained (i.e., turbidity less than 50 NTUs) in the well water. If high turbidity conditions are encountered, the well will be redeveloped in order to reach acceptable turbidity conditions, and/or both unfiltered and filtered groundwater samples will be collected and analyzed for total and dissolved metals, respectively;

8. Groundwater samples will be placed in appropriately sized and preserved laboratory supplied glassware, and will be stored and transported at cold temperatures, following proper chain of custody procedures;

9. The protective cap on the well will be replaced and locked. The field sampling crew will move to the next most contaminated well and the process will be repeated.

2.3.5.4 Analysis of Groundwater Samples

Groundwater samples will be submitted for laboratory analysis of total and dissolved TAL Metals, VOCs (USEPA Method 8260 plus MTBE), PAHs (USEPA Method 8270), and PCBs (USEPA Method 8082).

2.3.5.5 Groundwater Flow Calculations

The direction of groundwater flow will be determined based on elevations of static groundwater as measured at all on-site wells, measured prior to water quality sample collection. Measurements will be collected with an electronic depth meter with an accuracy of measuring depth to the nearest 0.01 foot. Data will be recorded in field logs for use in generating a Direction of Groundwater Flow Map in the final RIR (Section 2.3.7).

2.3.6 Hudson River Sediment and Water Sampling

Hudson River sediments will be sampled at six locations at the eastern portion of the Site. In addition, a surface water sample will be collected from the Hudson River at both an up-river and down-river location.

2.3.6.1 Sample Collection

Sediment sampling will be conducted from a stable work boat or barge capable of safely supporting all required personnel and field equipment, and which can be readily maneuvered to the appropriate sampling locations and be held stationary through anchors, ropes, or other practical means. Sampling location will be documented using global positioning system technology and field observations. The choice of sampling equipment will be determined by the field technician based on depth to the river bottom and encountered field conditions (e.g., soft verses hard bottom materials).

Sediment will be collected from 0 to 4 feet below the river bottom, using equipment capable of retrieving discreet sediment cores. Logs will be prepared for all sediment samples to document sediment structure and any field evidence of contamination. Grossly contaminated sediment will not be returned to the river and will be disposed of in accordance with applicable guidance and regulations. Decontaminated stainless steel trowels and dedicated gloves will be used to place the material into the laboratory-supplied glassware. Prior to and after the collection of each material sample, all sample collection equipment will be properly decontaminated to avoid cross-contamination between samples.

2.3.6.2 Sample Analysis

Two samples (0-6" and 42-48") from each of the six sampling locations will be submitted for laboratory analysis of TAL Metals, PAHs (USEPA Method 8270), and PCBs (USEPA Method 8082). Surface water samples will be analyzed for VOCs (USEPA Method 8260 plus MTBE), PAHs (USEPA Method 8270) and PCBs (USEPA Method 8082).

2.3.7 Preparation of Final Reports

A final Remedial Investigation Report (RIR) and a Remedial Workplan (RWP) with an alternatives analysis will be submitted to the NYSDEC following the completion of Site investigative services, in accordance with Division of Environmental Remediation Draft Technical Guidance for Site Investigation and Remediation requirements. The RIR and RWP will, respectively, 1) summarize and document all investigative activities conducted on the Site (including all relevant maps, drawings, summary data tables, and complete laboratory reports), and 2) provide an analysis of potential remedial response actions (for use in developing a Remedial Action Workplan or Remedial Design, depending on the complexity of the selected remedy).

Quarterly groundwater monitoring reports will be provided to the NYSDEC as data becomes available. Such reports will include applicable maps, physical well data (e.g., groundwater levels), data summary tables and laboratory reports, and a discussion of results and specific recommendations for additional investigation, remediation, or monitoring.

3.0 TIME SCHEDULE

The following schedule is anticipated for this project, subject to revision by mutual consent of both the NYSDEC and the Participant:

Within 3 months of the approval of the RIWP:

- Installation of all monitoring wells
- Completion of all investigative activities

Within 5 months of the approval of the RIWP:

- Preparation of the final RIR, and RWP with alternatives analysis, and submission to the NYSDEC for review

ATTACHMENT A

Figures

Source: U.S. Department of the Interior Geological Survey Topographic Map of the Haverstraw, NY Quadrangle, dated 1967 (photorevised 1979)

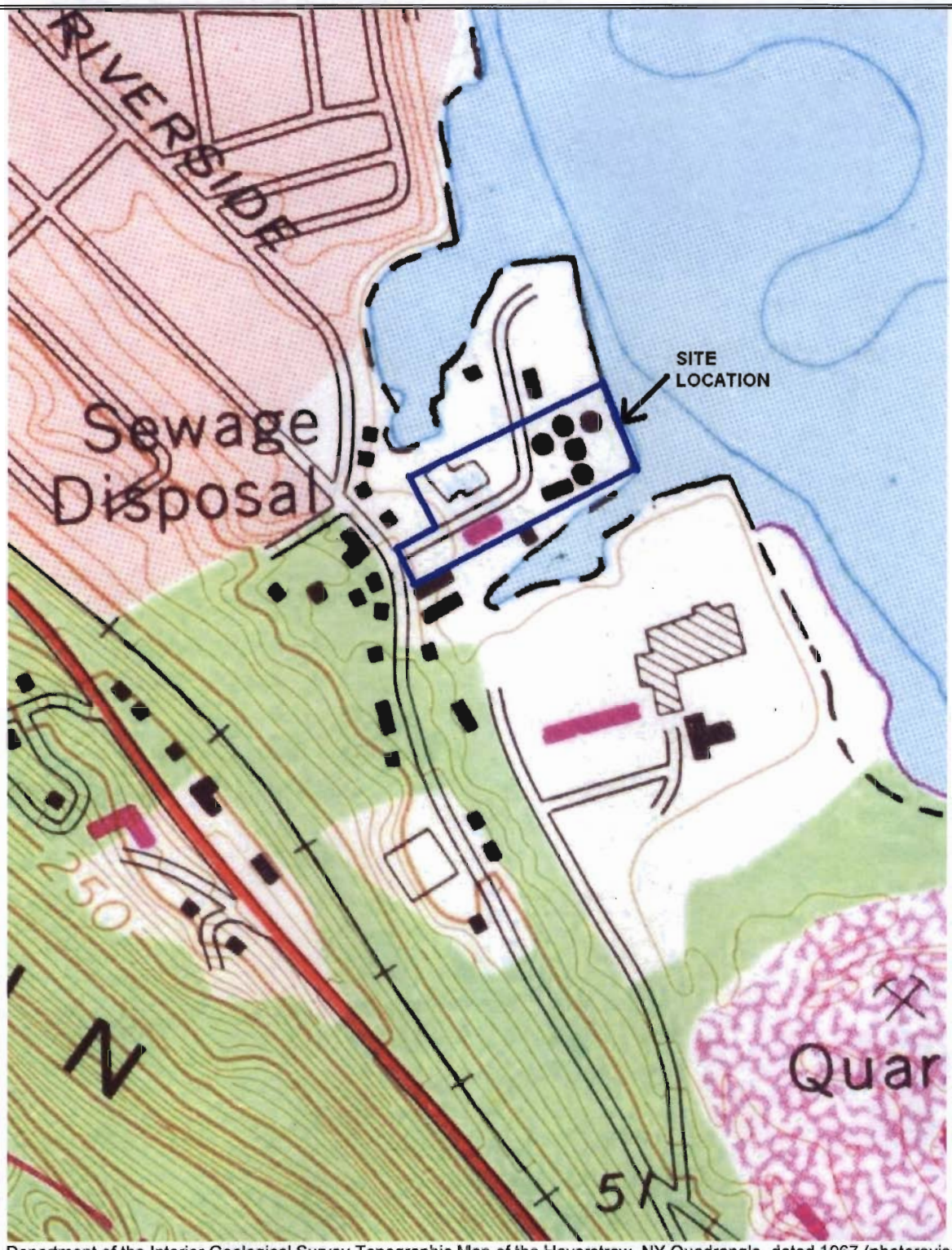
Site Location Map – Overview
Haverstraw Harbors Site
Dr. George W. Girling Drive
Village of Haverstraw
Rockland County, New York

N

ESI File: GH9964.42

Date: July 2006

Attachment A – Figure 1



Source: U.S. Department of the Interior Geological Survey Topographic Map of the Haverstraw, NY Quadrangle, dated 1967 (photorevised 1979)

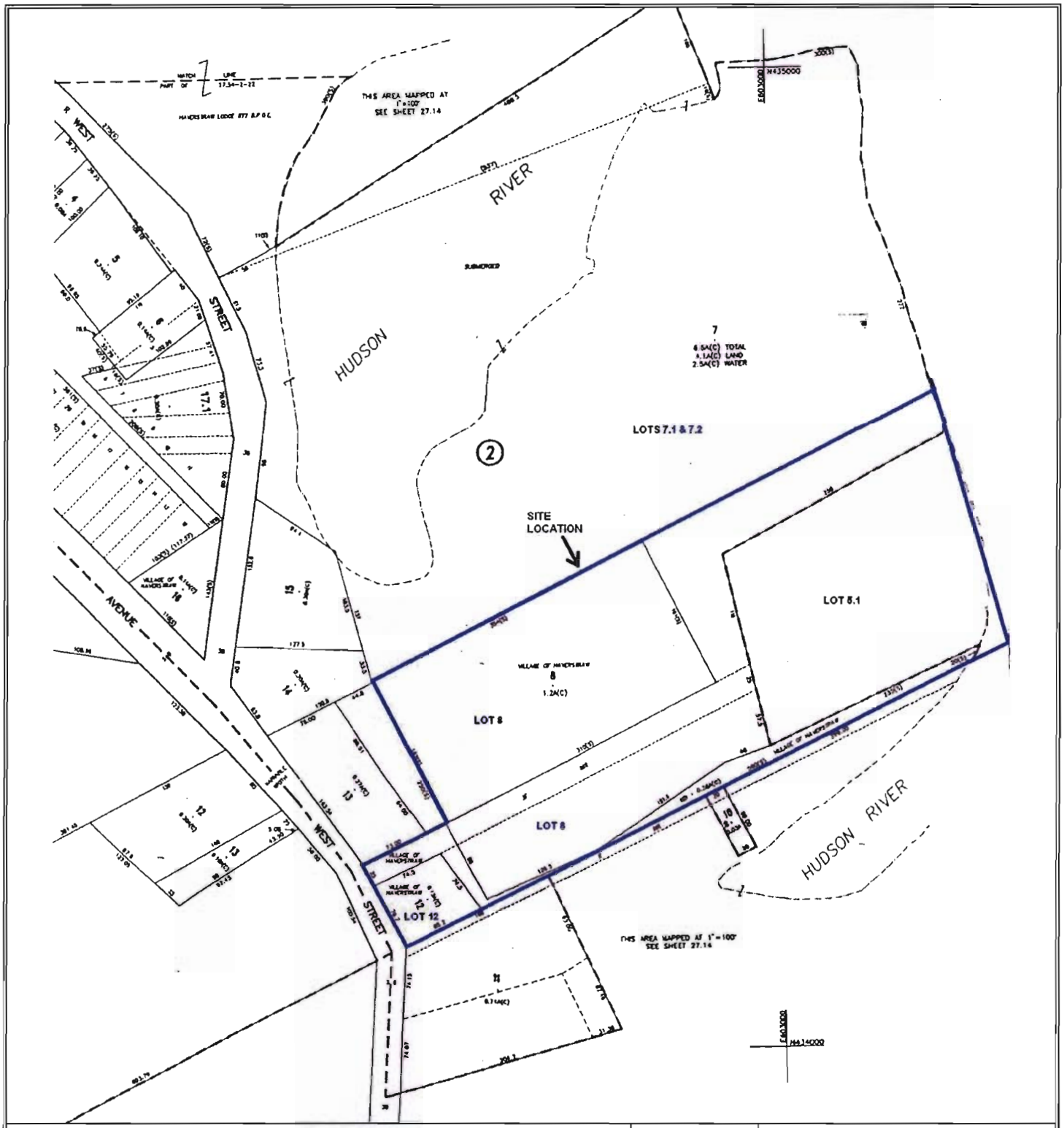
Site Location Map - Detail
Haverstraw Harbors Site
Dr. George W. Girling Drive
Village of Haverstraw
Rockland County, New York

N

ESI File: GH9964.42

Date: July 2006

Attachment A – Figure 2



Village of Haverstraw Tax Map

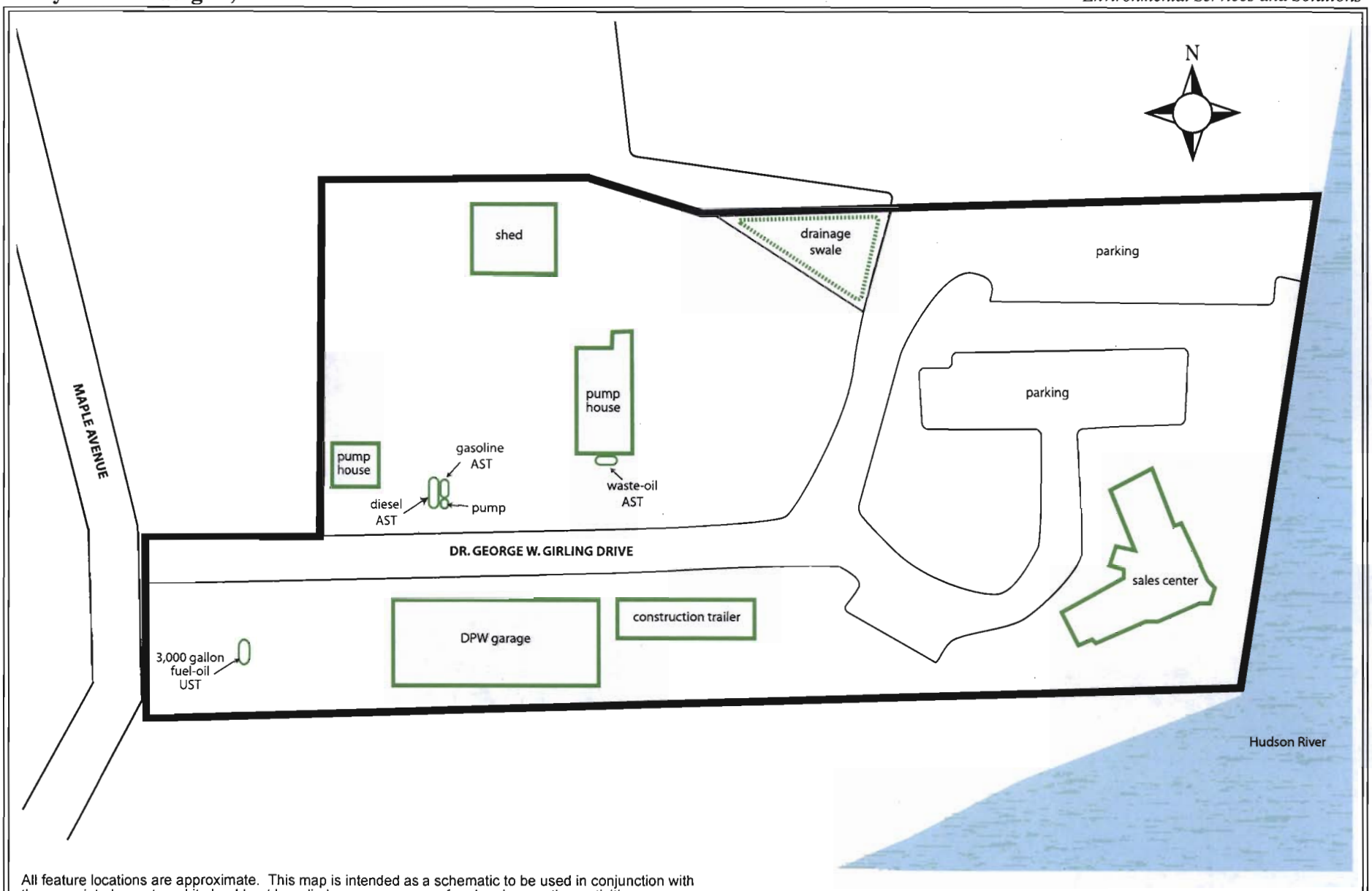
Haverstraw Harbors Site
Dr. George W. Girling Drive
Village of Haverstraw
Rockland County, New York

N

ESI File: GH9964.42

Date: July 2006

Attachment A – Figure 3

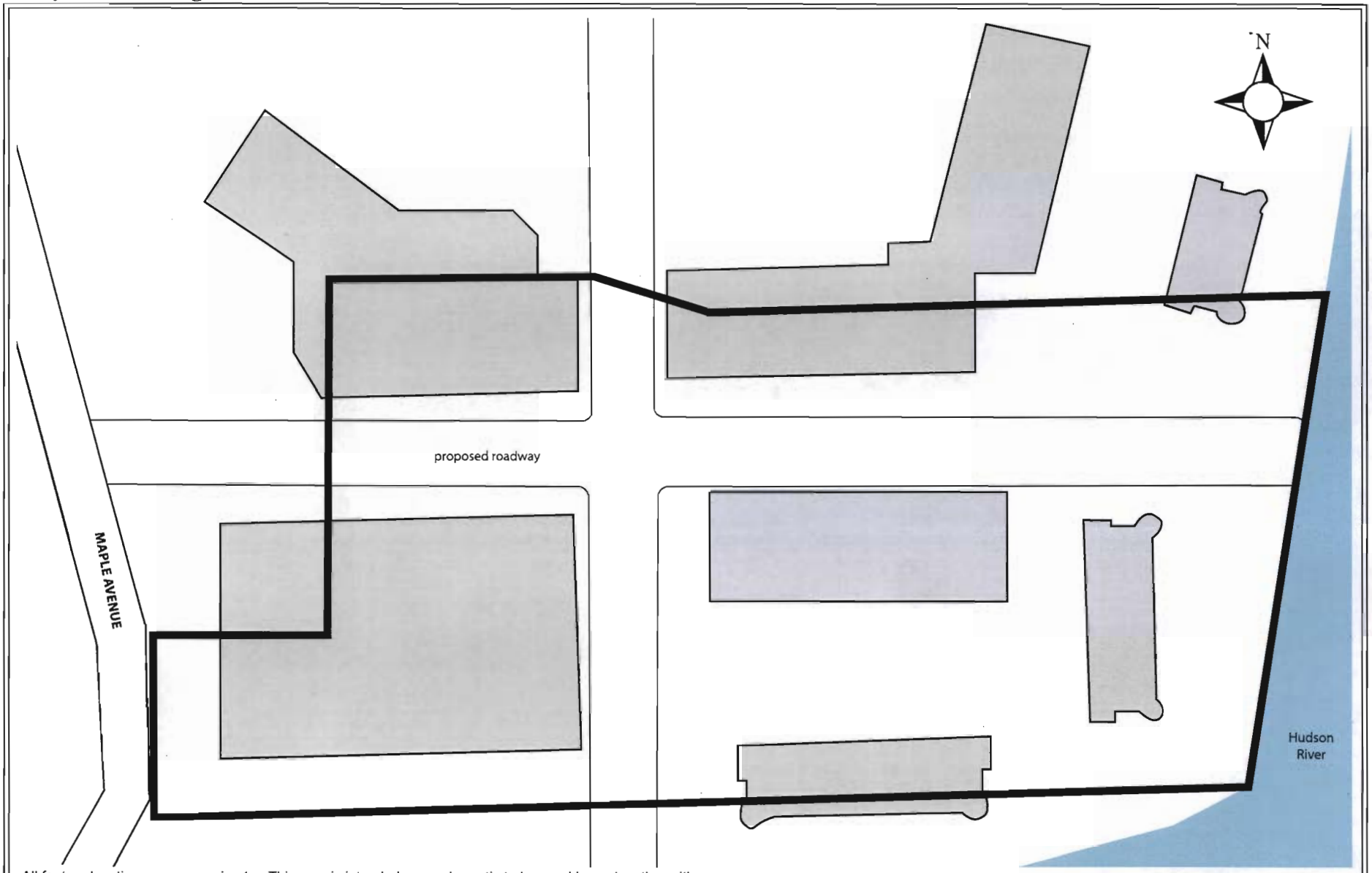


All feature locations are approximate. This map is intended as a schematic to be used in conjunction with the associated report, and it should not be relied upon as a survey for planning or other activities.

Existing Site Features Map

Haverstraw Harbors Site
Dr. George W. Girling Drive
Village of Haverstraw
Rockland County, New York

ESI File: GH9964.42
July 2006
Scale: 1" = 80' (approximately)
Attachment A - Figure 4



All feature locations are approximate. This map is intended as a schematic to be used in conjunction with the associated report, and it should not be relied upon as a survey for planning or other activities.

Preliminary Site Plan

Haverstraw Harbors Site
Dr. George W. Girling Drive
Village of Haverstraw
Rockland County, New York

Legend:

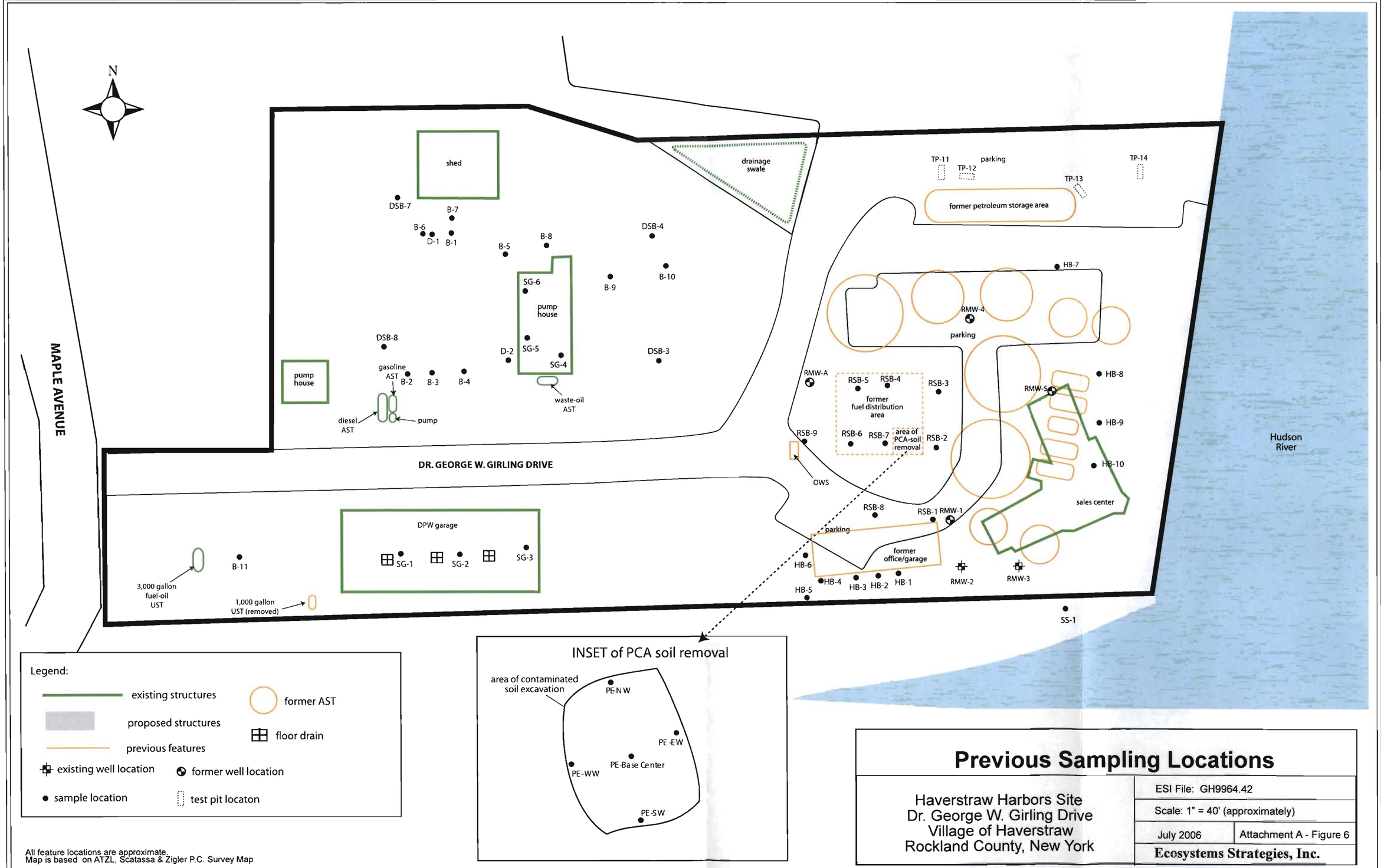
proposed buildings

ESI File: GH9964.42

July 2006

Scale: 1" = 80' (approximately)

Attachment A - Figure 5



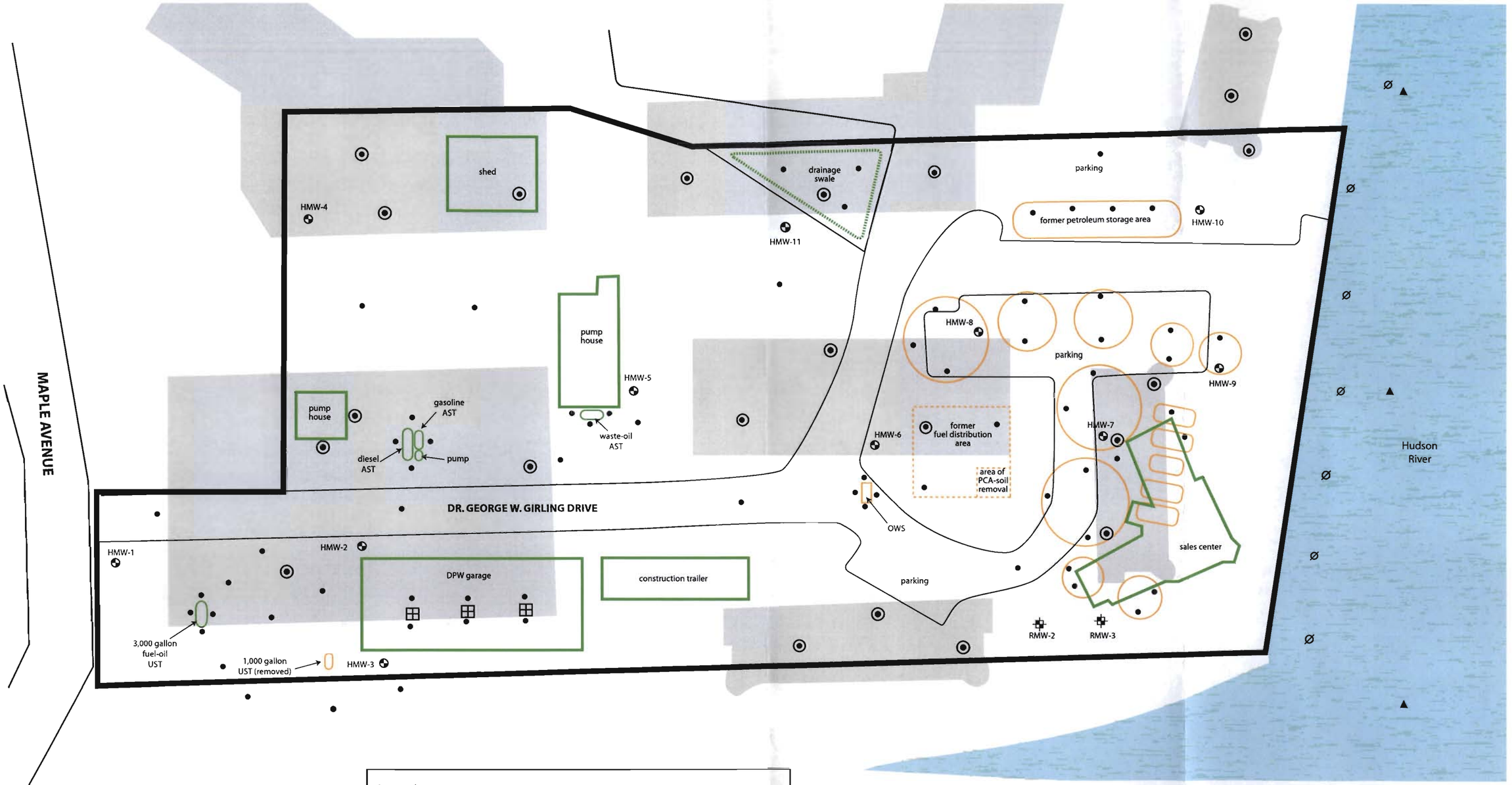
Legend:

- existing structures
- proposed structures
- previous features
- former AST
- floor drain
- existing well location
- former well location
- sample location
- test pit locaton

All feature locations are approximate.
Map is based on ATZL, Scatassa & Zigler P.C. Survey Map

Previous Sampling Locations

Haverstraw Harbors Site Dr. George W. Girling Drive Village of Haverstraw Rockland County, New York	ESI File: GH9964.42 Scale: 1" = 40' (approximately) July 2006 | Attachment A - Figure 6 **Ecosystems Strategies, Inc.**



All feature locations are approximate.
Map is based on ATZL, Scatassa & Zigler P.C. Survey Map

Proposed Fieldwork Map

Haverstraw Harbors Site
Dr. George W. Girling Drive
Village of Haverstraw
Rockland County, New York

ESI File: GH9964.42
Scale: 1" = 40' (approximately)
July 2006 | Attachment A - Figure 7
Ecosystems Strategies, Inc.

ATTACHMENT B

Excerpts from Previous Environmental Reports

Excerpts of Previous Report

Phase I Environmental Site Assessment – February 5, 1999

4.0 Subsurface Investigation

4.1 Test Pits and Test Trenches

4.1.1 Methodology

Fifteen test pits were excavated throughout the Keahon Brothers property on December 1, 1998 by Wiltse Excavators, Inc. ESI personnel observed and documented all field activities.

Locations for the test pits were determined based upon the site history findings and based upon observations made during a site inspection on November 30, 1998. The following potential areas of concern were identified in the course of preparation of the Environmental Site Assessment: the historic truck storage/parking area (with stained surface soil) located in the southwestern portion of the site (test pits #1-#4); the former northern truck parking area (test pit #5); the former truck washing area located north of the on-site garage (test pit #6); a bermed area located in the vicinity of the former concrete batch facility's structure (test pit #7); the septic system and historic battery storage area located east of the garage (test pits #8-#10 and #15); the historic drum storage and current aboveground PBS tanks located south and southeast of the garage (test pits #11-#14).

All test pit locations are shown on the Selected Site Features Map provided on page 6 of this Assessment.

Test pits were dug with a backhoe to a sufficient depth to intercept the water table or until refusal (whichever came first). The following information was noted during excavation and documented in field notes: soil type, classification of buried wastes (if present), unusual odors and soil discoloration (see Section 4.1.2, below). Due to equipment malfunctioning, soils were not screened with a photoionization dectector.

Following test pit excavation and sample collection, each test pit was backfilled to original grade.

4.1.2 Field Observations

Observations made in the field at each location are described below.

Southwestern Truck Storage Area

The soils encountered in test pit #1 consisted of light brown and brown sand with brick and cobbles at depths of 0'-2' below grade. An approximately two inch concrete slab was encountered at two feet below grade and fill material consisting of metal and rubber items, brick and brown sand was encountered as depths of 2'-5.5'. Refusal was encountered at 5.5' below grade.

The soils encountered in test pits #2-#4 consisting of gravel and brown-red sand with cobbles from 0'-1', gray soil which had layers of dark green and gray and had a strong petroleum odor was encountered at 1'-2.5' below grade. Gray, silty clay was encountered at 2.5' below grade. Groundwater was encountered at 3.5' below grade in test pits #2 and #4 and at a depth of 5.0' below grade in test pit #3.

Northern Truck Parking Area

The soils encountered in test pit #5 consisted of fill material (fine light brown sand) from 0'-1', coal ash with large cobbles from 1' to 2' below grade, crushed brick and sand from 2' to the water interface which was encountered at 7.0 feet below grade.

Former Truck Washing Area

The soils encountered in test pit #6 consisted of fine light brown sand from 0'-6" below grade, gray-brown medium coarse sand with cobbles from 6" to 3' below grade, water began seeping into the pit at approximately 3.2' below grade. Cement was encountered at approximately 3.5' below grade.

Former Concrete Batch Structure and Bermed Area

The soils encountered in test pit #7 consisted of dark brown sand with large cobbles from 0'-3' below grade, light brown-orange and dark brown/red sand with cobbles from 3' to 4.5' below grade. The water interface was encountered at 4.0 feet below grade.

Septic System and Battery Storage Area

Metal and rubber piping was documented in test pit #8 from 0' to 2.5' below grade. Soils consisting of dark brown medium to fine grain dark brown sand from 2.5' to7' feet below grade. The water interface was encountered at 7 feet below.

The soils encountered in test pits # 9 and #10 consisted of light brown medium fine, dark gray very coarse, and reddish-black coarse grain sand with large cobbles from 0 to 1' below grade, light brown medium grain sand with brick and cobbles from 1' to 2' and grey silty clay at 2'. Groundwater interface was encountered at both of these test pits at 7 feet below grade.

The soils encountered in test pit #15 (within the septic system leaching bed) consisted of gravel and large cobbles from 0.5'-2.5' and alight brown fine to medium grain sand from 2.5' to 5'. This test pit was extended to a depth of 5' below grade.

Drum Storage and PBS Area

Soils encountered in test pits #11-#13 consisted of gravel and concrete from 0'-0.3', gray and dark gray silty-clay fine grain soil with a strong petroleum odor from 0.3'-2.8' below grade, dark brown and gray medium coarse grain soil with bricks and cobbles from 3.0' to 7' below grade and a gray silty very clayey soil at 7' below grade. The groundwater interface was encountered at approximately 7.5 feet below grade. A strong petroleum order was noted from approximately 0.3' to the groundwater interface (7.5'); a sheen was noted on groundwater in all three test pits.

The soils encountered in test pit #14 consisted of light brown medium to fine grain soil from 0' to 1' below grade, light brown-orange with brick and medium size cobbles from 1' to 2' below grade and a gray silty clay soil with a strong petroleum odor from 2.5' to the groundwater interface which was encountered at 6.0 feet below grade. A sheen was noted on groundwater entering the test pit.

4.1.3 Laboratory Results

Action Levels

The term "action level," as defined in this Report, refers to the concentration of a particular contaminant above which remedial actions are considered more likely. The overall objective of setting action levels is to assess the integrity of on-site soils relative to conditions which are likely to present a threat to public health or the environment, given the existing and probable future uses of the site. On-site soils with contaminant levels exceeding these action levels are considered more likely to warrant remediation. No independent risk assessment was performed by Ecosystems Strategies, Inc. for this Report.

The action levels identified in this Report for soils are determined based on the New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum (TAGM) 4046, issued January 24, 1994. In accordance with the respective guidance values set forth in the above-referenced documents, all compounds referenced in Sections 2.3 and 2.4 below are presented with their respective action levels.

Analyses and Results

Laboratory analyses were selected based upon the selected location of the test pit and observations made in the field. A summary of the chemical tests requested for sample analysis is presented below.

Table 6: Summary of soil samples collected

Sample ID	Date collected	Area of concern	Depth sample (ft)	Laboratory analysis
TP-3	December 1, 1998	Truck Storage Area	1	Cadmium, Chromium and Lead
TP-3	December 1, 1998	Truck Storage Area	5	Cadmium, Chromium, Lead, VOCs and PAHs
TP-6	December 1, 1998	Truck Washing Area	3	Cadmium, Chromium, Lead, VOCs and PAHs
TP-8	December 1, 1998	Battery Storage Area	3	8 RCRA Metals
TP-11	December 1, 1998	Drum Storage Area	2.5	Cadmium, Chromium, Lead, VOCs and PAHs
TP-11	December 1, 1998	Drum Storage Area	6.5	Cadmium, Chromium, Lead, VOCs and PAHs
TP-13	December 1, 1998	PBS Area	7	Cadmium, Chromium, Lead and VOCs
TP-14	December 1, 1998	Downgradient from PBS Area	6	VOCs
TP-15	December 1, 1998	Septic Leachfield	4	Cadmium, Chromium, Lead, VOCs and PAHs

Levels of VOCs which exceeded NYSDEC action levels (n-Butylbenzene, sec-Butylbenzene, p-Isopropylbenzene, n-Propylbenzene, 1,2,4-Trimethylbenzene, 1,3,5-Trimenthylbenzene and o-Xylene) were documented in test pits extended in the former truck washing area (test pits #6), the drum storage area (test pit #11-2.5) and in the vicinity of and downgradient of the on-site PBS area (test pits #13 and #14). Low levels of VOCs were detected in test pit #3-5'. Chromium was the only metal detected at elevated levels in TP-3 (5'). Low levels of PAHs were detected in test pits #3-5' and #11-2.5'. Although the highest levels of VOCs were documented in the vicinity of and downgradient of the on-site PBS area, these levels could potentially be attributable to petroleum leakage on the Rockland Fuel Oil property. PAHs were not detected above NYSDEC action levels in any of the samples analyzed; however low levels of PAHs were detected in test pits #3-1', #6, #8, #11-2.5', #13 and #15.

A summary of soil sample laboratory results is provided in Appendix H of this Assessment. Provided below in Tables # 7 and #8 is a summary of the laboratory data for each sample collected.

Table #7: Laboratory Analyses of Detected Volatile and Semi-volatile Organic Compounds in Soil
(Results in **bold** exceed designated action levels. All results measured in µg/kg-ppb).

	Compound	Action Level[1,2]	TP-3		TP-6	TP-8	TP-11		TP-13	TP-14	TP-15
			1'	5'	3'	3'	2.5'	6.5'	7'	6'	4'
VOCs	Benzene	60[2]	NA	ND	ND	NA	24	ND	ND	ND	ND
	n-Butylbenzene	100[1]	NA	ND	**810**	NA	ND	ND	**70,000**	**15,000**	ND
	sec-Butylbenzene	100[1]	NA	ND	ND	NA	ND	ND	**17,000**	**2,900**	ND
	1,3-Dichlorobenzene	1,600[2]	NA	ND	ND	NA	710	ND	ND	ND	ND
	Isopropylbenzene	100[1]	NA	ND	ND	NA	ND	ND	**7,200**	ND	ND
	p-Isopropylbenzene	100[1]	NA	ND	**170**	NA	ND	ND	ND	ND	ND
	Naphthalene	200[1]	NA	4	160	NA	ND	ND	ND	ND	ND
	n-Propylbenzene	100[1]	NA	ND	ND	NA	ND	ND	**22,000**	**5,500**	ND
	1,2,4-Trimethylbenzene	100[1]	NA	ND	**100**	NA	**300**	ND	**13,000**	**2,800**	ND
	1,3,5-Trimethylbenzene	100[1]	NA	ND	**96**	NA	ND	ND	**12,000**	ND	ND
	o-Xylene	100[1]	NA	ND	ND	NA	**120**	ND	ND	**1,700**	ND
	p-m Xylene	100[1]	NA	ND	ND	NA	95	ND	ND	ND	ND
PAHs	Phenanthene	50,000[2]	NA	210	ND	NA	120	ND	NA	NA	NA
	Pyrene	50,000[2]	NA	ND	ND	NA	170	ND	NA	NA	NA

Notes:
1. Source: NYSDEC STARS Memo #1 (July 1993)
2. Source: NYSDEC TAGM (January 24, 1994)
3. ND = Not Detected, NA = Not Analyzed

Table #8: Summary of RCRA Metals in Soils
(All data provided in mg/kg. Concentrations shown in **bold** exceed NYSDEC established action levels.)

Metals	Background Levels[1]	Action Levels[1]	Sample Identification								
			TP-3 (1')	TP-3 (5')	TP-6 (3')	TP-8 (3')	TP-11 (2.5')	TP-11 (6.5')	TP-13 (7')	TP-14 (6')	TP-15 (4')
Arsenic	3.0 - 12.0	7.5	NA	NA	NA	1.3	NA	NA	NA	NA	NA
Barium	15 - 600	300	NA	NA	NA	26	NA	NA	NA	NA	NA
Cadmium	0.1 - 1.0	1	ND	4	ND	ND	ND	ND	ND	NA	ND
Chromium	1.5 - 40	10	ND	12	4	4	ND	ND	3	NA	3
Lead	4.0 - 61	250	20	ND	10	10	20	ND	ND	NA	10
Mercury	0.0001 - 0.2	0.2	NA	NA	NA	ND	NA	NA	NA	NA	NA
Selenium	0.1 - 3.9	2	NA	NA	NA	ND	NA	NA	NA	NA	NA
Silver	NE[2]	NE[2]	NA	NA	NA	ND	NA	NA	NA	NA	NA

Notes: 1. Source: NYSDEC Technical and Administrative Guidance Memorandum (January 24, 1994).
2. NYSDEC action and/or background levels were not established for this compound.
3. Not detected above laboratory detection limit
4. NA = Not Analyzed

4.1.4 Agency Notification

State regulations (6 NYCRR; Part 617.9) require reporting of known petroleum releases to the NYSDEC. Pursuant to this regulation, this office submitted a spill report on December 22, 1998. The event has been assigned Spill Number 9811999. Until further remedial action is undertaken and appropriate documentation provided to the NYSDEC that compounds are not present at levels exceeding established action levels, the spill will remain designated as "Active" in NYSDEC spill files. In accordance with reporting requirements, the NYSDEC has been informed of the approximate extent of the spill, its location, compound content, and the lack of available information regarding the spills impact on groundwater.

5.0 Conclusions and Recommendations

This Assessment has been performed on the approximately 9.6-acre Keahon Brothers and Rockland Fuel Oil properties and structures located on Dr. Girling Drive in the Village of Haverstraw, Rockland County, New York as described in Section 2.0, above. This Assessment has revealed no evidence of potential recognized environmental conditions in connection with the property with the exception of the items detailed below. With respect to these conditions, the following conclusions and recommendations (in **bold**) are made.

1. Information obtained during a review of historic photographs, village records, and information provided by the property representative indicates that the northern portion of the subject property has been occupied by a concrete batch facility and associated garage for at least 75 years. Also occupying the northern portion of the subject property area a dwelling and yacht club since at least 1960. The southern portion of the property has been occupied by the Rockland Fuel Oil company since at least 1960 and that it has not been active since the mid-1990s.

   Available information suggests that monitoring wells have been installed in the eastern portion of the property; these wells were not identified during the 1998 site inspection. Two sets of two PVC pipes (utility unknown) were noted in the western and southern portions of this parcel. The on-site oil/water separator and monitoring wells are sampled monthly and the results are submitted to the NYSDEC. FOIL requests for information concerning the Rockland Fuel Oil property have been submitted to both the RCDOH and the NYSDEC; both districts indicate that they do not have information regarding this site.

   It is recommended that the owner of Rockland Fuel Oil be contacted and that all information regarding the environmental integrity of this site (e.g., monitoring well locations, laboratory data, etc.) be reviewed in order to determine the current status of this site. The scope of intrusive investigative work will be based in part on a review of this information. It is also recommended that the utility of the two PVC pipes be determined.

2. All on-site structures receive potable water from the central water system. The Rockland Fuel Oil property utilizes the central sewer system. Located west of the Rockland Fuel Oil large is a 1,000-gallon underground oil/water separator (OWS) which is located within a concrete vault. Currently, water is located within this vault surrounding the tank. An access way is located west of the on-site fuel pumping rack; this access way is most likely associated with the OWS. The OWS is sampled monthly and these laboratory results are submitted to the NYSDEC.

   See recommendation in Paragraph #1, above

   The Keahon Brothers property utilizes a private septic system located southeast of the garage. Available information suggests that the dwelling and club house also are connected to a private septic system; however it is not known w hether they are connected to separate systems or the system associated with the garage. No contamination was documented in the location of the garage's septic system (see Paragraphs #14 and 15, below).

   It is recommended that a determination as to the presence or absence of separate septic systems on the Keahon Brothers property be made.

3. The subject property is located within a 100-year flood plain and within the boundary of a "fringe" federal wetland.

It is recommended that any future development be conducted in accordance with applicable flood plane and wetland regulations.

4. The Keahon property is registered with the RCDOH as a PBS site (PBS ID: 3-990485) having a 2,500-gallon leaded gasoline AST and a 8,000-gallon diesel AST which were both installed in 1975. Currently these tanks are both located with a concrete dike secondary containment area; however the 8,000-gallon AST is labeled as containing fuel oil and the 2,500-gallon AST is labeled as containing gasoline. Also located within this secondary containment area are four unlabeled 275-gallon ASTs and three petroleum pumps. The secondary containment is filled with a brownish water/oil mixture which has a strong petroleum odor and sheen.

Federal Regulations specified in 40 CFR, Part 112 apply to all facilities storing greater than 1,360 gallons aboveground. Based on the known active storage capacity of Keahon property (11,325 gallons aboveground), the Keahon site is subject to Federal PBS regulations which includes but are not limited to a Spill Prevention Control and Countermeasure Plan (SPCC) Plan. No SPCC Plan is known to exist for the Keahon property.

It is recommended that the oil/water mixture be removed from the containment and disposed of in accordance with applicable regulations. If future use of these tanks is anticipated it is recommended that the secondary containment area and tanks be inspected for leaks and that a cover be placed over the tanks in order to prevent rainwater from entering. It is also recommended that the Keahon property comply with USEPA regulations as per 40 CFR, Part 112 which includes, but is not limited to the preparation of a SPCC plan. See recommendation in Paragraph #14, below.

5. The Rockland Fuel Oil property is registered with the NYSDEC as a MOSF facility (ID: 3-1700) having 14 ASTs with a total capacity of approximately 2,500,000 gallons. Observations made during the site inspection indicated the presence of surface staining surrounding several of the tanks and several of the pipe joints associated with the tanks.

Federal Regulations specified in 40 CFR, Part 112 apply to all facilities storing greater than 1,360 gallons aboveground. Although available information suggests that none of the tanks located on the Rockland Fuel Oil property are active, information provided in the above-referenced Phase I Environmental Site Assessment, dated June 1996, indicates that a SPCC plan does exist for the Rockland Fuel Oil property.

See recommendation in Paragraph #1, above.

6. Available information indicates that the Rockland Fuel Oil property has a SPDES permit associated with the on-site OWS. A review of NYSDEC SPDES records did not list this site or the facility ID as being registered with NYSDEC.

It is recommended that the SPDES permit and any other information regarding the on-site OWS be obtained from the Rockland Fuel Oil property owner, and that this information be maintained on-site.

7. The adjoining western Haverstraw Transit, located at 200 Riverside Avenue and the western adjoining Village of Haverstraw Department of Public Works are both registered with the RCDOH as PBS facilities (PBS IDs: 3-990331 and 3-990614, respectively). Spill events are on record for both of these sites.

   The southern adjoining Tilcon Minerals property, although it is not registered with the RCDOH as a PBS facility, RCDOH PBS records indicate that petroleum "wastes" were documented in borings extended on this property.

   It is recommended that RCDOH PBS records for these three adjoining properties be periodically reviewed in order to whether or not these sites could impact the subject property. See recommendation #8, below.

8. Nineteen spill events have occurred within 0.5 mile of the subject property. Spill events are on record as having occurred at the northern adjoining Haverstraw Elks property, western adjoining Haverstraw Transit property and western adjoining Haverstraw DPW property and at the southern adjoining Tilcon Minerals property. Based on available information the spill events are the most likely to have impacted occurred at the Haverstraw DPW (spill number: 9302784) and at the Haverstraw Transit (spill number: 9100857) properties. Neither of these spill events are listed with closure dates or having met NYSDEC clean-up standards.

   It is recommended that the spill files for spill numbers 9100857 and spill number 9302784 be reviewed in order to determine whether or not the subject property could potentially be impacted by these events.

9. Although no registered NYSDEC landfills/transfer stations are located within 0.5 mile of the subject property, the Village of Haverstraw recycling department is located with in the Village of Haverstraw DPW.

   No further investigation is recommended.

10. Approximately 245 cubic yards of debris, consisting of drums, wood and metal items, household appliances, concrete, gravel, car parts, tires, trailers, a van, wires and three-gallon containers are located throughout the subject property. Staining indicative of petroleum releases is located throughout the debris areas.

    It is recommended that the debris be segregated into appropriate waste streams (those which can be disposed of as solid waste and those which require special handling) and that it be removed and disposed of in accordance with applicable regulations. It is also recommended that any contaminated soils encountered during the removal of the debris also be removed and disposed of in accordance with applicable regulations.

11. Asbestos-containing materials could potentially be present on the subject property. No asbestos survey is known to have been conducted. The 12"x12" linoleum floor tiles located throughout the dwelling could potentially contain asbestos. However, items such as roofing materials could also potentially contain asbestos.

    It is recommended that any suspect material encountered during maintenance, renovation or demolition activities be tested for lead or be treated as though it were asbestos in the absence of analytical data. All maintenance, renovation, or demolition activities should be conducted in accordance with applicable regulations.

12. The dates of construction of the on-site structures indicate that LBP is likely to have been used. A lead-based paint survey of the subject property's structures is not known to have been conducted. All exterior and interior painted surfaces were in fair to poor condition at the time of the site inspection. No statement can be made by this office regarding the presence or absence of LBP in underlying layers of paint.

It is recommended that any suspect material encountered during maintenance, renovation or demolition activities be tested for lead or be treated as though it were LBP in the absence of analytical data. All maintenance, renovation, or demolition activities should be conducted in accordance with applicable local, state and federal regulations.

13. Given the date of construction of the on-site structure, PCBs could potentially be present in on-site light ballasts. No equipment likely to contain PCBs was noted on the subject property during the site inspection. However, light ballasts could contain PCBs.

It is recommended that any equipment which could potentially contain PCBs or materials contaminated with PCBs encountered during maintenance, renovation, or demolition activities be handled, removed, and disposed of in accordance with applicable regulations.

Soils Investigation

14. Test pits were excavated throughout the subject property on December 1, 1998. Soil samples were collected from selected test pits and laboratory analyses performed as described in Section 4.1.3 of this Assessment. Groundwater was encountered at a depth of approximately 3.0-5.0 feet below grade in the western former truck storage area and at an average depth of approximately 7 feet below grade in the eastern portion of the property. Contamination was encountered in several of the excavations. The findings of the soil investigation are as follows:

- The soils viewed from the test pit (TP-3) extended in the former truck storage area did exhibit a strong petroleum odor and a gray discoloration. Only chromium was detected at levels above NYSDEC standards at the soil/water interface. The strong petroleum odor and gray discoloration was encountered at soils at the soil/water interface, although no sheen was noted.

- Varying levels of VOCs were detected in the soils in the former truck washing area (TP-6), the petroleum storage and former drum storage area (TP-11 and TP-13), and downgradient from the petroleum storage area (TP-14). The highest concentrations of VOCs were detected downgradient from the petroleum storage area (TP-13 and TP-14). Strong petroleum odor and gray discoloration was encountered in all three of these excavations, extending down to the soil/water interface.

- Low levels of metals were also detected in the soils collected from the former truck washing area (TP-6); the soil in this area was located on a concrete slab.

- Low levels of metals (below NYSDEC cleanup standards) were detected in the soils collected from the septic leaching field (TP-15) and the former battery storage area (TP-8). No other contaminants were detected in either of these excavations.

It is recommended that the vertical and lateral extent of the contamination identified in these areas be determined through additional subsurface evaluations.

Estimated cost: The current cost estimate of remediation of known soil contamination is $30,000-45,000. The cost estimate to provide delineation is $8,000-$10,000.

15. The field work conducted on the subject property documented the presence of subsurface contamination (VOCs) at the southern end of the property near the on-site petroleum storage area and former drum storage area and which also abuts the Rockland Fuel Oil property. Field observations indicate that groundwater is likely to be impacted in the area of the former truck storage area and in the southern portion of the property. The visual contamination encountered in the former truck storage area is most likely attributable to leaking vehicles which were stored in this area. The contamination encountered in the southern portion of the subject property is most likely attributable to the historic use, storage and release of petroleum product on the subject property but can also possibly be attributable to leaking ASTs on the adjoining Rockland Fuel Oil property.

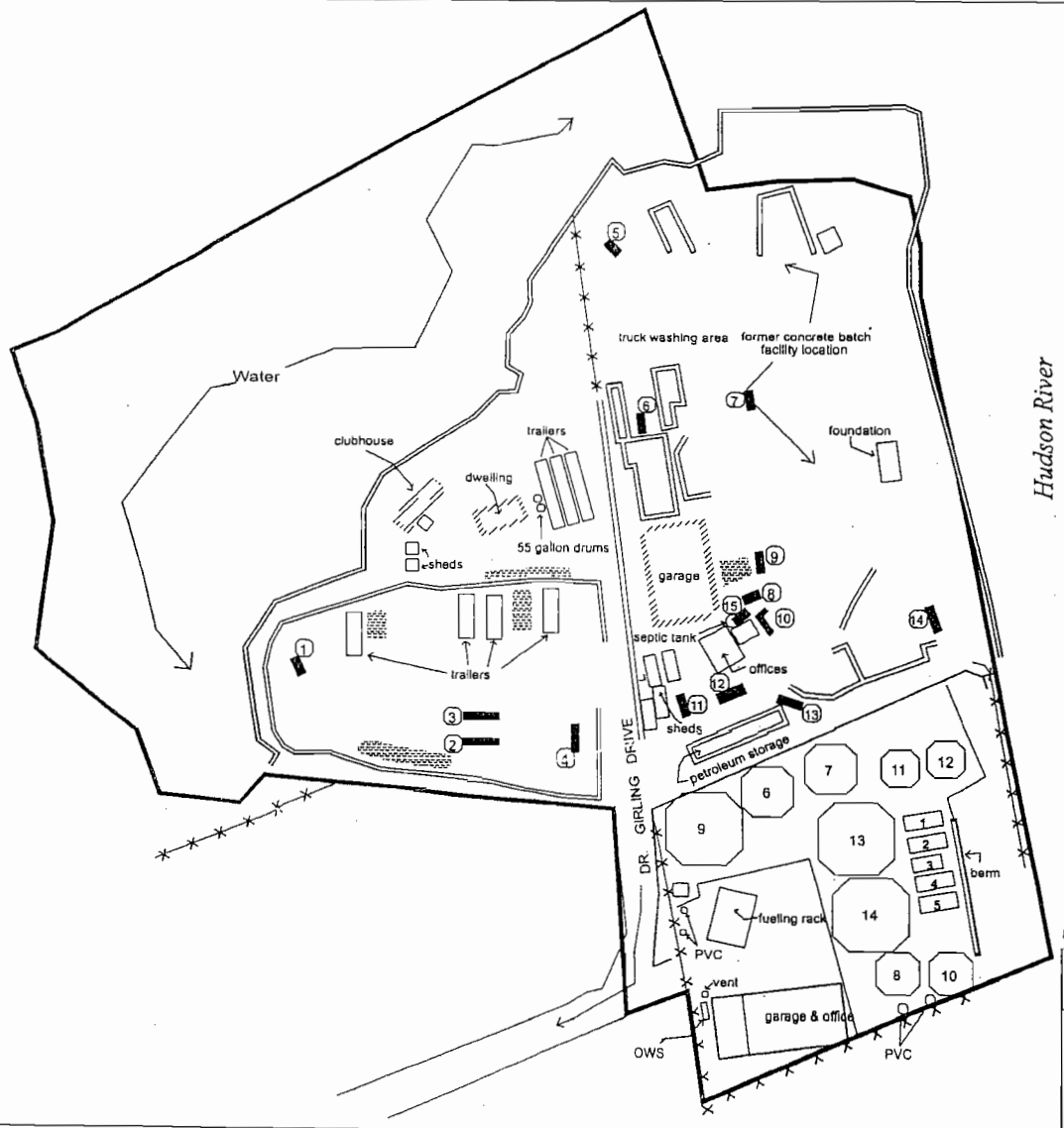
It is recommended that a groundwater investigation be initiated. Groundwater monitoring wells should be installed in the southern and western portions of the subject property in order to determine the extent of on-site groundwater contamination. It is also recommended that the owner of the Rockland Fuel Oil property be contacted and that any and all information regarding the site's environmental integrity be reviewed by this office. If no information can be obtained, it is recommended that monitoring wells also be installed on the Rockland Fuel Oil property in order to determine if on-site contamination is attributable petroleum releases on the adjoining southern property.

Estimated cost: The cost estimate for groundwater investigation is $10,000 - $15,000.

16. State regulations (6 NYCRR, Part 617.9) required reporting of the contamination findings to the NYSDEC. Pursuant to this regulation, this office submitted a spill report on December 22, 1998. The event was assigned Spill Number 9811999 and is designated "Active" in NYSDEC pending acceptable remediation of the spill site. In accordance with reporting requirements, the NYSDEC has been informed of the approximate extent of the spill, its location, compound content, and the lack of available information regarding the spills impact on groundwater.

Additionally, subsequent to the contaminant delineation work and additional investigative services recommended above, an evaluation of various remedial alternatives for effectiveness and appropriateness for this specific site will be necessary.

It is recommended that the NYSDEC be kept appraised of the additional investigatory and remedial work conducted on this property. When the most acceptable course of action has been determined after discussion with representatives of the NYSDEC, a proposal and site specific Workplan should be devised in order to effectuate the necessary remedial efforts.



Based on an undated map prepared by Atzl, Scatassa & Zigler, P.C.

Selected Site Features Map

Selected Site Features Map

Keahon Brothers, Inc. and
The Rockland Fuel Oil Corporation
Dr. George Girling Drive
Village of Haverstraw
Rockland County, New York

ESI File: GH98177.10

Not to Scale

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Ecosystems Strategies, Inc.

Excerpts of Previous Report

Combined Phase I – Phase II Environmental Site Assessment – June 16, 1999

4.0 SUBSURFACE INVESTIGATION

4.1 General

4.1.1 Personnel

Field work documented in this ESA was performed by Ecosystems Strategies, Inc. personnel and Zebra Environmental personnel on May 4 and 5, 1999.

Laboratory services were subcontracted to York Analytical Laboratories, Inc. (New York State Department of Health [NYSDOH] ELAP #10854).

4.1.2 Terminology

Action Levels

The term "action level," as defined in this ESA, refers to the concentration of a particular contaminant above which remedial actions are considered more likely. The overall objective of setting action levels is to assess the integrity of on-site soils and groundwater relative to conditions which are likely to present a threat to public health, given the existing and probable future uses of the site. On-site soils and groundwater with contaminant levels exceeding these action levels are considered more likely to warrant remediation. No independent risk assessment was performed as part of this investigation.

Action levels for metals are based on the NYSDEC Division Technical and Administrative Guidance Memorandum (TAGM) on Determination of Soil Cleanup Objectives and Cleanup Levels (January 24, 1994). The action levels identified in this ESA for petroleum hydrocarbons in soils are determined based on the NYSDEC Spill Technology and Remediation Series (STARS) Memo #1: Petroleum-Contaminated Soil Guidance Policy (July 1993) and TAGM. In accordance with standards set forth in the above-referenced documents, all detected compounds are provided in the Tables 1-7 located in Appendix F, with their respective guidance values.

Background Levels

The term "background level", as defined in this ESA is the concentration of a particular metal which is known to naturally occur in Eastern United States soils. The overall objective of setting background levels for metals is to assess the concentrations of metals in on-site soils relative to those that are naturally occurring.

On-site soils with metal concentrations exceeding these background levels are considered more likely to have been affected by anthropogenic contributions. The background levels for metals provided in this ESA are based on the NYSDEC TAGM (January 24, 1994). Background levels do not exist for refined petroleum hydrocarbons and therefore, no discussion of naturally occurring levels for these compounds is appropriate.

4.2 Soil Investigation

4.2.1 Site Preparation Services

ESI personnel supervised the extension of twenty-eight (28) soil borings within areas potentially impacted from the areas of concern described in Section 2.2, above. All 28 borings extended on the subject properties are described below.

A Thermal Instruments 580B photo-ionization detector (PID) calibrated to read parts per million gas equivalents of isobutylene (ppm-cge) was utilized by ESI personnel to screen all encountered material for the presence of any volatile organic vapors.

4.2.2 Field Work Methodology

All drilling operations were performed by Zebra Environmental ("Zebra") using a van-mounted Geoprobe unit equipped with a 2-inch inside diameter hollow-stem auger with disposable polyethylene sample sleeves. Split spoon sampling was conducted at each boring location at depths ranging from 2 to 16 feet below surface grade.

All drilling operations were performed on the Rockland Fuel Oil Company property by ESI personnel using a hand-held direct push sampling spoon equipped with a slide hammer. Sampling was conducted at each boring location at one-foot intervals to a maximum depth of four to five feet below grade or until refusal was reached.

ESI personnel maintained independent field logs documenting the physical characteristics, PID readings, and any field indications of contamination for all encountered material at each boring location. Relevant information from ESI logs for each boring location is summarized in Section 3.2.2, below.

Prior to initiation of field work, a request for a complete utility markout of the subject property was submitted by ESI as required by New York State Department of Labor regulations. Confirmation of underground utility locations was secured and a field check of the utility markout was conducted prior to the extension of soil borings.

A Selected Site Features Map indicating the boring locations and associated selected site features is provided in Appendix B of this ESA.

All soil samples were collected in a manner consistent with NYSDEC sample collection protocols. Stainless steel trowels were used at each sample location to place samples into jars pre-cleaned at the laboratory. After sample collection, the sample containers were placed in a cooler prior to transport to the laboratory. The soil samples were transported via overnight delivery to York Analytical Laboratories, Inc., a New York State Department of Health-certified laboratory (ELAP Certification Number 10854) for chemical analysis. Appropriate chain of custody procedures were followed. All sample collection equipment was properly decontaminated prior to the initiation of sampling and between sample locations to avoid cross-contamination.

4.2.3 Geoprobe Investigation

This section summarizes observations made by ESI field personnel during the extension of soil borings and the collection of soil samples. The approximate location of borings are indicated on the Selected Site Features Map located in Appendix B of this ESA.

Rockland Fuel Oil Company

Subsurface soils encountered on the subject property during the extension of the soil borings generally consisted of fill material, dark brown to dark grey sand and gravel intermixed with silt.

Nine soil borings were extended to determine the presence or absence of petroleum, chemical or heavy metal subsurface contamination in the vicinity of the petroleum storage area. Soil borings RSB-1, RSB-2, RSB-3, RSB-4, and RSB-5 were extended in the parking lot area adjoining the containment berm; soil boring RSB-6 was extended near the loading dock; soil boring RSB-7 was extended in the center of the parking lot; soil boring RSB-8 was extended near the northern side of the building; and soil boring RSB-9 was extended near a black PVC pipe on the western side of the property. Field observations are found in Table 6 of Appendix F.

"Josephs"

Subsurface soils encountered on the subject property during the extension of the soil borings generally consisted of till material, dark brown sand, clay, and gravel intermixed with silt.

Soil borings JSB-1, JSB-2, AND JSB-3 were extended on the northern area of drums near a pile of abandoned tires; JSB-4, JSB-5, and JSB-6 were extended near monitoring well MW-1 located west of the concrete pad; soil boring JSB-7 was extended to the east of the concrete pad, on the eastern side of the property near rubble and a fill pile where two drums were located; soil borings JSB-8, JSB-9, and JSB-10 were extended near monitoring well MW-3 located to the east of the concrete pad; and soil boring JSB-11 was located to the south of MW-3 and to the east of the concrete pad, near a protruding pipe from the ground. All soil borings were extended to determine the presence or absence of petroleum, chemical, or heavy metal subsurface contamination on the subject site. Field observations are found in Table 7 of Appendix F.

Department of Public Works

Subsurface soils encountered on the subject property during the extension of the soil borings generally consisted of a five-inch layer of concrete, a three-foot gravel fill, and clay interspersed with cobbles. At two locations (D-1 and D-7), refusal in the form of septic material was encountered.

Soil borings D-1and DSB-7 were extended on the northwestern portion of the subject property near the sand and gravel shed; soil borings D-2 and DSB-8 were extended on the southwestern portion of the property near the brick building and the ASTs, respectively; soil boring DSB-3 was extended on the southeastern portion of the subject property, approximately ten feet from the eastern property border; soil boring DSB-4 was extended approximately ten feet from the eastern property border near the receiving dock; soil boring DSB-5 was extended on the northern portion of the property, approximately ten feet east of the sand and gravel shed; and DSB-6 was extended on the northeastern portion of the property approximately ten feet west of the property border. All soil borings were extended to determine the presence or absence of heavy metals; DSB-4 was additionally analyzed for PCBs, and D-2 was analyzed for VOCs. Field observations are found in Table 8 of Appendix F.

4.2.4 Hand Borings Investigation

This section summarizes observations made by ESI field personnel during the extension of hand borings and the collection of soil samples. The approximate location of borings are indicated on the Selected Site Features Map located in Appendix B of this ESA.

Hand borings HB-1, HB-2, HB-3, HB-4, and HB-5 were extended on the southern portion of the IRFOC property at approximately four feet south of the storage building and approximately eight-foot intervals between borings. Hand boring HB-6 was extended approximately three feet to the southwest of the Oil-Water Separator. Hand boring HB-7 was extended on the northern border of the property outside the containment berm area. Hand borings HB-8, HB-9, and HB-10 were extended along the eastern border at approximately eight feet west of the property line outside

One surface soil sample SS-1 was collected at approximately ten inches below grade in the vicinity of the sewer outlet southeast of the property as described in Table 9, in Appendix F.

4.2.5 Laboratory Findings

Soil samples were collected from each of the soil borings at several soil depths (1 - 4 feet, 4 - 8 feet, and 8 - 15 feet). Election of samples to be submitted for laboratory analysis was based upon the presence of elevated PID readings, unusual odors, discoloration, suspected contaminant exposure, and any other unusual patterns observed. Laboratory results are summarized in Tables 10 (VOCs), 11 (PAHs), 12 (RCRA Metals), 13 (PCBs), 14 (TPH), and 15 (VOCs for groundwater). A complete copy of the laboratory report is included as Appendix G. Recommendations regarding detected contaminants are located in Section 4.0, Conclusions and Recommendations, of this ESA.

RFOC

Hand borings

Soil samples were collected from each of the hand borings at several soil depths (1 - 5 feet). Sampling for laboratory analysis was based upon the presence of elevated PID readings, the presence of unusual odors, discoloration, suspected contaminant exposure, and any other unusual patterns observed. Laboratory results tables are located in Appendix F of this ESA. A complete copy of the laboratory report is included as Appendix G. Recommendations regarding detected contaminants are located in Section 4.0, Conclusions and Recommendations, of this ESA.

One to two samples of soil material were collected from each of the hand borings. Sample HB-9 (4') was analyzed to determine the presence of volatile organic compounds (VOCs) and methyl t-butyl ether (MTBE) using USEPA Method 8021. Samples HB-1 (3'), HB-2 (5'), HB-5 (3'), HB-7 (3'), HB-9 (4'), and HB-10 (5') were analyzed for the presence of polynuclear aromatic hydrocarbons (PAHs) utilizing USEPA Method 8270. Samples HB-2 (3') and SS-1 were tested for PCBs utilizing USEPA Method 8080. Samples HB-1 (5'), HB-7 (3') and SS-1 were analyzed for total petroleum hydrocarbons-DRO (TPH) utilizing USEPA Method 8015B. Sample HB-9 (4') was analyzed for total petroleum hydrocarbons TPH-GRO utilizing USEPA Method 8015B.

VOCs+ MTBE

No VOCs were detected above the laboratory detection limit of 330 μg/kg for sample HB-9 (4'). No MTBE was detected above the laboratory detection limit of 5 μg/kg for sample HB-9 (4').

PAHs

Laboratory data obtained from sample HB-7 (3') indicated borderline guidance values of phenanthrene (1,000 μg/kg). No compounds were detected in samples HB-2 (5'), HB-5 (3'), HB-9 (4'), and HB-10 (5'). Established guidance values and detection limits are included in Table 11 of Appendix F.

PCBs

Samples HB-2 (3') and SS-1 were analyzed for PCBs utilizing USEPA Method 8080. PCB-1260 was detected in sample HB-2 (3') with a concentration of 0.11 μg/kg, which is below guidance value of 10 μg/kg. No PCBs were detected in sample SS-1. Laboratory results are found in Table 13 of Appendix F.

TPH

Samples HB-1 (5'), HB-7 (3') and SS-1 were analyzed for total petroleum hydrocarbons TPH-DRO (diesel) utilizing USEPA Method 8015B. Laboratory data obtained from sample HB-1 (5') indicated a concentration of 1,400 mg/kg; sample HB-7 (3') indicated a concentration of 43,000 mg/kg; and sample SS-1 indicated a concentration of 68 mg/kg. .Sample HB-9 (4') was analyzed for TPH-GRO (gasoline) utilizing USEPA Method 8015B. No TPH-GRO was detected in sample HB-9 (4'). Laboratory results are found in Table 14 of Appendix F.

Soil Borings

Samples from soil borings RSB-1 (1-2'), RSB-2 (1-2', 4-5', 5-6'), RSB-3 (2-3', 5-6'), and RSB-4 (5-6', 12') were analyzed for volatile organic compounds (VOCs) utilizing USEPA Method 8260. Samples from soil borings RSB-1 (1-2', 4'), RSB-2 (4-5', 5-6'), RSB-3 (2-3'), RSB-4 (2-3', 5-6'), RSB-5 (6-7'), RSB-6 (7-8'), RSB-7 (6-7') and RSB-9 (7') were analyzed for polynuclear aromatic hydrocarbons (PAHs), a specific type of semi-volatile organic compound (SVOC) utilizing USEPA Method 8270. Samples from soil borings RSB-1 (1-2'), RSB-3 (2-3'), RSB-3 (3-4') and RSB-8 (3-4') were analyzed for total RCRA metals. Sample RSB-9 (2') was analyzed for PCBs utilizing USEPA Method 8080.

VOCs

Analysis of soil sample RSB-1 (1-2') indicated the presence of 1,3,5-trimethylbenzene (250 micrograms per kilogram μg/kg); RSB-2 (1-2') indicated the presence of 1,2,4-trimethylbenzene (290 μg/kg), 1,3,5-trimethylbenzene (121 μg/kg), o-xylene (113 μg/kg) and p/m-xylene (216 μg/kg); RSB-2 (4-5') indicated the presence of n-butylbenzene (1,800 μg/kg), sec-butylbenzene (1,300 μg/kg), terc-butylbenzene (475 μg/kg), isopropylbenzene (500 μg/kg), n-propylbenzene (710 μg/kg) and 1,1,2,2-tetrachloroethane (610 μg/kg) all at levels above their established guidance values.

Analysis of RSB-2 (5-6') indicated the presence of n-butylbenzene (3,300 μg/kg), sec-butylbenzene (2,700 μg/kg), terc-butylbenzene (1,000 μg/kg), isopropylbenzene (1,200 μg/kg), n-propylbenzene (1,500 μg/kg) and 1,1,2,2-tetrachloroethane (1,300 μg/kg); RSB-3 (2-3') indicated the presence of 1,2,4-trimethylbenzene (460 μg/kg), 1,3,5-trimethylbenzene (200 μg/kg), o-xylene (220 μg/kg) and p/m-xylene (360 μg/kg) all at levels above their established guidance values.

Analysis of RSB-3 (5-6') indicated the presence of n-butylbenzene (340 μg/kg), sec-butylbenzene (235 μg/kg), isopropylbenzene (140 μg/kg) and n-propylbenzene (270 μg/kg); RSB-4 (5-6') indicated the presence of n-butylbenzene (390 μg/kg), sec-butylbenzene (240 μg/kg) and n-propylbenzene (230 μg/kg) all at levels above their established guidance values. Laboratory results are found in Table 10 of Appendix F.

MTBE was not detected in these soil samples, supporting the conclusion that gasoline was not a petroleum product released at this site.

PAHs

Laboratory data obtained from samples RSB-1 (4'), RSB-2 (4-5', 5-6'), RSB-3 (2-3'), RSB-4 (2-3', 5-6'), RSB-5 (6-7'), RSB-6 (7-8'), RSB-7 (6-7') and RSB-9 (7') indicated several compounds present at levels exceeding guidance values. Analysis of sample RSB-1 (4') indicated the presence of phenanthrene (1,300 μg/kg). Sample RSB-2 (4-5') indicated the presence of acenaphthene (670 μg/kg) and phenanthrene (1,300 μg/kg). Sample RSB-2 (5-6') indicated the presence of acenaphthene (540 μg/kg) and phenanthrene (2,300 μg/kg). Sample RSB-3 (2-3')

Analysis of sample RSB-4 (2-3') indicated the presence of acenaphthene (1,400 µg/kg), fluorene (2,800 µg/kg) and phenanthrene (5,600 µg/kg). Sample RSB-4 (5-6') indicated the presence of anthracene (4,300 µg/kg), fluorene (7,000 µg/kg) and phenanthrene (14,000 µg/kg). Sample RSB-5 (6-7') indicated the presence of acenaphthene (12,000 µg/kg), fluorene (18,000 µg/kg) and phenanthrene (36,000 µg/kg). Analysis of sample RSB-6 (7-8') indicated the presence of acenaphthene (400 µg/kg), anthracene (1,100 µg/kg) and phenanthrene (1,200 µg/kg). Sample RSB-7 (6-7') indicated the presence of phenanthrene (1,600 µg/kg). Sample RSB-9 (7') indicated the presence of acenaphthene (4,300 µg/kg), fluorene (6,900 µg/kg) and phenanthrene (15,000 µg/kg), all above guidance values. Laboratory results are found in Table 11 of Appendix F.

RCRA METALS

Sample RSB-1 (1-2') indicated the presence of cadmium (1.12 milligrams per kilogram) and lead (1,190 mg/kg); RSB-3 indicated the presence of cadmium (6.23 mg/kg) and selenium (3.17 mg/kg); RSB-8 (3-4') indicated the presence of chromium (12.3 mg/kg) and selenium (4.61 mg/kg) all at levels above their guidance value. Laboratory results are found in Table 12 of Appendix F.

PCBs

PCB-1260 was detected with a concentration of 0.16 µg/kg, which is below guidance value of 10 µg/kg. Laboratory results are found in Table 13 of Appendix F.

"Josephs"

Samples from soil borings JSB-1 (4'), JSB-8 (4') and JSB-9 (3-4') were analyzed to determine the presence of volatile organic compounds (VOCs). Samples from soil borings JSB-4 (4') and JSB-8 (4') were analyzed to determine the presence of polynuclear aromatic hydrocarbons (PAHs), a specific type of semi-volatile organic compound (SVOC) utilizing USEPA Method 8270. Samples from soil borings JSB-1 (4'), JSB-2 (5-6'), JSB-3 (6'), JSB-4 (4'), JSB-7 (3-6) and JSB-10 (4-5') were analyzed to determine the presence of total RCRA metals.

VOCs

Analysis of soil sample JSB-8 (4') indicated the presence of sec-butylbenzene (100 µg/kg) at levels above its established guidance value. Laboratory results are found in Table 10 of Appendix F.

PAHs

Laboratory data obtained from sample JSB-4 (4') indicated the presence chrysene (400 µg/kg), fluorene (2,300 µg/kg), naphthalene (980 µg/kg) and phenanthrene (6,300 µg/kg) at levels exceeding guidance values. Laboratory results are found in Table 11 of Appendix F.

RCRA METALS

Soil samples JSB-1(4'), JSB-2 (5-6'), JSB-3 (6'), JSB-4 (4'), JSB-7 (3-6') and JSB-10 (4-5') were analyzed for the presence of total RCRA metals. Samples JSB-1(4'), JSB-2 (5-6'), JSB-3 (6') and JSB-4 (4') indicated levels of chromium and selenium above established guidance values as follows: JSB-1(4') chromium (12.3 mg/kg) and selenium (4.61 mg/kg); JSB-2 (5-6') chromium (13.5 mg/kg) and selenium (4.79 mg/kg); JSB-3 (6') chromium (16.1 mg/kg) and selenium (4.87 mg/kg); JSB-4 (4') chromium (16.1 mg/kg) and selenium (3.14 mg/kg); and JSB-7 (3-6') indicated the presence of selenium (3.85 mg/kg) all at a levels above their established guidance

DPW

Samples from soil borings D-1 (0-4') and D-2 (8-10') were analyzed to determine the presence of volatile organic compounds (VOCs). Soil samples from soil borings D-1 (0-4'), D-2 (8-10'), DSB-4 (3'), DSB-5 (3), DSB-6 (3) and DSB-8 (6') were analyzed to determine the presence of total RCRA metals. Sample DSB-4 (3') was analyzed for PCBs utilizing USEPA Method 8080

VOCs

Soil samples were analyzed for the presence of volatile organic compounds (VOCs) utilizing USEPA Method 8260. Analysis of soil sample D-1 (0-4') indicated the presence of toluene (110 μg/kg) and soil sample D-2 (8-10') indicated the presence of toluene (114 μg/kg) at levels slightly above its established guidance value. Laboratory results are found in Table 10 of Appendix F.

RCRA METALS

Soil sample D-1 (0-4') indicated the presence of selenium (3.61 mg/kg); D-2 (8-10') indicated the presence of selenium (3.45 mg/kg); DSB-4 (3') indicated the presence of chromium (12.2 mg/kg), mercury (0.40 mg/kg) and selenium (4.01 mg/kg); DSB-5 (3) indicated the presence of chromium (14.3 mg/kg) and selenium (3.31 mg/kg); DSB-6 (3) indicated the presence of chromium (18.3 mg/kg) and selenium (3.86 mg/kg); and DSB-8 (6') indicated the presence of chromium (112.6 mg/kg) and selenium (3.63) all at a levels above their established guidance value. Laboratory Results are found in Table 12 in Appendix F.

PCBs

Sample DSB-4 (3') was analyzed for PCBs utilizing USEPA Method 8080. PCB-1260 was detected with a concentration of 0.08 μg/kg, which is below guidance value of 10 μg/kg. Laboratory results are found in Table 13 of Appendix F.

4.3 Groundwater

4.3.1 Methodology

To document groundwater conditions on the Rockland Fuel Oil Company and "Josephs" Inc. properties, three groundwater wells (JMW-1, JMW-2 and JMW-3) previously installed by Soiltesting Inc. in March 1993 on the "Josephs" property and four groundwater wells (RMW-1, RMW-2, RMW-3 and RMW-A) previously installed by an undisclosed company on the RFOC were sampled by ESI personnel on May 5, 1999. Prior to sample collection, each well casing was opened and screened with a Thermal Instruments 580B PID and readings recorded in a field data log.

Each monitoring well was purged with a mechanical pump and properly decontaminated between wells in accordance with standard decontamination protocol. Water removed from each monitoring well was visually inspected for indications of petroleum contamination. All groundwater samples were collected with dedicated, disposable polyethylene bailers to avoid cross-contamination of the wells. All groundwater samples for laboratory analysis of VOCs and MTBE (USEPA Method 8021) and PAHs (USEPA Method 8270) were collected in sample containers pre-cleaned at the laboratory. Monitoring well RMW-A was submitted for petroleum identification (fingerprint) analysis due to the presence of product on the water. VOC sample vials were pre-preserved with hydrochloric acid.

After sample collection, the containers were placed on ice in a cooler prior to transport to the laboratory. All groundwater samples were transported via overnight delivery to York Analytical Laboratories Inc and one was sent to Friedman & Bruya, Inc. (for fingerprinting analysis). Appropriate chain of custody procedures were followed. A discussion of the analytical results is included in the Conclusions and Recommendations section of this ESA (Section 4.0). A complete copy of the laboratory results for is provided in Appendix G of this ESA.

4.3.2 Field Work Observations

This section summarizes observations made by ESI field personnel during groundwater sampling. The approximate location of monitoring wells are indicated on the Selected Site Features Map located in Appendix B of this ESA.

RFOC

Four on-site monitoring wells were sampled on May 5, 1999. Each well was purged and sampled in accordance with the methodology described in Section 3.4.1, above. Laboratory results are found in Table 6 of Appendix F. Copies of the full laboratory report are provided in Appendix G.

Monitoring well RMW-1 is located flush on the ground to the northeast of the storage building. Monitoring well RMW-2 is located to the southeast of the storage building. Monitoring well RMW-3 is located to the east of the building and south of the southernmost fuel tank. Monitoring well RMW-A is located on the western portion of the property, near the gate.

Groundwater was encountered at a depth of 3.58 feet to PVC for RMW1, 7.85 feet to PVC for RMW2, 8.97 feet to PVC for RMW3 and 7.70 feet to PVC below land surface (bls) for RMW-A. PID readings in these wells were observed as follows: RMW-1 - 0.0 ppm, RMW-2 - 0.0 ppm, RMW-3 - 0.0 ppm and RMW-A - no reading. A slight oily odor was detected for RMW-1. Total purged volume for RMW-1 was 1.5 gallons. A slight oily odor and sheen was detected for RMW-2. Total purged volume for RMW-2 was 15 gallons. No odor was initially detected for MW-3. Total purged volume for RMW-3 was 8 gallons when it ran dry and a slight oily odor was detected. Product was found in RMW-A. Field observations are found in Table 16 of Appendix F.

"Josephs"

Three on-site monitoring wells were sampled on May 5, 1999. Each well was purged and sampled in accordance with the methodology described in Section 3.4.1, above. Laboratory results are found in Table 15 of Appendix F. Copies of the full laboratory report are provided in Appendix G.

Monitoring well JMW-1 is located on the western portion of the property, adjoining the access road. Monitoring well JMW-2 is located to the southwest of the concrete pad, near a dirt road and monitoring well JMW-3 is located to the northeast of the concrete pad.

No odor or PID readings were detected in JMW-2 or JMW-3. A slight sheen and petroleum odor was detected in JMW-1. Groundwater was encountered at a depth of 4.95 feet at PVC for JMW1, 3.96 feet at PVC and 4.19 at steel rim for JMW2, and 3.77 feet at PVC and 3.99 feet at steel rim for JMW3. Total purge volume for JMW-1 was 15 gallons, total purge volume for JMW-2 was 10 gallons and total purge volume for JMW-3 was 10 gallons. Laboratory results are found in Table 15 of Appendix F. Copies of the full laboratory report are provided in Appendix G.

4.3.3 Laboratory Findings

Groundwater samples designated RMW-1, RMW-2, and RMW-3 for the Rockland Fuel Oil Company property and JMW-1. JMW-2 and JMW-3 for the "Josephs" property, collected by ESI on May 5, 1999 were analyzed for the presence of VOCs and MTBE (USEPA Method 8021) and PAHs (USEPA Method 8270). RMW-A was analyzed for petroleum identification.

RFOC

Laboratory analysis of the groundwater sample collected from RMW-1 and analyzed for VOCs, MTBE and PAHs indicated the presence of several VOCs above NYSDEC established guidance values: benzene (260 µg/l), n-butylbenzene (14 µg/l), 1,2,4-trimethylbenzene (200 µg/l), 1,3,5 trimethylbenzene (53 µg/l), o-xylene (13 µg/l) and p/m-xylene (360 µg/l).

Laboratory analysis of the groundwater sample collected from RMW-2 and analyzed for VOCs, MTBE and PAHs indicated the presence of benzene (16 µg/l), 1,3,5 trimethylbenzene (6 µg/l), and p/m-xylene (29 µg/l) above NYSDEC established guidance values for benzene (0.7 µg/l); and 1,3,5 trimethylbenzene and p/m-xylene (5 µg/l), respectively.

Laboratory analysis of the groundwater sample collected from RMW-3 and analyzed for VOCs, MTBE and PAHs indicated the presence of benzene (5 µg/l) and n-butylbenzene (6 µg/l) above NYSDEC established guidance values for benzene (0.7 µg/l); and n-butylbenzene (5 µg/l), respectively.

Laboratory analysis results of the product sample collected from RMW-A and analyzed for product fingerprinting by Friedman & Bruya, Inc. indicated that the product was a biologically degraded diesel fuel with an approximate age of five years.

"Josephs"

Laboratory analysis of the groundwater samples collected from JMW-1, JMW-2 and JMW-3 and analyzed for the presence of VOCs, MTBE and PAHs did not identify any concentrations of these compounds above detection limits.

5.0 Conclusions and Recommendations

This ESA has been performed on the approximately 1.2-acre Rockland Fuel Oil Company ("RFOC"), the approximately 1.2-acre Department of Public Works ("DPW"), and the approximately 18-acre "Josephs" parcels and structures located on Dr. Girling Drive & 183 West Street in the Village of Haverstraw, Rockland County, New York as described in Section 2.0, above. This ESA has revealed no evidence of potential recognized environmental conditions in connection with the property with the exception of the items detailed below. With respect to these conditions, the following conclusions and recommendations (in **bold**) are made. Estimated costs to implement recommended actions are provided (in *italics*) where appropriate.

1. Information obtained during a review of historic photographs, historic maps, village records, and information provided by the property representative indicates that the RFOC parcel has been occupied by the Rockland Fuel Oil company since at least 1946 and that it has not been active since the mid-1990s.

   Available information and field observations indicate that four monitoring wells have been installed in the southern and western portion of the parcel. The on-site oil/water separator and monitoring wells are sampled monthly, and the results are submitted to the NYSDEC. FOIL requests for information concerning the Rockland Fuel Oil property have been submitted to both the RCDOH and the NYSDEC; both agencies indicate that they do not have information regarding this site.

2. All on-site structures receive potable water from a central water system. Documented on-site groundwater contamination (see paragraph #17 below) does not represent a threat to sources of potable water for nearby properties.

   The Rockland Fuel Oil property utilizes the central sewer system. Located southwest of the Rockland Fuel Oil large is a 1,000-gallon underground oil/water separator (OWS) which is located within a concrete vault. Currently, water is located within this vault surrounding the tank. An accessway is located west of the on-site fuel pumping rack; this accessway is most likely associated with the OWS. The OWS is sampled monthly, and these laboratory results are submitted to the NYSDEC.

   It is recommended that the oil/water mixture be removed from the containment and disposed of in accordance with applicable regulations.

3. The subject parcels are located within a 100-year flood plain and within the boundary of a "fringe" federal wetland.

   It is recommended that any future development be conducted in accordance with applicable flood plain and wetland regulations.

4. The Rockland Fuel Oil property is registered with the NYSDEC as a MOSF facility (ID: 3-1700) having 14 ASTs with a total capacity of approximately 2,500,000 gallons. Observations made during the site inspection indicated the presence of surface staining surrounding several of the tanks and several of the pipe joints associated with the tanks.

   Federal Regulations specified in 40 CFR, Part 112 apply to all facilities storing greater than 1,360 gallons aboveground. Although available information suggests that none of the tanks located on the Rockland Fuel Oil property are active, information provided by Mr. Tarricone, the owner, indicated that two tanks formerly containing diesel fuel are currently active but maintained empty.

5. The adjoining Keahon property is registered with the RCDOH as a PBS site (PBS ID: 3-990485) having a 2,500-gallon leaded gasoline AST and an 8,000-gallon diesel AST which were both installed in 1975. Currently these tanks are both located within a concrete dike secondary containment area; however the 8,000-gallon AST is labeled as containing fuel oil, and the 2,500-gallon AST is labeled as containing gasoline.

   Federal Regulations specified in 40 CFR, Part 112 apply to all facilities storing greater than 1,360 gallons aboveground. Based on the known active storage capacity of Keahon property (11,325 gallons aboveground), the Keahon site is subject to Federal PBS regulations which includes, but are not limited to, a Spill Prevention Control and Countermeasure Plan (SPCC) Plan. No SPCC Plan is known to exist for the Keahon property.

6. Available information indicates that the Rockland Fuel Oil property has a SPDES permit associated with the on-site OWS. A review of NYSDEC SPDES records did not list this site or the facility ID as being registered with NYSDEC.

   See Paragraph #2 above.

7. The adjoining western Haverstraw Transit, located at 200 Riverside Avenue and the Village of Haverstraw DPW garage are both registered with the RCDOH as PBS facilities (PBS IDs: 3-990331 and 3-990614, respectively). Spill events are on record for both of these sites.

   The southern adjoining Tilcon Minerals property, although not registered with the RCDOH as a PBS facility, RCDOH PBS records indicate that petroleum "wastes" were documented in borings extended on this property.

   It is recommended that RCDOH PBS records for these adjoining properties be periodically reviewed in order to whether or not these sites could impact the subject parcels. See recommendation #8, below.

8. Eighteen spill events have occurred within 0.5 mile of the subject parcels. Spill events are on record as having occurred at the northern Keahon brothers property and the western DPW garage property. Based on available information, the spill events are the most likely to have impacted occurred at the Haverstraw DPW garage (spill number: 9302784) and at the Keahon Brothers (spill number: 9811999) properties. Neither of these spill events are listed with closure dates or having met NYSDEC clean-up standards.

   It is recommended that the spill files for spill number 9302784 and spill number 9811999 be reviewed in order to determine whether or not the subject parcels could potentially be impacted by these events.

9. Although no registered NYSDEC landfills/transfer stations are located within 0.5 mile of the subject parcels, the Village of Haverstraw recycling department is located with in the Village of Haverstraw DPW.

   No further investigation is recommended.

10. Less than five cubic yards of debris, consisting of garbage cans, wood items, an abandoned van, and a partially buried 55-gallon drum are located in the western portion of the RFOC.

    It is recommended that the debris be segregated into appropriate waste streams (those which can be disposed of as solid waste and those which require special handling) and that it be removed and disposed of in accordance with applicable regulations.

11. Asbestos-containing materials could potentially be present on the subject parcels. No asbestos survey is known to have been conducted.

It is recommended that any suspect material encountered during maintenance, renovation, or demolition activities be tested for asbestos or be treated as though it were asbestos in the absence of analytical data. All maintenance, renovation, or demolition activities should be conducted in accordance with applicable regulations.

12. The dates of construction of the structures indicate that LBP is likely to have been used. A lead-based paint survey of the subject parcels's structures is not known to have been conducted. All exterior painted surfaces were in fair to poor condition at the time of the site inspection. No statement can be made by this office regarding the presence or absence of LBP in underlying layers of paint or building interiors.

It is recommended that any suspect material encountered during maintenance, renovation or demolition activities be tested for lead or be treated as though it were LBP in the absence of analytical data. All maintenance, renovation, or demolition activities should be conducted in accordance with applicable local, state and federal regulations.

Rockland Fuel Oil Company

13. Soil borings were extended in the west, central and southern portions of the site in the vicinity of the 14 ASTs and the office building. Soil samples collected from soil borings and hand borings document the presence of elevated concentrations of VOCs (n-butylbenzene, sec-butylbenzene, terc-butylbenzene, isopropylbenzene, n-propylbenzene,and 1,1,2,2-tetrachloroethane. 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, o-xylene and p/m-xylene) in samples RSB-2, RSB-3 and RSB-4 and PAHs (phenanthrene, acenaphthene, naphthalene, fluorene) in RSB-2, RSB-4, RSB-5, RSB-6 and HB-7. These samples were collected in the northern and central portions of the subject site. Laboratory data suggest that the vertical extent of contamination in subsurface soils is present approximately one foot below grade and extends to the soil/groundwater interface at approximately six feet below grade. Laboratory data suggest that the horizontal extent of contamination in subsurface soils is present approximately in 10,000 square feet in the central portion of the property. The estimated extent of contamination is approximately 1,850 cubic yards.

Additional laboratory data confirm the presence of diesel fuel present in on-site groundwater. Spillage of fuel oil may also have contributed to soil and groundwater contamination, but the absence of MTBE supports the conclusion that gasoline was not released at this site.

The presence of petroleum contamination at this site is reportable to the NYSDEC, consistent with 6 NYCRR, Part 613.

It is recommended that this event be reported to the NYSDEC. It is further recommended that all remedial actions proposed within this ESA and all Workplans and Specifications prepared as a result of this ESA be submitted for review and comment to the NYSDEC. Resulting approved remedial actions should be implemented in accordance with a schedule determined in conjunction with the NYSDEC.

It is recommended that contaminated soil be excavated and stockpiled on 6-mil plastic and covered prior to off-site disposal. Groundwater should be skimmed for the removal of petroleum product. Groundwater monitoring to document changes in on-site water quality should be conducted after remediation has been completed. No active groundwater remediation is recommended unless elevated dissolved hydrocarbon

14. Laboratory data indicated the presence of elevated concentrations of cadmium, lead, chromium and selenium, at levels above NYSDEC established guidance values. Selenium appears to be relatively high in samples taken on all three sites.

    No further action is recommended. Future development of the site should incorporate protective actions to ensure that direct contact with these soils is minimized.

15. Fourteen empty ASTs formerly containing fuel oil, gasoline, and diesel are located on the eastern and northern portions of the site. Some of these ASTs may have been present on-site since at least the early 1930s according to the review of historic Sanborn Company Fire Insurance Maps.

    It is recommended that prior to any remedial action the fourteen ASTs be properly cleaned, closed and removed from the site in accordance with the requirements of 6 NYCRR Parts 612 - 614.

16. Laboratory analysis for PCBs in two soil samples indicated the presence of PCBs below guidance values.

    No further action is recommended.

17. Laboratory analysis of groundwater samples from monitoring well RMW-1 detected the presence of benzene, n-butylbenzene, 1,2,4-trimethylbenzene, 1,3,5 trimethylbenzene, o-xylene and p/m-xylene above NYSDEC guidance values. Elevated levels of some of these compounds were also detected in monitoring wells RMW-2 and RMW-3. The relatively low levels of dissolved contaminants and the absence of any potable groundwater wells near the site would support a determination that no groundwater remediation is warranted at this site.

    See Paragraph #13 above.

18. A review of Rockland Fuel Oil laboratory data indicated the presence of a diesel compound in a hand boring sample collected on the northern portion of the site at three feet below grade, (HB-7 (3') 43,000 mg/kg) and in a sample collected on the southern portion of the site near the storage building at five feet below grade (HB-1 (5') 1,400 mg/kg). Sample HB-9 (4') was analyzed for total petroleum hydrocarbons-GRO (TPH). No gasoline compound was detected in sample HB-9 (4').

    See Paragraph #13 above.

"Josephs"

19. Soil samples collected from soil boring JSB-4 located on the western portion of the subject site near MW-1 document the presence of elevated concentrations of PAHs (fluorene, naphthalene and phenanthrene) at levels exceeding NYSDEC guidance values. The estimated extent of contamination is less than 300 cubic yards.

    It is recommended that contaminated soil be excavated and stockpiled on 6 mil plastic and covered prior to off-site disposal. Groundwater should be skimmed for the removal of petroleum product.

20. Soil borings were located on the southwestern portion of the subject property. Soil samples collected from soil boring JSB-1, JSB-2, and JSB-3 at a depth of four to six feet below grade document the presence of concentrations of chromium and selenium at levels moderately exceeding NYSDEC established guidance values. Laboratory data suggest that the horizontal extent of contamination in subsurface soils is present approximately in an area of 1,000 square feet, approximately 75 feet west of the concrete pad, and the vertical extent is approximately four to six feet below grade. The estimated extent of contamination is approximately 75 cubic yards.

See Paragraph #19 above.

21. Laboratory analysis of the groundwater samples collected from the monitoring wells were analyzed for the presence of VOCs, MTBE and PAHs. The analysis did not identify any detectable concentrations of these compounds. These data support the conclusion that on-site groundwater contamination is localized on the adjoining property to the north and does not seem to be migrating to the subject site.

No further action is recommended. Periodic monitoring of wells is recommended to assess the presence of contaminants in the groundwater.

22. The review of Sanborn Company Fire Insurance Maps by this office revealed that in 1931 a 180,000-gallon fuel oil tank was located on the northwestern portion of the "Josephs" property.

It is recommended that additional soil borings be extended in this area to document the presence or absence of petroleum product contamination.

Department of Public Works

23. A review of laboratory data from soil samples D-1 (0-4') and D-2 (8-10') located on the northwestern an southwestern areas of the property respectively indicated the presence of toluene at levels exceeding NYSDEC established guidance values. These data are not considered by this office to be indicative of significant contamination, but the source is not known at this time.

It is recommended that additional soil sampling be performed to delineate the extent of soil contamination.

24. Laboratory data indicated the presence of elevated concentrations of chromium and selenium at levels exceeding NYSDEC established guidance values and slightly above background levels.

No further action is recommended. Future development of the site should incorporate protective actions to ensure that direct contact with these soils is minimized.

25. Laboratory analysis for PCBs indicated the presence of PCBs below guidance values.

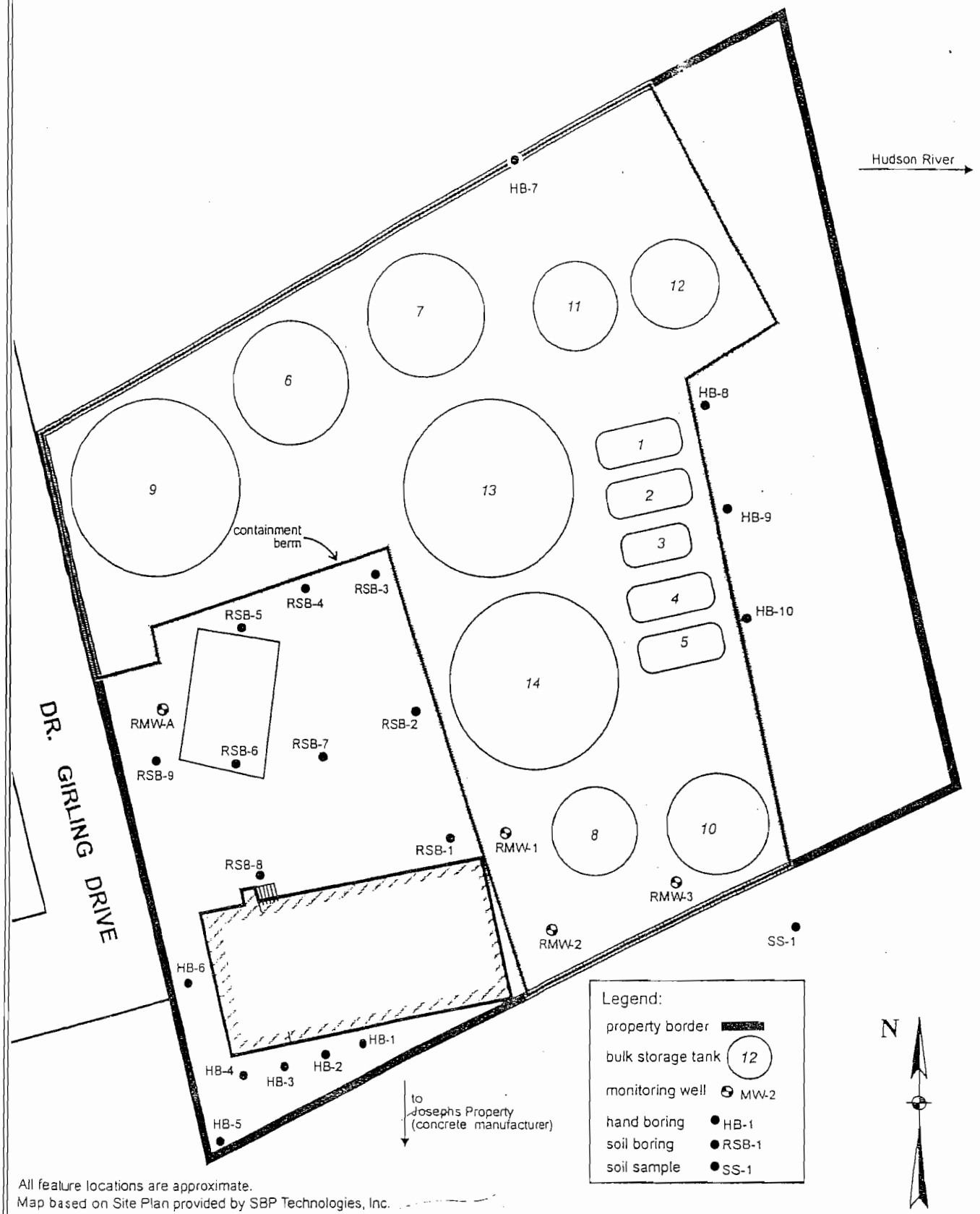
No further action is recommended.

26. According to the Petroleum Bulk Storage Registration Certificate, two active 1,500-gallon ASTs, three 275-gallon ASTs, and one 3,000-gallon UST are located on the subject property.

It is recommended that all on-site tanks be properly cleaned, closed, and removed from the site in accordance with the requirements of 6 NYCRR Parts 612 - 614.

27. The site is a former wastewater treatment plant for the Village of Haverstraw. Field observations and soil borings detected the presence of wastes likely to be septage at four feet below grade in the northwestern portion of the site. The estimated extent of contamination is approximately 200 cubic yards.

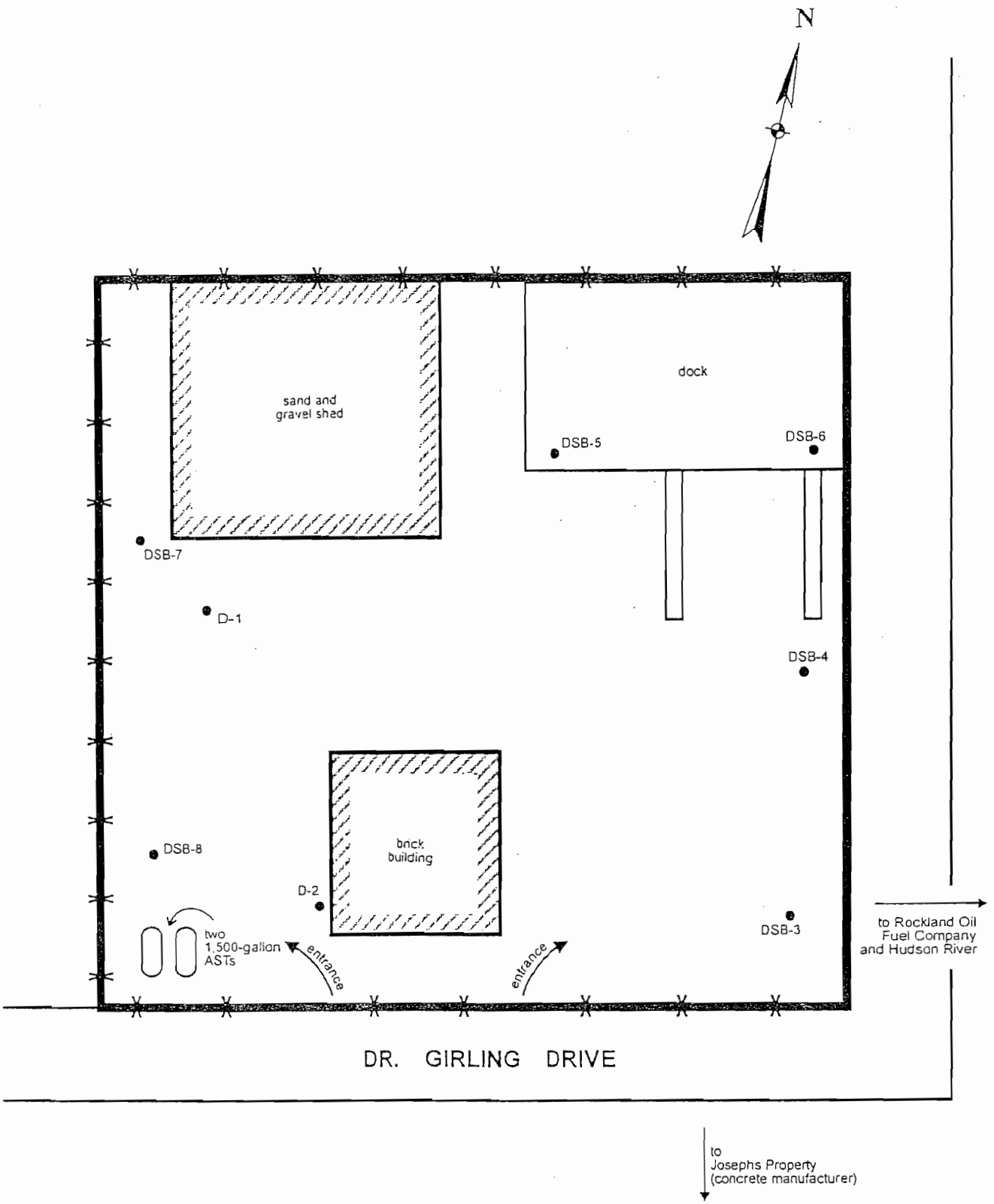
It is recommended that future development of this portion of the site be managed to avoid human contact with this identified septic material through the removal of this material.



All feature locations are approximate.
Map based on Site Plan provided by SBP Technologies, Inc.

Rockland Oil Fuel Company
Selected Site Features Map
Dr. Girling Drive
Village of Haverstraw
Rockland County, New York

ESI File: GH9964.20
June 1999
Scale: 1 = 47' (approximately)
Appendix B

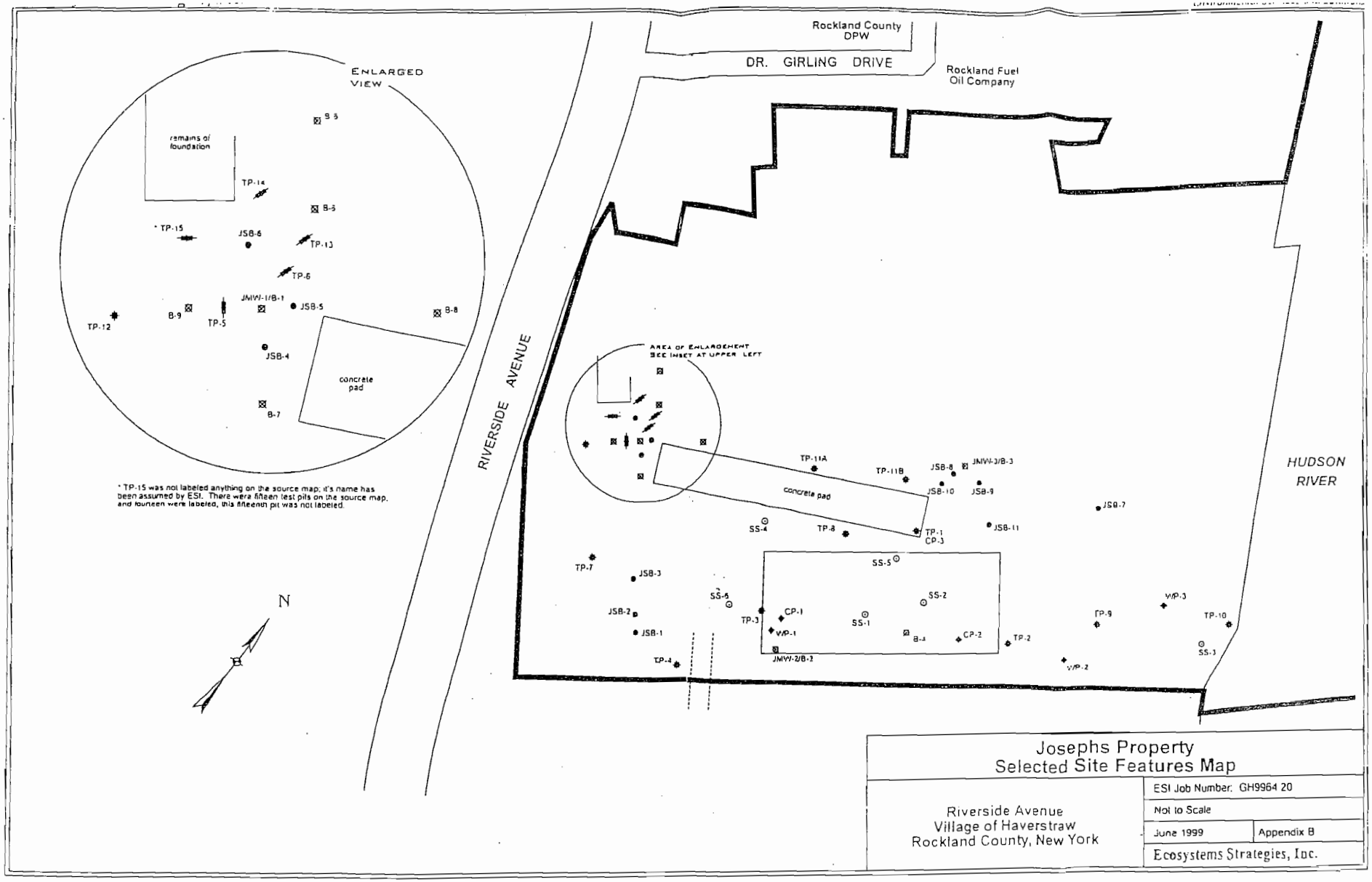


All feature locations are approximate.

Rockland County DPW
Selected Site Features Map
Dr. Girling Drive
Village of Haverstraw
Rockland County, New York

Legend:
- property border
- soil boring locations (D and DSB)
- chain-link fence

ESI File: GH9964.20
June 1999
Not to Scale
Appendix B



Josephs Property
Selected Site Features Map

Riverside Avenue
Village of Haverstraw
Rockland County, New York

ESI Job Number: GH9964 20
Not to Scale
June 1999 | Appendix B
Ecosystems Strategies, Inc.

Table 4: MOSF Information for the Rockland Fuel Oil Company

Tank Number	Tank Location[1]	Date of Installation	Overfill Prevention	II° Containment	Leal Detection	Product	Capacity (gallons)	Status
1	AST	Not Provided	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	20,652	Temporarily out of Service
2	AST	Not Provided	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	20,652	Temporarily out of Service
3	AST	Not Provided	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	15,308	Temporarily out of Service
4	AST	Not Provided	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	20,652	Temporarily out of Service
5	AST	Not Provided	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	20,652	Temporarily out of Service
6	AST on saddles, legs, stilts, rack or cradle	Not Provided	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	217,998	In-Service
7	AST on saddles, legs, stilts, rack or cradle	Not Provided	Product Level Gauge	Earthen Dike	Not Specified	Diesel	217,724	Temporarily out of Service
8	AST on saddles, legs, stilts, rack or cradle	Not Provided	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	108,188	Temporarily out of Service
9	AST on saddles, legs, stilts, rack or cradle	12/36	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	408,167	In-Service
10	AST on saddles, legs, stilts, rack or cradle	Not Provided	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	186,339	Temporarily out of Service
11	AST on saddles, legs, stilts, rack or cradle	Not Provided	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	128,597	Temporarily out of Service
12	AST on saddles, legs, stilts, rack or cradle	Not Provided	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	128,552	Temporarily out of Service
13	AST on saddles, legs, stilts, rack or cradle	12/54	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	508,032	Temporarily out of Service
14	AST on saddles, legs, stilts, rack or cradle	12/54	Product Level Gauge	Earthen Dike	Not Specified	#1, 2 or 4 Fuel Oil	508,032	Temporarily out of Service

Notes: 1 AST = aboveground storage tank

Table 5: Available PBS Information for the Village of Haverstraw DPW.

Tank Number	Tank Location[1]	Date of Installation	Overfill Prevention	II° Containment	Product	Capacity (gallons)	Status
1	UST	Not Provided (1976?)	Vent Whistle	None	#1, 2, or 4 Fuel Oil	3,000	Active
2	AST	12/1992	None	Vault	Diesel	1,500	Active
3	AST	12/1992	None	None	Unleaded Gasoline	1,500	Active
4	AST (with saddles, racks, legs, etc.)	Not Provided	None	None	Waste Oil	275	Active
5	AST	Not Provided	None	None	Waste Oil	275	Active
6	AST	Not Provided	None	None	Waste Oil	275	Active

Notes: 1. UST = underground storage tank AST = aboveground storage tank

Table 6: Field Observations Rockland Fuel

BORING	LOCATION	DEPTH	SOIL CHARACTERISTICS	PID READINGS	FIELD OBSERVATIONS
RSB-1	North of the building, outside of the berm	Sample at 1-2 ' Sample at 4 '	0-4' - dry loose granular fill 4-8' - dry loose granular fill	177 ppm 50-60 ppm	Strong petroleum odor Wet at 3.5'
RSB-2	Abandoned van located outside of the berm, 30' north of RSB-1	Sample at 1-2' Sample at 4-5' Sample at 5-6'	0-4' - dry loose granular fill with gray silt at 6-8" 4-8' - medium grain well sorted sand	454 ppm 178 ppm 143 ppm	Gas/chemical odor Wet at 4'
RSB-3	Northeastern corner of the AST loading area	Sample at 2-3' Sample at 5-6'	0-4' - fill material, ash, sand and cobbles 4-8' - well graded sand with intermixed cobbles and silt	300 ppm 160 ppm	Petroleum odor Wet at 4-5' Oil present at 5-6'
RSB-4	At the AST filling location, west of RSB-3	Sample at 2-3' Sample at 5-6' Sample at 12'	0-4' - fill material, layers of brick red soil 4-8' - silty at 4' and silty clay at 7' 8-12' - gray clay	none 160 ppm none	Wet at 4' No odor
RSB-5	Northern end of loading dock, near the berm	Sample at 6-7'	0-4' - fill material, silt at 4' 4-8' - blackish coarse-grained sand and gravel	none 65 ppm	No odor Moist at 4' Odor
RSB-6	Southern end of the loading dock	Sample at 7-8'	0-4' - fill material, gravel and silt 4-8' - mostly blackish wet gravel and ash	30 ppm 30 ppm	Slight odor Wet at 2'
RSB-7	Center of parking lot	Sample at 6-7'	0-4' - fill material, ash, sand and cobbles 4-8' -gravel	70-90 ppm	Slight odor Wet at 7'
RSB-8	Near entrance to the office, east of gate and northeast of Oil Water Separator	Sample at 3-4'	0-4' - dry fill material, silty wet 4-8' - wet gravelly cobbles with sandy silt	39 ppm	Slight odor
RSB-9	East of the chain-link fence, near the black pvc pipe	Sample at 2' Sample at 7'	0-4' - dry fill material, sand and cobbles 4-8' - dark black sand and gravel with oil	17 ppm 17 ppm	Oily at 2'

Table 7: Field Observations "Josephs"

BORING	LOCATION	DEPTH	SOIL CHARACTERISTICS	PID READINGS	FIELD OBSERVATIONS
JSB-1	Southwestern portion of the subject property, to the north of drums, near tires	Sample at 4'	0-4 - sandy sit with gravel, cobbles	none	No odor Wet at 4'
JSB-2	Southwestern portion of the subject property, to the north of drums, near tires	Sample at 5-6'	0-4' - upper till brown, lower gray silt, dune sand	none	No odor
JSB-3	Southwestern portion of the subject property, to the north of drums, near tires	Sample at 6'	0-4' - fill material, crushed brick 4-8' - brown till	none	Wet at 6' No odor
JSB-4	Near MW-1, west of the concrete pad	Sample at 2' Sample at 4'	3-4' - brown silt and clay 4-8' - clay/silt interspersed with gray sand	34 ppm	Layer of petroleum contamination at 2' No odor, no PID
JSB-5	Near MW-1, west of the concrete pad	Sample at 5'	0-4' - till and brown grain with clay and silt 4-8' - clay	34 ppm	Product lining the clay
JSB-6	Near MW-1, west of the concrete pad	Sample at 2-3'	0-4' - gravelly wet sand	82 ppm	Some odor
JSB-7	east of the concrete pad, on the eastern side of the property, Near rubble and fill pile	Sample at 3-6'	0-3' - till 3-4' - brown sand with cobbles 4-8' - well graded brown sand, few cobbles	none	No odor
JSB-8	10' southwest of MW-3	Sample at 4'	0-4' - dry fill, black sand 4-8' - wet black sand	none 26 ppm	No odor Rainbow sheen, gasoline odor
JSB-9	20' southeast of MW-3	Sample at 3-4'	0-4' - upper fill dry wet at 3' 4-8' - wet	none	slight gasoline odor
JSB-10	30 to 40 feet southwest of JSB-8	Sample at 4-5'	0-4' - crushed concrete and brick on top, lower silt gray, mixed with silt at 4'	none	No odor
JSB-11	South southeast of MW-3, near protruding piping from ground		0-4' - crushed concrete and brick on top	none	No odor

Table 8: Field Observations DPW

BORING	LOCATION	DEPTH	SOIL CHARACTERISTICS	PID READINGS	FIELD OBSERVATIONS
D-1	20' south of salt shed, northwest corner of the property	Total depth 12'	0-4' - gravelly with asphalt, silt, sand and crushed brick	none	Ammonia odor Sewage encountered at 4'
D-2	10' feet west of brick building on southern side of property	Sample at 8' Total depth 10'	0-4' - dry fill, gravel, cobbles, silty sand 4-8' - no recovery 8-12' wet, cobbles	none	No odor
DSB-3	10' west of southeastern corner	Total depth 1.5'	01.5' - concrete	-	Refusal at 1.5'
DSB-4	10' west of eastern property border, near receiving dock	Sample at 3' Sample at 7' Total depth 7'	0-4' concrete, dry cobbles, moist clay 4-8' moist clay	none	Concrete and gravel fill to 3' Dark gray clay
DSB-5	Northern portion of property, 10' east of sand shed	Sample at 3' Sample at 7' Total depth 7'	0-4' concrete, dry cobbles, moist clay 4-8' moist clay	none	Concrete and gravel fill to 3' Dark gray clay
DSB-6	Northeast portion, 10' east of property border near sand shed	Sample at 3' Sample at 7' Total depth 7'	0-4' concrete, dry cobbles, moist clay 4-8' moist clay	none	Concrete and gravel fill to 3' Dark gray clay
DSB-7	10' south of salt shed, northwest corner of the property	Total depth 8'	0-4' concrete, dry cobbles, moist clay 4-8' moist clay	-	Sewage encountered at 8'
DSB-8	Southwest portion of property, near the ASTs	Sample at 3' Sample at 7' Total depth 7'	0-8' concrete, cobbles, fill	none	Concrete and gravel fill to 8' Moist clay at 6'

Table 9: Field Observations Hand Boring

BORING	LOCATION	DEPTH	SOIL CHARACTERISTICS	PID READINGS	FIELD OBSERVATIONS
HB-1	4' south of storage building	Sample at 3' Sample at 5'	0-4' - oily color 5' - oily soil	47.1 25.4	Oily odor Product
HB-2	4' south of storage building, 10' from HB-1	Sample at 3' Sample at 5'	0-4' - dark brown dry 5' product	8.7 90.7	Moist, oily odor Product
HB-3	4' south of storage building, 10' from HB-2	Sample at 3' Sample at 5'	0-4' - dark brown to black 5' light grey and red clay	none 54.4	Oily odor
HB-4	4' south of storage building, 10' from HB-3	Sample at 3'	0-3' dry dark brown and red brick soil	none	Upper dry Lower moist
HB-5	Southeastern corner of property	Sample at 3' Sample at 5'	0-5' dark brown to red soil	none 25.4	Oily odor
HB-6	Three feet southwest of OWS		Concrete	none	Refusal at 1.5'
HB-7	Northern portion of property, outside of berm	Sample at 3'	0-3' bricks, oily	105	Product at 3' Refusal at 4'
HB-8	Eastern side of property, near outlet			-	Refusal at 8"
HB-9	10' south from HB-8	Sample at 4'	0-4' dark brown, oily	none	Oily odor Refusal at 4'
HB-10	10' south from HB-9	Sample at 5'	Light brown	none	Refusal at 5'
SS-1	Vicinity of sewer outlet, southeast of property	Sample at 10"	Dark brown	none	Dark grey shine

Table 10: Summary of Detected VOCs in Soil Samples
(Results in bold exceed designated action levels. All results measured in µg/kg-ppb).

			Sample Identification				
	Compound	Action Level[1,2]	RSB-1 (1-2)	RSB-2 (1-2)	RSB-2 (4-5)	RSB-2 (5-6)	RSB-3 (2-3)
VOCs	n-Butylbenzene	100[2]	52	27	**1,800**	**3,300**	30
	sec-Butylbenzene	100[2]	6	ND	**1,300**	**2,700**	ND
	tert-Butylbenzene	100[2]	ND	40	**475**	**1,000**	ND
	Chlorobenzene	1,700[1]	ND	ND	15	36	ND
	1,2-Dichlorobenzene	7,900[1]	ND	ND	ND	ND	ND
	1,3-Dichlorobenzene	1,600[1]	ND	ND	ND	ND	ND
	1,4-Dichlorobenzene	8,500[1]	ND	ND	ND	ND	ND
	Ethylbenzene	100[2]	8	19	ND	33	54
	Isopropylbenzene	100[2]	8	ND	**500**	**1,200**	ND
	p-Isopropyltoluene	100[2]	18	10	ND	ND	13
	Naphthalene	200[2]	8	137	68	36	25
	n-Propylbenzene	100[2]	12	ND	**710**	**1,500**	34
	1,1,2,2-Tetrachloroethane	600[1]	ND	ND	**610**	**1,300**	ND
	Toluene	100[2]	ND	6	ND	ND	16
	1,2,4-Trichlorobenzene	3,400[1]	ND	ND	ND	ND	ND
	1,2,4-Trimethylbenzene	100[2]	61	**290**	ND	ND	**460**
	1,3,5-Trimethylbenzene	100[2]	**250**	**121**	ND	ND	**200**
	o-Xylene	100[2]	33	**113**	ND	ND	**220**
	p/m-Xylene	100[2]	24	**216**	16	12	**360**

Notes:
1. Source: NYSDEC TAGM (January 24, 1994)
2. Source: STARS Memo (July 1993)
3. ND = Not Detected, NA = Not Analyzed

Table 10: Summary of Detected VOCs in Soil Samples
(Results in bold exceed designated action levels. All results measured in μg/kg-ppb).

			Sample Identification				
	Compound	Action Level[1,2]	RSB-3 (5-6)	RSB-4 (5-6)	RSB-4 (12)	JSB-1 (4)	JSB-8 (4)
VOCs	n-Butylbenzene	100[2]	**340**	**390**	ND	83	80
	sec-Butylbenzene	100[2]	**235**	**240**	17	50	100
	tert-Butylbenzene	100[2]	82	68	15	18	57
	Chlorobenzene	1,700[1]	ND	ND	ND	ND	ND
	1,2-Dichlorobenzene	7,900[1]	ND	ND	ND	ND	ND
	1,3-Dichlorobenzene	1,600[1]	ND	ND	ND	ND	ND
	1,4-Dichlorobenzene	8,500[1]	ND	ND	ND	ND	ND
	Ethylbenzene	100[2]	ND	ND	ND	ND	ND
	Isopropylbenzene	100[2]	**140**	90	ND	12	9
	p-Isopropyltoluene	100[2]	ND	ND	ND	ND	ND
	Naphthalene	200[2]	15	14	ND	ND	ND
	n-Propylbenzene	100[2]	**270**	**230**	ND	21	21
	1,1,2,2-Tetrachloroethane	600[1]	79	90	ND	20	21
	Toluene	100[2]	ND	ND	ND	ND	6
	1,2,3-Trichlorobenzene	3,400[1]	ND	45	ND	26	ND
	1,2,4-Trimethylbenzene	100[2]	22	14	ND	ND	12
	1,3,5-Trimethylbenzene	100[2]	10	ND	ND	ND	6
	o-Xylene	100[2]	9	ND	ND	ND	ND
	p/m-Xylene	100[2]	11	5	ND	ND	ND

Notes:
1. Source: NYSDEC TAGM (January 24, 1994)
2. Source: STARS Memo (July 1993)
3. ND = Not Detected, NA = Not Analyzed

Table 10: Summary of Detected VOCs in Soil Samples
(Results in bold exceed designated action levels. All results measured in μg/kg-ppb).

	Compound	Action Level[1,2]	Sample Identification JSB-9 (3-4)	D-1 (0-4)	D-2 (8-10)
VOCs	n-Butylbenzene	100[2]	12	11	8
	sec-Butylbenzene	100[2]	17	ND	ND
	tert-Butylbenzene	100[2]	32	ND	ND
	Chlorobenzene	1,700[1]	ND	5	ND
	1,2-Dichlorobenzene	7,900[1]	ND	200	165
	1,3-Dichlorobenzene	1,600[1]	ND	6	5
	1,4-Dichlorobenzene	8,500[1]	ND	60	46
	Ethylbenzene	100[2]	11	ND	ND
	Isopropylbenzene	100[2]	ND	ND	ND
	p-Isopropyltoluene	100[2]	ND	14	12
	Naphthalene	200[2]	38	110	88
	n-Propylbenzene	100[2]	ND	ND	ND
	1,1,2,2-Tetrachloroethane	600[1]	ND	ND	ND
	Toluene	100[2]	5	**110**	**114**
	1,2,3-Trichlorobenzene	3,400[1]	ND	ND	ND
	1,2,4-Trimethylbenzene	100[2]	60	31	24
	1,3,5-Trimethylbenzene	100[2]	32	12	10
	o-Xylene	100[2]	50	ND	ND
	p/m-Xylene	100[2]	94	8	6

Notes:
1 Source: NYSDEC TAGM (January 24, 1994)
2 Source: STARS Memo (July 1993)
3 ND = Not Detected, NA = Not Analyzed

Table 11: Summary of Detected PAHs in Soils

(Results in bold exceed designated action levels. All results measured in µg/kg-ppb).

			SAMPLE IDENTIFICATION					
	Compound	Action Level[1,2]	RSB-1 (1-2)	RSB-1 (4)	RSB-2 (4-5)	RSB-2 (5-6)	RSB-3 (2-3)	RSB-4 (2-3)
PAHs	Acenaphthene	400[2]	ND	ND	670	540	ND	1,400
	Anthracene	1,000[2]	ND	ND	ND	ND	940	ND
	Chrysene	400[1]	ND	ND	ND	ND	ND	ND
	Fluorene	1,000[2]	ND	630	ND	ND	430	2,800
	Naphthalene	200[2]	ND	ND	ND	ND	430	ND
	Phenanthrene	1,000[2]	850	1,300	1,700	2,300	970	5,600
	Pyrene	1,000[2]	ND	ND	ND	ND	ND	ND

Notes:
1. Source: NYSDEC TAGM (January 24, 1994)
2. Source: Spill Technology and Remediation Series (STARS) Memo #1, July 1993
3. ND = Not Detected
4. J = Estimated value based on achievable detection limits

Table 12: Summary of RCRA Metals in Soils

(All data provided in mg/kg. Concentrations shown in bold exceed NYSDEC established action levels.)

			SAMPLE IDENTIFICATION					
METALS	Background Levels[1]	Action Levels[1]	RSB-1 (1-2)	RSB-3 (2-3)	RSB-8 (3-4)	RSB-9 (2')	JSB-1 (4)	JSB-2 (5-6)
Arsenic	3.0 - 12.0	7.5	ND	ND	1.86	ND	2.07	6.98
Barium	15 - 600	300	85.3	32.9	54.9	30.7	46.9	48.9
Cadmium	0.1 - 1.0	1	**1.12**	**6.23**	ND	0.64	ND	ND
Chromium	1.5 - 40	10	3.75	6.73	**12.3**	5.63	**12.3**	**13.5**
Lead	200 - 500	400	**1,190**	48.9	15.3	45.3	8.87	9.36
Mercury	0.0001 - 0.2	0.2	ND	ND	ND	ND	ND	ND
Selenium	0.1 - 3.9	2	1.94	**3.17**	**4.28**	**5.63**	**4.61**	**4.79**
Silver	NE[2]	NE[2]	ND	ND	ND	ND	ND	ND

Notes: 1: Source: NYSDEC Technical and Administrative Guidance Memorandum (January 24, 1994).
2: NYSDEC action and/or background levels were not established for this compound.
3: Not detected above laboratory detection limit
4: NA = Not Analyzed

Table 12: Summary of RCRA Metals in Soils (Cont'd)
(All data provided in mg/kg. Concentrations shown in bold exceed NYSDEC established action levels.)

METALS	Background Levels[1]	Action Levels[1]	JSB-3 (6)	JSB-4 (4)	JSB-7 (3-6)	JSB-10 (4-5)	D-1 (0-4)	D-2 (8-10)
Arsenic	3.0 - 12.0	7.5	1.95	1.96	1.97	4.50	1.32	2.36
Barium	15 - 600	300	49.8	108	29.6	20.4	62.9	40.6
Cadmium	0.1 - 1.0	1	ND	ND	ND	0.62	0.73	ND
Chromium	1.5 - 40	10	**16.1**	**13.1**	9.36	3.50	7.92	8.70
Lead	200 - 500	400	9.99	9.72	8.02	13.5	59.8	59.4
Mercury	0.0001 - 0.2	0.2	ND	ND	ND	ND	ND	ND
Selenium	0.1 - 3.9	2	**4.87**	**3.14**	**3.85**	1.44	**3.61**	**3.45**
Silver	NE[2]	NE[2]	ND	ND	ND	ND	3.23	1.65

Notes: 1: Source: NYSDEC Technical and Administrative Guidance Memorandum (January 24, 1994).
2: NYSDEC action and/or background levels were not established for this compound.
3: Not detected above laboratory detection limit
4: NA = Not Analyzed

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Table 12: Summary of RCRA Metals in Soils (Cont'd)
(All data provided in mg/kg. Concentrations shown in **bold** exceed NYSDEC established action levels.)

METALS	Background Levels[1]	Action Levels[1]	DSB-4 (3)	DSB-5 (3)	DSB-6 (3)	DSB-8 (6)
Arsenic	3.0 - 12.0	7.5	1.66	2.31	2.42	ND
Barium	15 - 600	300	82.2	47.8	98.2	94.2
Cadmium	0.1 - 1.0	1	0.64	ND	ND	ND
Chromium	1.5 - 40	10	**12.2**	**14.3**	**18.3**	**12.6**
Lead	200 - 500	400	96.3	20.2	12.3	11.2
Mercury	0.0001 - 0.2	0.2	**0.40**	ND	ND	ND
Selenium	0.1 - 3.9	2	**4.01**	**3.31**	**3.86**	**3.63**
Silver	NE[2]	NE[2]	ND	ND	ND	ND

Notes: 1: Source: NYSDEC Technical and Administrative Guidance Memorandum (January 24, 1994).
2: NYSDEC action and/or background levels were not established for this compound.
3: Not detected above laboratory detection limit
4: NA = Not Analyzed

Table 14: Summary of Total Petroleum Hydrocarbon Results in Soil and Water Samples
(Results in bold exceed designated action levels. All results measured in mg/kg-ppm or mg/l-ppm)

Parameter (Method 8015B)	RMW-A (Water)	JSB-5 (Soil 6-7)	HB-1 (Soil 5')	HB-7 (Soil 3')	HB-9 (Soil 4')	SS-1
Total Petroleum Hydrocarbons - GRO	ND	ND	NA	NA	ND	NA
Total Petroleum Hydrocarbons - DRO	NA	NA	1,400	43,000	NA	68

Notes: ND = Not Detected
NA = Not Analyzed

Table 15: Summary of Laboratory Analysis of Groundwater Samples
(Results in bold exceed designated action levels. All results measured in µg/l-ppb).

	Action Level[1]	Sample Identification						
		JMW-1	JMW-2	JMW-3	RMW-1	RMW-2	RMW-3	RMW-A
Volatile Organic Compounds (VOCs) with MTBE - Method 8021								
Benzene	0.7	ND	ND	ND	260	16	5	NA
n-Butylbenzene	5	ND	ND	ND	14	4	6	NA
tert-Butylbenzene	5	ND	ND	ND	ND	ND	1	NA
Ethylbenzene	5	ND	ND	ND	ND	ND	2	NA
Isopropylbenzene	5	ND	ND	ND	ND	ND	3	NA
MTBE	50	ND	ND	ND	26	22	4	NA
Naphthalene	10	ND	ND	ND	4	2	2	NA
n-Propylbenzene	5	ND	ND	ND	ND	ND	3	NA
Toluene	5	ND	ND	ND	2	ND	ND	ND
1,2,4-Trimethylbenzene	5	ND	ND	ND	200	3	3	NA
1,3,5-Trimethylbenzene	5	ND	ND	ND	53	6	2	NA
o-Xylene	5	ND	ND	ND	13	4	2	NA
p/m-Xylene	5	ND	ND	ND	360	29	1	NA
Polynuclear Aromatic Hydrocarbons (PAHs) Method 8270								
		ND	ND	ND	ND	ND	ND	NA

Notes 1. Source: STARS Memo (July 1993)
2. ND = Not Detected, NA = Not Analyzed

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Excerpts of Previous Report

Status of Groundwater Quality at Rockland Fuel Oil Site – April 23, 2002

Ecosystems Strategies, Inc.
Environmental Services and Solutions
24 Davis Avenue, Poughkeepsie, New York 12603-2332
TEL: 845-452-1658 • FAX: 845-485-7083 •
EMAIL: mail@ecosystemsstrategies.com

April 23, 2002

Andrew Maniglia
Ginsburg Development Corporation
245 Saw Mill River Road
Hawthorne, NY 10532

Re: Status of Groundwater Quality at the Rockland Fuel Oil Corporation Site, located on Dr. George Girling Drive, Village of Haverstraw, Rockland County, New York
ESI File: GH98177 and GH9964

Dear Mr. Maniglia:

This letter is prepared in your response to your request for this office to conduct additional groundwater sampling to document the current status of groundwater quality for the above-referenced site. This letter compares data generated in April 2002 with data generated from a previous sampling round in May 1999. Both rounds of laboratory data are included as Attachment B of this letter. Maps showing the location of the site and the specific locations of the wells on the property are provided as Attachment A.

Methodology

Four on-site groundwater monitoring wells were sampled on April 1, 2002 for the purpose of documenting current groundwater conditions on the above-referenced site. Sampling was also conducted in May 1999 in conjunction with the preparation of a Combined Phase I – Phase II Environmental Site Assessment. On both occasions, groundwater monitoring wells RMW-1, RMW-2, RMW-3, and RMW-A, which had been previously installed by an unknown company, were sampled by ESI personnel. Prior to sample collection, each well casing was opened and screened with a Thermal Instruments 580B photo-ionization detector (PID) and readings recorded in a field data log.

Each monitoring well was purged with a mechanical pump and properly decontaminated between wells in accordance with standard decontamination protocol. Water removed from each monitoring well was visually inspected for indications of petroleum contamination. All groundwater samples were collected with dedicated, disposable polyethylene bailers to avoid cross-contamination of the wells. All groundwater samples intended for laboratory analysis of VOCs and MTBE (USEPA Method 8021) and PAHs (USEPA Method 8270) were collected in sample containers pre-cleaned at the laboratory.

After sample collection, the containers were placed on ice in a cooler prior to transport to the laboratory. All groundwater samples were transported via overnight delivery to York Analytical Laboratories Inc. Appropriate chain of custody procedures were followed. A complete copy of the laboratory results is provided as Attachment B to this letter.

Table 1: Summary of Laboratory Analysis of Groundwater Samples 1999 and 2002
(Results in **bold** exceed designated action levels. All results measured in µg/l-ppb).

		Sample Identification						
	Action Level[1]	RMW-1 1999	RMW-1 2002	RMW-2 1999	RMW-2 2002	RMW-3 1999	RMW-3 2002	RMW-A 2002
Volatile Organic Compounds (VOCs) with MTBE - Method 8021								
Benzene	0.7	**260**	**2400**	**16**	**11**	**5**	**4**	ND*
n-Butylbenzene	5	**14**	ND	4	ND	**6**	ND	3
tert-Butylbenzene	5	ND	ND	ND	2	1	**1**	ND
Ethylbenzene	5	ND	**870**	ND	**29**	2	**6**	ND
Isopropylbenzene	5	ND	**17**	ND	4	3	**26**	3
MTBE	10	26	**100**	**22**	**17**	4	3	**13**
Naphthalene	10	4	ND	2	ND	2	ND	2
n-Propylbenzene	5	ND	**14**	ND	**9**	3	**65**	4
Toluene	5	2	**10**	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	**200**	**260**	3	**16**	3	4	ND
1,3,5-Trimethylbenzene	5	**53**	**16**	**6**	ND	2	ND	ND
o-Xylene	5	**13**	ND	4	ND	2	ND	ND
p/m-Xylene	5	**360**	**77**	**29**	2	1	ND	ND
Polynuclear Aromatic Hydrocarbons (PAHs) Method 8270								
		ND	ND	ND	ND	ND	ND	

Notes:
1. Source: STARS Memo (July 1993)
2. ND = Not Detected above method detection limit
3. * method detection limit exceeds action level

Recommendations

Laboratory data show a general increase in the concentrations of VOCs in on-site groundwater and in some cases above NYSDEC action levels. It is the opinion of this office that the source of this groundwater contamination is the presence of contaminated soils known on the site. Removal of this soil should be completed, and the reassessment of groundwater quality should be conducted prior to a determination as to the need for active groundwater treatment. Further, the on-site tanks should be closed and removed in accordance with applicable regulations to prevent any further releases.

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

Sincerely,

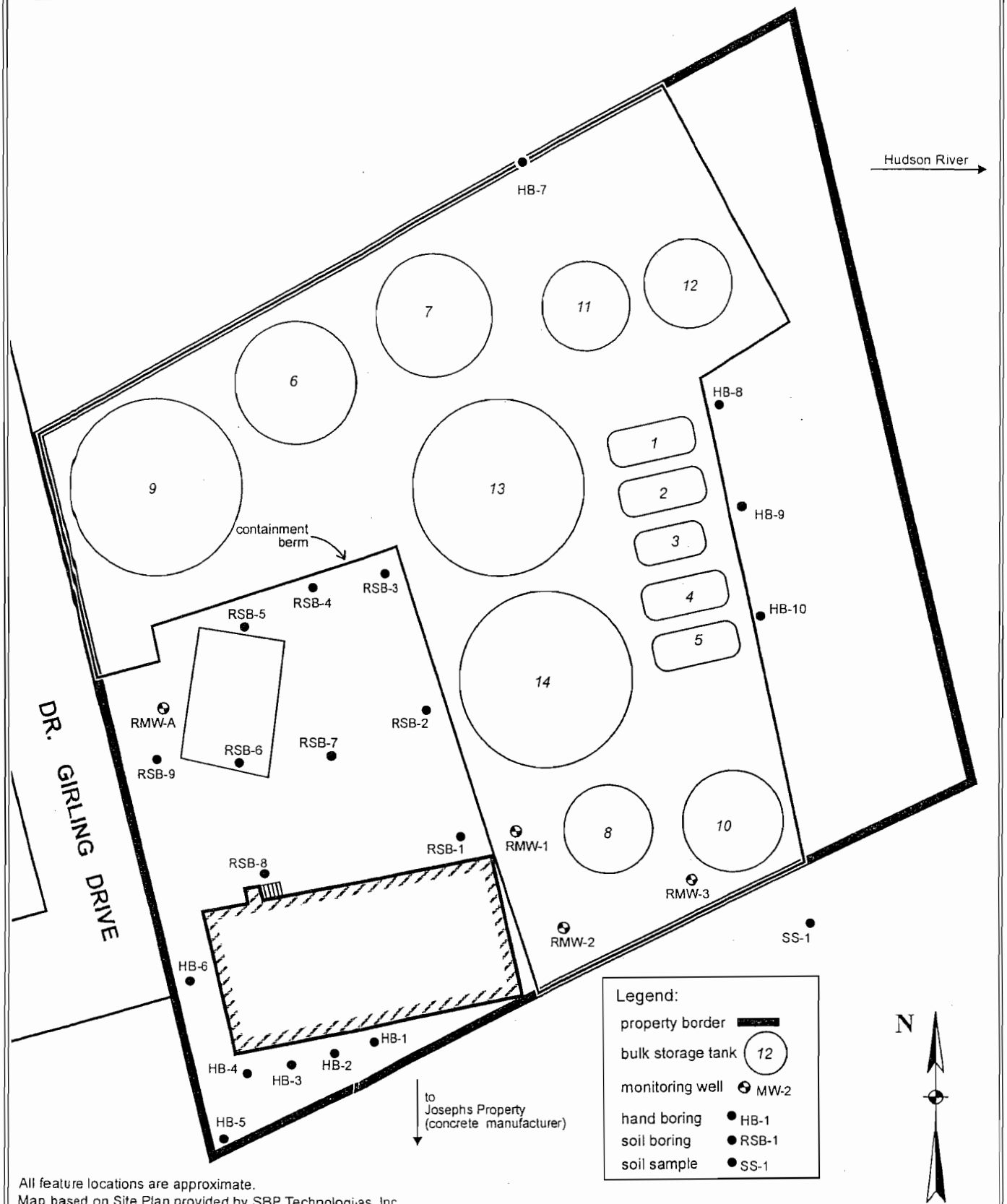
ECOSYSTEMS STRATEGIES, INC.

Paul H. Ciminello
President

PHC:kgs

Attachments

cc: R. Adamo
File



All feature locations are approximate.
Map based on Site Plan provided by SBP Technologies, Inc.

Rockland Oil Fuel Company
Selected Site Features Map
Dr. Girling Drive
Village of Haverstraw
Rockland County, New York

ESI File: GH9964.20
April 2002
Scale: 1 = 47' (approximately)
Attachment A

Excerpts of Previous Report

Summary Report of Remedial Activities – August 2003

1.0 INTRODUCTION

1.1 Purpose

This Summary Report of Remedial Activities (Report) summarizes fieldwork performed by Ecosystems Strategies, Inc. (ESI), and/or designated subcontractors, during June and July, 2003, on the former Rockland Fuel Oil Site - Haverstraw Harbors property, located at Dr. George W. Girling Drive, Village of Haverstraw, Rockland County, New York. The remedial activities summarized in this Report were performed to address the presence of contaminated soil previously identified on a portion of the property. Fieldwork objectives are outlined in Section 2.1, below.

The purpose of this Report is to document remedial activities performed on a specified portion of the former Rockland Fuel Oil Site - Haverstraw Harbors property (the "Site"). Remedial activities were deemed necessary based upon the confirmed presence of low concentrations of the chlorinated solvent tetrachlorethane (PCA). This Report describes all soil excavation, fieldwork methodology and confirmatory soil sampling procedures, includes discussions of the resulting analytical data from collected soil samples, and provides conclusions and recommendations drawn from the fieldwork and analytical data.

1.2 Limitations

This written analysis is a summary of fieldwork activities conducted on a specified portion of the former Rockland Fuel Oil Site - Haverstraw Harbors property, located on Dr. George W. Girling Drive, Village of Haverstraw, Rockland County, New York and is not relevant to other portions of this property or any other property. It is a representation of those portions of the property analyzed as of the respective dates of fieldwork. This Report cannot be held accountable for activities or events resulting in contamination after the dates of fieldwork.

Services summarized in this Report were performed in accordance with generally accepted practices and established New York State Department of Environmental Conservation (NYSDEC) protocols. Unless specifically noted, the findings and conclusions contained herein must be considered not as scientific certainties, but as probabilities based on professional judgment.

1.3 Site Location and Description

The Haverstraw Harbors property was accepted into the New York State Department of Environmental Conservation's (NYSDEC) Voluntary Cleanup Program (VCP) in July 2003 (VCP Site#: V-00646-3). The property is comprised of two parcels: the 1.2-acre former Rockland Fuel Oil Company (Rockland Fuel) parcel (Village of Haverstraw Tax Lot Parcel: Section 27.14, Block 1, Lot 5.1) and an approximately 0.4-acre portion of the 8.4-acre Keahon property (Village of Haverstraw Tax Lot Parcel: Section 27.62, Block 1, Lots 7.1 and 7.2). These properties, which are contiguous and are located on the Hudson River, form an irregularly-shaped parcel with a combined frontage of approximately 515 feet on the eastern side of Dr. George W. Girling Drive.

The Site, as defined in this Report, consists of specific portions of the Rockland Fuel parcel, a former registered NYSDEC Major Oil Storage Facility. The Site formerly contained multiple features associated with the Rockland Fuel Oil Company: 14 aboveground storage tanks (ASTs), a fuel-oil distribution area, an oil/water separator (OWS), and an office and garage. A degraded concrete secondary containment was formerly located beneath the petroleum distribution area. A clay and burlap geo-technical layer, covered by approximately 24 inches of mixed soil and gravel, covers the area of the property formerly containing the ASTs. A soil and gravel berm of similar construction surrounds this portion of the property.

A Site Location Map showing the location of the Rockland Fuel property, and a Selected Site Features Map that illustrates the configuration of the Site, are included in Appendix A of this Report.

1.4 Previous Environmental Reports

The Site has been the subject of several environmental investigations, which documented the presence of volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs) and heavy metals in on-site soils at concentrations above NYSDEC guidance levels (a NYSDEC Spill Event, number 0001146, was reported for the Site in April 2000). Based on these investigations, a Draft Remedial Action Workplan (Workplan) for remediation of the Site was issued by ESI in February 2003. The Workplan called for the removal of all ASTs (and associated features) and the remediation of soils contaminated by 1,1,2,2-tetrachloroethane (a chlorinated solvent referred to as PCA). The source of this solvent has not been confirmed but may have been related to discharges during equipment cleaning. It was estimated that 50-100 tons of solvent contaminated soils required remediation.

2.0 SUBSURFACE INVESTIGATION

2.1 Specified Objectives

ESI conducted remedial activities on the Site for the following purposes:

- To remove PCA contaminated soil from the Site, in accordance with NYSDEC regulations and Section 2.3.4 of the Workplan;
- To document the post-excavation integrity of remaining on-site soils;
- To restore excavated area to former grade;
- suggest, if appropriate, further investigative and/or remedial options regarding identified subsurface or surface contamination; and,
- To prepare a Report documenting all fieldwork activities, resulting analytical data and conclusions and recommendations pertaining to the subsurface investigation.

2.2 Fieldwork

2.2.1 Site Preparation Services

Prior to the initiation of fieldwork, a request for a complete utility markout of the subject property was submitted by ESI as required by New York State Department of Labor regulations. Confirmation of underground utility locations was secured and a field check of the utility markout was conducted prior to the extension of soil cores.

2.2.2 Soil Excavation Methodology and Observations

Soil excavation was conducted under the supervision of ESI personnel by Luzon Environmental Services on June 9, 2003 using a tracked excavator. A MiniRAE 2000 (Model PGM 7600) photo-ionization detector (PID) was utilized by ESI personnel to screen all encountered material for the presence of any volatile organic vapors where appropriate. Prior to the initiation of fieldwork, this PID was properly calibrated to read parts per million calibration gas equivalents (ppm-cge) of isobutylene in accordance with protocols set forth by the equipment manufacturer. An assessment of subsurface soil characteristics, including soil type, the presence of foreign materials, field indications of contamination (e.g., unusual coloration patterns or odors), and instrument indications of contamination (i.e., PID readings) was made by ESI personnel during the soil excavation.

ESI personnel maintained field logs documenting the physical characteristics of the encountered soil, PID readings and any field indications of contamination for all encountered material. The approximate dimensions of the excavation area was 17 feet (east to west), 22 feet (north to south) and approximately 8 feet in depth.

Encountered soil generally consisted of medium-brown to gray, clay-like material with traces of silt and sand at varying degrees of wetness, with the exception of the uppermost 24 inches, which consisted mainly of gravel, clay, and burlap associated with the original geo-technical layer. Soil material encountered from the surface to a depth of eight feet below surface grade (bsg) exhibited varying degrees of petroleum odor and staining. PID readings of 0.6 ppm to 1,300 ppm were recorded during excavation activity, with the highest readings recorded at a depth of 5-6 feet bsg. Two, three-inch steel fuel lines were encountered at a depth of approximately 24 inches. Groundwater began to enter the excavation at depths of 6-8 feet bsg.

Based on field observations and previous laboratory data, approximately 60.4 tons of soil was excavated and stockpiled at the former garage/office structure slab pending off-site removal. Stockpiled materials were placed on, and covered with, 6 mil plastic sheeting. Soil sampling data confirm this stockpiled soil to be non-hazardous petroleum-contaminated waste.
At the conclusion of excavation activity a volume of clean fill, including soil, brick and concrete rubble from on-site, was used to restore the excavation to grade.

2.2.3 Post-Excavation Confirmatory Sample Collection

All soil samples were collected in a manner consistent with NYSDEC sample collection protocols. Decontaminated stainless steel trowels and dedicated gloves were used at each sample location to place the material into jars pre-cleaned at the laboratory. All sample collection equipment was properly decontaminated prior to the initiation of sampling and between sample locations to avoid cross-contamination.

All sample containers were placed in a cooler immediately after sample collection and were maintained at cool temperatures prior to transport to the laboratory. The soil samples were transported the following day via courier to York Analytical Laboratories, Inc. (York), a New York State Department of Health-certified laboratory (ELAP Certification Number 10854) for chemical analyses. Appropriate chain-of-custody procedures were followed.

Five post-excavation confirmatory grab soil samples were collected at the conclusion of excavation activity. Soil samples PE-NW, PE-EW, PE-SW and PE-WW were collected, respectively, at a depth of approximately 6 feet bsg from the north, east, south and west walls of the excavation. Soil sample PE-Base Center was collected from the base center of the excavation at a depth of approximately 8 feet bsg.

2.3 Laboratory Analysis and Discussion

2.3.1 Guidance levels

The guidance levels identified in this Report for hydrocarbons in soils are determined based on the NYSDEC's Technical and Administrative Guidance Memorandum #4046 (TAGM), dated January 24, 1994, as modified by subsequent NYSDEC memoranda. All data have been analyzed in accordance with applicable TAGM standards.

2.3.2 Analysis of Confirmatory Endpoint Samples

All confirmatory endpoint samples were submitted for laboratory analysis of VOCs utilizing United States Environmental Protection Agency (USEPA) Method 8010. No VOCs, including PCA, were detected in any of the confirmatory wall or the base samples. The complete laboratory data package is included as Appendix B.

2.3.3 Sampling and Disposal of Stockpiled Soil

Composite soil samples were collected from the soil stockpile and submitted to York for laboratory analysis. A waste profile was analyzed by York in accordance with the requirements of the waste disposal facility. Results of the sampling indicated the presence of chemical compounds typically encountered in petroleum-contaminated soils.

On July 16, 2003 a total of 60.4 tons of stockpiled soil was removed from the Site by Allied Waste Services Inc. for proper off-site disposal. Disposal manifests are included as Appendix C of this Report.

3.0 CONCLUSIONS AND RECOMMENDATIONS

This office has completed the services summarized in Section 2.0 for the specified portion of the Former Rockland Fuel Oil Site - Haverstraw Harbors property, located at Dr. George W. Girling Drive, Village of Haverstraw, Rockland County, New York. On June 9, 2003, ESI personnel supervised the excavation of soil material suspected of containing tetrachlorethane (PCA). Confirmatory sampling of the base and walls of the excavation was conducted to document the presence or absence of contamination in remaining soils. All stockpiled soil material was removed from the site upon receipt of soil stockpile analysis.

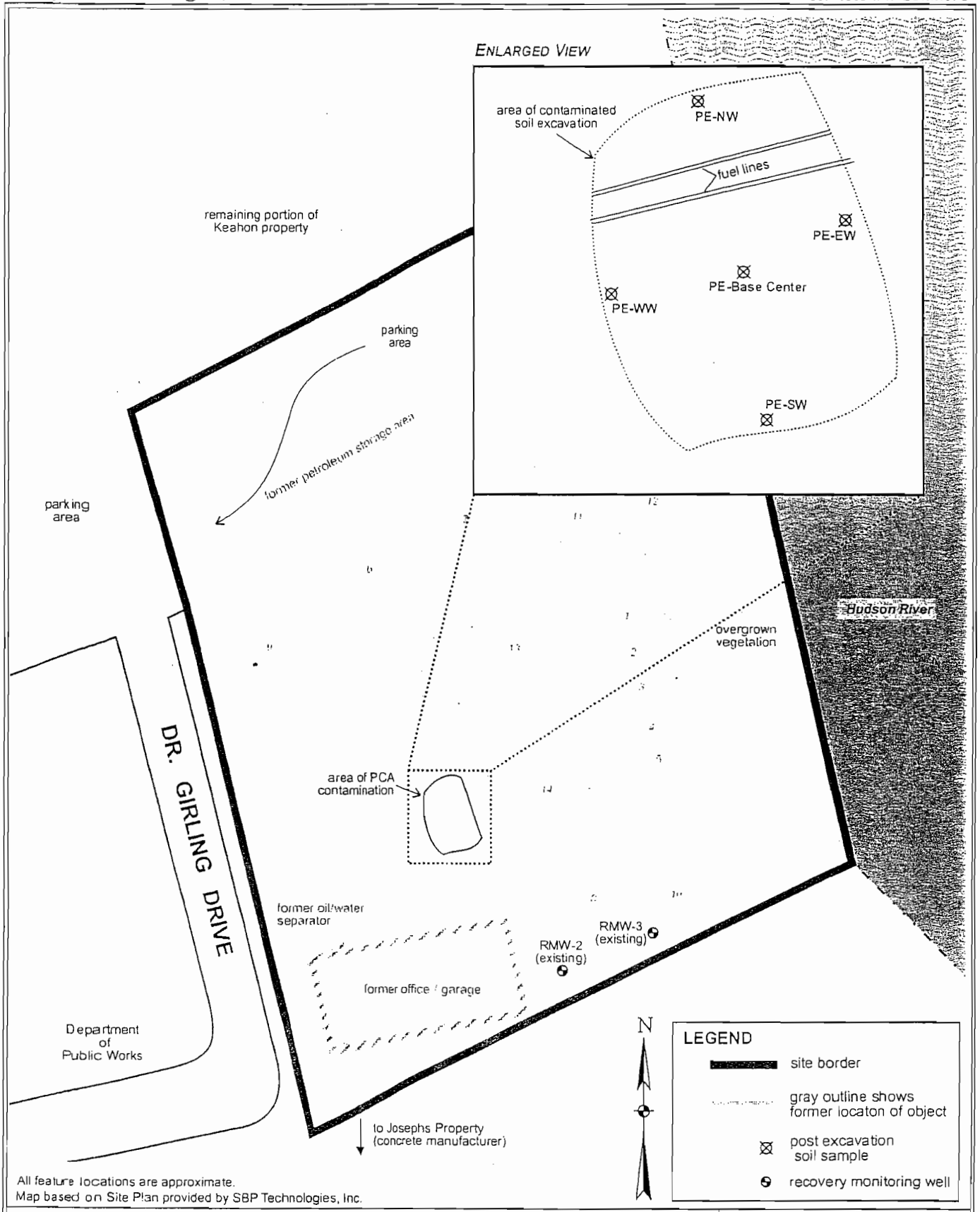
Based on the services provided and data generated, the following conclusions and recommendations (in **bold**) have been made.

1. Confirmatory endpoint sampling of the walls and base of the excavation document the absence of VOCs, including PCA, in the excavation.

   No further investigation or remediation is recommended.

2. This remedial work has been conducted consistent with the recommendations outlined in the Draft Remedial Action Workplan, as submitted to the NYSDEC. The Site is currently part of the NYSDEC Voluntary Cleanup Program (VCP Identification Number V-00646-3).

   It is recommended that this Report be submitted to the NYSDEC for their review.



Fieldwork Map

Former Rockland Fuel Oil Site - Haverstraw Harbors Site
Dr. George W. Girling Drive
Village of Haverstraw
Rockland County, New York

ESI File: GH9964.40
August 2003
Scale: 1" = 50' (approximately)
Attachment A

Excerpts of Previous Report

Tank Closure Site Assessment – August 2003

1.0 INTRODUCTION

1.1 Purpose

This Tank Closure Site Assessment (TCSA) summarizes all tank closure services performed by Ecosystems Strategies, Inc. (ESI) personnel (and/or designated subcontractors) associated with the closing of 14 registered aboveground storage tanks (ASTs), and one unregistered AST, located on the former Rockland Fuel Oil Site - Haverstraw Harbors property as detailed in Section 1.3, below. This TCSA describes all tank closure procedures and provides written documentation of the removal of the above-referenced tanks and their contents, associated piping, and an oil-water separator.

1.2 Limitations

Services summarized in this TCSA were performed in accordance with generally accepted practices and established New York State Department of Environmental Conservation (NYSDEC) protocols. Unless specifically noted, the findings and conclusions contained herein must be considered not as scientific certainties, but as probabilities based on professional judgment.

1.3 Site Location and Description

The environmental services summarized in this TCSA were performed on the former Rockland Fuel Oil Site - Haverstraw Harbors property ("Site") located at Dr. George W. Girling Drive, Village of Haverstraw, Rockland County, New York. A Site Location Map and a Fieldwork Map are included in Appendix A of this TCSA.

1.4 Previous Environmental Reports

The Site has been the subject of several environmental investigations. Based on these investigations, a Draft Remedial Action Workplan (Workplan) for remediation of the Site was issued by ESI in February 2003. The Workplan called for the removal of fourteen ASTs and associated piping located on the central portion of the Site and the removal of an oil-water separator (OWS) located on the southwestern portion of the Site.

The fieldwork performed during tank closure activities at the Site is outlined in Section 2.0. All other items of concern identified in the Workplan are to be addressed through the New York State Department of Environmental Conservation's (NYSDEC) Voluntary Cleanup Program (VCP). The Site was accepted into the program in July 2003 (VCP Site#: V-00646-3).

2.0 TANK CLOSURE

2.1 Summary of Services

The following fieldwork documented in this TCSA was performed by Luzon Environmental Services (Luzon) under the supervision of ESI personnel between April 14, 2003 and June 11, 2003:

- Coordination and supervision of the removal of residual fuel and/or sludge from 14 registered ASTs (plus an additional 275-gallon unregistered AST discovered during tank closure activities), associated piping, and an oil-water separator;
- Off-site disposal of liquid and/or sludge wastes from the 15 ASTs, associated piping, and oil-water separator; and
- Off-site disposal of 15 ASTs, associated piping, and oil-water separator.

ESI prepared this comprehensive Tank Closure Summary Report, which fully documents all tank closure activities (see Section 2.2, below).

2.2 Tank Closure Activities

2.2.1 Fieldwork Methodology

Tank closure services associated with the removal of 15 ASTs, associated piping, and an oil-water separator (including pump-out, cleaning, and liquid waste disposal) were provided by Luzon under the supervision of ESI personnel. A Fieldwork Map illustrating the former location of on-site ASTs is provided in Appendix A and Fieldwork Photographs are provided in Appendix C.

Under the direction of ESI personnel, Luzon pumped a total of approximately 9,903 gallons of liquid and tank bottom sludge from the on-site ASTs, associated piping, and oil-water separator using a vacuum truck. Seven of the 15 on-site tanks were then disposed of off-site by Luzon as scrap metal. The sides of the remaining tanks were cut up with torches into approximately 4 by 8 foot sections, and placed into an on-site dumpster. The bottoms of the remaining tanks were then rendered free of any residual liquid and/or solid waste using degreasers and "Speedy-Dry". The bottoms were then cut and placed into the on-site dumpster. Associated piping and the oil-water separator were rendered free of product, and were then placed into the on-site dumpster.

The metal from the dismantled tanks, associated piping, and the oil-water separator were removed from the site by Luzon, and the plate steel from the tanks was recycled by Luzon whenever possible. Three 55-gallon drums containing waste oil, five cubic yards of spent Speedy Dry, and 10 empty 55-gallon drums were also removed from the site (see Appendix B).

2.2.2 Fieldwork Observations

Tank closure activities were performed between April 14 and June 11, 2003 by Luzon. Evidence of a material release (petroleum odor and staining) was observed during tank closure activities beneath the invert of Tank 8. No other evidence of obvious contamination was observed beneath the other tank inverts.

Three groundwater-monitoring wells were located on the Site; one groundwater-monitoring well (RMW-A), located on the western portion of the Site was, destroyed during tank removal activities, and two groundwater-monitoring wells (RMW-2 and RMW-3) are located to the south of Tank 8. The installation of two additional groundwater-monitoring wells is outlined in the Workplan.

2.2.3 Confirmatory Sampling

Soil samples were not collected during tank closure activities; additional testing will be completed through the NYSDEC Voluntary Cleanup Program (see "Previous Environmental Reports", Section 1.4).

3.0 CONCLUSIONS AND RECOMMENDATIONS

This office has completed the services summarized in Section 2.0 of this TCSA on the specified portion of the Former Rockland Fuel Oil Site - Haverstraw Harbors property ("Site") located at Dr. George W. Girling Drive, Village of Haverstraw, Rockland County, New York. Services included: the coordination and supervision of the pumping and rendering free of fuel/sludge from 15 aboveground storage tanks (ASTs), associated piping, and an oil-water separator; the removal and off-site disposal of liquid and/or sludge wastes; and the removal and off-site disposal of the ASTs, associated piping, and oil-water separator.

Based on the services provided by this office, the following conclusions and recommendations (shown in **bold**) are provided below.

1. Fifteen aboveground storage tanks (ASTs), associated piping, and an oil-water separator were removed from the Site between April and June 2003 and were disposed of in accordance with New York State Department of Environmental Conservation (NYSDEC) regulations.

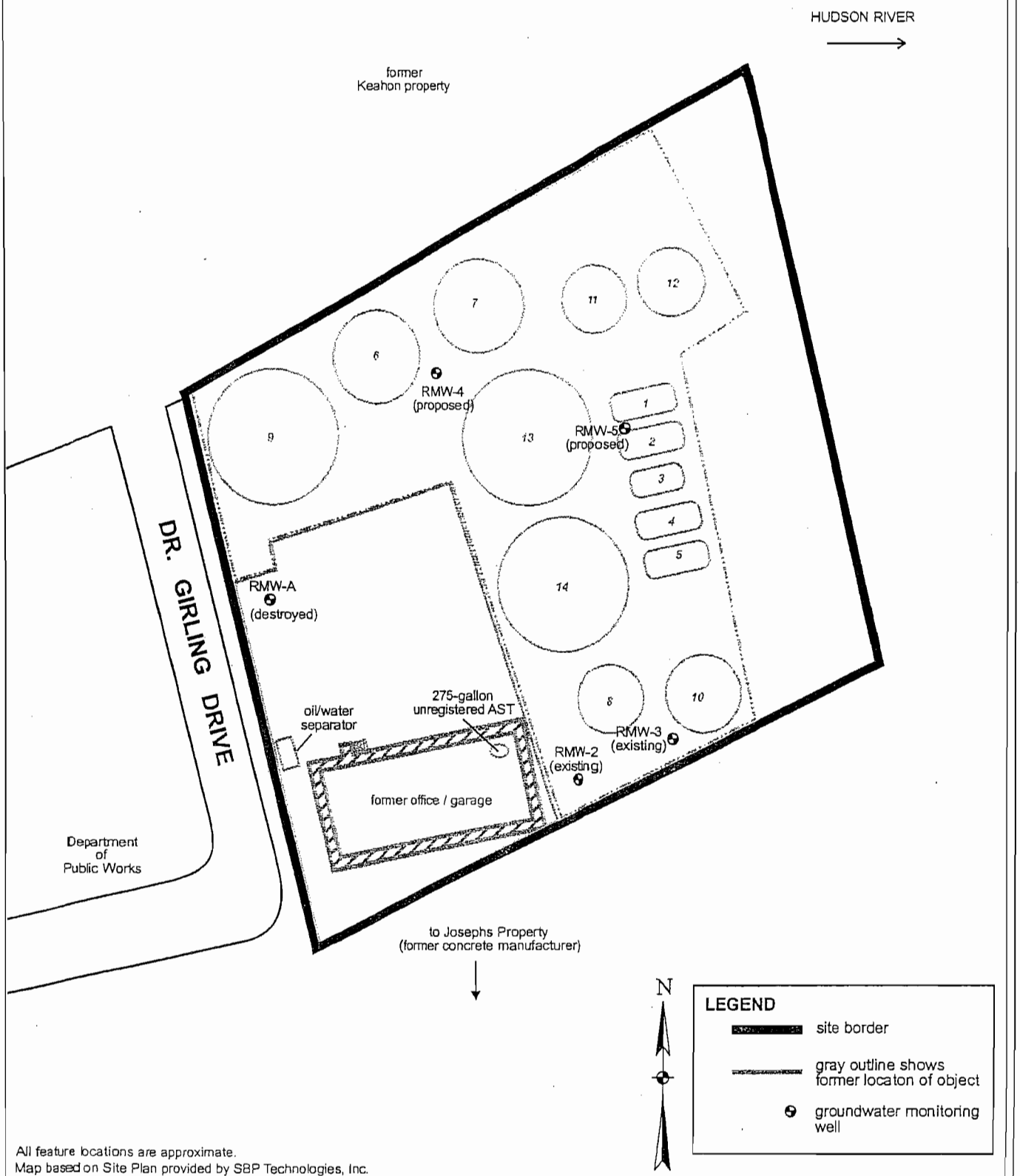
   It is recommended that this TCSA be submitted to the NYSDEC in support of the de-listing of the Haverstraw Harbors property as a Major Oil Storage Facility (MOSF).

2. The Haverstraw Harbors property was accepted into the NYSDEC Voluntary Cleanup Program (VCP) in July 2003 (VCP Site#: V-00646-3). There is known soil contamination and low levels of groundwater contamination present on the Site. During tank removal activities, contaminated soil was noted under Tank 8 (no other tanks appeared to have failed). Additional response actions will be completed as part of the VCP process.

   It is recommended that this TCSA be submitted to the NYSDEC to document tank closure activities completed at the Site.

3. Three groundwater-monitoring wells were located on the Site; one groundwater monitoring well (RMW-A), located on the western portion of the Site, was destroyed during tank removal activities, and two groundwater-monitoring wells (RMW-2 and RMW-3) are located to the south of Tank 8. The installation of two additional groundwater-monitoring wells is outlined in the Workplan.

   It is recommended that the destroyed monitoring well be replaced during the installation of additional groundwater-monitoring wells planned at the Site.



All feature locations are approximate.
Map based on Site Plan provided by SBP Technologies, Inc.

Fieldwork Map

Former Rockland Fuel Oil Site - Haverstraw Harbors Site
Dr. Girling Drive
Village of Haverstraw
Rockland County, New York

ESI File: GH9964.40
August 2003
Not to Scale
Attachment A

Excerpts of Previous Report

Letter Report of Groundwater Sampling – February 24, 2004

Ecosystems Strategies, Inc.
Environmental Services and Solutions
24 Davis Avenue, Poughkeepsie, New York 12603-2332
TEL: 845-452-1658 • FAX: 845-485-7083 •
EMAIL: mail@ecosystemsstrategies.com

February 24, 2004

Andrew Maniglia
Ginsburg Development Corporation
245 Saw Mill River Road
Hawthorne, NY 10532

Re: Status of Groundwater Quality at the Haverstraw Harbors Site (Former Rockland Fuel Oil Corporation Site and Josephs Property), located on Dr. George Girling Drive
Village of Haverstraw, Rockland County, New York
ESI File: GH98177 and GH9964
VCA ID Number: VOO646-3

Dear Mr. Maniglia:

This Letter Report of Groundwater Sampling (Letter Report) summarizes the investigative work performed by Ecosystems Strategies, Inc (ESI) on the above-referenced site. This Letter Report compares data from the January 2004 groundwater sampling event with previously collected data from April 2002 and May 1999. Maps showing the location of the site and the specific locations of the wells (current and former) on the property are provided as Attachment A of this Letter Report. All relevant laboratory data are included as Attachment B.

Fieldwork

Monitoring Well Installation

Three shallow overburden monitoring wells (RMW-4, RMW-5, and RMW-A-replacement) were installed on October 22, 2003 by Todd Syska, Inc using a truck-mounted Geoprobe. RMW-4, RMW-5, and RMW-A-replacement were installed in the northwest, north-central, and northeast (near RMW-A's former location) portions of the former Rockland Fuel Oil Site (Rockland Fuel Site), respectively. Monitoring wells were constructed of 1" internal diameter polyvinyl chloride (PVC) well casing and were installed to a depth of 15' 6" below surface grade.

Groundwater Sampling Methodology

Groundwater sample collection was conducted at three wells on the Rockland Fuel Site (RMW-2, RMW-5, and RMW-A-replacement) and at one well on the Josephs property (JMW-3) located to the south (this well was sampled for information purposes only). Monitoring wells RMW-A and RMW-1 were destroyed during previous site demolition activity. RMW-4 was covered by snow and ice and RMW-3 was dry and neither well could be sampled.

Prior to sample collection, each well casing was opened and screened with a photo-ionization detector (PID). PID measurements and field observations were recorded in a field data log. Each monitoring well was purged with a mechanical pump (properly decontaminated between wells) or disposable polyethylene bailers. Water removed from each monitoring well was visually inspected for indications of petroleum contamination. All groundwater samples were collected with disposable polyethylene bailers to avoid cross-contamination of the wells.

All groundwater samples intended for laboratory analysis were collected in a manner consistent with the United States Environmental Protection Agency (USEPA) and New York State Department of Environmental Conservation (NYSDEC) sample protocols. After sample collection, the containers were placed on ice in a cooler and were transported via overnight delivery to York Analytical Laboratories Inc. Appropriate chain of custody procedures were followed.

Laboratory Analysis

All relevant data are provided in a Table included as Attachment C to this Letter Report. A discussion is provided of the current sampling round, as well as previous sampling events, in this section.

Rockland Fuel Site

Groundwater samples collected from monitoring wells RMW-2, RMW-5, and RMW-A-replacement on January 26, 2004 were submitted for analysis of volatile organic compounds (VOCs) using USEPA Method 8260 and polynuclear aromatic hydrocarbons (PAHs) using USEPA Method 8270.

VOCs

Elevated concentrations of MTBE (260 parts per billion, ppb) and BTEX compounds (ethylbenzene and total xylenes, at concentrations of 800 ppb and 152 ppb, respectively) were detected at RMW-5. (The reported minimum detection level (MDL) of 10 ppb at RMW-5 may potentially be masking the presence of other VOCs in groundwater at RMW-5). No VOCs were identified in any other groundwater samples.

PAHs

Slightly elevated levels of acenaphthene (22 ppb) and phenanthrene (52 ppb) were detected at RMW-A-replacement. Phenanthrene (25 ppb) was detected at concentrations below NYSDEC guidance levels in sample RMW-A-replacement. No PAHs were identified in any other groundwater samples. (Reported MDLs of 10 ppb could potentially be masking the presence of low-level concentrations of several PAHs in all samples).

Josephs Property

A groundwater sample collected from JMW-3 (the single remaining on-site monitoring well) on January 26, 2004 was submitted for analysis of VOCs using USEPA Method 8260 and PAHs using USEPA Method 8270.

VOCs

No VOCs were identified in groundwater sample JMW-3.

PAHs

No PAHs were identified in groundwater sample JMW-3 (reported MDLs of 10 ppb could potentially be masking the presence of low-level concentrations of several PAHs in this sample).

Comparison with Previous Data

Rockland Fuel Site

VOCs

Low level VOC contamination was detected at RMW-2 and RMW-A during previous sampling rounds (1999 and 2002); no VOCs, however, were detected at RMW-2 or RMW-A-replacement during the current sampling round. RMW-5 was recently installed and therefore has no comparative data from past sampling.

PAHs

No PAHs were detected in groundwater samples during any sampling rounds.

Josephs Property

VOCs

No VOCs were detected in groundwater samples from JMW-3 during the May 1999 and current sampling rounds.

PAHs

No PAHs were detected in JMW-3 during previous or current sampling rounds.

Conclusions

This office has completed investigative work to monitor the post remediation level of VOCs and PAHs in the on-site groundwater at the Haverstraw Harbors Site (former Rockland Fuel Oil Corporation Site and Josephs Property), located on Dr. George Girling Drive, Village of Haverstraw, Rockland County, New York. Based on the services provided and data generated, the following conclusions and recommendations have been made.

Josephs Property

1. JMW-3 is the only remaining monitoring well on the Josephs Property. No VOCs were detected in the current groundwater sample. No VOCs had been detected in the sampling event of 1999, which included groundwater samples from JMW-3 and from two other destroyed wells (JMW-1 and JMW-2). These findings support the conclusion that there is no significant groundwater contamination at the Josephs Property.

Rockland Fuel Site

1. Elevated levels of MTBE and BTEX compounds (ethylbenzene and total xylenes) were detected in groundwater sample RMW-5. This data could be indicative of an area of contamination located outside of the Rockland Fuel property.

2. Slightly elevated levels of VOCs were detected in RMW-2 and RMW-A during the 1999 and 2002 sampling rounds; no VOCs, however, were detected in RMW-2 and RMW-A-replacement (used for comparison with 2002 groundwater data from RMW-A) during the current sampling event, documenting a decrease in contamination over time. Slightly elevated levels of PAHs in RMW-A-replacement do not warrant active remediation.

The following actions will be conducted prior to, or during, the next groundwater sampling:

- JMW-3 (located on the Josephs Property) will be closed.
- The installment and development of a new well north of RMW-5 (on the Keahon Property).
- Sampling of the remaining wells on former Rockland Fuel Site and the newly installed well on the Keahon Property to confirm the trends in groundwater quality.

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

Sincerely,

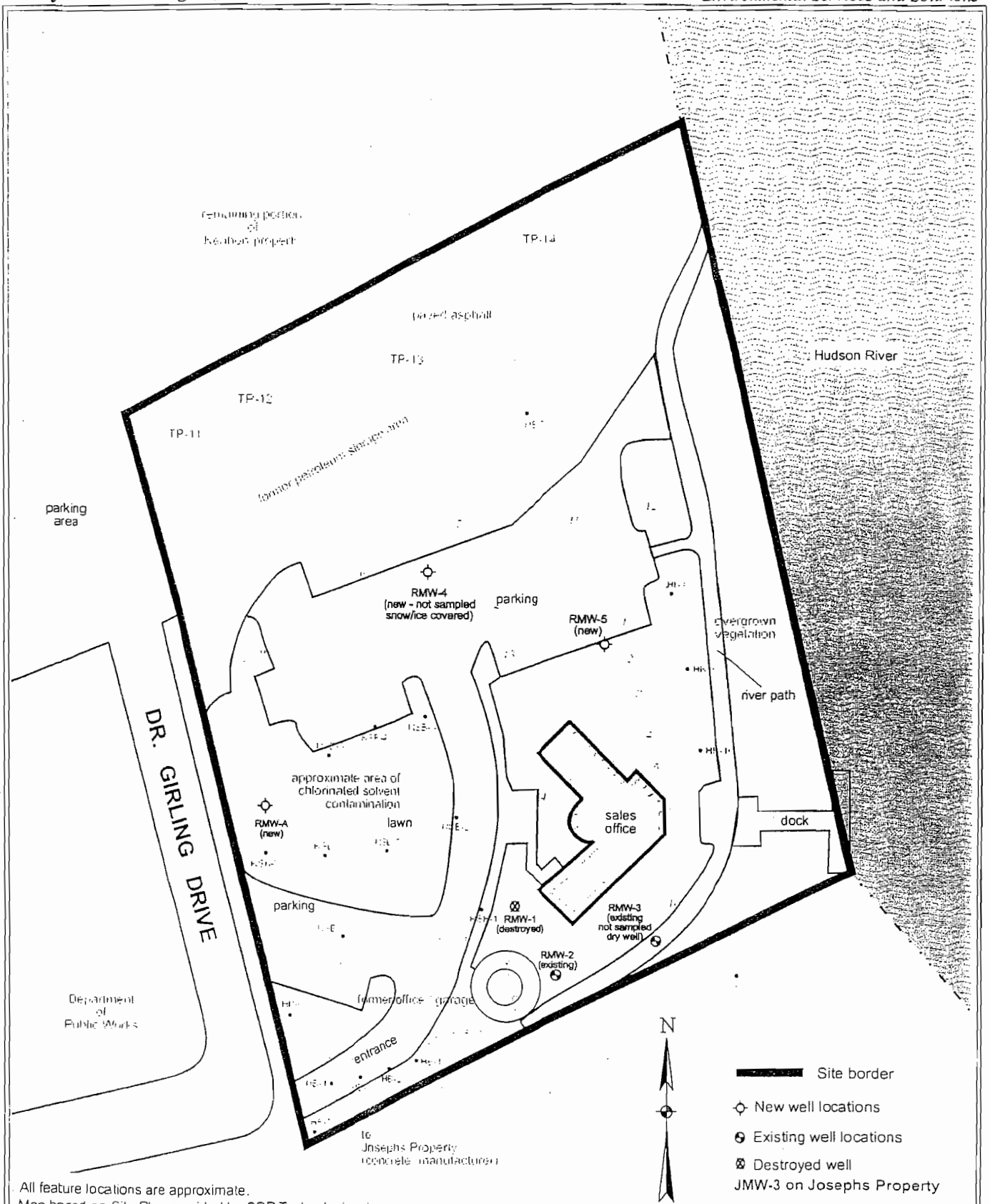
ECOSYSTEMS STRATEGIES, INC.

Paul H. Ciminello
President

PHC:cpr

Attachments

cc: R. Adamo
File



All feature locations are approximate.
Map based on Site Plan provided by SBP Technologies, Inc.

Well Locations

Haverstraw Harbors Site
Dr. George W. Girling Drive
Village of Haverstraw
Rockland County, New York

ESI File: GH9964 / GH98177
February 2004
Scale: 1" = 50' (approximately)
Attachment A

Table: Comparison of Groundwater Data - 1999, 2002, and 2004
Results measured in µg/l.
(Results in bold exceed designated action levels.)

	Guidance	Sample Identification									
	Level	RMW-1 1999	RMW-1 2002	RMW-2 1999	RMW-2 2002	RMW-2 2004	RMW-5 2004	RMW-A 2002	RMW-A * 2004	JMW-3 1999	JMW-3 2004
VOCs with MTBE Method 8260											
Benzene	1	**260**	**2400**	16	11	ND	ND	ND	ND	ND	ND
n-Butylbenzene	5	14	ND	4	ND	ND	ND	3	ND	ND	ND
tert-Butylbenzene	5	ND	ND	ND	2	ND	ND	ND	ND	ND	ND
Ethyl benzene	5	ND	**870**	ND	**29**	ND	**800**	ND	ND	ND	ND
Isopropylbenzene	5	ND	17	ND	4	ND	ND	3	ND	ND	ND
MTBE	10	**26**	**100**	**22**	**17**	ND	**260**	**13**	ND	ND	ND
Naphthalene	10	4	ND	2	ND	ND	ND	2	ND	ND	ND
n-Propylbenzene	5	ND	14	ND	9	ND	ND	4	ND	ND	ND
Toluene	5	2	**10**	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	5	**200**	**260**	3	**16**	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	5	**53**	16	6	ND	ND	ND	ND	ND	ND	ND
o-Xylene	5	13	ND	4	ND	ND	65	ND	ND	ND	ND
p/m-Xylene	5	**360**	77	29	2	ND	87	ND	ND	ND	ND
PAHs- Method 8270											
Acenaphthene	20	ND	ND	ND	ND	ND	ND	NA	22	ND	ND
Fluorene	50	ND	ND	ND	ND	ND	ND	NA	25	ND	ND
Phenanthrene	50	ND	ND	ND	ND	ND	ND	NA	52	ND	ND

Notes:

Guidance levels based on NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards And Guidance Values And Groundwater Effluent Limitations, October 22, 1993 (Revised June 1998).

ND = Not Detected

NA = Not Analyzed

* Replacement for RMW-A

Excerpts of Previous Report

Tank Closure Report – February 22, 2005

1.0 INTRODUCTION

1.1 Purpose

This Tank Closure Report (Report) summarizes all tank closure services (performed by Ecosystems Strategies, Inc. [ESI] personnel and/or designated subcontractors) associated with removal of an abandoned 1,000-gallon underground storage tank (UST) at the Haverstraw DPW Property (see Section 1.2, below). This Report provides written documentation of all tank removal procedures and provides laboratory data regarding remaining soils.

1.2 Site Location and Description

The subject property is located on the southern side of Dr. George Girling Drive and is occupied by a one-story building utilized by the Village of Haverstraw DPW as a vehicle maintenance facility. The specified portion of the property on which tank removal activities were conducted (hereafter referred to as the "Site") consists of a portion of the parking lot located to the north of the on-site structure. The storage tank described in this Report was discovered during site development activities (utility trenching) associated with residential construction on the adjoining property to the south. The DPW property, as well as several adjoining properties, has been accepted into the NYSDEC Brownfields Program (ID #C344060). Site Location and Fieldwork Maps (indicating specific Site characteristics) are provided in Appendix A of this Report.

1.3 Limitations

This written analysis summarizes tank closure activities conducted on a specified portion of the Village of Haverstraw DPW property located at 17 Dr. George Girling Drive, Village of Haverstraw, Rockland County, New York and is not relevant to other portions of this property or any other property. This Report presents Site conditions as of the respective dates of tank removal and soil sampling activities, and cannot be held accountable for activities or events resulting in contamination after the dates of fieldwork.

Services summarized in this Report were performed in accordance with generally accepted practices and established NYSDEC protocols. Unless specifically noted, the findings and conclusions contained herein must be considered not as scientific certainties, but as probabilities based on professional judgement.

2.0 TANK CLOSURE

2.1 Summary of Services

The following fieldwork was performed and/or supervised by ESI on January 19, 20, and 26, 2005:

- Coordination and supervision of the excavation and removal of one (1), 1,000-gallon capacity underground storage tank and surrounding soils;
- Removal and off-site disposal of liquid wastes located in the UST;
- Removal and off-site disposal of the tank carcass;
- Inspection of surrounding soils for visual evidence of a petroleum release and screening of the tank surface as well as soils in the excavated area with a photoionization detector (PID); and,
- Collection of soil samples from the tank excavation pit to document soil integrity.

Section 2.3 of this Report fully documents all tank and soil excavation activities and includes discussions on fieldwork methodology and observations, sample collection procedures, and analysis of collected soil samples. Section 3.0 of this Report provides conclusions and recommendations for further actions based on these tank closure activities.

2.2 Tank and Soil Excavation Activities

2.2.1 Fieldwork Methodology

Excavation services were provided by on-site personnel retained by the Client. Tank pump-out and liquid waste disposal services were provided by Enviro Waste of Mahopac, New York, and tank disposal services were provided by Luzon Oil Company, Inc. of Woodridge, New York. Laboratory services were subcontracted to York Analytical Laboratories, Inc. (York Laboratories), a New York State Environmental Laboratory Approval Program (ELAP) certified laboratory (ELAP Number 10854).

ESI personnel maintained independent field logs documenting the physical characteristics, PID readings and any field indications of contamination for all encountered material in the tank excavation.

A MiniRAE 2000 (Model PGM 7600) PID was utilized by ESI personnel to screen all encountered material for the presence of any volatile organic vapors where appropriate. Prior to the initiation of fieldwork, this PID was properly calibrated to read parts per million calibration gas equivalents (ppm-cge) of isobutylene in accordance with protocols set forth by the equipment manufacturer.

2.2.2 Fieldwork Observations

The top of a metallic UST was exposed at approximately 2 feet below surface grade (bsg) during trenching activities (associated with an adjoining construction site to the south) on January 19, 2005. The tank was positioned approximately 40 feet to the southwest of the southwest corner of the DPW building, with its long axis oriented in a north/south direction. ESI personnel supervised soil removal along the side of the tank and the tank was measured at approximately 10 feet long by 4 feet in diameter (i.e. a tank capacity of approximately 1,000-gallons). A concrete filled pipe

and an open pipe fitting were located at the top of the tank, which appeared to be in sound condition. Two small cut pipes (suspected to be fuel lines), extending to the southwest toward the site of a former building on the adjoining construction site property, were discovered near the southern end of the tank. The tank contained approximately 30 inches of water, which was noted to have a slight petroleum odor. Construction personnel cut a small opening in the tank top and all liquids (including some groundwater that had entered the partial excavation) were vacuumed by Enviro Waste personnel.

ESI personnel directed the removal of the tank and surrounding soils on January 20, 2005. Soils consisted of approximately 9 feet of fill (coarse sands and gravels with extensive brick fragments) overlying dense native clay. Soil in immediate contact with the tank exhibited no overt evidence of petroleum contamination. Groundwater was observed at approximately 7 feet bsg and appeared to be confined by the clay layer. Saturated soils formed a distinct two-foot thick layer at approximately 1 foot below the tank invert, which was stained and contained light non-aqueous phase liquid (LNAPL) and exhibited a mild odor of weathered petroleum. Droplets of LNAPL and slight sheens were observed on groundwater entering the excavation. Soils in the vadose zone exhibited no overt evidence of petroleum contamination (note: field screening of impacted soils with the PID proved to be impractical due to very cold temperatures and high winds).

Following the soil sampling described below, the excavated area was restored to grade with clean backfill (coarse gravel from an off-site source) in order to maintain site safety. The tank and all excavated soils were stockpiled on plastic at the adjoining construction site. The tank appeared to be intact, but was noted to have significant areas of corrosion along the sides and bottom. The tank was removed for off-site disposal by Luzon personnel on January 26, 2005. Excavated soil is stockpiled at the construction site (under plastic) pending off-site disposal at a licensed repository.

A Fieldwork Map illustrating the former location of the tank is provided in Appendix A, documentation regarding tank and liquid waste disposal is provided in Appendix B, and Site Photographs are provided in Appendix E.

2.2.3 Collection of Soil Samples

Soil samples were collected from the excavation to provide a preliminary assessment of soil integrity in the vicinity of the former tank. Grab samples BN and BS were collected from soils located at approximately 6 inches below the tank invert, grab sample BE was collected from saturated, overtly impacted soil at the bottom, eastern portion of the final excavation (presumed to be downgradient of the tank), and composite samples WE, WS, and WN) were collected from non-saturated areas of the excavation sidewalls.

All soil samples collected by ESI were obtained in a manner consistent with NYSDEC sample collection and decontamination protocols. Decontaminated stainless steel trowels and dedicated gloves were used at each sample location to place the material into laboratory supplied glassware. Prior to the collection of each material sample, the sample collection instrument was decontaminated to avoid cross-contamination between samples

All sample containers were placed in a cooler immediately after sample collection and were maintained at cool temperatures prior to transport to the laboratory. The soil samples were transported the following day via courier to York Laboratories for chemical analyses. Appropriate chain-of-custody procedures were followed.

2.3 Laboratory Analysis

2.3.1 Guidance Levels

The term "guidance level," as defined in this Report, refers to the concentration of a particular contaminant above which remedial actions are considered more likely. The overall objective of setting guidance levels is to assess the integrity of on-site soils relative to conditions which are likely to present a threat to public health or the environment, given the existing and probable future uses of the site. On-site soils with contaminant levels exceeding these guidance levels are considered more likely to warrant remediation. No independent risk assessment was performed as part of this investigation.

The guidance levels identified in this Report for petroleum hydrocarbons in soils are based on "recommended cleanup objectives" contained in the NYSDEC's Technical and Administrative Guidance Memorandum #4046 (TAGM 4046), dated January 24, 1994, as modified by subsequent NYSDEC memoranda. All data presented in this Report have been analyzed in accordance with applicable TAGM 4046 standards and all detected compounds with their respective guidance levels are provided in the data summary tables.

2.3.2 Laboratory Analysis

Soil sample BE was submitted for analysis of volatile organic compounds (VOCs) using USEPA Method 8021 (plus MTBE), polycyclic aromatic hydrocarbons (PAHs) using USEPA Method 8270, and PCBs using USEPA Method 8082. All other samples were submitted for analysis of VOCs using USEPA Method 8021 STARS List (plus MTBE) and PAHs using USEPA Method 8270. Data Summary Tables are provided in Appendix C of this Report and complete laboratory results are included as Appendix D. Based on laboratory analysis of soil samples (see below), a spill event (0411778) was reported to the NYSDEC on February 3, 2005.

VOCs

Elevated concentrations of isopropylbenzene (17,000 ppb, guidance level of 2,300 ppb), and low levels of four other BTEX related compounds (peak individual analyte concentration of 530 ppb) were detected in sample BE. No MTBE or halogenated hydrocarbons were detected. Very low levels of two petroleum-derived VOCs were detected in samples BN and BS (peak individual analyte concentrations of 20 ppb and 16 ppb, respectively). No petroleum-derived VOCs were detected in samples WE, WS, or WN.

PAHs

Elevated concentrations of multiple PAHS were detected in all samples, with the exception of sample WE, which contained very low concentrations of only two PAH compounds. Peak exceedences of guidance levels (e.g., 16,000 ppb chrysene, guidance level of 400 ppb) occurred in sample BE, collected from overtly impacted saturated soil. Samples BN, BS, and WN contained peak PAH concentrations of 1,100 ppb, 3,200 ppb, and 1,400 ppb, respectively. A single exceedence of guidance levels was reported for sample WS (benzo(a) pyrene at 230 ppb, guidance level of 61 ppb).

PCBs

Total PCBs were detected at 1.08 ppm in sample BE (guidance levels for PCBs are 1 ppm in surface soils and 10 ppm in subsurface soils).

3.0 CONCLUSIONS AND RECOMMENDATIONS

This office has completed the services summarized in Section 2.0 of this Tank Closure Report on the specified portion of the Haverstraw DPW property, located at 17 Dr. Girling Drive, Village of Haverstraw, Rockland County, New York. Services included the excavation of an abandoned 1,000-gallon underground storage tank (UST) and associated petroleum impacted soils, the off-site disposal of the tank and its contents, and the collection of soil samples to document soil integrity.

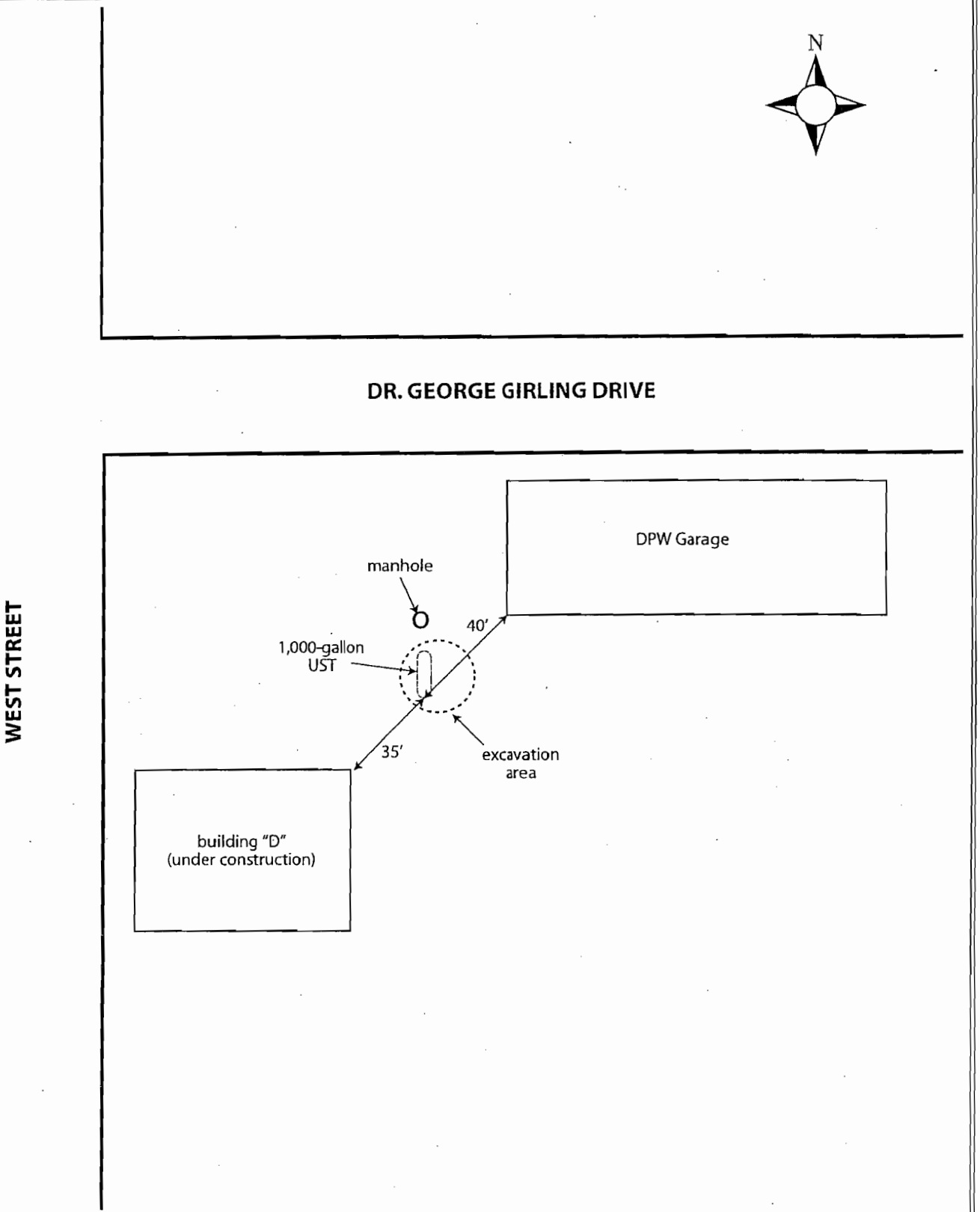
Based on the services provided by this office and analytical data generated, the following conclusions and recommendations (shown in **bold**) are provided below.

1. The identified 1,000-gallon UST has been properly excavated and drained, and the tank and all waste materials have been disposed of off-site. Field evidence suggests that this tank formerly provided fuel oil for an off-site structure, which has since been demolished.

   No further remedial action is recommended at this time.

2. Field evidence and laboratory analysis of soil samples indicates that significant petroleum contamination, including free product, is present in saturated soils located in the immediate vicinity of the former tank. The source of this contamination is likely to have been a historic release of fuel oil from the former tank or piping network; the potential exists, however, that this contamination has originated from another source, such as the DPW maintenance facility. Based on these laboratory data, a spill event (#0411778) has been reported to the NYSDEC. Further investigation, including the collection of both soil and groundwater samples, is warranted in order to delineate the nature and extend of known contamination, and to definitively establish the source of the release.

   It is recommended that an additional investigation be completed as part of a Remedial Investigative Workplan approved by the NYSDEC Brownfields program. The investigation should specifically include the adjoining DPW property and should address local groundwater quality. This Tank Closure Report should be submitted to the NYSDEC and Rockland County Department of Health (RCDOH) in order to document current Site conditions.



All feature locations are approximate. This map is intended as a schematic to be used in conjunction with the associated report, and it should not be relied upon as a survey for planning or other activities.

Fieldwork Map

Haverstraw DPW Property
17 Dr. George Girling Drive
Village of Haverstraw
Rockland County, New York

ESI File: GH9964.41
February 2005
Not to Scale
Appendix A

Table 1: VOCs in Soils

(Results provided in parts per billion. Results in **bold** exceed guidance levels).

Compound (USEPA Method 8021 - STARS)	Guidance Level	Sample Identification				
		BN	BS	WE	WS	WN
1,2,4-Trimethylbenzene	**10,000**	20	16	ND	ND	ND
1,3,5-Trimethylbenzene	**3,300**	ND	9	ND	ND	ND
Benzene	**60**	ND	ND	ND	ND	ND
Ethylbenzene	**5,500**	ND	ND	ND	ND	ND
Isopropylbenzene	**2,300**	9	ND	ND	ND	ND
Methyl tert-butyl ether (MTBE)	**120**	ND	ND	ND	ND	ND
Methylene chloride	**100**	ND	ND	ND	ND	ND
Naphthalene	**13,000**	ND	ND	ND	ND	ND
n-Butylbenzene	**10,000**	ND	ND	ND	ND	ND
n-Propylbenzene	**3,700**	ND	ND	ND	ND	ND
o-Xylene	**1,200**	ND	ND	ND	ND	ND
p-&m-Xylenes	**1,200**	ND	ND	ND	ND	ND
total Xylenes	**1,200**	ND	ND	ND	ND	ND
p-Isopropyltoluene	**10,000**	ND	ND	ND	ND	ND
sec-Butylbenzene	**10,000**	ND	ND	ND	ND	ND
tert-Butylbenzene	**10,000**	ND	ND	ND	ND	ND
Toluene	**1,500**	ND	ND	ND	ND	ND

Notes:

Guidance levels based on NYSDEC TAGM 4046 and subsequent memoranda.

ND = Not Detected

Table 2: VOCs in Soil

(Results provided in parts per billion. Results in **bold** exceed guidance levels).

Compound (USEPA Method 8021 plus MTBE)	Guidance Level	Sample Identification BE
1,1,1,2-Tetrachloroethane	600	ND
1,1,1-Trichloroethane	800	ND
1,1,2,2-Tetrachloroethane	**	ND
1,1,2-Trichloroethane	**	ND
1,1-Dichloroethane	200	ND
1,1-Dichloroethylene	400	ND
1,1-Dichloropropylene	**	ND
1,2,3-Trichlorobenzene	**	ND
1,2,3-Trichloropropane	400	ND
1,2,3-Trimethylbenzene	**	ND
1,2,4-Trichlorobenzene	3,400	ND
1,2,4-Trimethylbenzene	10,000	520
1,2-Dibromo-3-chloropropane	**	ND
1,2-Dibromoethane	**	ND
1,2-Dichlorobenzene	7,900	ND
1,2-Dichloroethane	100	ND
1,2-Dichloroethylene (total)	300	ND
1,2-Dichloropropane	**	ND
1,3,5-Trimethylbenzene	3,300	ND
1,3-Dichlorobenzene	1,600	ND
1,3-Dichloropropane	300	ND
1,4-Dichlorobenzene	8,500	ND
1-Chlorohexane	**	ND
2,2-Dichloropropane	**	ND
2-Chlorotoluene	**	ND
4-Chlorotoluene	**	ND
Benzene	60	ND
Bromobenzene	**	ND
Bromochloromethane	**	ND
Bromodichloromethane	**	ND
Bromoform	**	ND
Bromomethane	**	ND
Carbon tetrachloride	600	ND
Chlorobenzene	1,700	ND
Chloroethane	1,900	ND
Chloroform	300	ND
Chloromethane	**	ND
Cis-1,3-Dichloropropylene	**	ND
Dibromochloromethane	**	ND
Dibromomethane	**	ND
Dichlorodifluoromethane	**	ND
Ethylbenzene	5,500	530
Hexachlorobutadiene	**	ND
Isopropylbenzene	2,300	17,000
Methyl tert-butyl ether (MTBE)	120	ND
Methylene chloride	100	ND
Naphthalene	13,000	ND
n-Butylbenzene	10,000	ND
n-Propylbenzene	3,700	ND
o-Xylene	1,200	ND
p-&m-Xylenes	1,200	150
total Xylenes	1,200	ND
p-Isopropyltoluene	10,000	ND
sec-Butylbenzene	10,000	ND
Styrene	**	ND
tert-Butylbenzene	10,000	520
Tetrachloroethylene	1,400	ND
Toluene	1,500	ND
Trans-1,3-Dichloropropylene	**	ND
Trichloroethylene	700	ND
Trichlorofluoromethane	**	ND
Vinyl chloride	200	ND

Notes:

Guidance levels based on NYSDEC TAGM 4046 and subsequent memoranda.

** TAGM 4046 cleanup objective not established (total individual and sum of VOCs not listed must be less than or equal to 10,000 ppb).

Table 4: PCBs in Soil

(Results provided in parts per billion. Results in **bold** exceed guidance levels).

PCB Compound (USEPA Method 8082)	Sample Identification BE
PCB 1016	ND
PCB 1221	ND
PCB 1232	ND
PCB 1242	ND
PCB 1248	ND
PCB 1254	**1.08**
PCB 1260	ND
PCB, Total	**1.08**

Notes:

Guidance levels for PCBs are 1.0 ppm for surface soils and 10 ppm for subsurface soils, based on NYSDEC TAGM 4046 and subsequent memoranda.

ND = Not Detected

Excerpts of Previous Report

Summary Report of Subsurface Investigation – August 2005

1.0 INTRODUCTION

1.1 Purpose

This Summary Report of Subsurface Investigation (Report) chronicles fieldwork performed by Ecosystems Strategies, Inc. (ESI) on the Village of Haverstraw Department of Public Works (DPW) property located at Dr. George W. Girling Drive, Village of Haverstraw, Rockland County, New York. The investigative and analytical work summarized in this Report was performed to address potential environmental liabilities on specified portions of the subject property, which were identified during previous environmental investigations conducted by ESI (see Section 1.4, below).

This Report describes all fieldwork methodologies for the work conducted by this office, includes discussions of the resulting analytical data from collected samples, and provides conclusions and recommendations drawn from the fieldwork and analytical data.

1.2 Limitations

This written analysis summarizes the site characterization activities conducted on a specified portion of the property located at Dr. George W. Girling Drive, Village of Haverstraw, Rockland County, New York and is not relevant to other portions of this property or any other property. It is a representation of those portions of the property analyzed as of the respective dates of fieldwork. This Report cannot be held accountable for activities or events resulting in contamination after the dates of fieldwork.

Services summarized in this Report were performed in accordance with generally accepted practices and established New York State Department of Environmental Conservation (NYSDEC) protocols. Unless specifically noted, the findings and conclusions contained herein must be considered not as scientific certainties, but as probabilities based on professional judgement.

1.3 Site Location and Description

The Site is an irregular-shaped parcel, which has approximately 200 feet of frontage on the northern and southern sides of Dr. George Girling Drive. The property is occupied by Village of Haverstraw Department of Public Works (DPW) facilities. The northern portion of the DPW parcel (a former wastewater treatment plant) is utilized by the Village of Haverstraw as a maintenance yard and contains two, small one-story brick buildings (water and sewage pump houses), a salt/gravel shed, and two aboveground storage tanks (diesel fuel and gasoline) with a fuel pump. The southern portion of the parcel contains a one-story, metal garage utilized for vehicle maintenance activities, and a landscaped area to the west, which contains a 3,000-gallon underground storage tank (UST) supplying heating oil to the garage.

The majority of the Site is relatively level, with a gentle slope to the east towards the Hudson River, and has a surface elevation of approximately 5 feet above mean sea level. The western end of the southern portion of the Site slopes moderately downward from Maple Avenue. During the course of the fieldwork documented in this Report, shallow groundwater was noted to be present at depths of approximately 4 to 8 feet below surface grade (bsg) in the vicinity of the Water Pump House. Shallow groundwater flow in the vicinity of the subject property is likely to be toward the west-southwest, towards the Hudson River, and is likely to be tidally influenced.

A Fieldwork Map indicating specific Site characteristics is located in Appendix A of this Report.

1.4 Previous Environmental Reports

Northern DPW Parcel

A limited subsurface investigation conducted by ESI in May 1998 (Phase I/II ESA) documented low levels of VOCs and PCBs, and slightly elevated metals concentrations (chromium, mercury, and selenium), in on-site soils. No groundwater monitoring has been conducted.

Southern DPW Parcel

An inactive 1,000-gallon UST was removed by ESI from the western end of the parcel in January 2005 (Tank Closure Report). Surrounding soils at the soil/groundwater interface were impacted by petroleum and a spill event (#0411778) was reported to the NYSDEC in February 2005. A small quantity of contaminated soil has been removed from the excavation area. The vertical and horizontal extent of the spill has not been delineated and groundwater quality has not been assessed.

2.0 SUBSURFACE INVESTIGATION

2.1 Summary of Services

The following services were conducted by ESI on selected portions of the Site:

- Coordinated and supervised the extension of 16 soil cores on the Site to a maximum depth of approximately 16 feet below grade in the vicinity of a former fuel oil UST, garage floor drains, and other areas of the property potentially impacted by historic site usage;
- Collected five soil gas samples from below the slabs of the DPW Garage and the Water Pump House, and a total of 16 soil samples from the Site; and,
- Documented the on-site presence or absence of contamination through sampling and laboratory analysis of subsurface soil and soil gas samples for volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and RCRA metals (arsenic, barium, cadmium, chromium, mercury, lead, selenium, and silver).

This Report is divided into individual sections that describe the fieldwork conducted by ESI on the subject property (Section 2.2), laboratory analysis of samples (Section 2.3), and conclusions and recommendations (Section 3.0).

2.2 Fieldwork Methodology

2.2.1 Site Preparation Services

Prior to the initiation of fieldwork, a request for a complete utility markout of the subject property was submitted by ESI as required by New York State Department of Labor regulations. Confirmation of underground utility locations was secured and a field check of the utility markout was conducted prior to the extension of soil cores.

2.2.2 Extension of Soil Cores

ESI personnel extended 16 soil cores on June 22 and July 1, 2005 in the following locations:

- to the west of the Water Pump House (B-1, B-2, B-3, B-4, B-5, B-6, and B-7)
- to the north and east of the Water Pump House (B-8, B-9, and B-10)
- to the west of the DPW Garage (B-11) in the vicinity of the former 1,000-gallon UST
- inside the Water Pump House (SG-4, SG-5, and SG-6)
- inside the DPW Garage (SG-1, SG-2, and SG-3)

A Fieldwork Map indicating coring locations and associated selected site features is provided in Appendix A.

All manual soil corings (SG-1, SG-2, SG-3, SG-4, SG-5, and SG-6) were extended by ESI personnel using a hand-held, direct-push sampling spoon equipped with a slide hammer and disposable acetate sleeves (used to prevent the cross contamination of soil samples). Sampling was conducted at each coring location at two-foot intervals to a maximum depth of six feet below grade or until refusal was reached. The sampling spoon was decontaminated prior to the initiation of fieldwork and after the collection of each sample. Decontamination procedures were consistent with established NYSDEC protocols.

Haz-Probe, LLC personnel, under the direct supervision and coordination of ESI personnel, mechanically extended eleven soil cores (B-1, B-2, B-3, B-4, B-5, B-6, B-7, B-8, B-9, B-10, and B-11) at the Site. All soil cores were extended using a direct-push sampling spoon equipped with disposable acetate sleeves (used to prevent the cross contamination of soil samples). Sampling was conducted at each boring location at four-foot intervals to a depth ranging from 12 to 16 feet below grade or until refusal was reached. The sampling spoon was decontaminated prior to the initiation of fieldwork and after the collection of each sample. Decontamination procedures were consistent with established NYSDEC protocols.

A MiniRAE 2000 (Model PGM 7600) photo-ionization detector (PID) was utilized by ESI personnel to screen all encountered material for the presence of any volatile organic vapors where appropriate. Prior to the initiation of fieldwork, this PID was properly calibrated to read parts per million calibration gas equivalents (ppm-cge) of isobutylene in accordance with protocols set forth by the equipment manufacturer.

An assessment of subsurface soil characteristics, including soil type, the presence of foreign materials, field indications of contamination (e.g., unusual coloration patterns, or odors), and instrument indications of contamination (i.e., PID readings) was made by ESI personnel during the extension of each soil coring. ESI personnel maintained independent field logs documenting physical characteristics, PID readings, and any field indications of contamination for all encountered material at each coring location. Relevant information from ESI logs for each coring location is summarized in Table, Appendix B.

Samples of soil material were collected from each of the soil corings where appropriate (see Section 2.2.3 for specifics regarding sample collection methodology) and notations were made regarding the sampled material's physical characteristics. At each sample location a sufficient volume of material was collected for the known required analyses and for any potential additional analyses.

Subsurface soils encountered at the Site during the extension of the soil corings generally consisted of sandy loam with layers of silty clay and clay in the first eight feet bsg. Sandy loam, sand and organic muck were encountered at depths greater than eight feet bsg. Groundwater was encountered during the extension of the soil cores from six to eight feet bsg to the west of the Water Pump House and four to six feet to the east of the Water Pump House (see Appendix B for Fieldwork Observations Table documenting each coring).

2.2.3 Sample Collection

All soil samples collected during the fieldwork conducted by ESI at the Site were obtained in a manner consistent with NYSDEC sample collection and decontamination protocols. Decontaminated stainless steel trowels and dedicated gloves were used at each sample location to place the material into jars pre-cleaned at the laboratory. Prior to the collection of each material sample, the sample collection instrument was decontaminated to avoid cross-contamination between samples.

Soil gas samples were collected by inserting a hollow, 1.5" diameter steel rod with an expendable tip into the boring, removing the tip, and lowering an air-stone attached to ¼" Teflon tubing into the rod to the invert of the boring. The rod was then removed, clean silica sand was used to fix the air-stone in place, and the boring was sealed using a non-VOC containing caulk, in order to prevent the infiltration of surface air. Each soil-gas boring was purged for at least a period of five minutes, using a GilAir 3 air-sampling pump, at a rate of approximately 4 liters/minute. Soil-gas samples were collected into a 1-liter Tedlar air-sampling bag.

All sample containers were placed in a cooler immediately after sample collection and were maintained at cool temperatures prior to transport to the laboratory. The soil samples were transported the following day via courier to York Analytical Laboratories, Inc. (York Laboratories), a New York State Department of Health-certified laboratory (ELAP Certification Number 10854) for chemical analyses. Appropriate chain-of-custody procedures were followed.

2.3 Laboratory Analysis

2.3.1 Terminology

Guidance Levels

The term "guidance level," as defined in this Report, refers to the concentration of a particular contaminant above which remedial actions are considered more likely. The overall objective of setting guidance levels is to assess the integrity of on-site soils relative to conditions which are likely to present a threat to public health or the environment, given the existing and probable future uses of the site. On-site soils with contaminant levels exceeding these guidance levels are considered more likely to warrant remediation. No independent risk assessment was performed as part of this investigation.

The guidance levels identified in this Report for petroleum hydrocarbons and metals in soils are based on "recommended cleanup objectives" contained in the NYSDEC's Technical and Administrative Guidance Memorandum #4046 (TAGM 4046), dated January 24, 1994, as modified by subsequent NYSDEC memoranda. Guidance levels for VOCs in soil gas are based on the New York State Department of Health's "Guidance for Evaluating Soil Vapor Intrusion in the State of New York", and subsequent memoranda. All data presented in this Report have been analyzed in accordance with applicable TAGM standards.

Background Levels

The term "background level", as defined in this Report, is the concentration of a particular metal which is known to naturally occur in soils located in the lower Hudson Valley. The overall objective of setting background levels for metals is to assess the concentrations of metals in on-site soils relative to those that are naturally occurring. On-site soils with metal concentrations exceeding these background levels are considered more likely to have been affected by anthropogenic contributions.

The background levels for metals provided in this Report are based on TAGM 4046 and values reported in Background Concentrations of Heavy Metals in Lower Hudson Valley Soils, an unpublished NYSDEC report (see Appendix C).

Refined petroleum hydrocarbons are not naturally occurring; therefore, no discussion of background levels for these compounds is appropriate.

2.3.2 Laboratory Results

Submission of samples for laboratory analysis was based on observations made by ESI personnel during the extension of the soil cores, including the presence or absence of elevated PID readings, unusual odors, discoloration, or, any other unusual patterns. A sufficient number of samples were submitted for analysis to provide a general screening of the property.

A summary of the results of the laboratory analyses conducted is presented below (Data Summary Tables are presented in Appendix D and complete copies of Laboratory Reports with Chains of Custody are included as Appendix E). Recommendations regarding these findings are located in Section 3.0 of this Report, Conclusions and Recommendations.

VOCs in Soil

Soil samples SG-1 (2-4'), SG-2 (2-4'), SG-3 (2-4'), SG-4 (2-4'), SG-6 (2-4'), B-1 (4-8'), B-3 (2-4'), B-7 (8-12'), B-8 (8-12'), B-9 (8-12'), B-10 (4-6'), and B-11 (8-10') were submitted for analysis of VOCs using USEPA Method 8021.

Concentrations of chlorobenzene were detected in B-1 (4-8') at the 1,700 parts per billion (ppb) NYSDEC guidance level. Low levels of several other VOCs were detected in B-1 (4-8'), B-3 (2-4'), B-10 (4-6'), and B-11 (8-10') at concentrations below guidance levels. No VOCs were detected in other samples.

VOCs in Soil Gas

Soil gas samples SG-1, SG-2, SG-3, SG-4, and SG-5 were submitted for analysis of VOCs using USEPA Method TO-14.

Low grade concentrations of tetrachloroethylene (PCE) were detected in all soil gas samples with the exception of SG-2. The peak concentration was detected in SG-4 at 7.8 part per billion volume (ppbv) (background value 0.25 to 1.2 ppbv) followed by 1.9 ppbv at SG-3. Dichlorodifluoromethane (Freon 12) were detected in all soil gas samples. The peak concentration was detected in SG-3 at 5,100 ppbv followed by SG-1 at 100 ppbv. Low grade concentrations of trichlorofluoromethane (Freon 11) were detected in SG-4 at 9.6 ppbv. Low grade concentrations of toluene were detected in SG-1, SG-2, and SG-4 with the peak concentration at SG-2 at 1.5 ppbv (background level 4.2 to 25 ppbv). No other VOCs were detected in any other soil gas samples.

PAHs

Soil samples B-1 (4-8'), B-3 (2-4'), and B-11 (8-10') were submitted for analysis of PAHs using USEPA Method 8270.

Elevated levels of eight PAHs were detected in B-11 (8-10'); peak concentrations include chrysene at 3,900 ppb (guidance level 400 ppb), benzo[a]anthracene at 3,800 ppb (guidance level 224 ppb), and benzo[a]pyrene at 3,600 pbb (guidance level 61 ppb). Several other PAHs were detected in this sample at levels below guidance values. Elevated levels of four PAHs were detected in B-3 (2-4'): chrysene at 480 ppb, benzo[a]anthracene at 530 ppb, benzo[a]pyrene at 570 pbb (guidance level 61 ppb), and dibenzo[a,h]anthracene at 99 ppb (guidance level 14 ppb). Several other PAHs were detected in this sample at levels below guidance values. Low levels of two PAHs (anthracene at 550 ppb, guidance levels 50,000 ppb; and, phenanthrene at 1,200 ppb, guidance level 50,000 ppb) were detected in B-1 (4-8').

Metals

Soil samples B-2 (1-3') and B-6 (2-3') where submitted for analysis of RCRA metals. Elevated concentrations of silver (3.11 parts per million-ppm, guidance level not established) and selenium (3.75 ppm, guidance level 2 ppm) were detected in B-6 (2-3'). Elevated concentrations of selenium were detected in B-2 (1-3') at 3.32 ppm. All other detected metal concentrations were below their respective guidance or background levels.

3.0 CONCLUSIONS AND RECOMMENDATIONS

This office has completed the services summarized in Section 2.0 on specified portions of the Village of Haverstraw Department of Public Works property located at Dr. George W. Girling Drive, Village of Haverstraw, Rockland County, New York. Services included the extension of sixteen soil cores at various locations throughout the Site to document the presence or absence of subsurface soil and soil gas contamination. Sampling locations were selected to provide additional data regarding subsurface soil conditions.

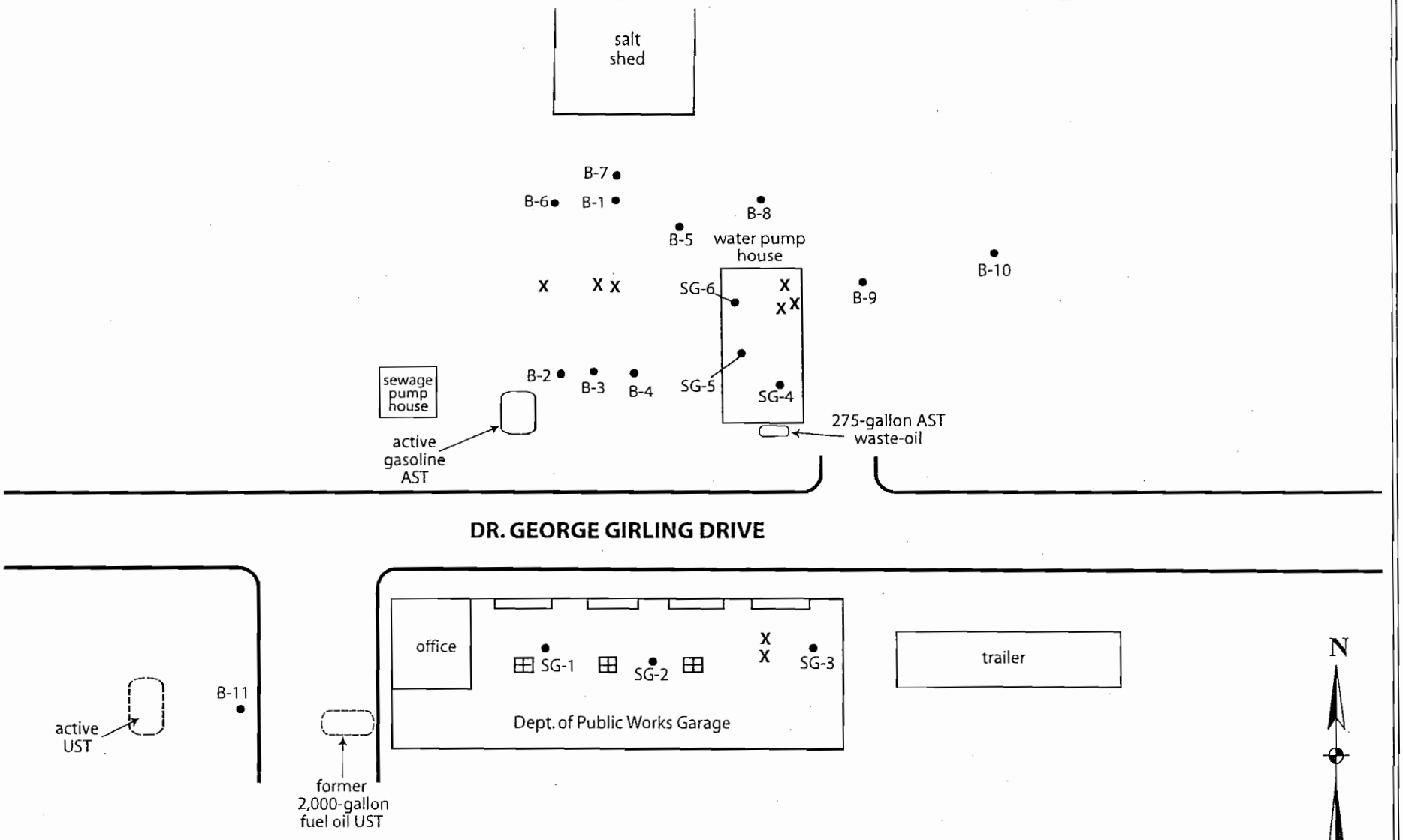
Based on the services provided and data generated, the following conclusions and recommendations (in **bold**) have been made.

1. Field evidence of contamination and significantly elevated levels of polycyclic aromatic hydrocarbons (PAHs) were detected in sample B-11 (8-10'), located in the vicinity of a former 1,000-gallon underground storage tank, near the western end of the garage. Document contamination is likely to be associated with a release from this former tank.

   It is recommended that additional investigative work be conducted in the vicinity of the former UST in order to delineate the full extent of subsurface contamination.

2. Low grade VOC, PAH, and metal contamination detected in soil samples collected at the northern portion of the DPW property is consistent with previous findings. VOC contamination in soil gas collected beneath the water pump house and garage suggest the potential presence of low-grade soil contamination in these areas. These findings support the conclusion that impacts to the property from historic site activities are likely to be minimal, and are not likely to impact current site utility; future residential use of the property, however, will require additional investigation in order to more fully document on-site conditions.

   Further investigation is recommended in conjunction with site development activities. This report should be provided to the NYSDEC in support of the Client's Brownfields Cleanup Program application.



All feature locations are approximate. This map is intended as a schematic to be used in conjunction with the associated report, and it should not be relied upon as a survey for planning or other activities.

Fieldwork Map

Haverstraw DPW Property
17 Dr. George Girling Drive
Village of Haverstraw
Rockland County, New York

Legend:

- ● sample location
- X refusal location
- ⊞ drain

ESI File: GH9964.43

August 2005

Scale: 1" = 40' (approximately)

Appendix A

Table: PAHs in Soil

Results provided in parts per billion. Results in **bold** exceed guidance levels.

Compound (USEPA Method 8270)	Guidance level	Sample Identification		
		B-1 (4-8')	B-3 (2-4')	B-11 (8-10')
Acenaphthene	50,000	ND	79	5,900
Acenaphthylene	41,000	ND	ND	ND
Anthracene	50,000	550	160	3,000
Benzo(a)anthracene	224	ND	**480**	**3,800**
Benzo(a)pyrene	61	ND	**530**	**3,600**
Benzo(b)fluoranthene	1,100	ND	520	**1,900**
Benzo(g,h,i)perylene	50,000	ND	160	1,100
Benzo(k)fluoranthene	1,100	ND	530	**3,000**
Chrysene	400	ND	**570**	**3,900**
Dibenzo(a,h)anthracene	14	ND	**99**	**590**
Fluoranthene	50,000	ND	890	5,200
Fluorene	50,000	ND	98	3,400
Indeno(1,2,3-cd)pyrene	3,200	ND	180	1,500
Naphthalene	13,000	ND	58	1,200
Phenanthrene	50,000	1,200	630	9,300
Pyrene	50,000	ND	710	6,300

Notes:

* Guidance levels based on NYSDEC TAGM 4046 and subsequent memoranda.

ND = Not Detected

Table: VOCs in Soil Gas

Results provided in ppbv Results in **bold** exceed background levels or are deemed uncharacteristically high by ESI.

Compound	Background Levels[1]	Sample ID				
		SG-1	SG-2	SG-3	SG-4	SG-6
1,1,1-Trichloroethane	<0.25 - 1.4	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	<0.25	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	<0.25	ND	ND	ND	ND	ND
1,1-Dichloroethane	<0.25	ND	ND	ND	ND	ND
1,1-Dichloroethylene	NA	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	NA	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	0.78 - 4.4	ND	ND	ND	ND	ND
1,2-Dibromoethane	<0.25	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	<0.25	ND	ND	ND	ND	ND
1,2-Dichloroethane	<0.25	ND	ND	ND	ND	ND
1,2-Dichloropropane	<0.25	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	<0.25 - 1.7	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	<0.25	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	NA	ND	ND	ND	ND	ND
3-Chloropropene	NA	ND	ND	ND	ND	ND
4-Ethyltoluene	NA	ND	ND	ND	ND	ND
Benzene	1.2-5.7	ND	ND	ND	ND	ND
Benzyl Chloride	NA	ND	ND	ND	ND	ND
Bromomethane	<0.25	ND	ND	ND	ND	ND
Carbon Tetrachloride	<0.25 -0.68	ND	ND	ND	ND	ND
Chlorobenzene	<0.25	ND	ND	ND	ND	ND
Cloroethane	NA	ND	ND	ND	ND	ND
Chloroform	<0.25	ND	ND	ND	ND	ND
Chloromethane	<0.25 - 2.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	<0.25	ND	ND	ND	ND	ND
cis-1,3-Dichloropropylene	NA	ND	ND	ND	ND	ND
Dichlorodifluoromethane	NA	**100**	**35**	**5,100**	**23**	**7.8**
Freon-113	NA	ND	ND	ND	ND	ND
Hexachloro-1,3-Butadiene	NA	ND	ND	ND	ND	ND
Methylene Chloride	0.38-6.3	ND	ND	ND	ND	ND
o-Xylene	0.39-3.1	ND	ND	ND	ND	ND
p- & m-Xylenes	0.52-4.7	ND	ND	ND	ND	ND
Styrene	<0.25-0.68	ND	ND	ND	ND	ND
Tetrachloroethylene	<0.25 - 1.2	**1.3**	ND	**1.9**	**7.8**	**1.6**
Toluene	4.2-25	1.4	1.5	ND	1.3	ND
trans-1,3-Dichloropropylene	NA	ND	ND	ND	ND	ND
Trichloroethylene	<0.25	ND	ND	ND	ND	ND
Trichlorofluoromethane	NA	ND	ND	ND	9.6	ND
Vinyl Chloride	<0.25	ND	ND	ND	ND	ND

Notes:

1. Background Levels based on NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York and subsequent memoranda.

NA=Not Available ND=Not Detected

Table: RCRA Metals in Soil Samples

All results provided in parts per million. Results in **bold** exceed designated guidance levels.

Compound	Lower Hudson Background	Guidance level	Sample Identification	
			B-2 (1-3')	B-6 (2-3')
Arsenic	7.4	7.5 or SB	3.02	2.7
Barium	81.1	300 or SB	58.5	91.9
Cadmium	0.22	1 or SB	ND	0.92
Chromium	20.9	10 or SB	14.3	13.8
Lead	72.5	400	74.5	150
Selenium	1.0	2 or SB	**3.32**	**3.75**
Silver	NP	SB	ND	**3.11**
Mercury	0.24	0.1 or SB	ND	0.15

Notes:

Guidance levels for metals are based on NYSDEC TAGM 4046 memoranda.

Background levels are based on 90% Upper Confidence Limits of NYSDEC Study of background concentrations of heavy metals in Lower Hudson Valley Soils.

ND = Not Detected NP = Not Provided SB = Site Background

Table: VOCs in Soils

Results provided in parts per billion. Results shown in **bold** exceed guidance levels.

Compound (USEPA Method 8021)	Guidance Level	Sample Identification						
		B-1 (4-8')	B-3 (2-4')	B-7 (8-12')	B-8 (8-12')	B-9 (8-12')	B-10 (4-6')	B-11 (8-10')
1,1,1,2-Tetrachloroethane	600	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	800	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	**	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	**	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	200	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	400	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloropropylene	**	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	**	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	400	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	3,400	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10,000	270	14	ND	ND	ND	240	16
1,2-Dibromo-3-chloropropane	**	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	**	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	7,900	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	100	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethylene (cis)	**	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethylene (trans)	300	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethylene (total)	**	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	**	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	3,300	97	ND	ND	ND	ND	150	ND
1,3-Dichlorobenzene	1,600	130	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	300	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	8,500	750	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	**	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	**	ND	ND	ND	ND	ND	ND	ND
Benzene	60	ND	35	ND	ND	ND	ND	ND
Bromobenzene	**	ND	ND	ND	ND	ND	ND	ND
Bromochloromethane	**	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	**	ND	ND	ND	ND	ND	ND	ND
Bromoform	**	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	600	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	1,700	1,700	ND	ND	ND	ND	ND	ND
Chloroethane	1,900	ND	ND	ND	ND	ND	ND	ND
Chloroform	300	ND	ND	ND	ND	ND	ND	ND
Chloromethane	**	ND	ND	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	**	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	**	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	**	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	**	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5,500	11	7	ND	ND	ND	42	ND
Hexachlorobutadiene	**	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	2,300	ND	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether (MTBE)	120	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	100	ND	ND	ND	ND	ND	ND	ND
Naphthalene	13,000	1,900	ND	ND	ND	ND	15	48
n-Butylbenzene	10,000	100	ND	ND	ND	ND	8	15
n-Propylbenzene	3,700	15	ND	ND	ND	ND	7	ND
o-Xylene	1,200	23	11	ND	ND	ND	66	ND
p-&m-Xylenes	1,200	39	24	ND	ND	ND	180	ND
total Xylenes	1,200	62	35	ND	ND	ND	246	ND
p-Isopropyltoluene	10,000	150	ND	ND	ND	ND	10	9
sec-Butylbenzene	10,000	17	ND	ND	ND	ND	ND	ND
Styrene	**	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	10,000	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	1,400	ND	ND	ND	ND	ND	ND	ND
Toluene	1,500	100	ND	ND	ND	ND	5	ND
trans-1,3-Dichloropropylene	**	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	700	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	**	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	200	ND	ND	ND	ND	ND	ND	ND

Notes:

Guidance levels based on NYSDEC TAGM 4046 and subsequent memoranda.

** TAGM 4046 cleanup objective not established (total individual and sum of VOCs not listed must be less than or equal to 10 ppm).

ND: Not Detected

Table: VOCs in Soils (continued)

Results provided in parts per billion. Results shown in **bold** exceed guidance levels.

Compound (USEPA Method 8021)	Guidance Level	Sample Identification				
		SG-1 (2-4')	SG-2 (2-4')	SG-3 (2-4')	SG-4 (2-4')	SG-6 (4-6')
1,1,1,2-Tetrachloroethane	600	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	800	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	**	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	**	ND	ND	ND	ND	ND
1,1-Dichloroethane	200	ND	ND	ND	ND	ND
1,1-Dichloroethylene	400	ND	ND	ND	ND	ND
1,1-Dichloropropylene	**	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	**	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	400	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	3,400	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10,000	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	**	ND	ND	ND	ND	ND
1,2-Dibromoethane	**	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	7,900	ND	ND	ND	ND	ND
1,2-Dichloroethane	100	ND	ND	ND	ND	ND
1,2-Dichloroethylene (cis)	**	ND	ND	ND	ND	ND
1,2-Dichloroethylene (trans)	300	ND	ND	ND	ND	ND
1,2-Dichloroethylene (total)	**	ND	ND	ND	ND	ND
1,2-Dichloropropane	**	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	3,300	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	1,600	ND	ND	ND	ND	ND
1,3-Dichloropropane	300	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	8,500	ND	ND	ND	ND	ND
2-Chlorotoluene	**	ND	ND	ND	ND	ND
4-Chlorotoluene	**	ND	ND	ND	ND	ND
Benzene	60	ND	ND	ND	ND	ND
Bromobenzene	**	ND	ND	ND	ND	ND
Bromochloromethane	**	ND	ND	ND	ND	ND
Bromodichloromethane	**	ND	ND	ND	ND	ND
Bromoform	**	ND	ND	ND	ND	ND
Carbon tetrachloride	600	ND	ND	ND	ND	ND
Chlorobenzene	1,700	ND	ND	ND	ND	ND
Chloroethane	1,900	ND	ND	ND	ND	ND
Chloroform	300	ND	ND	ND	ND	ND
Chloromethane	**	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropylene	**	ND	ND	ND	ND	ND
Dibromochloromethane	**	ND	ND	ND	ND	ND
Dibromomethane	**	ND	ND	ND	ND	ND
Dichlorodifluoromethane	**	ND	ND	ND	ND	ND
Ethylbenzene	5,500	ND	ND	ND	ND	ND
Hexachlorobutadiene	**	ND	ND	ND	ND	ND
Isopropylbenzene	2,300	ND	ND	ND	ND	ND
Methyl tert-butyl ether (MTBE)	120	ND	ND	ND	ND	ND
Methylene chloride	100	ND	ND	ND	ND	ND
Naphthalene	13,000	ND	ND	ND	ND	ND
n-Butylbenzene	10,000	ND	ND	ND	ND	ND
n-Propylbenzene	3,700	ND	ND	ND	ND	ND
o-Xylene	1,200	ND	ND	ND	ND	ND
p-&m-Xylenes	1,200	ND	ND	ND	ND	ND
total Xylenes	1,200	ND	ND	ND	ND	ND
p-Isopropyltoluene	10,000	ND	ND	ND	ND	ND
sec-Butylbenzene	10,000	ND	ND	ND	ND	ND
Styrene	**	ND	ND	ND	ND	ND
tert-Butylbenzene	10,000	ND	ND	ND	ND	ND
Tetrachloroethylene	1,400	ND	ND	ND	ND	ND
Toluene	1,500	ND	ND	ND	ND	ND
trans-1,3-Dichloropropylene	**	ND	ND	ND	ND	ND
Trichloroethylene	700	ND	ND	ND	ND	ND
Trichlorofluoromethane	**	ND	ND	ND	ND	ND
Vinyl chloride	200	ND	ND	ND	ND	ND

Notes:

Guidance levels based on NYSDEC TAGM 4046 and subsequent memoranda.

** TAGM 4046 cleanup objective not established (total individual and sum of VOCs not listed must be less than or equal to 10 ppm).

ND: Not Detected

ATTACHMENT C

Health & Safety Plan

HEALTH AND SAFETY PLAN

FOR

SITE INVESTIGATION

(INCORPORATING COMMUNITY HEALTH AND SAFETY PLAN)

Haverstraw Harbors Site

Dr. George W. Girling Drive
Village Of Haverstraw
Rockland County, New York

NYSDEC Brownfields Cleanup Program Site ID: C344060
NYSDEC Spill Files: 9811999, 0001146, and 0411778

May 2006
ESI File: GH9964.42

Appendix C of the Draft Remedial Investigation Work Plan, Dated May 2006

Prepared By

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1.0 INTRODUCTION

1.1 Purpose

This Health and Safety Plan (HASP) has been developed to provide the requirements and general procedures to be followed by Ecosystems Strategies, Inc. (ESI) and designated subcontractors while performing site investigation activities at the "Haverstraw Harbors " property located at Dr. George W. Girling Drive, Village of Haverstraw, Rockland County, New York.

This HASP incorporates policies, guidelines, and procedures that have the objective of protecting the public health of the community during the performance of fieldwork activities, and therefore serves as a Community Health and Safety Plan (CHASP). The objectives of the CHASP are met by establishing guidelines to minimize community exposure to hazards during fieldwork, and by planning for and responding to emergencies affecting the public.

This HASP describes the responsibilities, training requirements, protective equipment, and standard operating procedures to be utilized by all personnel while on the Site. This HASP incorporates by reference the applicable Occupational Safety and Health Administration (OSHA) requirements in 29 CFR 1910 and 29 CFR 1926.

The requirements and guidelines in this HASP are based on a review of available information and evaluation of potential on-site hazards. This HASP will be discussed with Site personnel and will be available on-site for review while work is underway. On-site personnel will report to the Site Safety and Health Officer (SSHO) in matters of health and safety. The on-site project supervisor(s) are responsible for enforcement and implementation of this HASP.

This HASP is specifically intended for the conduct of activities within the defined scope of work in specified areas of the Site. Changes in site conditions and future actions that may be conducted at this site may necessitate the modification of the requirements of the HASP. Although this HASP can be made available to interested persons for informational purposes, ESI has no responsibility over the interpretations or activities of any other persons or entities other than employees of ESI and designated subcontractors to ESI.

1.2 Site Location and Description

The Site as defined in this HASP is the Haverstraw Harbors Property - Site "B", located at Dr. George W. Girling Drive in the Village of Haverstraw. A Site Location Map and a Proposed Fieldwork Map (illustrating the configuration of the Site as well as the areas of proposed investigative activities) are included in the Attachments of this HASP.

1.3 Work Activities

Environmental investigation activities are detailed in the Draft Remedial Investigation Work Plan (RIWP) dated May 2006. The specific tasks detailed in the RIWP are wholly incorporated by reference into this HASP. The RIWP was prepared as a requirement of the Developers participation in the New York State Department of Environmental Conservation (NYSDEC) Brownfields Cleanup Program (BCP), and describes investigative tasks required to adequately characterize on-site environmental conditions. Existing and suspected contamination includes petroleum and metals impacted soils, and petroleum impacted groundwater.

The following field tasks will be performed:

- Investigation and sampling of soils using hand-held and mechanized boring equipment, and (as necessary) excavation machinery;
- Investigation of soil gas at selected boring locations; and,
- Installation and sampling of groundwater-monitoring wells at selected boring locations.

2.0 HEALTH AND SAFETY HAZARDS

2.1 Hazard Overview for On-site Personnel

The potential exists for the presence of elevated levels of petroleum hydrocarbons and metals in on-site soils and elevated levels of petroleum hydrocarbons in groundwater. The possibility exists for on-site personnel to have contact with contaminated soils, groundwater, and vapor during site investigative work. Contact with contaminated substances may present a skin contact, inhalation, and/or ingestion hazard. These potential hazards are addressed in Sections 3.0 through 11.0, below.

2.2 Potential Hazards to the Public from Fieldwork Activities

The potential exists for the public to be exposed to identified contaminated soils, groundwater, and vapor, which may present a skin contact, inhalation, and/or ingestion hazard. Additional potential hazards to the public that are associated with fieldwork activities include mechanical/physical hazards, traffic hazards from fieldwork vehicles, and noise impacts associated with operation of mechanical equipment.

Impacts to public health and safety are expected to be limited to hazards that could directly affect on-site visitors and/or trespassers. These effects will be mitigated through site access and control measures (see Section 6.0, below). Specific actions taken to protect the public health (presented in Sections 3.0 through 11, below, and in the Community Air Monitoring Plan) are anticipated to minimize any potential off-site impacts from contaminant migration, noise, and traffic hazards.

3.0 PERSONAL PROTECTIVE EQUIPMENT

The levels of protection identified for the services specified in the RIWP represent a best estimate of exposure potential and protective equipment needed for that exposure. Determination of levels was based on data provided by previous studies of the Site and information reviewed on current and past Site usage. The SSHO may recommend revisions to these levels based on an assessment of actual exposures.

The level of protective clothing and equipment selected for this project is Level D. Workers will wear Level D protective clothing including, but not limited to, a hard hat, steel-toed boots, latex gloves (when handling soils and/or groundwater), and safety goggles (when decontaminating equipment). Personal protective equipment (PPE) will be worn at all times, as designated by this HASP. The requirement for the use of PPE by official on-site visitors shall be determined by the SSHO. All on-site visitors shall, at a minimum, be required to wear an approved hardhat and be provided with appropriate hearing protection as necessary.

The need for an upgrade in PPE will be determined based upon encountered Site conditions, including measurements taken in the breathing zone of the work area using a photo-ionization detector (PID). An upgrade to a higher level of protection will begin when PID readings above specified limits are measured, or as otherwise required by the SSHO (see Section 5.0, below).

If any equipment fails and/or any employee experiences a failure or other alteration of their protective equipment that may affect its protective ability, that person will immediately leave the work area. The Project Manager and the SSHO will be notified and, after reviewing the situation, determine the effect of the failure on the continuation of on-going operations. If the failure affects the safety of personnel, the work site, or the surrounding environment, personnel will be evacuated until appropriate corrective actions have been taken.

4.0 CONTAMINANT CONTROL

Precautions will be taken during dry weather (e.g., wetting or covering exposed soils) to avoid generating and breathing dust-generated from soils. A PID and P-5 Digital Dust Indicator (or equivalent equipment) will be used to monitor potential contaminant levels. Response to the monitoring will be in accordance with the action levels provided in Section 5.0.

5.0 MONITORING AND ACTION LEVELS

Concentrations of petroleum hydrocarbons and metals in the air are expected to be below the OSHA Permissible Exposure Limits (PELs). A Community Air Monitoring Plan will be implemented for all fieldwork (a copy of the Community Air Monitoring Plan is provided as an appendix to the RIWP). Air monitoring will be conducted for VOCs and dust. Monitoring will be conducted at all times that fieldwork activities which are likely to generate emissions are occurring. PID readings consistently in excess of 5 ppm, and dust levels in excess of 150 ug/m3 will be used as an indication of the need to initiate personnel monitoring, increase worker protective measures, and/or modify or cease on-site operations in order to mitigate off-site community exposure.

PID and/or dust readings that consistently exceed background in the breathing zone (during any of the proposed tasks) will necessitate moving away from the source or implementing a higher PPE level.

6.0 SITE ACCESS AND CONTROL

Site control procedures will be established to reduce the possibility of worker/visitor contact with compounds present in the soil, to protect the public in the area surrounding the Site and to limit access to the Site to only those persons required to be in the work zone. Notices will be placed near the Site warning the public not to enter fieldwork areas and directing visitors to report to the Project Manager or SSHO. Measures will be taken to limit the entry of unauthorized personnel into the specific areas of field activity and to safely direct and control all vehicular traffic in and near the Site (e.g., placement of traffic cones and warning tape).

7.0 NOISE CONTROL

All fieldwork activities will be conducted in a manner designed to reduce unnecessary noise generation, and to minimize the potential for both on-site and off-site harmful noise levels. The Project Manager and SSHO will establish noise reduction procedures (as appropriate to the Site and the work) to meet these requirements.

8.0 PERSONNEL TRAINING

Work zones that will accomplish the general objective stated above will be established by the Project Manager and the SSHO. Site access will be monitored by the SSHO, who will maintain a log-in sheet for personnel that will include, at the minimum, personnel on the Site, their arrival and departure times, and their destination on the Site. All workers will be properly trained in accordance with OSHA requirements (29 CFR 1910). Personnel exiting the work zone(s) will be decontaminated prior to exiting the Site.

Site-specific training will be provided to each employee. Personnel will be briefed by the SSHO as to the potential hazards to be encountered. Topics will include:

- Availability of this HASP;
- General site hazards and specific hazards in the work areas, including those attributable to known of suspect on-site contaminants;
- Selection, use, testing, and care of the body, eye, hand, and foot protection being worn, with the limitations of each;
- Decontamination procedures for personnel, their personal protective equipment, and other equipment used on the Site;
- Emergency response procedures and requirements;
- Emergency alarm systems and other forms of notification, and evacuation routes to be followed; and,
- Methods to obtain emergency assistance and medical attention.

9.0 DECONTAMINATION

The SSHO will establish a decontamination system and decontamination procedures (appropriate to the Site and the work) that will prevent potentially hazardous materials from leaving the Site. Trucks will be brushed to remove materials adhering to their surfaces. Sampling equipment will be segregated and, after decontamination, stored separately from splash protection equipment. Decontaminated or clean sampling equipment not in use will be covered with plastic and stored in a designated storage area in the work zone.

10.0 EMERGENCY RESPONSE

10.1 Notification of Site Emergencies

In the event of an emergency, the SSHO will be immediately notified of the nature and extent of the emergency (the names and contact information for key site safety and management personnel, as well as other site safety contact telephone numbers, shall be posted at the Site).

Table 1 in this HASP contains Emergency Response Telephone Numbers, and immediately following is a map detailing the directions to the nearest hospital emergency room. This information will be maintained at the work Site by the SSHO. The location of the nearest telephone will be determined prior to the initiation of on-site activities. In addition to any permanent phone lines, a cellular phone will be available.

10.2 Responsibilities

Prior to the initiation of on-site work activities, the SSHO will:

- Notify individuals, authorities, and/or health care facilities of the potentially hazardous activities and potential wastes that may develop as a result of the investigation.
- Confirm that first aid supplies and a fire extinguisher are available on-site.
- Have a working knowledge of safety equipment available.
- Confirm that a map detailing the most direct route to the hospital is prominently posted with the emergency telephone numbers.

The SSHO will be responsible for directing notification, response, and follow-up actions and for contacting outside response personnel (ambulance, fire department, or others). In the case of an evacuation, the SSHO will account for personnel. A log of individuals entering and leaving the Site will be kept so that everyone can be accounted for in an emergency.

Upon notification of an exposure incident, the SSHO will contact the appropriate emergency response personnel for recommended medical diagnosis and, if necessary, treatment. The SSHO will determine whether and at what levels exposure actually occurred, the cause of such exposure, and the means to prevent similar incidents from occurring.

10.3 Accidents and Injuries

In the event of an accident or injury, measures will be taken to assist those who have been injured or exposed and to protect others from hazards. If an individual is transported to a hospital or doctor, a copy of the HASP will accompany the individual.

The SSHO will be notified and will respond according to the severity of the incident. The SSHO will perform an investigation of the incident and prepare a signed and dated report documenting the investigation. An exposure-incident report will also be completed by the SSHO and the exposed individual. The form will be filed with the employee's medical and safety records to serve as documentation of the incident and the actions taken.

10.4 Communication

No special hand signals will be utilized within the work zone. Field personnel will utilize standard hand signals during the operation of heavy equipment.

10.5 Safe Refuge

Vehicles and on-site structures will serve as the immediate place of refuge in the event of an emergency. If evacuation from the area is necessary, project vehicles will be used to transport on-site personnel to safety.

10.6 Site Security and Control

Site security and control during emergencies, accidents, and incidents will be monitored by the SSHO. The SSHO is responsible for limiting access to the Site to authorized personnel and for oversight of reaction activities.

10.7 Emergency Evacuation

In case of an emergency, personnel will evacuate to the safe refuge identified by the SSHO, both for their personal safety and to prevent the hampering of response/rescue efforts.

10.8 Resuming Work

A determination that it is safe to return to work will be made by the SSHO and/or any personnel assisting in the emergency, e.g., fire department, police department, utility company, etc. No personnel will be allowed to return to the work areas until a full determination has been made by the above-identified personnel that all field activities can continue unobstructed. Such a determination will depend upon the nature of the emergency (e.g., downed power lines -- removal of all lines from the property; fire -- extinguished fire; injury -- safe transport of the injured party to a medical facility with either assurance of acceptable medical care present or completion of medical care; etc.).

Before on-site work is resumed following an emergency, necessary emergency equipment will be recharged, refilled, or replaced. Government agencies will be notified as appropriate. An Incident Report Form will be filed.

10.9 Fire Fighting Procedures

A fire extinguisher will be available in the work zone during on-site activities. This extinguisher is intended for small fires. When a fire cannot be controlled with the extinguisher, the area will be evacuated immediately. The SSHO will be responsible for directing notification, response, and follow-up actions and for contacting ambulance and fire department personnel.

10.10 Emergency Decontamination Procedure

The extent of emergency decontamination depends on the severity of the injury or illness and the nature of the contamination. Whenever possible, minimum decontamination will consist of washing, rinsing, and/or removal of contaminated outer clothing and equipment. If time does not permit decontamination, the person will be given first aid treatment and then wrapped in plastic or a blanket prior to transport.

10.11 Emergency Equipment

The following on-site equipment for safety and emergency response will be maintained in the on-site vehicle of the SSHO:

- Fire extinguisher;
- First-aid kit; and,
- Extra copy of this Health and Safety Plan.

11.0 SPECIAL PRECAUTIONS AND PROCEDURES

The activities associated with this investigation may involve potential risks of exposure to both chemical and physical hazards. The potential for chemical exposure to hazardous or regulated substances will be significantly reduced through the use of monitoring, personal protective clothing, engineering controls, and implementation of safe work practices.

11.1 Heat/Cold Stress

Training in prevention of heat/cold stress will be provided as part of the site-specific training. The timing of this project is such that heat/cold stress may pose a threat to the health and safety of personnel. Work/rest regimens will be employed, as necessary, so that personnel do not suffer adverse effects from heat/cold stress. Special clothing and appropriate diet and fluid intake regimens will be recommended to personnel to further reduce this temperature-related hazard. Rest periods will be recommended in the event of high/low temperatures and/or humidity to counter the negative effects of heat/cold stress.

11.2 Heavy Equipment

Working in the vicinity of heavy equipment is the primary safety hazard at the Site. Physical hazards in working near heavy construction equipment include the following: overhead hazards, slips/trip/falls, hand and foot injuries, moving part hazards, improper lifting/back injuries, and noise. All workers will be properly trained in accordance with OSHA requirements (29 CFR 1910). No workers will be permitted within any excavated areas without proper personal protective equipment (PPE), including, as warranted, respirators, Tyvek suits and/or gloves. Air monitoring for VOCs will be conducted in accordance with the HASP and the Community Air Monitoring Plan (RIWP appendices E and F).

11.3 Additional Safety Practices

The following are important safety precautions which will be enforced during this investigation:

- Medicine and alcohol can aggravate the effect of exposure to certain compounds. Controlled substances and alcoholic beverages will not be consumed during investigation activities. Consumption of prescribed drugs will only be at the discretion of a physician familiar with the person's work.
- Eating, drinking, chewing gum or tobacco, smoking, or other practices that increase the probability of hand-to-mouth transfer and ingestion of material is prohibited except in areas designated by the SSHO.
- Contact with potentially contaminated surfaces will be avoided whenever possible. Workers will not unnecessarily walk through puddles, mud, or other discolored surfaces; kneel on the ground; or lean, sit, or place equipment on drums, containers, vehicles, or the ground.
- Personnel and equipment in the work areas will be minimized, consistent with effective site operations.
- Unsafe equipment left unattended will be identified by a "DANGER, DO NOT OPERATE" tag.
- Work areas for various operational activities will be established.

11.4 Daily Log Contents

The SSHO will establish a system appropriate to the Site, the work, and the work zones that will record, at a minimum, the following information:

- Personnel on the Site, their arrival and departure times, and their destination on the Site.
- Incidents and unusual activities that occur on the Site such as, but not limited to, accidents, spills, breaches of security, injuries, equipment failures, and weather-related problems.
- Changes to the HASP.
- Daily information generated such as: changes to work and health and safety plans; work accomplished and the current Site status; and monitoring results.

12.0 TABLE AND FIGURES

Table 1: Emergency Response Telephone Numbers

Emergency Agencies	Phone Numbers
EMERGENCY	**911**
Nyack Hospital 160 N. Midland Avenue, Nyack	**(845) 434-2345 - Emergency Room**
Haverstraw Police Department	**(845) 429-5711 or 911**
Haverstraw Fire Department	**(845) 429-5444 or 911**
Village of Haverstraw Town Hall	(845) 429-0300
United Water New York	(845) 623-1500
Haverstraw Municipal Sewer	(845) 429-5715

Figure 1: Directions to Hospital

Exit the work site using **Dr. Girling Drive**.

Turn Left (southeast) onto **West Street/Riverside Avenue**, continue straight onto **Short Clove Road**.

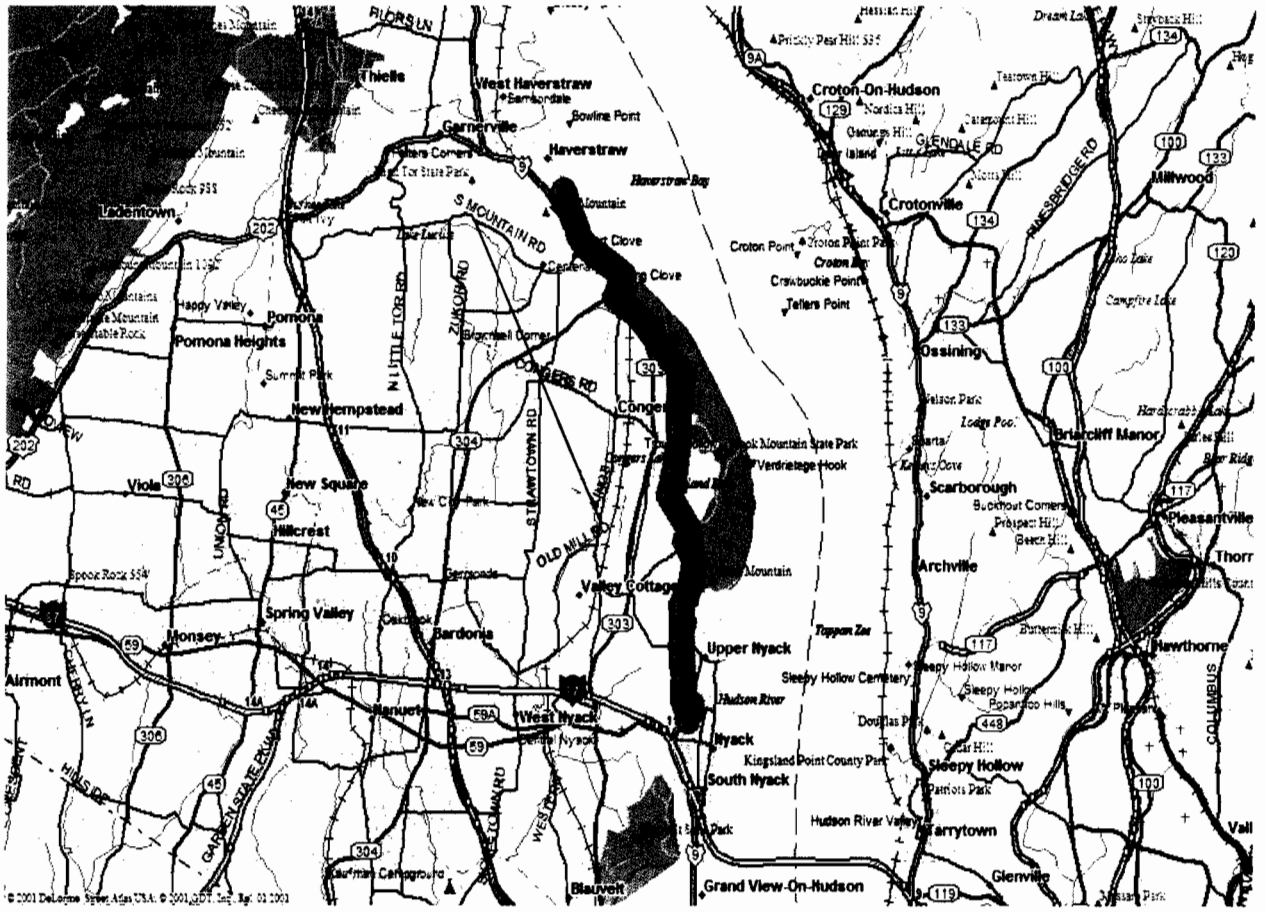
Turn Left (South) onto **US Route 9W, continue south into Upper Nyack**.

Turn Left (East) onto **6th Avenue**.

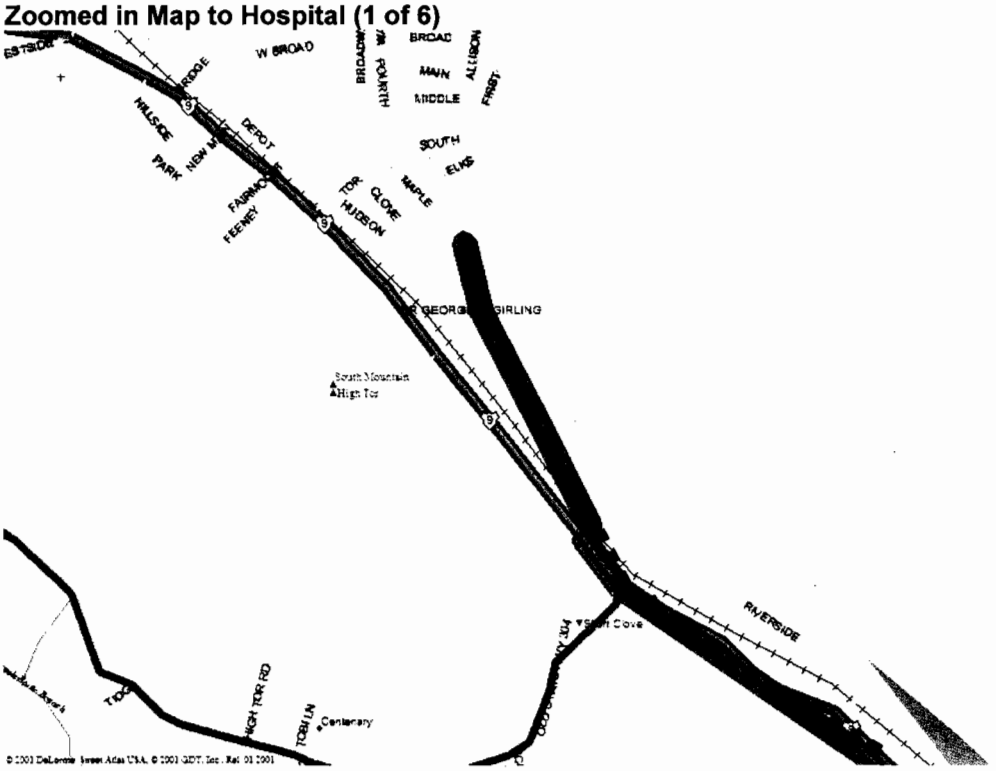
Turn Right (Southwest) onto **North Midland Avenue**.

Hospital is located on Right at 160 North Midland Avenue (see Map on next page).

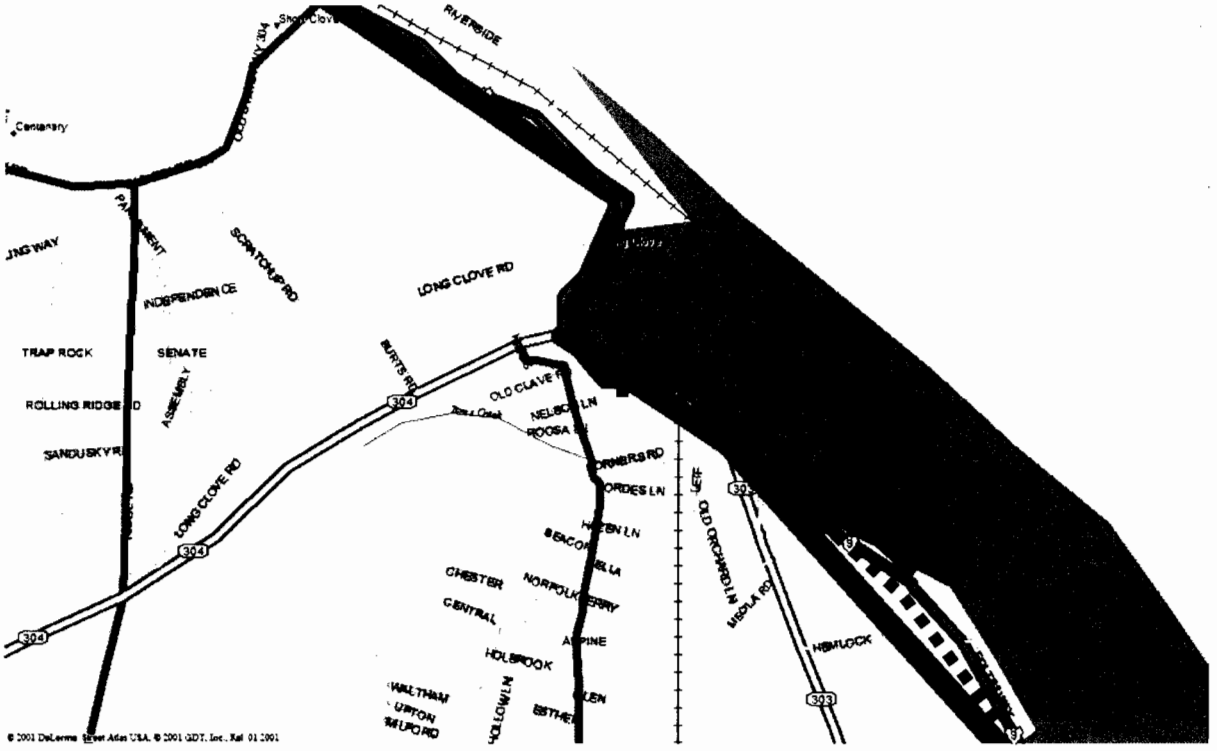
Figure 2: Map to Hospital (overview)



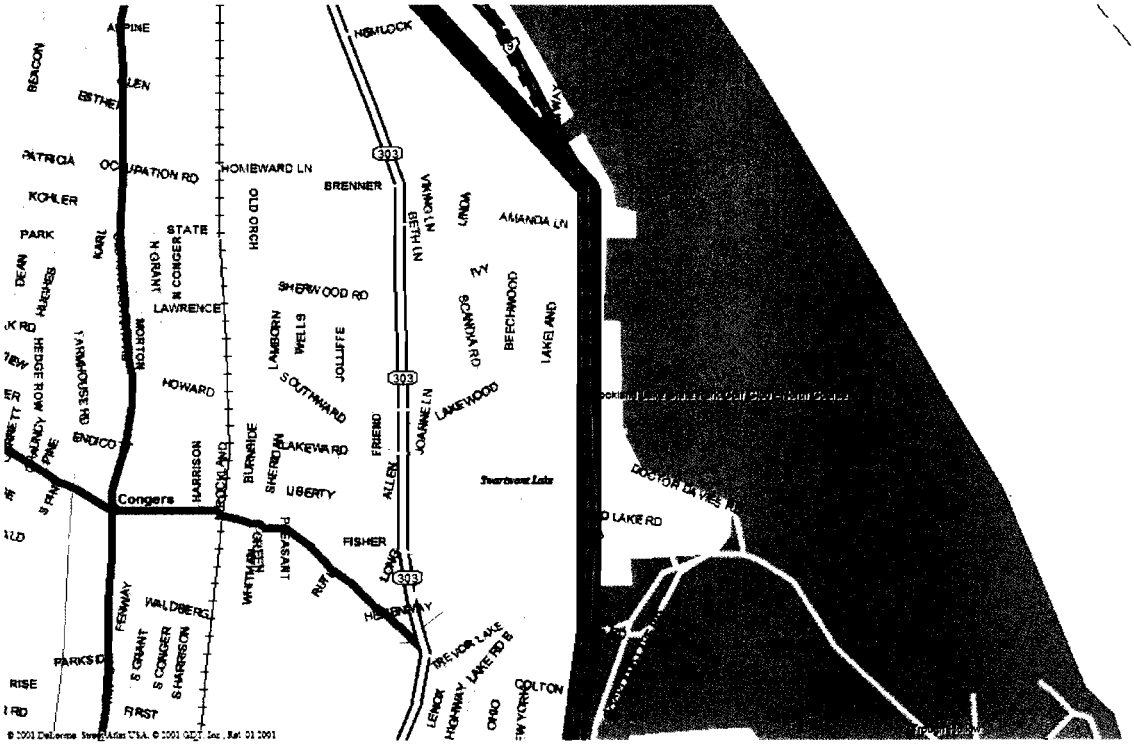
Zoomed in Map to Hospital (1 of 6)



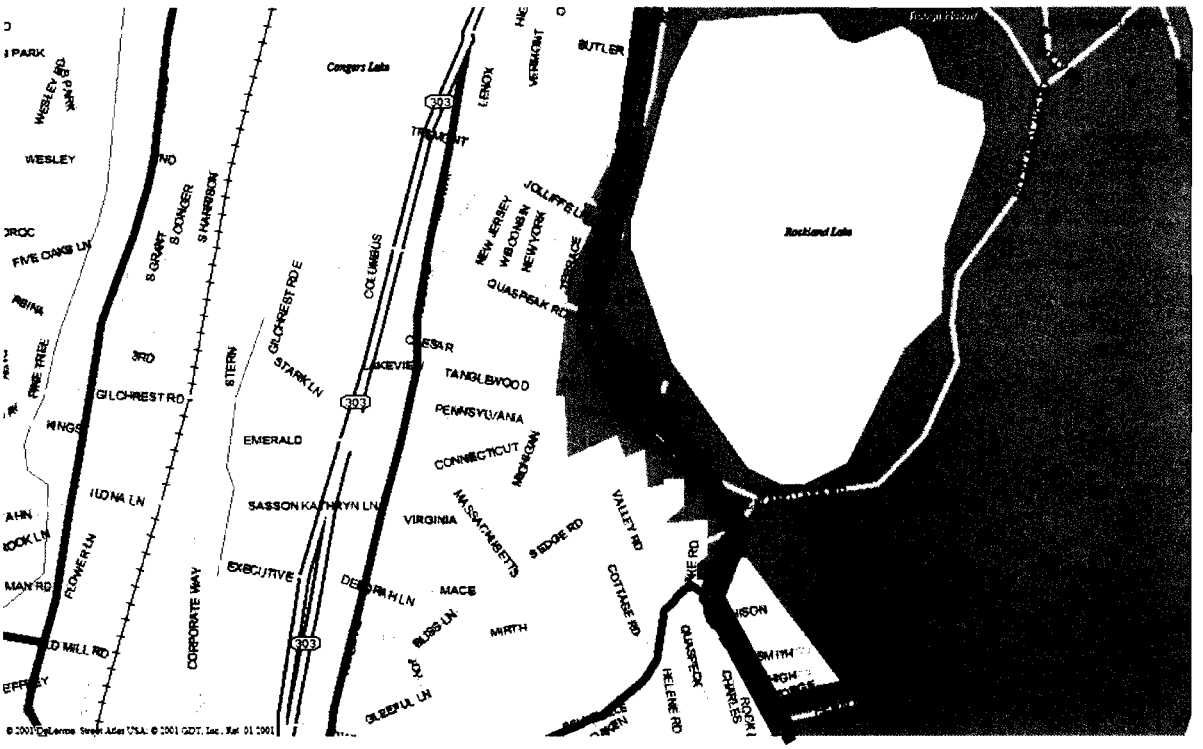
Zoomed in Map to Hospital (2 of 6)



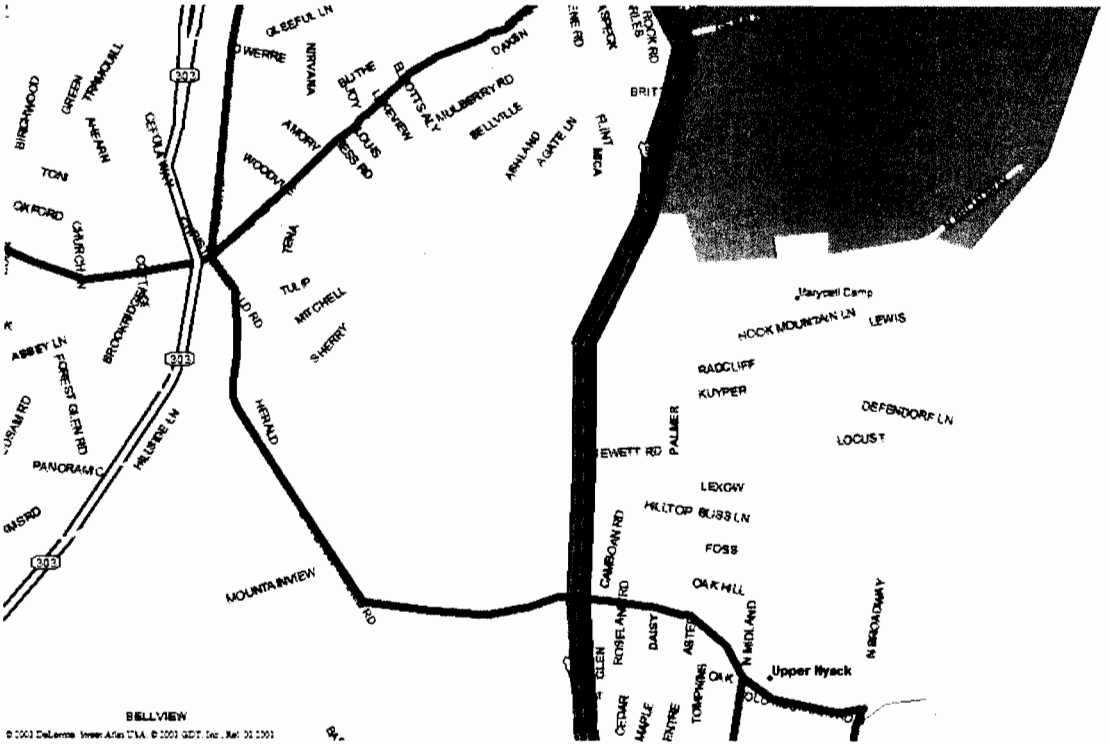
Zoomed in Map to Hospital (3 of 6)



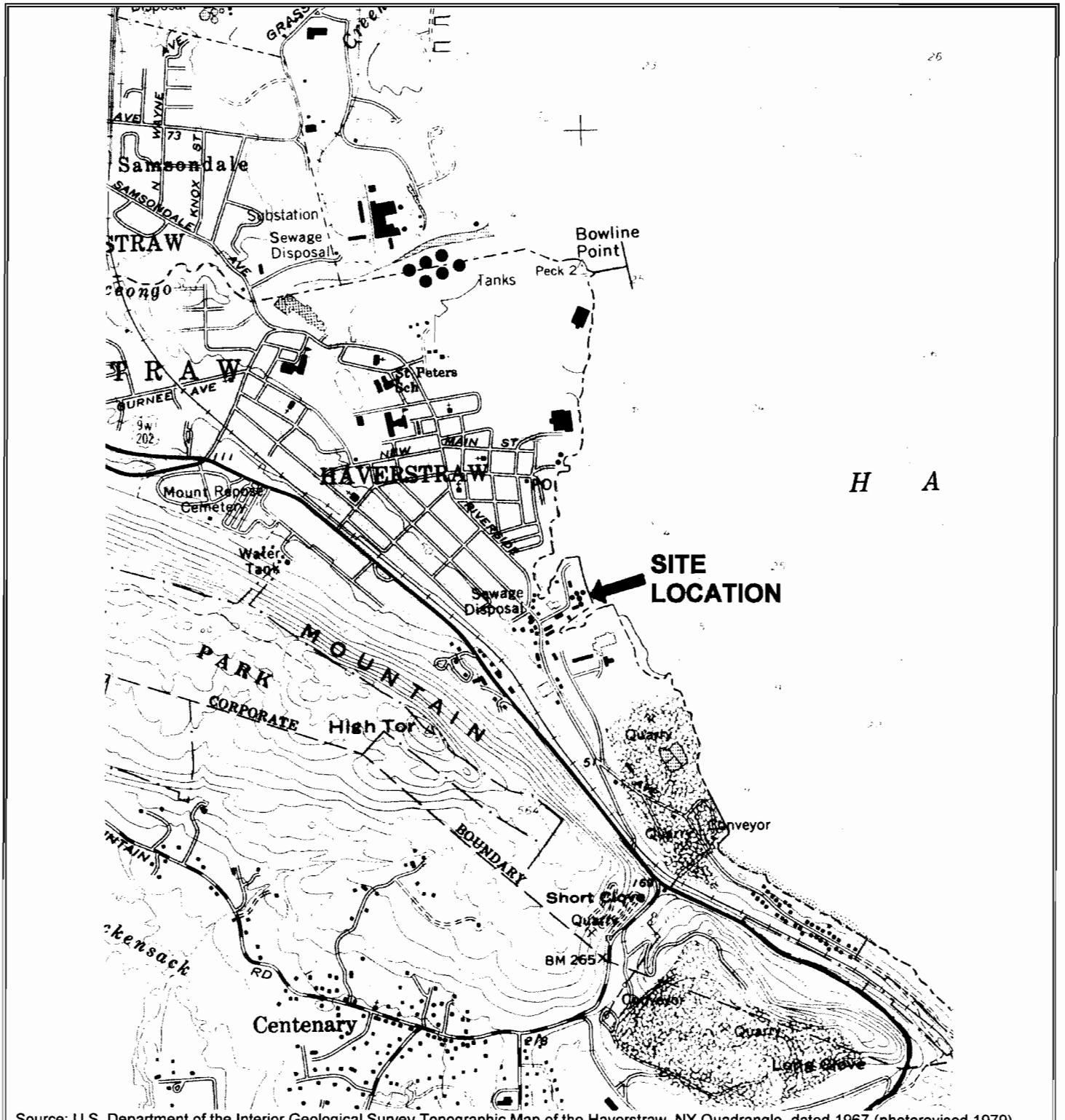
Zoomed in Map to Hospital (4 of 6)



Zoomed in Map to Hospital (5 of 6)

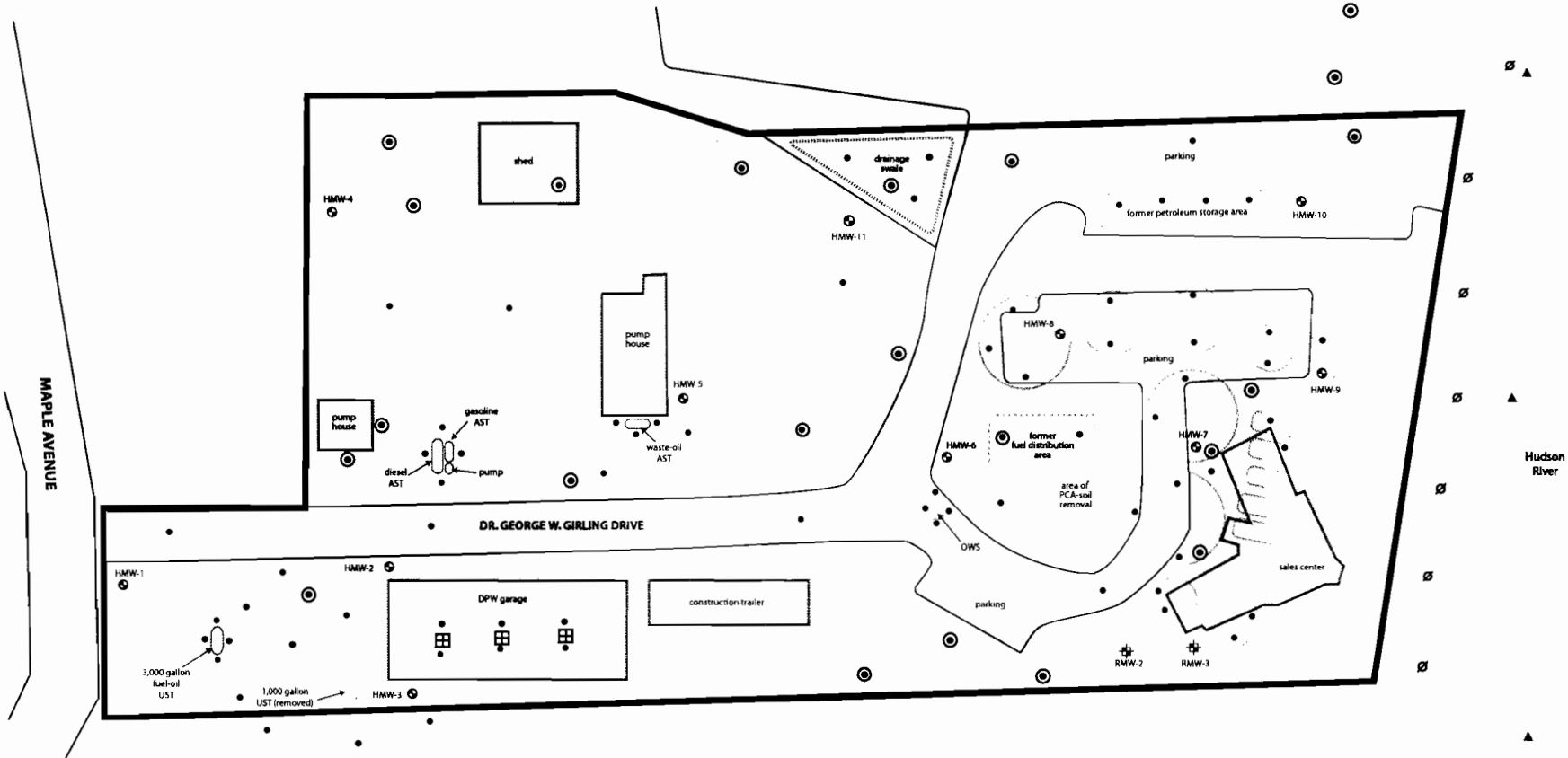


Zoomed in Map to Hospital (6 of 6)



Source: U.S. Department of the Interior Geological Survey Topographic Map of the Haverstraw, NY Quadrangle, dated 1967 (photorevised 1979)

Site Location Map Haverstraw Harbors Site Dr. George W. Girling Drive Village of Haverstraw Rockland County, New York	N	ESI File: GH9964.42 Date: July 2006 Attachment



All feature locations are approximate.
Map is based on ATZL, Scatassa & Zigler P.C. Survey Map

Proposed Fieldwork Map

Haverstraw Harbors Site
Dr. George W. Girling Drive
Village of Haverstraw
Rockland County, New York

ESI File: GH9964.42
Scale: 1" = 40' (approximately)
May 2006 | Attachment
Ecosystems Strategies, Inc.

ATTACHMENT D

Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN FOR SITE INVESTIGATIVE ACTIVITIES

Haverstraw Harbors Site
Dr. George W. Girling Drive
Village of Haverstraw
Rockland County, New York
ESI File: GH9964.42

Real-time air monitoring for volatile organic compounds (VOCs) and dust at the perimeter of the exclusion zone or work area will be necessary.

Dust will be monitored at three locations on the Site: two downwind locations 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 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 ug/m3 will be evidence of unacceptable air quality, and proper procedures to reduce dust levels will be immediately instituted by the contractor. Ameliorative 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.

Periodic monitoring for VOCs will be required during all ground intrusive activities (e.g., test pitting and the installation of soil borings an/or monitoring wells), and during the collection of soil, sediment, and groundwater samples. Periodic monitoring might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling near roadways or occupied on-site buildings.

VOC Monitoring, Response Levels, and Actions

VOCs must be periodically monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone). Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using a photoionization detector (PID) that has been properly calibrated at least daily.

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

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

- If the persistent organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All PID readings must be recorded and be available for New York State Department of Environmental Conservation (NYSDEC) and Rockland County Department of Health (RCDOH) personnel to review.

ATTACHMENT E

Resumes of Key Investigative Personnel

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
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. Twenty years experience in the investigation and remediation of petroleum contamination at commercial and residential properties. Major recent projects of relevance include:

- Irvington Waterfront Park (Irvington, NY): Project Manager for site investigation and remedial design of abandoned industrial riverfront properties. Documented soil and groundwater contamination and designed remediation including soil removal and site capping. Project completed in 2000; project awarded the 2000 Gold Metal Award by Consulting Engineers Council of New York State, Inc.

- Greyston Bakery Site (Yonkers, NY): Project Manager for site investigation and remedial design of former manufactured gas plant site for future use as a bakery. Documented soil, groundwater and soil gas contamination. Remedial systems included installations of a DNAPL collection system, a barrier layer, a subslab depressurization system under the building, and groundwater monitoring. Project completed in 2004.

- 400 Block Redevelopment (Poughkeepsie, NY): Project Manager for site investigation and remedial design of multi-use industrial development property (boiler repair, clothing manufacturer, auto repair) for future retail/residential use. Documented soil (petroleum, PCBs, metals) and groundwater (petroleum) contamination. Remedial systems include: soil (and tank) removal, installation of a barrier, and groundwater monitoring. Project scheduled for completion in 2005.

- Parkview Commons Site (Bronx, NY): Project Manager for site investigation and remedial design of former gas station/auto repair facility for future use as a residential/commercial building. Remedial investigation and design is currently on-going. Project scheduled for completion in 2006.

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 Community College, Poughkeepsie, New York 1991 to Present
Marist College, Poughkeepsie, New York
Vassar College, Poughkeepsie, New York

Courses: Macroeconomics, Environmental Economics (DCC)
Introduction to Environmental Issues (Marist)
Environmental Geology: Focus on Lead (Vassar)

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 setting 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.

Teacher, Eugene, Oregon 1980-1983

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.
- "Environmental Assessments in Urban Settings", Vassar College, Fall 1999 and Fall 2000.
- "Navigating Property Contaminant Problems", Land Trust Alliance Rally 2001, Oct 2001

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

ADDITIONAL INFORMATION

Member, Dutchess County (NY) Youth Board (1987-1992); Chairman, 1992
Member, City of Poughkeepsie (NY) School District Ad Hoc Committee on Teen Parents and Pregnancy Prevention (1991)
Member, City of Poughkeepsie School District Budget Advisory Committee (1994 to 2000)
Member, City of Poughkeepsie PTA and Middle School Building Level Team

Scott Spitzer
Senior Project Manager
scott@ecosystemsstrategies.com

PROFESSIONAL EXPERIENCE

Project Manger, Ecosystems Strategies, Inc., Poughkeepsie, NY *2001 - present*

- Conducts Environmental Site Investigations and prepares final site assessment reports. Over 300 Investigations and Final Reports completed to date.
- Investigates site histories.
- Conducts facility inspections.
- Reviews regulatory agency records.
- Documents facility compliance with relevant State and Federal regulations.
- Conducts Phase II Technical Environmental Investigations and prepares technical reports.
- Researches field and regulatory information.
- Manages tank removals.
- Coordinates subcontractors.
- Oversees fieldwork and handles collection of material, soil and water samples.

Select Projects

Scenic Hudson Land Trust, Inc., Beacon Waterfront Project, Beacon, NY

ESI conducted soil and groundwater investigations on a former MOSF and adjacent scrapyard. Projects involved soil remediation of both petroleum and PCB-contaminated soils and long-term groundwater monitoring. Both projects were classified as Voluntary Clean-Up projects by the NYSDEC and closure status was attained.

Sakmann Restaurant Corporation Site, Fort Montgomery, NY

Conducted Phase I Environmental Site Assessment and Phase II Subsurface Investigations for former filling station and automotive repair garage contaminated by solvent and waste-oil discharges to an on-site drywell.

Designed and implemented a sampling plan for soils impacted by chlorinated hydrocarbons, petroleum, and metals. Created Workplan (in coordination with the NYSDEC Voluntary Cleanup Program) for remediation of on-site contamination and long-term sampling of on-site groundwater monitoring wells.

Staten Island Marina Site, Staten Island, NY

Conducted Phase I Environmental Site Assessment and Phase II Subsurface Investigation for an active marine facility engaged in boat painting and engine maintenance activities. Coordinated the delineation of metals contamination over a three-acre area and analyzed potential impacts from on-site fill materials. Submitted remedial and budgetary analysis in support of regulatory agency approval for conversion of boatyard into a public park.

Octagon House Development Site, Roosevelt Island, NY

Conducted Phase I Environmental Site Assessment and Phase II Subsurface Investigations at the former site of a large, urban hospital. Interpreted the results of geotechnical studies, extended test pits, and conducted extensive soil sampling, to document subsurface soil conditions n support of clients application to the U.S. Housing and Urban Development Agency (HUD). Created Workplan (in coordination with the NYCDEP Office of Environmental Planning and Assessment) for site-wide remediation of contaminated soils and secured NYCDEP approval for site remediation as required by HUD.

Camp Glen Gray Boy Scout Facility, Mahwah, NJ

Conducted Phase I Environmental Site Assessment and Phase II Subsurface Investigations at an approximately 800-acre campground containing numerous structures. Documented subsurface soil conditions at the locations of aboveground and underground storage tanks, and delineated lead contamination at a former firing range. Assisted in design and implementation of remediation plans for removal of petroleum and lead contaminated soils, and obtained NJDEP approvals.

Independent Science Writer *1992 - 2001*

- Writings in applied science and biology for a variety of science and trade publications.

EDUCATION

Bachelor of Science from Department of Biology with honors in Environmental Science, SUNY at Stony Brook, Stony Brook, New York *May 1992*

PROFESSIONAL ORGANIZATIONS AND CERTIFICATIONS

- OSHA Hazardous Waste Site Operations
- OSHA Emergency Response Training
- 29 CRF 1910.120 (e) – 40 Hour Hazwoper

Carl R. Kochersberger, Jr.
PROJECT MANAGER
carl@ecosystemsstrategies.com

PROFESSIONAL EXPERIENCE

Project Manager, Ecosystems Strategies, Inc., Poughkeepsie, New York *2002 to present*

- Conducts Environmental Site Investigations and prepares final site assessment reports. Over 175 Investigations and Final Reports completed to date.
- Investigates site histories.
- Conducts facility inspections.
- Reviews regulatory agency records.
- Documents facility compliance with relevant State and Federal regulations.
- Conducts Phase II Technical Environmental Investigations and prepares technical reports.
- Researches field and regulatory information.
- Manages tank removals.
- Coordinates subcontractors.
- Oversees fieldwork and handles collection of material, soil and water samples.

Select Projects

Former Fur Processing Facility, Bronx, NY

Documented the presence of chlorinated hydrocarbon, petroleum, and metals contamination beneath and/or near a former industrial structure. Coordinated the sampling and removal of multiple drums of hazardous and non-hazardous material from the structure and secured NYCDEP approval. Developed a Workplan for site remediation and directed environmental restoration activities, including: excavation and removal of both aboveground and underground storage tanks, removal of contaminated soils, installation of a barrier layer soil cap, and pre-demolition removal of asbestos materials.

Jamaica Hospital Medical Center, Queens, NY

Coordinated and supervised the removal of two, large underground storage tanks and documented site conditions through soil and groundwater sampling. Secured NYSDEC approval of PBS tank closure and registration requirements.

The Point CDC, Bronx, NY

ESI assisted with the open space for community access to the waterfront in revitalization of a former fur processing plant. Activities included subsurface investigation, hazardous waste characterization/disposal program. Worked with architects, engineers, and demolition contractors to demolish existing structure and assisted with site redesign as a multi-purpose community access point to the Bronx River.

Assistant Technical Director, Tonawanda Coke Corporation., Tonawanda, New York *2001 to 2002*

Responsible for duly monitoring of compliance with State, Federal, and Publicly Owned Treatment Works (POTW) discharge permits. Perform New York State Environmental Laboratory Approval Program (ELAP) proficiency testing to maintain ELAP certification. Prepare laboratory standards and reagents. Perform daily quality and process control testing on raw materials, finished products, and by-products. Perform quarterly monitoring of breathing air quality of plant workers.

RELATED EXPERIENCE

Research Assistant, Cornell Biological Field Station, Bridgeport, New York *1995*

Conduct annual census of Common Tern, Ring-billed Gull, and Herring-Gull breeding colonies and assist in annual census of Double-crested Cormorant breeding colonies. Conduct Common Tern breeding habitat preference experiment. Conduct research of species, size, and age distribution of fish targeted as prey by Double-crested Cormorants. Assist in annual fish population census.

EDUCATION

Bachelor of Science, 2000
Cornell University, Ithaca, New York

Associates in Applied Science, 1994
Paul Smith's College, Paul Smiths, New York

PROFESSIONAL ORGANIZATIONS AND CERTIFICATIONS

- OSHA Hazardous Waste Site Operations
- OSHA Emergency Response Training
- 29 CRF 1910.120 (e) – 40 Hour Hazwoper