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ENVIRONMENTAL

AUDIT

February 3, 1997

Site Identification	Former Garret Storm, Inc. MOSF Site City of Beacon Dutchess County, New York
Tax Lot Identification	Map 5954, Block 32, Lot 481822
Property Description	Approximate 6.9-acre (4.5-acres above water and 2.4-acres under water) property

ESI File Number: SG96152.20

Prepared By:

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ENVIRONMENTAL

AUDIT

February 3, 1997

ESI File Number: SG96152.20

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Services performed by Ecosystems Strategies, Inc. and summarized in this Environmental Audit Phase I have been conducted in accordance with Method E 1527-94 as developed by the American Society for Testing and Materials (ASTM).

The undersigned has reviewed this Environmental Audit Phase I and certifies to Scenic Hudson Land Trust, Inc. that the information provided in this document is accurate as of the date of issuance by this office.

Paul H. Ciminello
President

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1.0 Introduction

1.1 Purpose of the Investigation

This Environmental Audit ("Audit") identifies environmental conditions which might represent a financial liability resulting from or associated with the storage, use, transport or disposal of hazardous or regulated materials on the approximate 6.9-acre (4.5-acres above water and 2.4-acres under water) property known as the former Garret Storm, Inc. Major Oil Storage Facility (MOSF) located off of Ferry Road in the City of Beacon, Dutchess County, New York. A full property description is provided in Section 2.1 below. A map showing the location of the subject property is provided on Page 5 of this Audit.

This Audit also summarizes all investigative work that was performed on the property to continue to document the presence or absence of petroleum hydrocarbons in on-site groundwater. Specifically, the four (4) on-site monitoring wells and the four (4) off-site monitoring wells were sampled to determine current site conditions and whether on-site contaminated groundwater has migrated off-site. Field observations and analytical data are combined with data on hydrologic conditions to provide a framework for further investigative and/or remedial activities in support of the ultimate closure of an "Active" NYSDEC spill file on this property.

1.2 Methodology

This Audit has been prepared in conformance with guidelines set forth by the American Society for Testing and Materials (ASTM) Method E 1527-94. The specific components of this Audit are as follows:

1. Investigation of the subject property's history through the analysis of Sanborn Fire Insurance Company Maps dated 1919, 1927, 1946 and 1962; aerial photographs dated 1936, 1960, 1970, 1980, 1983 and 1990; City and County road maps; Soil Survey of Dutchess County; USGS Topographic Map; City of Beacon Assessor's Office and Building Department records; previous environmental reports; and information provided by the Client.

2. Review of federal and state computer databases and printed records for documentation of potential liabilities relevant to the subject property. Records reviewed and corresponding search radii are consistent with, or exceed, the requirements set forth by the ASTM.

3. Visual inspection of the property conducted January 15, 1997 by Bradley E. Fisher and Jay A. Kaplan of Ecosystems Strategies, Inc.

4. Groundwater sampling of the four (4) on-site and four (4) off-site monitoring wells conducted on January 15, 1997 to determine the presence or absence of on-site contaminated groundwater and possible off-site migration.

1.3 Limitations

This Audit is an assessment of the approximate 6.9-acre (4.5-acres above water and 2.4-acres under water) former Garret Storm, Inc. Major Oil Storage Facility (MOSF) located off of Ferry Road in the City of Beacon, Dutchess County, New York and is not valid for any other property or location. It is a representation of the property analyzed as of the dates that services were provided. This Audit cannot be held accountable for activities or events resulting in environmental liability after the date of the site inspection or historic research.

This Audit is based in part on certain information provided in writing or verbally by federal, state and local officials (including public records) and other parties referenced herein. No attempt was made to independently verify the accuracy or completeness of this information. Unless specifically noted, the findings and conclusions contained herein must be considered not as scientific certainties, but as probabilities based on professional judgement.

This Audit is intended for the sole use of Scenic Hudson Land Trust, Inc. and must be used in its entirety.

2.0 Site Location and Description

2.1 Description of the Subject Property

The subject property is defined as the approximate 6.9-acre (4.5-acres above water and 2.4-acres under water) former Garret Storm, Inc. Major Oil Storage Facility (MOSF) located off of Ferry Road in the City of Beacon, Dutchess County, New York (see the Site Location Map, Page 6). The subject property is comprised of a single tax lot (City of Beacon Tax Identification: Map 5954, Block 32, Lot 481822).

The subject property is an irregularly-shaped parcel which is located off of Ferry Street between the Consolidated Railroad Corp. right of way (ROW) and the Hudson River; a portion of the subject property (approximately 2.4-acres) extends into the Hudson River. The subject property is a former major oil storage facility that ceased operation in 1992; all of the on-site tanks were removed by July 1994. The subject property contains the remnants of this previous usage, including tank cradles and a pump house. The western portion of the subject property is currently used as a marina for the Dutchess Boat Club; a one-story clubhouse and a shed are located on the peninsula. Photographs of the subject property are included in Appendix A of this Audit.

2.1.1 Site Topography

Information on the subject property's topography was obtained from a review of the 1956 (photorevised 1981) United States Geological Survey (USGS) Topographic Map of the Wappingers Falls, New York Quadrangle and observations made during a site inspection of the subject property performed by this office on January 15, 1997. A copy of the USGS topographic map with the subject property outlined is included in Appendix B of this Audit.

According to the USGS map, the portion of the subject property located above water is situated on a generally level plot at approximately 5 to 10 feet above mean sea level (msl). The underwater portion of the subject property has depths ranging from 2 feet below msl along the shoreline to approximately 24 feet below msl along the western border of the subject property (all depths measured during mean low water). According to the USGS map and observations made during the site inspection, there is a gradual upwards slope to the east towards the Ferry Street Bridge.

A review of the above-referenced topographic map did not indicate the presence of soil/gravel mining operations or unusual topographic patterns indicative of excavation or landfilling activities on the subject property. However, it is known that portions of the subject property were formed by landfilling activities. The USGS map also indicates the presence of three large aboveground storage tanks on the subject property.

2.1.2 Site Geology

At least three previous site specific investigations of the subsurface (e.g., test pits, borings and groundwater sampling) are known to have been performed on the subject property. Information obtained during the extension of test pits and borings for subsurface characterization purposes on the subject property indicates that the subsurface is characterized predominantly by fill material consisting of sand, gravel, slag, coal, asphalt and concrete within a matrix of silt to approximately 5 feet below grade. From approximately 5 feet below grade and below, the subsurface is characterized by dark gray/black silt and clay representative of riverine deposits. The actual depth to bedrock (Hudson River Formation) on the subject property cannot be accurately documented at this time.

According to the Dutchess County Soil and Water Conservation District's Soil Survey of Dutchess County, dated September 1991, the subject property is characterized by the Udorthents smoothed soil unit consisting of very deep, somewhat excessively drained to moderately well drained soils that have been altered by cutting and/or filling activities.

2.1.3 Site Hydrogeology

At least three site specific investigations of groundwater flow and depth are known to have been performed on the subject property. Depth to groundwater has been documented on the site to be between 0.63 feet above mean sea level and 1.76 feet above mean sea level (measurements taken in October 1994 and January 1997). Groundwater depth on the site is known to be influenced by tidal fluctuations due to the proximity of the site to the Hudson River.

Direction of groundwater flow is also known to be influenced by tidal flow. The on-site direction of groundwater flow has been documented in a northeasterly direction during times of high tide and in a southwesterly and northwesterly direction during times of low tide.

2.1.4 Surface Hydrology

Based on a review of the USGS map and observations made during the site inspection, a portion of the subject property (approximately 2.4-acres) is located within the Hudson River.

Wetlands

The New York State Department of Environmental Conservation (NYSDEC) Freshwater Wetlands Map and the National Wetlands Inventory Map for the Wappingers Falls, NY Quadrangle were reviewed by this office. According to the NYSDEC Wetlands Map (1973-2nd edition), there are no NYSDEC designated wetlands (areas greater than 12.7 acres in size) present on the subject property. According to the Federal Wetlands Map (1990), there are no federally designated wetlands (areas greater than 1.0 acre in size) located on the subject property. Copies of these wetland maps with the subject property outlined are provided in Appendix C of this Audit.

Flood Zone

Based on a review of the Federal Emergency Management Agency's (FEMA) Flood Boundary and Floodway Map of the City of Beacon, New York (Community Panel #360217 0001), effective date March 1, 1984), at least 90% of the subject property is present within an area of a 100-year flood (Zone A). The remaining portions of the subject property are present within areas of minimal flooding.

2.2 Description of Surrounding Properties

2.2.1 Surrounding Land Uses

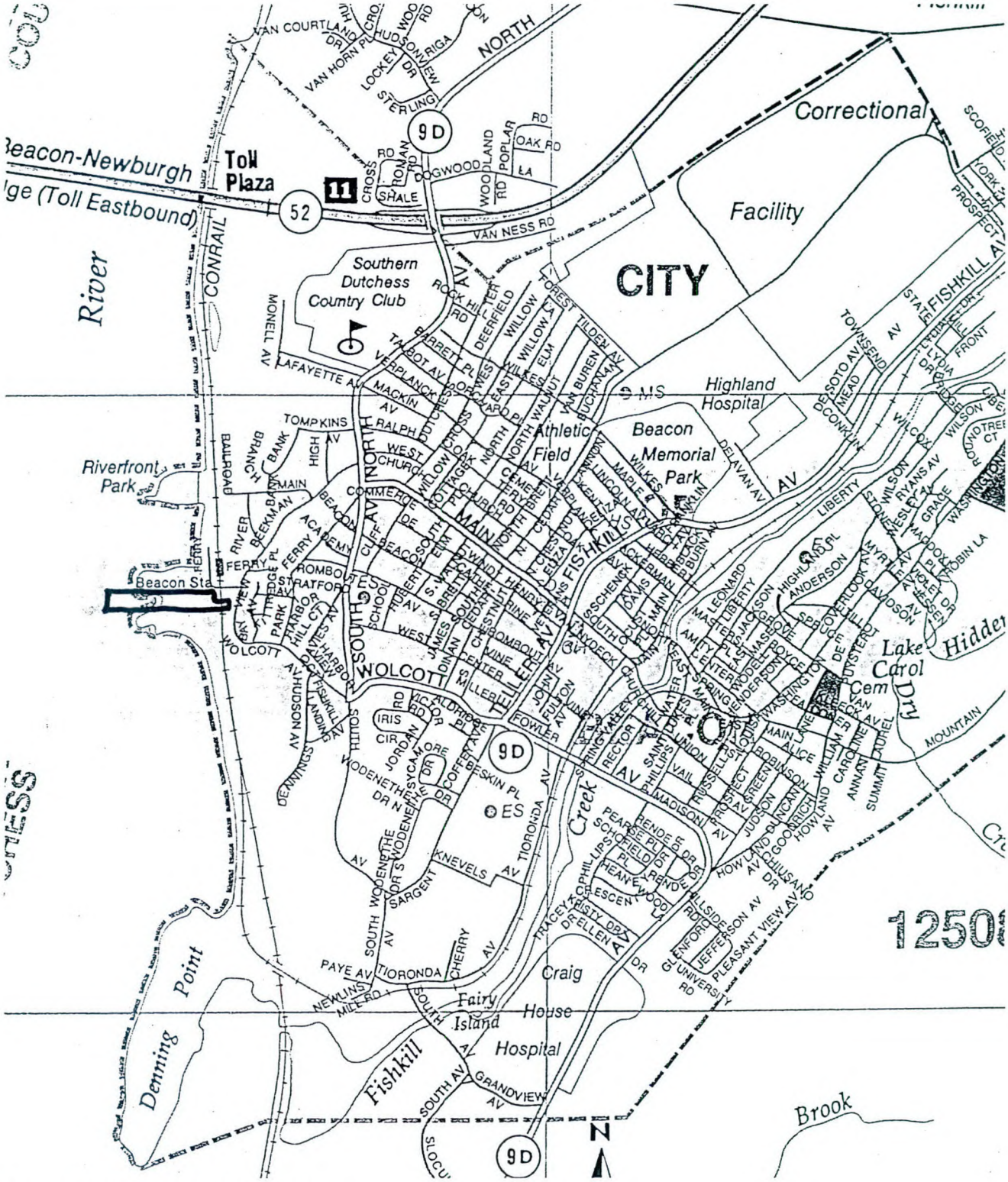
The subject property is located in a waterfront area comprised of former industrial and mixed use properties. A description of the adjoining and nearby properties is shown in Table 1, below.

Table 1: Land Uses in the Vicinity of the Subject Property

Direction	Adjoining Use(s)	Vicinity Use(s)
North	• Beacon Salvage (Scrapyard) • Single-Family Residence	• Abandoned Ferry Slip • Commuter Train Station
East	• Conrail Railroad Corp. ROW	• Multi-Family Residential
South	• Undeveloped Vacant Land • Hudson River	• Hudson River
West	• Hudson River	• Hudson River

2.2.2 Nearby Sensitive Environmental Receptors

According to applicable maps and observations made during the site inspection, there are sensitive environmental receptors in the immediate vicinity of the subject property. The Hudson River, which flows in a southerly direction and adjoins the subject property to the west, is a New York State protected waterway. According to the Federal Wetlands Map, there are two federally-designated wetlands located on the adjoining property to the south. No potable groundwater supply wells were noted on the subject property or on adjoining properties during the site inspection; the subject property and adjoining properties are likely to be connected to the central water system.



MAP FROM HAGSTROM MAP COMPANY, INC. (1990)

Site Location Map

FORMER GARRET-STORM, INC. MOSF SITE
City of Beacon, Dutchess County, New York

N

ESI File Number: SG96152.20

January 1997

Page 6

3.0 Investigation

3.1 Ownership Records

Ownership Information

The information provided below on current property ownership is gathered from information contained in the City of Beacon Assessor's Office records. This ownership summary does not constitute a title search. Provided below in Table 2 is a summary of the ownership information for Map 5954, Block 32, Lot 481822.

Table 2: Ownership Information (Map 5954, Block 32, Lot 481822)

Parcel ID	Owner	Date
Map 5954, Block 32, Lot 481822	Garret Storm, Inc.	1927

3.2 Site History

The history of the subject property is reconstructed through the review of Sanborn Fire Insurance Company Maps dated 1919, 1927, 1946 and 1962; aerial photographs dated 1936, 1960, 1970, 1980, 1983 and 1990; City of Beacon Assessor's Office and Building Department records; and previous environmental reports.

3.2.1 Sanborn Fire Insurance Company Maps

A summary of the information contained in the Sanborn Fire Insurance Company Maps dated 1919, 1927, 1946 and 1962 is provided below. Copies of these maps with the subject property outlined are provided in Appendix D of this Audit.

1919: The majority of the subject property is shown as being a basin of the Hudson River. Three multi-story structures (one is labeled as a dwelling) are located on the peninsula located on the westernmost portion of the subject property; these structures may be associated with the Long Dock Coal Company which occupies the land north of the subject property. The portion of the property along Ferry Street is depicted as vacant land. No petroleum or chemical bulk storage tanks are shown on the subject property.

Immediately adjoining the subject property to the north on the peninsula are a number of multi-story dwellings, offices, storage buildings and a large coal shed; these structures are likely associated with the Long Dock Coal Company. A transformer house is located on the north side of Ferry Street adjacent to the Long Dock structures. A two and a half-story structure labeled as the National Power Co. also adjoins the subject property to the north. Adjoining the subject property to the south are a number of buildings associated with a railroad yard; railroad tracks labeled as "coal run" extend from the main railroad tracks out onto the peninsula that extends into the Hudson River. A one and a half-story structure labeled as a store house and oil room is located immediately south of the basin. Adjoining the subject property to the east are the New York Central and Hudson River Railroad tracks. Further north of the subject property is the Newburgh Ferry, a boat shop, ferry boat slip, and the N.Y.C.R.R. passenger station. No petroleum or chemical bulk storage tanks are shown on adjoining or immediately surrounding properties.

1927: No significant changes are noted on the subject property; however, the Long Dock Coal Company is now labeled as the Garret-Storm Coal Yard. No petroleum or chemical bulk storage tanks are noted on the subject property.

No significant changes are noted on the adjoining property to the north; however, the Long Dock Coal Company is now labeled as the Garret Storm Coal Yard. The westernmost structure located north of the subject property at the end of the peninsula is now occupied by the Central Hudson Steamboat Company. The adjoining structure previously labeled as the National Power Co. is now labeled as being occupied by the Beacon Soap Co., Inc. No significant changes are noted on the adjoining property to the south; however, the structure previously labeled as an oil room is now only labeled as a storage house. No petroleum or chemical bulk storage tanks are shown on adjoining or immediately surrounding properties.

1946: A portion of the basin that formerly occupied a majority of the subject property has been filled in. Two large aboveground storage tanks, one medium size tank and six smaller tanks have been added to the eastern portion of the subject property; the capacities of these tanks are not indicated but all are labeled as containing fuel oil. The structures previously noted at the end of the peninsula are no longer shown; the land is now depicted as being vacant.

A majority of the previously noted dwellings, offices and sheds are no longer shown on the adjoining property to the north; however, the freight house occupied by the Central Hudson Steamboat Company and a multi-story office are still present as is the transformer house. The Beacon Soap company and the large coal shed are no longer shown on the property to the north. All of the structures previously noted on the peninsula to the south and along the "coal run" have been removed; however, railroad tracks are still shown on the adjoining property to the south as are some structures associated with the main railroad. No significant changes are noted on immediately surrounding properties. No petroleum or chemical bulk storage tanks are noted on adjoining or immediately surrounding properties.

1962: The entire basin is now shown as having been filled in. Two additional tanks are now shown on the subject property (one large tank and one much larger tank); the total number of tanks present on the subject property is now eleven. The product contained in the two additional tanks is not indicated; however, these tanks are likely to contain fuel oil as well. A one-story structure labeled as a boathouse has been constructed on the western portion of the subject property adjacent to the largest of the eleven tanks. The remaining portions of the subject property are depicted as undeveloped land.

The structure adjoining the subject property to the north at the end of the peninsula is no longer labeled as being occupied by the Central Hudson Steamboat Company; the property and the structure are now labeled as a junkyard. The transformer house along the northern side of Ferry Street is no longer shown on the map. A dwelling, a structure used for storage and a warehouse are present along the northern side of Ferry Street directly adjoining the on-site tanks; the locations of the dwelling and the storage house are consistent with the current adjoining structures to the north. A coal yard is indicated as being present at the western end of the Ferry Street bridge. The adjoining property to the south appears to be comprised of vacant land; however, railroad tracks are still located on the property. No petroleum or chemical bulk storage tanks are shown on adjoining or immediately surrounding properties.

3.2.2 Aerial Photographs

The following is a summary of information obtained from aerial photographs dated 1936, 1960, 1970, 1980, 1983 and 1990. The small scale of the aerial photographs made distinguishing details difficult.

1936: The majority of the subject property appears to be actively utilized as a petroleum storage facility. Present on the subject property are at least nine large and small aboveground storage tanks (three circular tanks, five tanks parallel to each other and one tank off-set from the others). A small shed is located adjacent to the parallel tanks; the location of this structure is consistent with the current on-site pump house. The land located east of these tanks is cleared and undeveloped; however, the area immediately surrounding the tanks appears to be disturbed.

Scattered structures are noted on the adjoining property to the north; these structures are generally consistent with the structures noted in the 1927 Sanborn map. Scattered debris is noted on the adjoining property to the north along the peninsula; this area appears to be slightly disturbed. Adjoining the subject property to the south is a rail yard; at least four structures likely associated with this property usage are present in the northwest portion of this property. A ferry slip and a train station are noted further north of the subject property.

1960: The entire basin now appears to have been filled in. A large aboveground storage tank has been added to the on-site petroleum bulk storage facility. The other tanks noted in the previous photograph are still visible and the land surrounding these tanks still appears to be disturbed. A second disturbed area is noted on the western end of the peninsula; the cause of which cannot be determined.

No significant changes are noted on adjoining properties to the north; scattered structures are located along Ferry Street and accumulated debris is present at the end of the peninsula. The adjoining property to the south is now comprised of partially cleared and vegetated land; however, railroad tracks are still shown extending from the main railway in a westerly direction towards the Hudson River. The four structures previously noted south of the subject property are no longer shown; the area appears to be disturbed. East of the subject property are scattered access roads extending from the bridge and the railroad tracks.

1970: No significant changes are noted on the subject property. The property still appears to be utilized as a petroleum bulk storage facility as all of the tanks noted in the previous photograph are visible. The area surrounding the tank complex still appears to be slightly disturbed.

No significant changes are noted on adjoining properties to the south or east or on immediately surrounding properties. No significant areas of disturbance are noted on the adjoining properties.

1980: The subject property is still utilized as a petroleum storage facility. The easternmost medium-size circular tank is no longer shown; however, a new medium-size tank has been added south of the parallel tanks (there are now ten tanks located on the subject property). A structure has been constructed on the western portion of the subject property; the location of this structure is consistent with the current location of the marina clubhouse. No significant areas of disturbance are noted on the subject property; however, the area surrounding the tanks appears to be slightly disturbed.

The adjoining properties to the north still appear to be actively used as junkyards as accumulated debris is visible. The current adjoining residence and the Beacon Salvage structure are present as is a large structure at the westernmost portion of the peninsula. The adjoining property to the south appears to be comprised of vacant and partially disturbed land; the nature of this disturbance cannot be determined. The railroad tracks previously noted on this adjoining property are no longer shown.

1983: Only nine tanks appear to be located on the subject property; one of the medium-size tanks is no longer visible. No changes are noted on the remaining portions of the subject property. No significant areas of disturbance are noted on the subject property.

The land located north of the subject property appears to be more actively used as a junkyard as large quantities of accumulated debris are visible. The adjoining property to the south still appears to be cleared and disturbed; areas of standing water are visible on this property. No significant changes are noted on adjoining properties to the east.

1990: Ten bulk storage tanks now appear to be present on the subject property; the remaining portions of this property remain unchanged. No significant areas of disturbance are noted on the subject property.

The structure noted at the end of the peninsula is no longer present and the large amounts of accumulated debris on this peninsula are no longer as pronounced. The adjoining residence and the Beacon Salvage structure are still present north of the subject property; areas of accumulated debris are still noted around the Beacon Salvage structure. No significant changes are noted on the adjoining property to the south; however, the disturbed areas on this property appear to be less pronounced.

3.2.3 Local Records

Assessor's Office Records

City of Beacon Assessor's Office records were reviewed for the subject property on January 29, 1997. According to information in the file, the on-site marina clubhouse was constructed in approximately 1950 and is connected to a private sewer system.

Building Department Records

A request was made to review the City of Beacon Building Department records for the subject property on January 29, 1997. According to office personnel, no Building Department records are on file for the subject property.

3.2.4 Previous Environmental Investigations

This section of the Audit summarizes environmental services that have been performed on the subject property. Reports detailing these investigative environmental services have been provided to this office by various sources.

Reports Prepared by Empire Soils Investigations, Inc.

A historic investigation and a subsurface investigation involving the extension of test pits on the subject property was performed by Empire Soils Investigations, Inc. ("Empire Soils") in 1987. This subsurface investigation was performed to document the presence or absence of subsurface soil and/or groundwater contamination. Ecosystems Strategies, Inc. personnel were not present during this investigation.

Information contained in the Empire Soils report indicates that the subject property was historically (since 1927) utilized as petroleum storage terminal by Garret-Storm, Inc. and that the facility primarily stored #2 fuel oil (kerosene and other types of fuel oil were stored prior to 1979). Two test pits extended on the subject property identified the subsurface to be comprised entirely of miscellaneous fill materials including demolition and building materials, gravel, ash and wood. Laboratory analyses of collected water samples from site wells extended into the test pits documented the presence of elevated levels of chlorides. A petroleum identification conducted on a sample collected from within the fuel oil storage area detected fuel oil in the groundwater.

Reports Prepared by Cortell Associates

A subsurface soil and groundwater investigation involving the extension of six (6) borings, the completion of three (3) monitoring wells (two of which are still present on the adjoining property: RD-K1 and RD-K2) and the collection of two sediment samples from the Hudson River was performed on the adjoining property to the south by Cortell Associates in May 1989. Ecosystems Strategies, Inc. was not present during this investigation. According to information contained in the report prepared by Cortell Associates, field screening of all soils encountered during the extension of the borings (borings extended to approximately 12 feet below grade) did not indicate the presence of any contaminated soil; however, attached boring logs document the presence of strong petroleum odors from 0 to 4 feet below grade during the extension of one of the monitoring wells (RD-K2).

Laboratory analyses of collected soil and sediment samples documented the presence of low concentrations of the 13 EPA Priority Pollutant Metals; however, elevated levels of lead (up to 1,000 ppm) were detected in three of the soil samples but at shallow depths (less than 5 feet below grade). The soil and sediment samples were also analyzed for PCBs; no PCBs were detected in any of the soil samples. Laboratory analyses of groundwater samples collected from three monitoring wells located on the adjoining property to the south indicated the presence of low levels of metals and petroleum hydrocarbons generally "...at levels not indicative of a major contamination problem."

Reports Prepared by Ecosystems Strategies, Inc.

A subsurface and groundwater investigation was performed on the subject property and adjoining properties by Ecosystems Strategies, Inc. between September 1994 and October 1994. This work is summarized in the Summary Report of Subsurface Investigation and Monitoring Well Installation ("Report") dated November 30, 1994. This investigation involved the extension of eleven (11) borings and the completion of six (6) of the borings as monitoring wells. Upon completion of the monitoring wells, the wells were sampled to document the presence or absence of contaminated groundwater, and the potential for off-site migration of contaminants.

Field observations made during the extension of borings (borings extended to the groundwater interface) within the former fuel distribution area indicated the presence of petroleum odors, instrument indications of contamination, and soil saturated with product. Floating product was also noted on the groundwater encountered in the borings. Laboratory analyses of soil samples collected from the borings documented the presence of elevated levels of hydrocarbons in two of the borings extended within the former fuel storage and distribution area. Petroleum hydrocarbons were detected at three other boring locations outside of the main storage and distribution area but at levels below designated action levels.

Groundwater sampling of the current monitoring wells was conducted by Ecosystems Strategies, Inc. in October 1994. Laboratory analysis documented the presence of elevated levels of petroleum hydrocarbons in two of the seven wells (RD-2 and RD-6); all detected compounds were detected at levels above NYSDEC-designated action levels. No petroleum hydrocarbons were detected in groundwater samples collected from wells located outside of the former fuel storage and distribution area suggesting that the contaminants are not migrating off-site.

Additional investigative work was performed on the subject property by Ecosystems Strategies, Inc. in January 1997. See Section 3.5, below for a complete discussion of investigative work performed as part of this Audit.

3.3 Review of Federal and State Agency Records

3.3.1 Methodology

Federal and state computer databases and printed records were reviewed for documentation of potential liabilities relevant to the subject property. Records reviewed and corresponding search radii are consistent with, or exceed, the requirements set forth by ASTM.

The following databases were searched at their specified radii, consistent with ASTM protocol:

USEPA National Priority List (1.0 mile)
USEPA CERCLIS List (0.5 mile)
USEPA RCRIS Hazardous Waste Treatment, Storage and Disposal Facilities List (1.0 mile)
USEPA RCRIS Hazardous Waste Generators Facilities List (subject/adjoining properties)
USEPA Emergency Response Notification System (subject property)
NYSDEC Registry of Inactive Hazardous Waste Disposal Sites (1.0 mile)
NYSDEC Leaking Underground Storage Tank (LUST) Records (0.25 mile)
NYSDEC Registry of Active and Inactive State Landfills (0.5 mile)
NYSDEC Petroleum Bulk Storage Tank Records (subject/adjoining properties)
NYSDEC Chemical Bulk Storage Tank Records (subject/adjoining properties)

The following databases not required by ASTM protocol were also reviewed:

NYSDEC Major Oil Storage Facilities (0.5 mile)
NYSDEC Petroleum and Chemical Spill Records (0.25 mile)
NYSDEC Resource Recovery Projects in New York State (0.5 mile)
NYSDEC Listing of SPDES Permitted Facilities (subject property)
NYSDOH Basement Radon Readings By County (Dutchess)
NYSDOH Basement Radon Readings By Zip Code (12508)

A complete definition of each database, along with the date of the version used for this Audit investigation, is provided below in Section 5.1 of this Audit.

3.3.2 Findings of Regulatory Records Review

Federal Hazardous Waste Sites

The subject property is not listed with the United States Environmental Protection Agency (USEPA) as a National Priority Listing (NPL) site. According to USEPA records, there are no NPL sites located within 1.0 mile of the subject property.

The subject property is not listed on the USEPA's CERCLIS List. According to USEPA records, there are no CERCLIS sites located within 0.5 mile of the subject property.

State Hazardous Waste Sites

The subject property is not listed with the New York State Department of Environmental Conservation (NYSDEC) as an inactive hazardous waste disposal site. According to NYSDEC records, there are no inactive hazardous waste disposal sites located within 1.0 mile of the subject property.

Hazardous Waste Storage and Disposal

SQG/LQG GENERATORS

The subject property is not identified in USEPA records as the location of a small quantity or large quantity generator (SQG/LQG) of hazardous waste. According to USEPA records, there are no registered generators of hazardous waste on adjoining properties.

TSD FACILITIES

The subject property is not registered with the USEPA as a treatment, storage or disposal (TSD) facility for hazardous waste or materials. According to USEPA records, there are no TSD facilities known to be located within 1.0 mile of the subject property.

Landfills and Solid Waste Disposal Facilities

The subject property is not listed with the NYSDEC as an active or inactive landfill, transfer station or solid waste disposal facility. There are no active or inactive landfills, transfer stations or solid waste disposal facilities located within 0.5 mile of the subject property.

The subject property is not listed with the NYSDEC as a resource recovery facility. There are no resource recovery facilities located within 0.5 mile of the subject property.

Major Oil Storage Facilities

According to NYSDEC records, the subject property (Garret-Storm, Inc.) is registered with the NYSDEC as a major oil storage facility (MOSF) site (MOSF #3-2500). NYSDEC records indicate that the current status of this facility is "temporarily closed" and that no tanks are located on the subject property. Previous investigations of this property indicate that during the operation of this site as a MOSF, nine (9) aboveground storage tanks (ASTs) and two (2) underground storage tanks (USTs) were located on the site: six (6) 20,000-gallon ASTs, two (2) 300,000-gallon ASTs, and one (1) 1,500,000-gallon AST were present on this site. The capacities of the two USTs which were used as spill overflow tanks are unknown. Available information indicates that the major oil storage facility ceased operations in 1992 and that all of the tanks were removed by July 1994. No documentation of the removal of any of the tanks from the subject property could be provided to this office for review.

Petroleum contaminated soil and groundwater is known to be present on the former Garret-Storm MOSF site (see Section 3.2.4, above and the State Chemical and Petroleum Spills Section, below).

Petroleum Bulk Storage

SUBJECT PROPERTY

According to NYSDEC records, the subject property is not registered as a petroleum bulk storage facility; however, the subject property is registered with the NYSDEC as a major oil storage facility (see above). No fill ports or vent pipes likely serving underground petroleum bulk storage tanks were noted on the subject property during the site inspection. However, observations made during the site inspection indicate the presence of an active 275-gallon aboveground petroleum bulk storage tanks (AST) and three (3) abandoned 275-gallon ASTs on the subject property.

See Section 3.4.3, below for a more complete discussion of all identified tanks. See the Selected Site Features Map, Page 20 of this Audit for the approximate locations of all identified tanks.

Petroleum Bulk Storage Regulations

NYSDEC Petroleum Bulk Storage Regulations 6 NYCRR Parts 612-614 require that all petroleum storage facilities with a combined storage capacity greater than 1,100 gallons register all on-site tanks with the NYSDEC. The known aboveground petroleum bulk storage capacity on the subject property is currently 275 gallons; therefore, the subject property is exempt from 6 NYCRR, Parts 612-614.

ADJOINING PROPERTIES

According to NYSDEC records, there are no petroleum bulk storage facilities located on adjoining properties. Observations made during the site inspection indicated the presence of three (3) approximate 6,000-gallon former USTs, one (1) approximate 10,000-gallon former UST and one (1) abandoned 275-gallon AST located on the adjoining property to the south. No historic documentation of the removal of any underground storage tanks on this adjoining property is known to exist.

Chemical Bulk Storage

No chemical bulk storage tanks are registered with the NYSDEC for the subject property or for any adjoining properties and no chemical bulk storage tanks or evidence of underground chemical bulk storage tanks (e.g., fill ports, vent pipes) were noted on the subject property during the site inspection.

Federal Chemical and Petroleum Spills

There are currently no chemical or petroleum spills on record with the USEPA's Emergency Response Notification System (ERNS) database for the subject property.

State Chemical and Petroleum Spills

There are currently two (2) petroleum spills known to have occurred on the subject property since 1986 (records updated through June 1996); a third spill of which no formal documentation exists is also known to have occurred on the subject property. Provided below is a description of all of these adjoining spill events.

Garret-Storm Site

According to the November 1994 Report prepared by Ecosystems Strategies, Inc., a spill involving the release of an unknown quantity of fuel oil onto the ground was reported to the Coast Guard in 1981 or 1982. The spill occurred when a valve was left open for an undetermined length of time allowing fuel oil to be discharged into the diked fuel storage area. The floating product was pumped back into the filter tank; however, an undetermined amount was not recovered.

Spill #8900064 occurred on April 4, 1989 when an unspecified quantity of an unknown petroleum product was released as a result of an unknown cause; groundwater is indicated as having been affected by this release. NYSDEC records indicate that possible petroleum contaminated soil and groundwater was encountered during the installation of monitoring wells. This spill event is listed with a "Closure Date" of June 10, 1989 indicating that investigative and/or remedial actions have been completed to the satisfaction of the NYSDEC.

Possibly related to spill #8900064 is information in NYSDEC records which indicates that a "slight fuel odor and a sheen" was noted during the extension of monitoring wells and that analysis of groundwater samples collected from an unspecified well (i.e., well either on subject property or on adjoining property to the south) detected petroleum hydrocarbons.

Spill #9212560 occurred on February 4, 1993 when an unspecified quantity of contaminated soil was encountered during the extension of test pits on the subject property; groundwater is indicated as having been affected by this release. This release is listed as "Active" with the NYSDEC indicating that additional information and/or remedial action has been requested by the NYSDEC.

Spills Within 0.25 Mile of Subject Property

A review of the NYSDEC spill records further indicates that there are two (2) other spill events which are known to have occurred within 0.25 mile of the subject property since 1986. A summary of the available information for each of the adjoining and vicinity spill events is provided in Table 3, below (Table does not include information on spill reported to the Coast Guard).

Table 3: Recorded Chemical and Petroleum Spills Within 0.25 Mile of Subject Property
(Spills that have occurred on the subject property are shown in **bold**)

Spill Number	Spill Date	Address of Spill (Location)	Product	Quantity (gallons)	Cause	Closure Date[2]
8707165	Unspecified	Dennings Avenue (Sewage Treatment Plant)	Unspecified	0[1]	Tank Test Failure	Unspecified
8900064	4/4/89	Garret-Storm (Ferry Street)	Unknown Petroleum Product	0[1]	Unknown	6/10/89
9212560	2/4/93	Garret-Storm (Ferry Street)	#2 Fuel Oil	0[1]	Unknown	Active
9403880	6/19/94	16 Main Street (Beacon Oil)	#2 Fuel Oil	10	Equipment Failure	6/27/94

Notes: 1. "0" gallons denotes that no product was reported as being spilled or that the quantity spilled could not be determined by NYSDEC.
2. Spills provided with a "Closure" date are generally events wherein investigative and/or remedial actions have been completed to the satisfaction of the NYSDEC. Files which are not provided with "Closure" dates are generally spills wherein additional information or action has been requested by the NYSDEC.

Air Discharges

No air discharge permits are known to have been issued by the NYSDEC for the subject property and no operations likely to require an air discharge permit were noted on the subject property during the site inspection.

Wastewater Discharges

No NYSDEC permits for wastewater discharges are known to exist for the subject property and no current operations likely to require a wastewater discharge permit were noted on the subject property during the site inspection. According to available information, the on-site marina clubhouse is connected to a private sewer system; the location of this system could not be determined.

Groundwater Usage

According to available information, no on-site potable wells or uses of groundwater are known to exist on the subject property. According to available information, the on-site marina clubhouse is connected to the central water system. Four (4) monitoring wells are located on the subject property; these wells were installed in September 1994 by Ecosystems Strategies, Inc. and designated subcontractors. Sampling of these wells and wells located on adjoining properties was performed by Ecosystems Strategies, Inc. in October 1994 and January 1997 (see Section 3.2.4, above regarding testing completed in October 1994 and Section 3.5, below regarding sampling performed in January 1997).

Radon

Information on radon levels in the vicinity of the subject property was obtained from New York State Department of Health (NYSDOH) documents. No regulatory standards for radon levels currently exist in New York State. The USEPA has established a guidance value (the level where mitigation measures may be appropriate) for radon of 4.0 or greater picoCuries/liter.

According to NYSDOH documents, the average radon level in Dutchess County is 6.7 picoCuries/liter (pCi/liter). This average level is based on radon sampling done in 2118 homes and has a standard deviation of 7.0 pCi/liter. NYSDOH documents further reveal that the average radon level for the subject property's zip code (12508) is 5.4 pCi/liter. This average level is based on radon sampling done in 26 homes and has a standard deviation of 5.8 pCi/liter.

This average county and zip code radon levels suggest the potential presence of elevated radon levels on the subject property; however, no definitive statement can be made regarding on-site radon levels without the placement of radon sampling canisters in the on-site structure.

3.4 Site Inspection

3.4.1 Protocol

A site inspection was conducted on January 15, 1997 in order to address any potential concerns raised during the historical research and regulatory review (above, Sections 3.1 through 3.3) and to identify any additional indications of contamination from the use, storage, or disposal of hazardous or regulated materials. To the extent possible, existing vegetation and topography were examined for any obvious indications of contamination (e.g., vegetative stress, soil stains, or the physical presence of contaminants) or any other unusual patterns.

Section 3.4.2 describes the physical characteristics of the subject property. Section 3.4.3 is divided into topics on specific environmental conditions or concerns, actual or potential, noted on the subject property during the site inspections. Section 3.4.4 describes the physical characteristics of adjoining properties as they concern the potential or actual environmental condition of the subject property.

Identified concerns and/or areas discussed specifically in this Section of this Audit are shown on the Selected Site Features Map, Page 20. Photographs of the subject property are included in Appendix A of this Audit.

3.4.2 Physical Characteristics of Subject Property

3.4.2.1 Property

The subject property is an irregularly-shaped parcel which is located off of Ferry Street between the Consolidated Railroad Corp. right of way (ROW) and the Hudson River; a portion of the subject property (approximately 2.4-acres) extends into the Hudson River. The subject property is a former major oil storage facility that ceased operation in 1992; all of the on-site tanks were removed by July 1994. The subject property contains the remnants of this previous usage including tank cradles and a pump house. The western portion of the subject property is currently used as a marina for the Dutchess Boat Club; a one-story clubhouse and a storage shed are located on the peninsula (see Section 3.4.2.2, below). The central portion of the subject property is comprised of undeveloped vacant land that has been disturbed by the dumping of concrete and dirt.

3.4.2.2 Structures

Present on the western portion of the subject property along the basin of the Hudson River is a one-story clubhouse used by the Dutchess Boat Club. This structure is a wood-frame structure constructed on a concrete block foundation. At the time of the site inspection, the exterior of this structure was being renovated. Representative interior areas of this structure that could be inspected were generally in good condition with wood or tiled floors and newly painted walls. An approximate ten by thirty feet wood shed is located north of the clubhouse; the interior of this shed could not be inspected, however, it is believed to be used for storage. See the Selected Site Features Map on Page 20 of this Audit for the approximate locations of these structures.

3.4.3 Specific On-Site Environmental Conditions

Debris Areas

Scattered debris consisting of household trash, metal, abandoned empty tanks, and wash-up materials from the River was noted on the northwestern peninsula of the subject property; wash-up materials were also noted on the southwestern peninsula. The majority of the central portion of the subject property in the vicinity of the former fuel storage area has been disturbed by the dumping of broken up concrete and dirt (presumably dumped from off-site sources); this dumping has created irregular topography (i.e., undulating mounds, berms). Fragments of metal and metal piping are also noted scattered throughout the subject property.

At least five (5) abandoned vehicles including two former petroleum tanker trucks are located along the eastern border of the subject property; these vehicles may actually be located on an adjoining property. At least three (3) other abandoned vehicles including a petroleum tanker truck were noted on the northwestern peninsula; however, these trucks may be located on the adjoining property to the north. An inspection of the ground beneath these vehicles could not be performed due to the presence of associated debris and unsafe conditions. See the Selected Site Features Map, Page 20 of this Audit for the approximate locations of identified areas of debris.

Petroleum Bulk Storage

The subject property is known to have been historically utilized as a petroleum bulk storage and distribution center from at least 1927 until 1992; all of the tanks were reportedly removed by July 1994. No documentation of the removal of any of the tanks from the subject property could be provided to this office for review. Specifically, nine (9) aboveground storage tanks with a combined storage capacity of 2,220,000 gallons and two (2) underground storage tanks used for spill overflow were located on the subject property during the operation as a major oil storage facility. No fill ports or vent pipes likely serving underground petroleum bulk storage tanks were noted on the subject property during the site inspection.

Observations made during the site inspection indicate that six (6) tank cradles are still located on the subject property as is the pump house. The surface soils underlying these tank cradles and surrounding the pump house are heavily stained with petroleum and a noticeable petroleum odor was noted in the area. Borings extended in the immediate vicinity of the tank cradles in 1994 identified the presence of contaminated soil extending to approximately four feet below grade and laboratory analyses of soil samples documented elevated levels of petroleum hydrocarbons in the vicinity of monitoring wells RD-2 and RD-6 (see Section 3.2.4, above).

An active 275-gallon aboveground storage tank (AST) used to store fuel oil was noted adjacent to the southern side of the on-site clubhouse. Two (2) abandoned ASTs were noted adjacent to the former fuel storage area and monitoring well RD-4 (see the Selected Site Features Map, Page 20). These tanks were labeled as having contained fuel oil and one of the tanks appeared to be partially filled with some type product. No strong petroleum odor was emanating from the tanks and the soil in the vicinity of the tanks did not appear to be noticeably stained. A third abandoned 275-gallon tank was noted on the western peninsula of the subject property; this tank and the ground immediately beneath the tank could not be inspected.

Chemical Storage

No chemical bulk storage tanks or fill ports or vent pipes likely serving underground storage tanks were noted on the subject property during the site inspection.

Asbestos-Containing Materials

Asbestos containing materials (ACMs) are those materials which are known to contain over 1% of any type of asbestos. No material suspected of containing asbestos was noted on the subject property during the site inspection. Due to the likely date of construction of the on-site clubhouse (1950), asbestos-containing materials (e.g., roofing materials, floor tiles, wallboard) may have been used during initial construction and/or during subsequent maintenance work.

Lead-Based Paint

The presence or absence of lead-based paint can only be determined through the material analysis of paint samples. The manufacture of lead-based paint is known to have ceased in 1978. The presence of deteriorated paint is indicative of a potential health risk in that paint dust and chips could be inhaled and/or ingested.

The likely date of construction of the on-site clubhouse (1950) indicates that lead-based paint may have been used during initial construction and/or during subsequent maintenance work. Paint suspected of containing lead was noted on exterior trim surfaces of the on-site clubhouse; these areas were generally in poor condition as paint was flaking from the surface. Interior painted portions of the on-site structure were generally in good condition.

Water Supply and Sewage Disposal

No on-site potable water supply wells are known to be located on the subject property and no such wells were noted during the site inspection. According to available information, the on-site marina clubhouse is connected to the central water system and a private sewer system; the location of this sewer system could not be determined during the site inspection.

Four (4) monitoring wells are located on the subject property; these wells were installed in September 1994 by Ecosystems Strategies, Inc. and designated subcontractors. Sampling of these wells and wells located on adjoining properties was performed by Ecosystems Strategies, Inc. in October 1994 and January 1997 (see Section 3.5, below).

Topographic Irregularities

The majority of the central portion of the subject property in the vicinity of the former fuel storage area has been disturbed by the dumping of broken-up concrete and dirt (brought onto the site from off-site sources, according to a representative of the boat club); this dumping has created irregular topography (i.e., undulating mounds, berms).

Surface Waters

The surface waters of the Hudson River could not be inspected by this office at the time of the site inspection as the waters along the banks were frozen.

Vegetative Features

Petroleum contaminated subsurface soil is known present on the subject property. Heavily stained soil was noted in the vicinity of the tank cradles and the pump house; this area is generally devoid of vegetation.

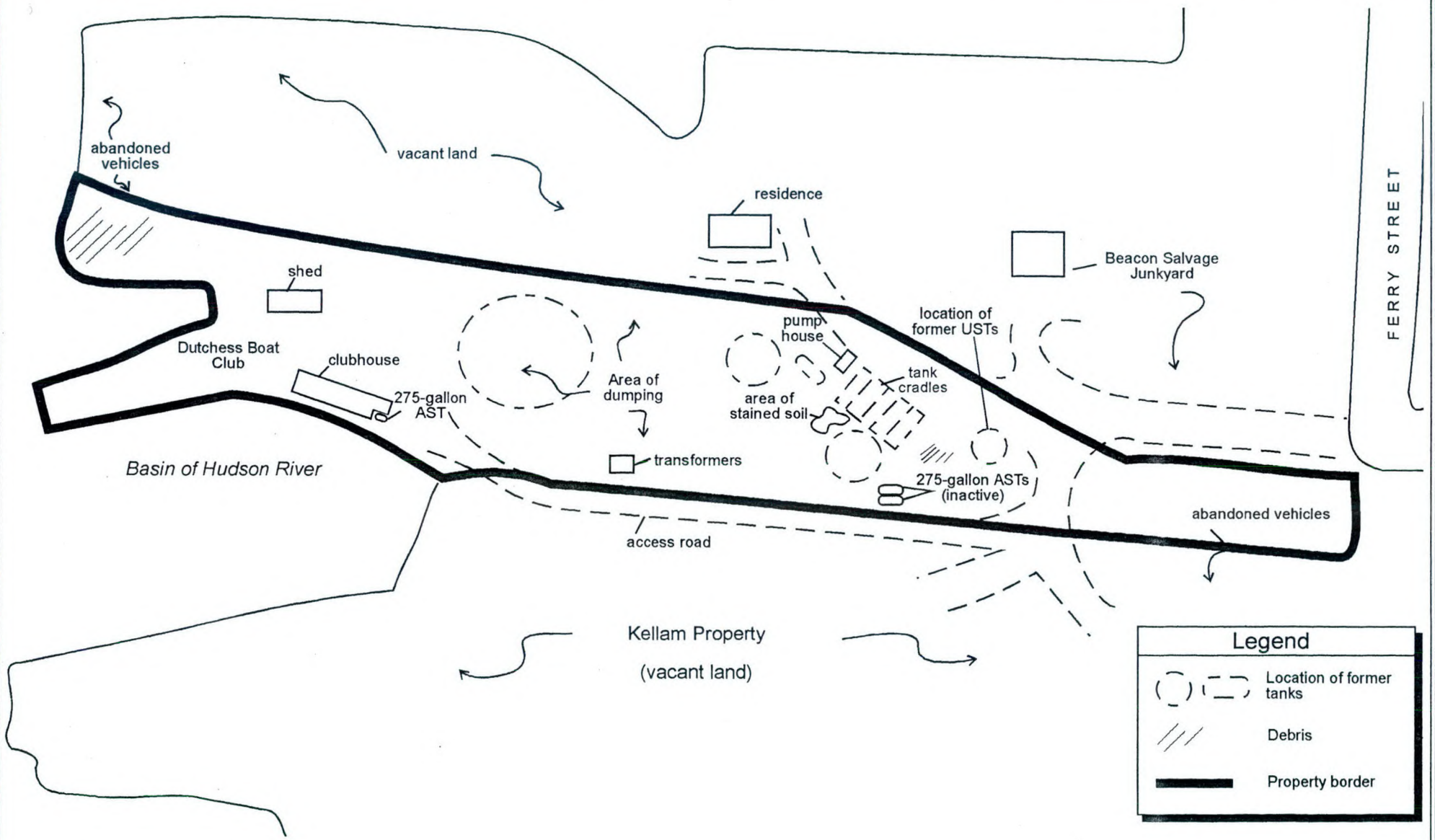
PCBs

An inspection for the presence of equipment likely to contain PCBs was conducted by this office during the site inspection. PCBs were widely used in equipment such as transformers, capacitors and hydraulic equipment until 1979 when the USEPA banned their use in this capacity.

Two (2) inactive pole-mounted transformers were noted along the southern border of the subject property in the vicinity of monitoring well RD-3. No staining was noted on or around the base of these transformers during the site inspection.

3.4.4 Environmental Conditions on Adjoining Properties

No conditions considered by this office to pose a threat to the environmental integrity of the subject property were noted on adjoining properties during the site inspection. Observations made during the site inspection indicated the presence of three (3) approximate 6,000-gallon former USTs, one (1) approximate 10,000-gallon former UST and one (1) abandoned 275-gallon AST located on the adjoining property to the south. No historic documentation of the removal of any underground storage tanks on this adjoining property is known to exist.



Note: Western property border in Hudson River

Selected Site Features Map

Former Garret - Storm, Inc. MOSF Site
City of Beacon, Dutchess County, New York

N

ESI File Number: SG96152.20
January 1997
Not to Scale

3.5 Field Work

On January 15, 1997 Ecosystems Strategies, Inc. sampled the four (4) on-site monitoring wells and the four (4) off-site monitoring wells to determine the continued presence or absence of on-site groundwater contamination and whether or not these contaminants have migrated off-site. Field observations and analytical data are combined with data on hydrologic conditions to provide a framework for further investigative and/or remedial activities in support of the ultimate closure of the "Active" spill file with the NYSDEC.

Previous investigations identified the known presence of contaminated subsurface soil and groundwater on the subject property as a result of the historic on-site handling, storage and dispensing of fuel oil during the operation of the subject property as a major oil storage facility. Three spills are known to have occurred on the subject property, two of which are known to have affected groundwater.

3.5.1 Summary of Services

The following services were conducted by Ecosystems Strategies, Inc. personnel:

- Conducted field screening and completed depth to groundwater measurements at each of the eight (8) monitoring wells;
- Collected a groundwater sample from each of the monitoring wells for laboratory analysis of poly aromatic hydrocarbons (PAHs) using USEPA Method 8270. Two (2) of the samples were also analyzed for volatile organic compounds (VOCs) using USEPA Method 8240; and
- Suggested (if appropriate) further investigative and/or remedial actions regarding the presence or absence groundwater contamination.

3.5.2 Field Work Methodology

Field screening with a Thermal Instruments 580B photoionization detector (PID) could not be performed due to the cold temperatures at the time of sampling.

Prior to sampling, depth to groundwater measurements were collected at each of the eight (8) monitoring well locations with a Solinst water level meter. The depth to groundwater for each monitoring well was recorded by Ecosystems Strategies, Inc. personnel on field data sheets; groundwater measurements as documented in January 1996 and the groundwater depth measurements from the previous October 1994 data collection days are provided in Table 4 on Page 24.

Groundwater sample collection from the on and off-site monitoring wells proceeded in the following order: RD-3, RD-7, RD-4, RD-9, RD-K1, RD-K2, RD-6 and RD-2. The specific locations of the monitoring wells are shown on the Direction of Groundwater Flow Map on Page 25 of this Audit.

Prior to sample collection, approximately three well volumes (approximately 5 gallons) were purged from each monitoring well with a mechanical pump decontaminated between wells to avoid cross-contamination; the specific amount purged depended on the total depth of the well and the volume of water in the well column. Purgewater was screened for any visual or olfactory indications of petroleum contamination (see Section 3.5.3, below).

At each monitoring well location, one (1) groundwater sample was collected using individual disposable bailors for laboratory analysis of the poly aromatic hydrocarbons (PAHs) using USEPA Method 8270. Two (2) of the samples (RD-2 and RD-6) were also analyzed for volatile organic compounds (VOCs) using USEPA Method 8240.

All groundwater samples were collected in a manner consistent with USEPA and NYSDEC sample collection protocols. All sample collection equipment was properly decontaminated prior to the initiation of sampling and between sample locations to avoid cross contamination. All samples were collected in sample vials sterilized at the laboratory; each sample vial was provided by the laboratory with hydrochloric acid for sample preservation. After sample collection, the jars were placed in a cool (4° C), dry place prior to their transport to the laboratory.

At the completion of sampling, all groundwater samples were transported via overnight delivery to Matrix Analytical, Inc., a New York State Department of Health approved laboratory (ELAP Certification Number: 11116). Appropriate chain of custody procedures were followed. Complete laboratory results for the groundwater samples are provided in Appendix E of this Audit.

3.5.3 Field Work Observations

Purgewater exhibiting a petroleum odor (the intensity of the odor varied) was encountered at each monitoring well location except RD-9 and RD-K2. The strongest odors were observed in the purgewater from monitoring wells RD-2 and RD-6 (wells located in immediate vicinity of former fuel storage and distribution area). A sheen was also noted on the purgewater from RD-2 and RD-6. These initial observations are consistent with the previous October 1994 sampling round which identified strong petroleum odors and sheens from the monitoring wells located within the former fuel storage and distribution area.

3.5.4 Action Levels

The term "action level," as defined in this Audit, 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 groundwater relative to conditions which are likely to present a threat to public health, given the existing and probable future uses of the site. Groundwater with contaminant levels exceeding these action levels is considered more likely to warrant remediation. No independent risk assessment was performed as part of this investigation.

The action levels identified in this Audit for groundwater are determined based on the NYSDEC Spill Technology and Remediation Series (STARS) Memo #1: Petroleum-Contaminated Soil Guidance Policy (August 1992). In accordance with standards set forth in the above-referenced document, all compounds referenced below are presented with their respective action levels.

3.5.5 Analytical Results

Laboratory analyses detected petroleum hydrocarbons in only two (2) of the eight (8) monitoring wells: 10 parts per billion (ppb) of 1-methyl napthalene in RD-6 and 5 ppb of 1-methyl napthalene in RD-2. Both of these detected levels are either at or below the NYSDEC-designated action level for 1-methyl napthalene (10 ppb). The remaining PAHs analyzed for were present at non-detectable levels in RD-2 and RD-6; detection limits were either at or below NYSDEC-designated action levels for specific compounds. No PAHs were detected in any of the other eight (8) monitoring wells; detection limits were either at or below NYSDEC-designated action levels for specific compounds.

The laboratory data are consistent with field observations which identified petroleum odors and sheens on the purgewater collected from RD-2 and RD-6. However, the laboratory data appear to be inconsistent with field observations in that odors were also noted in the other on-site wells (no elevated levels of petroleum hydrocarbons were detected in these wells). The absence of detectable concentrations at the other two monitoring wells within the former oil storage and distribution area suggests that the petroleum hydrocarbons may not be fully dissolved in the groundwater.

Current laboratory data are consistent with the previous October 1994 data in that elevated levels of petroleum hydrocarbons were only detected in the wells in the immediate vicinity of the fuel storage and distribution area (RD-2 and RD-6); however, the detected levels in January 1997 no longer exceed designated action levels. Specifically, laboratory analysis of the October 1994 samples detected the presence of elevated levels of napthalene (120 ppb), 1-methyl napthalene (380 ppb), and 2-methyl napthalene (480 ppb) in RD-2 and 2-methyl napthalene (120 ppb) in RD-6. Only 10 ppb and 5 ppb of 1-methyl napthalene were detected in RD-2 and RD-6, respectively during the January 1997 sampling; the other two previously detected compounds were not detected in January 1997.

The continued absence of detectable concentrations of PAHs in any of the off-site wells including RD-K1 and RD-K2 located on the adjoining property to the south suggests that any contaminated groundwater that may have previously been present on the subject property has not migrated off-site.

3.5.6 Site Hydrology

3.5.6.1 Mean Groundwater Elevations

To date, groundwater elevation data have been collected on the site on three separate dates to provide information on groundwater elevations and flow patterns. On-site groundwater is known to be influenced by tidal fluctuations due to the proximity of the subject property to the Hudson River; therefore, different elevations and flow patterns are expected as fluctuations in the tide occur.

Previous groundwater elevations were collected in the afternoon of October 3, 1994 (high tide) and the morning of October 4, 1994 (low tide). The groundwater measurements collected on January 15, 1997 were collected during the general time of low tide. Groundwater elevation data from these measurements and the January 15, 1997 measurements are summarized in Table 4, below (Table includes all on-site and off-site well data). To date, data indicate that groundwater is present on the site between 2.96 feet below grade and 6.36 feet below grade. Groundwater elevation was on average approximately 0.22 feet higher in October 1994 than in January 1997 (both sets of measurements collected during times of low tide).

Table 4: Summary of Water Level Data
(All elevations are in feet above mean sea level)

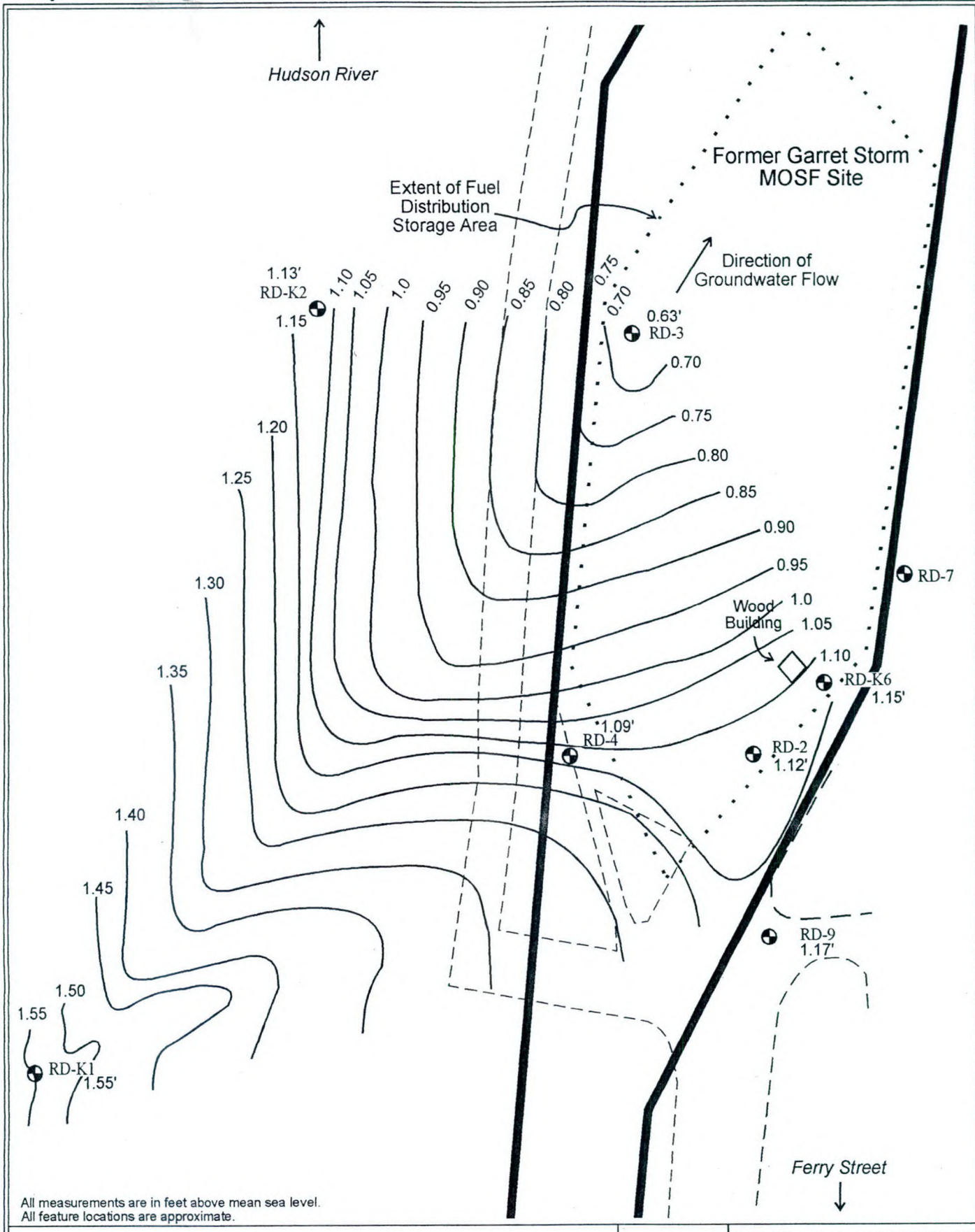
Location	Top of Casing Elevation[1]	Groundwater Level Elevations		
		October 3, 1994[2]	October 4, 1994[3]	January 15, 1997[4]
RD-2	7.48	1.70	1.50	1.12
RD-3	4.72	1.76	1.48	0.63
RD-4	5.18	1.70	1.50	1.09
RD-6	6.82	1.72	1.49	1.15
RD-7	8.70	1.96	1.48	1.41
RD-9	12.88	1.67	1.56	1.17
RD-K1	6.89	1.99	1.89	1.55
RD-K2	6.94	1.74	1.37	1.13

Notes:
1. Based on survey provided by Hayward and Pakan Associates
2. Depth to water measurements collected between 2:00 pm and 3:00 pm
3. Depth to water measurements collected between 9:00 am and 10:00 am
4. Depth to water measurements collected between 10:00 am and 11:30 am

3.5.6.2 Direction of Groundwater Flow Data

Direction of groundwater flow is graphically represented on the Direction of Groundwater Flow Map for data collected on January 15, 1997 (see Page 25 of this Audit). Direction of Groundwater Flow Maps for previous data sets (October 3, 1994 and October 4, 1994) are provided in Appendix F of this Audit; the same base map was used for each Direction of Groundwater Flow Map.

January 1997 data suggest that groundwater is moving in a northwesterly direction. Data collected to date indicate that groundwater is moving in a northeasterly direction during times of rising tides and in a southwesterly or northwesterly direction during times of low tides. These directions are varied due to the presence of fill material in the subsurface and the tidal fluctuations.



All measurements are in feet above mean sea level.
All feature locations are approximate.

Direction of Groundwater Flow Map

Former Garret Storm, Inc. MOSF Site
City of Beacon, Dutchess County, New York

N

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January 1997
Scale: 1" = 70" (approximately)
Page 25

4.0 Conclusions and Recommendations

This Audit has been performed on the approximate 6.9-acre (4.5-acres above water and 2.4-acres under water) former Garret Storm, Inc. Major Oil Storage Facility (MOSF) located off of Ferry Road in the City of Beacon, Dutchess County, New York as fully described in Section 2.0, above. Based on the work performed by this office to date, the following Conclusions and Recommendations (in **bold**) are made regarding the subject property. Cost estimates for proposed recommendations are provided in *italics*.

Historic Investigation

1. Historic information obtained from a review of historic maps, photographs, and previous reports identified historic environmental conditions which may represent a financial liability. The following is a summary of these identified environmental concerns:

   Historic Maps and Documents

   A review of Sanborn Fire Insurance Company Maps, aerial photographs and previous reports indicates that the subject property has historically (since at least 1927 until 1992) been utilized as a major oil storage facility and distribution center operated by Garret Storm, Inc.; all of the tanks were reportedly removed by July 1994. No documentation of the removal of any of the tanks from the subject property could be provided to this office for review. Specifically, nine (9) aboveground storage tanks with a combined storage capacity of 2,220,000 gallons and two (2) underground storage tanks used for spill overflow were located on the subject property during the operation as a major oil storage facility.

   See recommendations in Paragraphs #4 and #20, below.

   Available information indicates that a majority of the subject property has been reclaimed over time by filling activities including the recent deposition of demolition and building materials (see Paragraph #11, below).

   See recommendations in Paragraph #11, below.

   Previous Environmental Investigations

   Numerous previous investigations of the subsurface have been conducted on the subject property since at least 1987. These investigations have generally involved the extension of borings and test pits and the completion and sampling of on-site monitoring wells to determine whether the subject property has been impacted by historic site usage including the on-site storage, handling and distribution of petroleum.

   A subsurface and groundwater investigation performed on the subject property and adjoining properties by Ecosystems Strategies, Inc. between September 1994 and October 1994 documented the presence of petroleum odors, instrument indications of contamination, and soil saturated with product in borings extended within the former fuel storage and distribution area. Floating product was also noted on the groundwater encountered in the borings.

   Laboratory analyses of soil samples collected from the borings documented the presence of elevated levels of hydrocarbons in two of the borings extended within the former fuel storage and distribution area. Petroleum hydrocarbons were also detected at three other boring locations outside of the main storage and distribution area but at levels below designated action levels.

Groundwater sampling of the current monitoring wells was conducted by Ecosystems Strategies, Inc. in October 1994. Laboratory analysis documented the presence of elevated levels of petroleum hydrocarbons in two of the wells (RD-2 and RD-6); all detected compounds were detected at levels above NYSDEC-designated action levels. No petroleum hydrocarbons were detected in groundwater samples collected from wells located outside of the former fuel storage and distribution area suggesting that the contaminants are not migrating off-site.

Ecosystems Strategies, Inc. sampled the on-site and adjoining monitoring wells on January 15, 1997 to document the continued presence or absence of groundwater contamination and determine whether off-site migration of contaminants is occurring (see Paragraph #20, below).

See recommendation in Paragraph #20, below.

2. According to observations made during the site inspection and a review of NYSDEC and Federal Wetlands Maps for the subject property, there no NYSDEC or federally-designated wetlands located on the subject property. However, almost the entirety of the subject property is located within a designated 100-year flood zone. Any construction within federally designated wetland areas, their vicinity, or within the flood zone may require state, federal and/or local permits.

   No further investigation is recommended at this time. Any construction on the subject property should be conducted in accordance with applicable wetland and flood zone regulations.

Review of Regulatory Agency Records

3. A review of state, county and federal regulatory agency databases for the subject property indicates that the subject property was not identified on any of the databases for hazardous waste sites; hazardous and solid waste storage, generation and/or disposal sites; inactive or active landfills; chemical bulk storage; or air/wastewater discharges.

   No further investigation is recommended.

4. According to NYSDEC records, the subject property (Garret Storm, Inc.) is registered with the NYSDEC as a major oil storage facility (MOSF) site (#3-2500). NYSDEC records indicate that the current status of this facility is "temporarily closed" and that no tanks are located on the subject property. Previous investigations of this property indicate that during the operation of this site as a MOSF, nine (9) aboveground storage tanks (ASTs) with a combined storage capacity of 2,220,000 gallons and two (2) underground storage tanks (USTs) were located on the site. Available information indicates that the major oil storage facility ceased operations in 1992 and that all of the tanks were removed by July 1994. No documentation of the removal of any of the tanks from the subject property could be provided to this office for review.

   It is recommended that the NYSDEC be contacted to revise the current status of the Garret Storm, Inc. site to "Closed". It is further recommended that the property owner provide documentation on the closure and/or removal of the two on-site USTs.

5. A review of NYSDEC records indicates that there are two (2) spill events which are known to have occurred on the adjoining Garret-Storm property; a third spill of which no formal documentation exists is also known to have occurred on this adjoining site. Groundwater is indicated as having been affected by at least two of these releases. One of these spill events (#9212560) is currently listed as "Active" with the NYSDEC.

The direction of groundwater flow on the subject property is known to fluctuate due to tidal influences; therefore, migration of product onto adjoining properties is possible. However, groundwater sampling of the off-site monitoring wells in October 1994 and January 1997 did not document the presence of concentrations of petroleum hydrocarbons. Based on information and data obtained to date, it appears as if the environmental integrity of the adjoining properties has not been affected by any of the known releases on the subject property.

See recommendations in Paragraphs #12 and #20, below.

6. No petroleum bulk storage tanks are registered with the NYSDEC for the subject property and no fill ports or vent pipes likely serving underground petroleum bulk storage tanks (USTs) were noted on the subject property. No documentation of the removal of any USTs from the subject property is known to exist. Observations made during the site inspection indicate the presence of an active 275-gallon aboveground storage tank (AST) used to store fuel oil located adjacent to the southern side of the on-site clubhouse.

   NYSDEC Petroleum Bulk Storage Regulations 6 NYCRR Parts 612-614 require that all petroleum storage facilities with a combined storage capacity greater than 1,100 gallons register all on-site tanks with the NYSDEC. The known aboveground petroleum bulk storage capacity on the subject property is currently 275 gallons; therefore, the subject property is exempt from 6 NYCRR, Parts 612-614.

   No further investigation is recommended.

7. No chemical bulk storage tanks are registered with the NYSDEC for the subject and no chemical bulk storage tanks requiring registration with the NYSDEC were noted on the subject property during the site inspection.

   No further investigation is recommended.

8. No NYSDEC permits for wastewater discharges or air discharges are known to exist for the subject property and no operations likely to require an air or wastewater discharge permit were noted on the subject property during the site inspection. Available information indicates that the on-site structure is connected to the central water system and a private sewer system.

   No further investigation is recommended.

9. A review of state and federal regulatory agency databases for adjoining and vicinity properties indicates that:

   - There are no hazardous waste sites; hazardous and solid waste storage, generation and/or disposal sites; inactive or active landfills; chemical bulk storage facilities; chemical spill events; or air/wastewater discharges associated with immediately adjoining properties.

     No further investigation is recommended.

   - According to a review of NYSDEC spill records, there are two (2) spills known to have occurred within 0.25 mile of the subject property (records updated through June 1996). It is unlikely that the environmental integrity of the subject property was affected by any of these spills due to the intervening distance and topography between the subject property and these sites.

     No further investigation is recommended.

10. According to NYSDOH documents, the average radon level in Dutchess County is 6.7 picoCuries/liter (pCi/liter) and the average radon level for the subject property's zip code (12508) is 5.4 pCi/liter. No regulatory standards for radon level currently exist in New York State. The USEPA has established a guidance value of 4.0 or greater pCi/liter.

    These average radon levels suggest the potential presence of elevated radon levels on the subject property; however, no definitive statement can be made regarding on-site radon levels without the placement of radon sampling canisters in the on-site structure.

    Due to the non-residential usage of the subject property, no further investigation is recommended. If residential usage is proposed, it is recommended that radon sampling be conducted in the on-site structure to document the presence or absence of on-site elevated radon levels. Pending testing results, structural modifications to proposed units may have to be implemented.

Site Inspection

11. Scattered debris consisting of household trash, metal, abandoned empty tanks, and wash-up materials from the Hudson River was noted on the northwestern peninsula of the subject property; wash-up materials were also noted on the southwestern peninsula. The majority of the central portion of the subject property in the vicinity of the former fuel storage area has been disturbed by the dumping of broken-up concrete and dirt (presumably dumped from off-site sources); this dumping has created irregular topography (i.e., undulating mounds, berms). Fragments of metal and metal piping are also noted scattered throughout the subject property.

    It is recommended that all debris be segregated into that which can be disposed of as solid waste and that which may require special handling. All debris should then be removed from the subject property in accordance with applicable state and local regulations. Proper documentation of the removal of all debris materials requiring special handling should be maintained.

    The estimated cost of debris removal is less than $10,000.

    At least eight (8) abandoned vehicles including former petroleum tanker trucks are located along the eastern border of the subject property and on the northwestern peninsula; these vehicles may actually be located on an adjoining property. An inspection of the ground beneath these vehicles could not be performed due to the presence of associated debris and unsafe conditions.

    It is recommended that all on-site abandoned vehicles be drained of all internal liquids and be disposed of in accordance with applicable state and local regulations. Proper documentation of the disposal of internal fluids from the vehicles should be maintained.

12. Observations made during the site inspection indicate that six (6) tank cradles are still located on the subject property as is the pump house. The surface soils underlying these tank cradles and surrounding the pump house are heavily stained with petroleum and a noticeable petroleum odor was noted in the area. Borings extended in the immediate vicinity of the tank cradles in 1994 identified the presence of contaminated soil extending to approximately four feet below grade and laboratory analyses of soil samples documented elevated levels of petroleum hydrocarbons in the vicinity of RD-2 and RD-6.

    It is recommended that contaminated soil in the immediate vicinity of the former fuel distribution area and the tank cradles be properly remediated. It is estimated that the total volume of soil requiring remediation is between 300 and 600 cubic yards.

    The estimated costs associated with this remediation are between $30,000 and $40,000.

An active 275-gallon aboveground storage tank (AST) used to store fuel oil and two (2) abandoned ASTs were noted on the subject property. The abandoned tanks were labeled as having contained fuel oil and one of the tanks appeared to be partially filled with some type product. No strong petroleum odor was emanating from the tanks and the soil in the vicinity of the tanks did not appear to be noticeably stained. A third abandoned 275-gallon tank was noted on the western peninsula of the subject property.

It is recommended that all of the abandoned tanks be drained of any product in accordance with NYSDEC Petroleum Bulk Storage Regulations 6 NYCRR, Parts 612-614 and that they subsequently be removed from the subject property and disposed of as scrap metal.

It is estimated that the cost associated with the draining and removal of the abandoned tanks will be $5,000.

13. No chemical bulk storage tanks were noted on the subject property and no fill ports or vent pipes likely serving any underground chemical bulk storage tanks were noted on the subject property.

No further investigation is recommended.

14. No material suspected of containing asbestos was noted on the subject property during the site inspection. Due to the likely date of construction of the on-site clubhouse (1950), asbestos-containing materials (e.g., roofing materials, floor tiles, wallboard) may have been used during initial construction and/or during subsequent maintenance work.

It is recommended that any suspect material encountered during maintenance, renovation or demolition activities be analyzed for asbestos content or be treated as though it contained asbestos. All maintenance, renovation or demolition activities should be conducted in accordance with applicable regulations.

15. The likely date of construction of the on-site clubhouse (1950) indicates that lead-based paint may have been used during initial construction and/or during subsequent maintenance work. Paint suspected of containing lead was noted on exterior trim surfaces of the on-site clubhouse; these areas were generally in poor condition as paint was flaking from the surface. Interior painted portions of the on-site structure were generally in good condition.

It is recommended that any suspect paint encountered during maintenance, renovation or demolition activities be analyzed for lead content or be treated as though it were lead-based paint. All maintenance, renovation or demolition activities should be conducted in accordance with applicable guidelines and regulations. Any debris generated during renovation and/or demolition activities should be sampled for lead content and be handled in accordance with federal regulations.

16. No on-site potable water supply wells are known to be located on the subject property and no such wells were noted during the site inspection. According to available information, the on-site marina clubhouse is connected to the central water system and a private sewer system.

No further investigation is recommended.

17. The majority of the central portion of the subject property in the vicinity of the former fuel storage area has been disturbed by the dumping of broken-up concrete and dirt (brought onto the site from off-site sources, according to a representative of the boat club); this dumping has created irregular topography (i.e., undulating mounds, berms).

See recommendation in Paragraph #11, above.

18. Two (2) inactive pole-mounted transformers were noted along the southern border of the subject property in the vicinity of monitoring well RD-3. No staining was noted on or around the base of these transformers during the site inspection.

No further investigation is recommended at this time. If these transformers are to be removed from the subject property, it is recommended that provisions be made for the possible presence of PCBs within the transformers. The dismantling and disposal of these transformers should be performed in accordance with applicable regulations.

19. No conditions considered by this office to pose a threat to the environmental integrity of the subject property were noted on adjoining properties during the site inspection.

No further investigation is recommended.

Field Work

20. On January 15, 1997 Ecosystems Strategies, Inc. sampled the four (4) on-site monitoring wells and the four (4) off-site monitoring wells to determine the continued presence or absence of on-site groundwater contamination and the presence or absence of off-site migration of contaminated groundwater.

Laboratory analyses detected only one petroleum hydrocarbon (1-methyl napthalene) in only two (RD-2 and RD-6) of the eight (8) monitoring wells but at levels below NYSDEC-designated action levels. No PAHs were detected in any of the other eight (8) monitoring wells; detection limits were either at or below NYSDEC-designated action levels for specific compounds.

The laboratory data are consistent with field observations which identified petroleum odors and sheens on the purgewater collected from RD-2 and RD-6. However, the laboratory data appear to be inconsistent with field observations in that odors were also noted in the other on-site wells (no elevated levels of petroleum hydrocarbons were detected in these wells). The absence of detectable concentrations at the other two monitoring wells within the former oil storage and distribution area suggests that the petroleum hydrocarbons may not be fully dissolved in the groundwater.

Current laboratory data are consistent with the previous October 1994 data in that elevated levels of petroleum hydrocarbons were only detected in the wells in the immediate vicinity of the fuel storage and distribution area (three compounds were detected in RD-2 and one compound was detected in RD-6); however, the detected levels in January 1997 no longer exceed designated action levels.

The continued absence of detectable concentrations of PAHs in any of the off-site wells including RD-K1 and RD-K2 located on the adjoining property to the south suggests that any contaminated groundwater that may have previously been present on the property has not migrated off-site.

It is recommended that free product present in the on-site groundwater be removed through the process of product skimming. Direct discharge of treated groundwater may be appropriate if hydrocarbon concentrations in the resulting effluent remain at current levels.

The estimated costs associated with this proposed remedial action are between $15,000 and $25,000, assuming an operational period of three to five years.

It is further recommended that periodic sampling of all on-site and off-site wells along the northern property border and analysis for petroleum hydrocarbons be conducted.

The periodic testing of on-site and nearby monitoring wells is estimated to cost $4,000 per year.

5.0 Sources of Information

5.1 Regulatory Records Review

USEPA National Priorities List (NPL)

ASTM DATABASE
SEARCH: 1.0 MILE
UPDATED: MAY 1996

LISTING OF SITES WHICH ARE CONSIDERED TO POSE AN IMMEDIATE THREAT TO HUMAN HEALTH AND THE ENVIRONMENT AND HAVE BEEN IDENTIFIED FOR PRIORITY CLEANUP UNDER SUPERFUND.

USEPA Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) List

ASTM DATABASE
SEARCH: 0.5 MILE
UPDATED: MAY 1996

LISTING OF ABANDONED, INACTIVE OR UNCONTROLLED HAZARDOUS WASTE SITES WHICH THE USEPA HAS INVESTIGATED OR IS CURRENTLY INVESTIGATING FOR INCLUSION ON THE NPL.

NYSDEC Registry of Inactive Hazardous Waste Disposal Sites

ASTM DATABASE
SEARCH: 1.0 MILE
UPDATED: JANUARY 1996

LISTING OF FACILITIES SUBJECT TO INVESTIGATIONS CONCERNING LIKELY OR THREATENED RELEASES OF HAZARDOUS SUBSTANCES FROM THOSE FACILITIES.

USEPA Emergency Response Notification System (ERNS)

ASTM DATABASE
SEARCH: TARGET PROPERTY
UPDATED: MAY 1996

LISTING OF RELEASES OF PETROLEUM, CHEMICAL AND/OR HAZARDOUS SUBSTANCES INTO THE ENVIRONMENT AS REPORTED TO THE USEPA AND COAST GUARD.

NYSDEC Leaking Underground Storage Tanks (LUSTs)

ASTM DATABASE
SEARCH: 0.25 MILE
UPDATED: JUNE 1996

SUBSET OF NYSDEC CHEMICAL AND PETROLEUM SPILLS DATABASE (SEE BELOW) LISTING ALL REPORTED LEAKING UNDERGROUND STORAGE TANKS.

NYSDEC Petroleum and Chemical Spill Records

NON-ASTM DATABASE
SEARCH: 0.25 MILE
UPDATED: JUNE 1996

LISTING OF ALL PETROLEUM, CHEMICAL OR HAZARDOUS SUBSTANCE RELEASES REPORTED TO THE NYSDEC.

USEPA Resource Conservation and Recovery Information System (RCRIS) List of Hazardous Waste Generators (SQG/LQG)

ASTM DATABASE
SEARCH: TARGET/ADJOINING PROPERTY
UPDATED: MAY 1996

LISTING OF FACILITIES REGULATED UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) THAT GENERATE HAZARDOUS WASTE.

USEPA Resource Conservation and Recovery Information System (RCRIS) List of Hazardous Waste Treatment, Storage and Disposal Facilities (TSDF)

ASTM DATABASE
SEARCH: 1.0 MILE
UPDATED: MAY 1996

LISTING OF FACILITIES REGULATED UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) THAT TREAT, STORE AND/OR DISPOSE OF HAZARDOUS WASTE.

NYSDEC Petroleum Bulk Storage Tank Records (PBS)

ASTM DATABASE
SEARCH: TARGET/ADJOINING PROPERTY
UPDATED: FEBRUARY 1996

LISTING OF FACILITIES WHICH TYPICALLY STORE MORE THAN 1100 GALLONS OF PETROLEUM PRODUCT IN BULK STORAGE TANKS.

NYSDEC Chemical Bulk Storage Tank Records (CBS)

ASTM DATABASE
SEARCH: TARGET/ADJOINING PROPERTY
UPDATED: FEBRUARY 1996

LISTING OF FACILITIES WHICH STORE ANY VOLUME OF CHEMICALS IN AN UNDERGROUND STORAGE TANK AND/OR MORE THAN 185 GALLONS OF CHEMICALS IN AN ABOVEGROUND STORAGE TANK.

NYSDEC Major Oil Storage Facility Records (MOSF)

NON-ASTM DATABASE
SEARCH: 0.5 MILE
UPDATED: FEBRUARY 1996

LISTING OF FACILITIES STORING 400,000 GALLONS OR GREATER OF PETROLEUM PRODUCT.

NYSDEC Registry of Active Landfills, Transfer Stations and Solid Waste Disposal Facilities

ASTM DATABASE
SEARCH: 0.5 MILE
UPDATED: DECEMBER 1995

LISTING OF ACTIVE LANDFILLS, TRANSFER STATIONS AND SOLID WASTE DISPOSAL FACILITIES.

NYSDEC Registry of Inactive Landfills, Transfer Stations and Solid Waste Disposal Facilities

NON-ASTM DATABASE
SEARCH: 0.5 MILE
UPDATED: APRIL 1995

LISTING OF INACTIVE LANDFILLS, TRANSFER STATIONS AND SOLID WASTE DISPOSAL FACILITIES.

NYSDEC Resource Recovery Projects in New York State

NON-ASTM DATABASE
SEARCH: 0.5 MILE
UPDATED: DECEMBER 1995

LISTING OF ACTIVE RESOURCE RECOVERY FACILITIES.

NYSDOH Basement Radon Readings

NON-ASTM DATABASE
UPDATED: JUNE 1995

LISTING OF RADON LEVELS BY ZIP CODE, MUNICIPALITY AND COUNTY.

5.2 Maps and Documents

Environmental Audit Phase I dated May 5, 1993, prepared by Ecosystems Strategies, Inc. on the adjoining Kellam Property to the south.

Summary Report of Subsurface Investigation and Monitoring Well Installation dated November 30, 1994. Prepared on the former Garret-Storm, Inc. MOSF Site by Ecosystems Strategies, Inc.

Preliminary Hydrogeologic Assessment Beacon Development Project, dated 1987. Prepared by Empire Soils Investigations, Inc. and Thomsen Associates.

Environmental Constraints Analysis Ferry Plaza Project. Prepared by Cortell Associates.

Sanborn Fire Insurance Company Maps dated 1919, 1927, 1946 and 1962.

Aerial photographs dated 1936, 1960, 1970, 1980, 1983 and 1990, available for viewing at the City of Beacon Municipal Building, and the Dutchess County Soil and Water Conservation District.

United States Geological Survey Topographic Map of the Wappingers Falls, NY Quadrangle, dated 1956 (photorevised 1981).

United States Geological Survey Topographic Map of the West Point, NY Quadrangle, dated 1957 (photorevised 1981).

New York State Department of Environmental Conservation Freshwater Wetlands Map of the Wappingers Falls, NY Quadrangle (1973-2nd edition).

National Wetlands Inventory Map of the Wappingers Falls, NY Quadrangle (1990).

Soil Survey of Dutchess County, New York prepared by the US Department of Agriculture (issued September 1994).

Federal Emergency Management Agency's (FEMA) Flood Boundary and Floodway Map of the City of Beacon, New York (Community Panel #360217 0001), effective date March 1, 1984).

5.3 Local Agency Records

City of Beacon Assessor's Office records, reviewed January 29, 1997.

City of Beacon Building Department records, reviewed January 29, 1997.

APPENDIX A

Site Photographs

PHOTOGRAPHS



Photo # 1: Representative view of the subject property looking northeast. Former fuel storage and distribution area in foreground.



Photo # 2: View of the subject property looking west. Area of dumping in foreground.

PHOTOGRAPHS



Photo # 3: View of the former fuel storage and distribution area including remaining tank cradles.

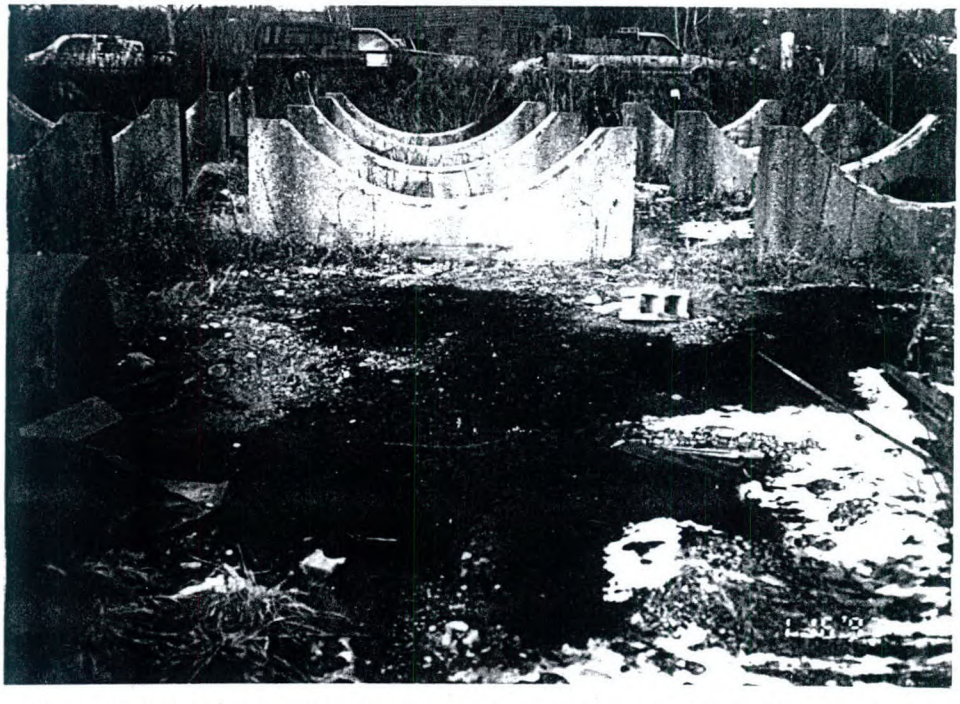
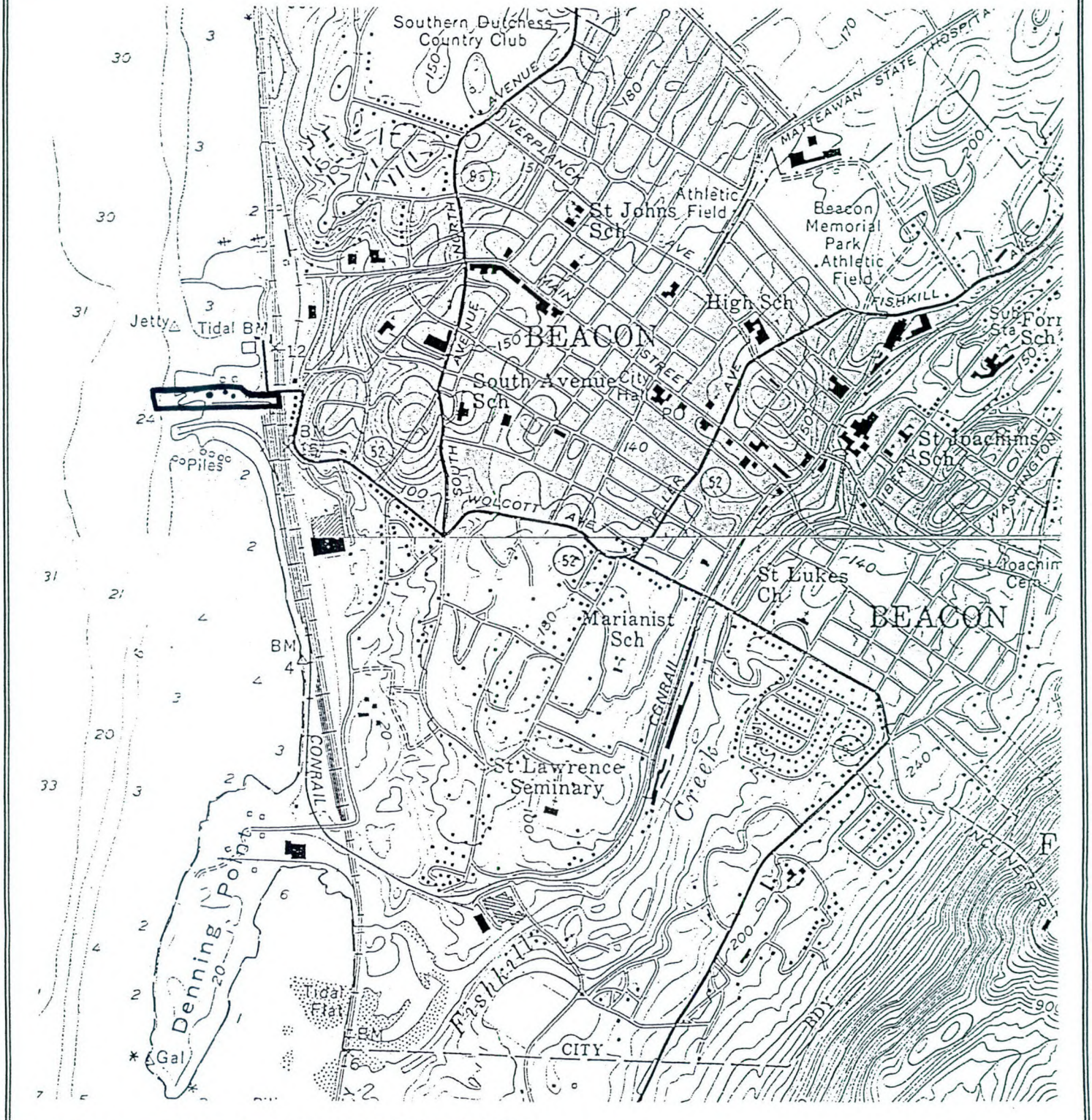


Photo # 4: View of stained soil within former fuel storage and distribution area.

APPENDIX B

USGS Topographic Map



Source: Wappingers Falls, New York Quadrangle 1956 (photrevised 1981)

USGS Topographic Map

FORMER GARRET-STORM, INC. MOSF SITE
City of Beacon, Dutchess County, New York

N

ESI File Number: **SG96152.20**

January 1997

APPENDIX C

Wetlands Maps



Source: U..S. Department of the Interior National Wetlands Map of the Wappinger Falls, NY Quadrangle 1990

National Wetlands Map

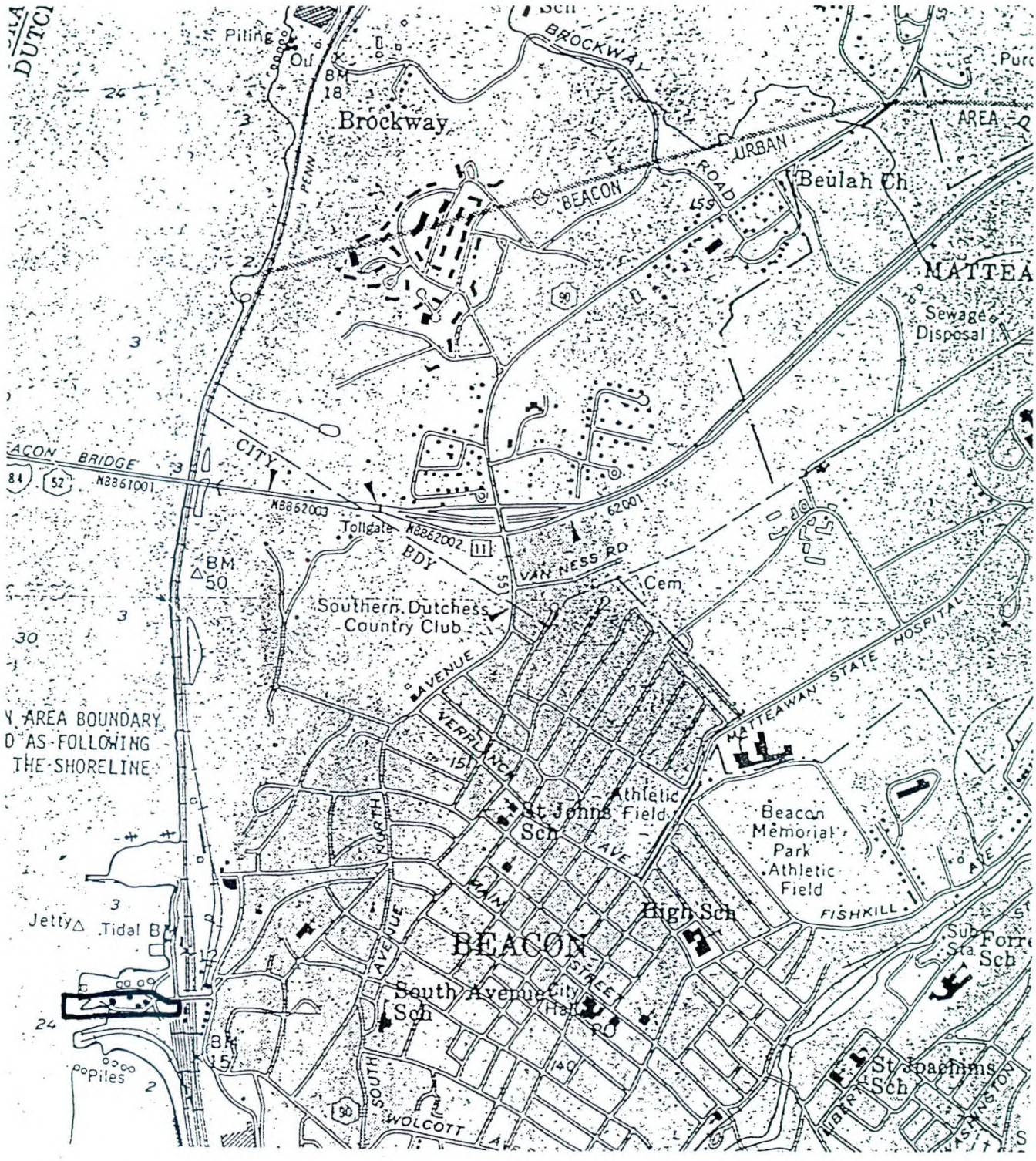
FORMER GARRET-STORM, INC. MOSF SITE

City of Beacon, Dutchess County, New York

N

ESI File Number: **SB96152.20**

Date: January 1997



Source: New York State Department of Environmental Conservation Freshwater Wetlands Map of the Wappingers Falls, NY Quadrangle 1973

New York State Freshwater Wetlands Map
FORMER GARRET-STORM, INC. MOSF SITE
City of Beacon, Dutchess County, New York

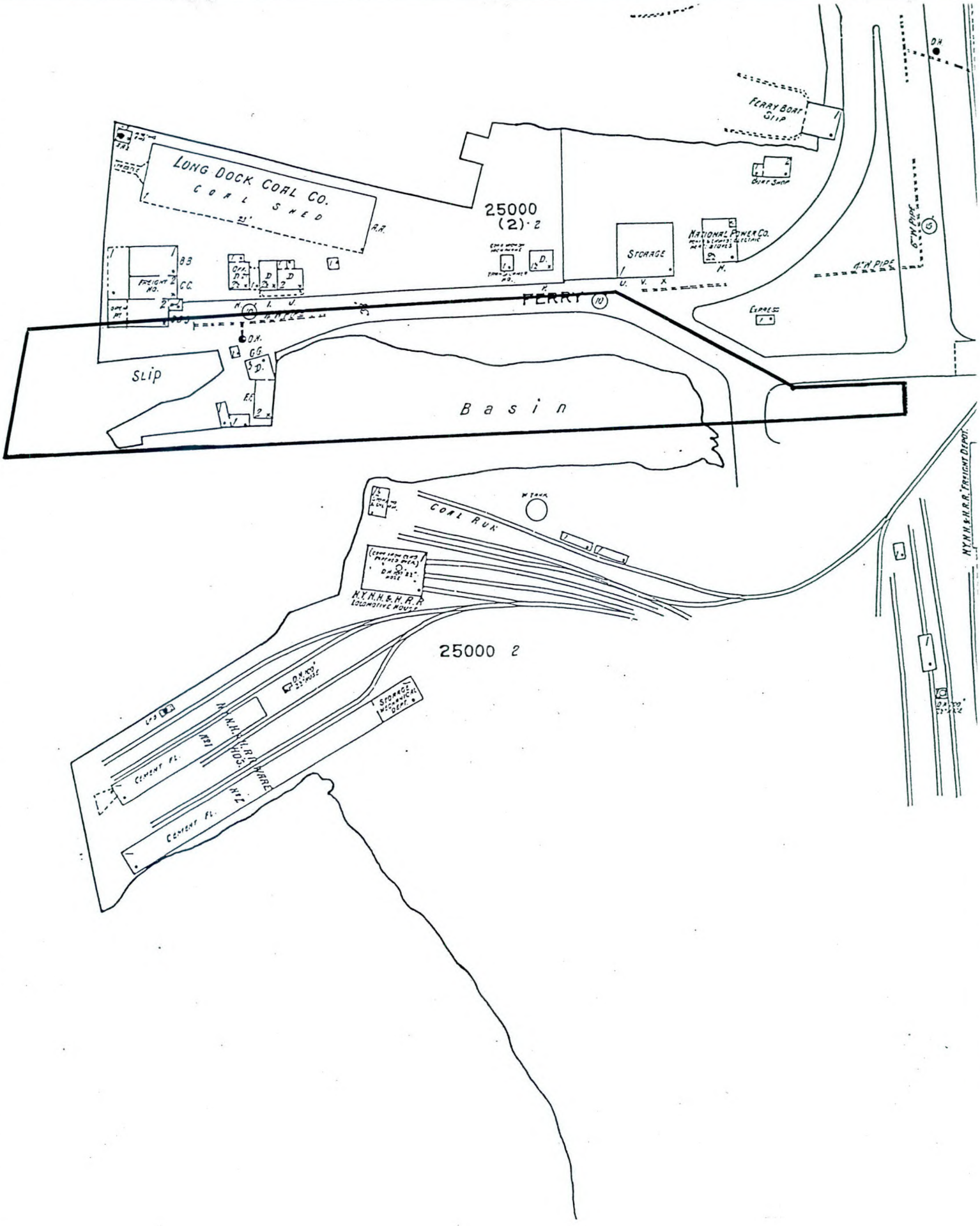
N

ESI File Number: **SG96152.20**

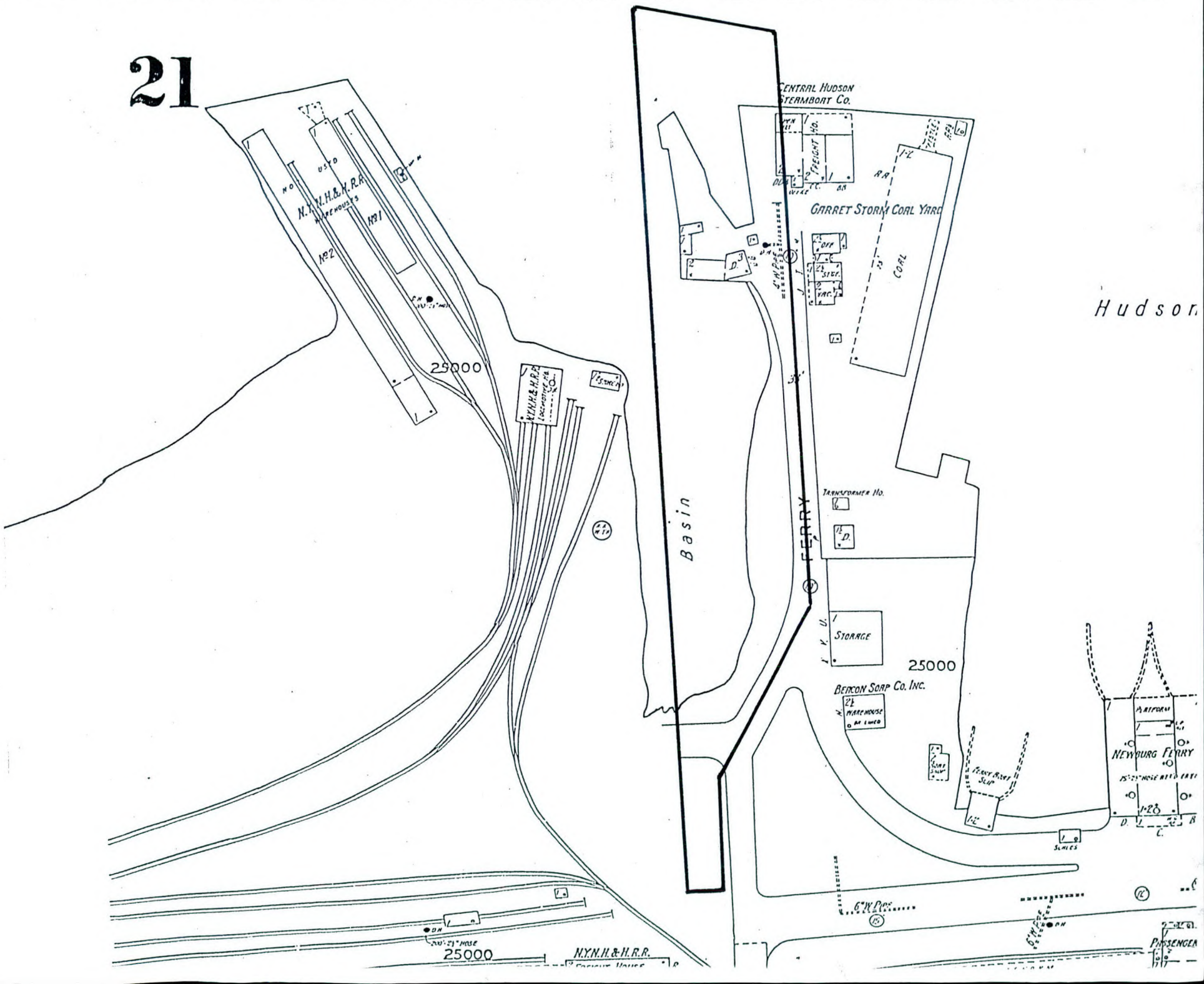
Date: January 1997

APPENDIX D

Sanborn Maps



Sanborn Fire Insurance Company Map - 1919



Sanborn Fire Insurance Company Map - 1927

Sanborn Fire Insurance Company Map - 1946

Sanborn Fire Insurance Company Map - 1962

APPENDIX E

Laboratory Results (Groundwater Sampling)

MATRIX

ANALYTICAL DATA SUMMARY

RECEIVED
JAN 27 1997

Report Date: 01/22/97

Account: Ecosystems Strategies
Address: 60 Worrall Ave.
Poughkeepsie, NY 12603
914-452-1658

Project Manager: Brad Fisher
Project Name: SB96152.20 (1-16-97)
Project No.: SB96152.20

Sample Information:

Laboratory ID	Client/Field ID
70160222-001	RD-3
70160222-002	RD-4
70160222-003	RD-6
70160222-004	RD-7
70160222-005	RD-9
70160222-006	RD-K1
70160222-007	RD-K2
70160222-008	RD-2
70160222-009	QC Report-Water

Reviewed by

Christine A. Larkin
Laboratory Manager

Lab Certifications

EPA ID: No. MA059
Massachusetts: No. M-MA059
Maine: Reciprocity
Rhode Island: No. 87
South Carolina: No. 88011
Florida(DEP): QA Plan No. 900437G
Florida(HRS): No. E87290
Connecticut: No. PH0515
New York: ELAP No. 11116
New Hampshire: No. 2041

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
1 (800) 362-8749

FINAL REPORT

Client Information

Account:	Ecosystems Strategies	Project Name:	SB96152.20 (1-16-97)
Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-001	Date Sampled:	01/15/97 11:35
Client ID:	RD-3	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Extraction Date:	01/17/97				rw	
Acenaphthene	ND	ug/l	5	8270A	jp	01/18/97
Acenaphthylene	ND	ug/l	5	8270A	jp	01/18/97
Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (b) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (k) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (g,h,i) Perylene	ND	ug/l	5	8270A	jp	01/18/97
Chrysene	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,j) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
7H-Dibenzo (c,g) Carbazole	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,e) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,i) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,h) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Fluorene	ND	ug/l	5	8270A	jp	01/18/97
Indeno (1,2,3-cd) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
2-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
3-Methylcholanthrene	ND	ug/l	5	8270A	jp	01/18/97
1-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Phenanthrene	ND	ug/l	5	8270A	jp	01/18/97

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
1 (800) 362-8749

FINAL REPORT

Client Information

Account:	Ecosystems Strategies	Project Name:	SB96152.20 (1-16-97)
Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-001	Date Sampled:	01/15/97 11:35
Client ID:	RD-3	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Pyrene	ND	ug/l	5	8270A	jp	01/18/97
SURROGATE STUDIES - BASE NEUTRALS						
2-Fluorobiphenyl	47	Percent			jp	01/18/97
Nitrobenzene-D5	47	Percent			jp	01/18/97
p-Terphenyl-D14	89	Percent			jp	01/18/97

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
1 (800) 362-8749

FINAL REPORT

Client Information

Account:	Ecosystems Strategies	Project Name:	SB96152.20 (1-16-97)
Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-002	Date Sampled:	01/15/97 11:50
Client ID:	RD-4	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Extraction Date:	01/17/97				rw	
Acenaphthene	ND	ug/l	5	8270A	jp	01/18/97
Acenaphthylene	ND	ug/l	5	8270A	jp	01/18/97
Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (b) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (k) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (g,h,i) Perylene	ND	ug/l	5	8270A	jp	01/18/97
Chrysene	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,j) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
7H-Dibenzo (c,g) Carbazole	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,e) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,i) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,h) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Fluorene	ND	ug/l	5	8270A	jp	01/18/97
Indeno (1,2,3-cd) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
2-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
3-Methylcholanthrene	ND	ug/l	5	8270A	jp	01/18/97
1-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Phenanthrene	ND	ug/l	5	8270A	jp	01/18/97

Matrix Analytical, Inc.
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FINAL REPORT

Client Information

Account:	Ecosystems Strategies	Project Name:	SB96152.20 (1-16-97)
Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-002	Date Sampled:	01/15/97 11:50
Client ID:	RD-4	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Pyrene	ND	ug/l	5	8270A	jp	01/18/97
SURROGATE STUDIES - BASE NEUTRALS						
2-Fluorobiphenyl	47	Percent			jp	01/18/97
Nitrobenzene-D5	27	Percent			jp	01/18/97
p-Terphenyl-D14	79	Percent			jp	01/18/97

One of the surrogates is outside the acceptance range, possibly due to matrix interference.

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FINAL REPORT

Client Information

Account:	Ecosystems Strategies	Project Name:	SB96152.20 (1-16-97)
Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-003	Date Sampled:	01/15/97 13:30
Client ID:	RD-6	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Benzene	ND	ug/l	1	8020	sh	01/21/97
Chlorobenzene	ND	ug/l	1	8020	sh	01/21/97
1,2-Dichlorobenzene	ND	ug/l	1	8020	sh	01/21/97
1,3-Dichlorobenzene	ND	ug/l	1	8020	sh	01/21/97
1,4-Dichlorobenzene	ND	ug/l	1	8020	sh	01/21/97
Ethylbenzene	ND	ug/l	1	8020	sh	01/21/97
MTBE	ND	ug/l	5	8020	sh	01/21/97
Toluene	ND	ug/l	1	8020	sh	01/21/97
Xylene	ND	ug/l	1	8020	sh	01/21/97
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene (602/8020)	123	Percent			sh	01/21/97
PAH's						
Extraction Date:	01/17/97				rw	
Acenaphthene	ND	ug/l	5	8270A	jp	01/18/97
Acenaphthylene	ND	ug/l	5	8270A	jp	01/18/97
Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (b) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (k) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (g,h,i) Perylene	ND	ug/l	5	8270A	jp	01/18/97
Chrysene	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Acridine	ND	ug/l	5	8270A	jp	01/18/97

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Client Information

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Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-003	Date Sampled:	01/15/97 13:30
Client ID:	RD-6	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Dibenzo (a,j) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
7H-Dibenzo (c,g) Carbazole	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,e) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,i) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,h) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Fluorene	ND	ug/l	5	8270A	jp	01/18/97
Indeno (1,2,3-cd) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
2-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
3-Methylcholanthrene	ND	ug/l	5	8270A	jp	01/18/97
1-Methyl Naphthalene	10	ug/l	5	8270A	jp	01/18/97
Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Phenanthrene	ND	ug/l	5	8270A	jp	01/18/97
Pyrene	ND	ug/l	5	8270A	jp	01/18/97
SURROGATE STUDIES - BASE NEUTRALS						
2-Fluorobiphenyl	57	Percent			jp	01/18/97
Nitrobenzene-D5	53	Percent			jp	01/18/97
p-Terphenyl-D14	71	Percent			jp	01/18/97

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FINAL REPORT

Client Information

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Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-004	Date Sampled:	01/15/97 11:45
Client ID:	RD-7	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Extraction Date:	01/17/97				rw	
Acenaphthene	ND	ug/l	5	8270A	jp	01/18/97
Acenaphthylene	ND	ug/l	5	8270A	jp	01/18/97
Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (b) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (k) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (g,h,i) Perylene	ND	ug/l	5	8270A	jp	01/18/97
Chrysene	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,j) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
7H-Dibenzo (c,g) Carbazole	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,e) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,i) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,h) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Fluorene	ND	ug/l	5	8270A	jp	01/18/97
Indeno (1,2,3-cd) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
2-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
3-Methylcholanthrene	ND	ug/l	5	8270A	jp	01/18/97
1-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Phenanthrene	ND	ug/l	5	8270A	jp	01/18/97

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FINAL REPORT

Client Information

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Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-004	Date Sampled:	01/15/97 11:45
Client ID:	RD-7	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Pyrene	ND	ug/l	5	8270A	jp	01/18/97
SURROGATE STUDIES - BASE NEUTRALS						
2-Fluorobiphenyl	57	Percent			jp	01/18/97
Nitrobenzene-D5	54	Percent			jp	01/18/97
p-Terphenyl-D14	67	Percent			jp	01/18/97

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Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-005	Date Sampled:	01/15/97 12:00
Client ID:	RD-9	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Extraction Date:	01/17/97				rw	
Acenaphthene	ND	ug/l	5	8270A	jp	01/18/97
Acenaphthylene	ND	ug/l	5	8270A	jp	01/18/97
Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (b) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (k) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (g,h,i) Perylene	ND	ug/l	5	8270A	jp	01/18/97
Chrysene	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,j) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
7H-Dibenzo (c,g) Carbazole	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,e) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,i) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,h) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Fluorene	ND	ug/l	5	8270A	jp	01/18/97
Indeno (1,2,3-cd) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
2-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
3-Methylcholanthrene	ND	ug/l	5	8270A	jp	01/18/97
1-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Phenanthrene	ND	ug/l	5	8270A	jp	01/18/97

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FINAL REPORT

Client Information

Account:	Ecosystems Strategies	Project Name:	SB96152.20 (1-16-97)
Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-005	Date Sampled:	01/15/97 12:00
Client ID:	RD-9	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Pyrene	ND	ug/l	5	8270A	jp	01/18/97
SURROGATE STUDIES - BASE NEUTRALS						
2-Fluorobiphenyl	73	Percent			jp	01/18/97
Nitrobenzene-D5	71	Percent			jp	01/18/97
p-Terphenyl-D14	88	Percent			jp	01/18/97

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FINAL REPORT

Client Information

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Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-006	Date Sampled:	01/15/97 13:15
Client ID:	RD-K1	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Extraction Date:	01/17/97				rw	
Acenaphthene	ND	ug/l	5	8270A	jp	01/18/97
Acenaphthylene	ND	ug/l	5	8270A	jp	01/18/97
Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (b) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (k) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (g,h,i) Perylene	ND	ug/l	5	8270A	jp	01/18/97
Chrysene	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,j) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
7H-Dibenzo (c,g) Carbazole	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,e) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,i) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,h) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Fluorene	ND	ug/l	5	8270A	jp	01/18/97
Indeno (1,2,3-cd) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
2-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
3-Methylcholanthrene	ND	ug/l	5	8270A	jp	01/18/97
1-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Phenanthrene	ND	ug/l	5	8270A	jp	01/18/97

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FINAL REPORT

Client Information

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Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-006	Date Sampled:	01/15/97 13:15
Client ID:	RD-K1	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Pyrene	ND	ug/l	5	8270A	jp	01/18/97
SURROGATE STUDIES - BASE NEUTRALS						
2-Fluorobiphenyl	62	Percent			jp	01/18/97
Nitrobenzene-D5	59	Percent			jp	01/18/97
p-Terphenyl-D14	74	Percent			jp	01/18/97

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Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-007	Date Sampled:	01/15/97 13:25
Client ID:	RD-K2	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Extraction Date:	01/17/97				rw	
Acenaphthene	ND	ug/l	5	8270A	jp	01/19/97
Acenaphthylene	ND	ug/l	5	8270A	jp	01/19/97
Anthracene	ND	ug/l	5	8270A	jp	01/19/97
Benzo (a) Anthracene	ND	ug/l	5	8270A	jp	01/19/97
Benzo (a) Pyrene	ND	ug/l	5	8270A	jp	01/19/97
Benzo (b) Fluoranthene	ND	ug/l	5	8270A	jp	01/19/97
Benzo (k) Fluoranthene	ND	ug/l	5	8270A	jp	01/19/97
Benzo (g,h,i) Perylene	ND	ug/l	5	8270A	jp	01/19/97
Chrysene	ND	ug/l	5	8270A	jp	01/19/97
Dibenzo (a,h) Acridine	ND	ug/l	5	8270A	jp	01/19/97
Dibenzo (a,j) Acridine	ND	ug/l	5	8270A	jp	01/19/97
Dibenzo (a,h) Anthracene	ND	ug/l	5	8270A	jp	01/19/97
7H-Dibenzo (c,g) Carbazole	ND	ug/l	5	8270A	jp	01/19/97
Dibenzo (a,e) Pyrene	ND	ug/l	10	8270A	jp	01/19/97
Dibenzo (a,i) Pyrene	ND	ug/l	10	8270A	jp	01/19/97
Dibenzo (a,h) Pyrene	ND	ug/l	10	8270A	jp	01/19/97
Fluoranthene	ND	ug/l	5	8270A	jp	01/19/97
Fluorene	ND	ug/l	5	8270A	jp	01/19/97
Indeno (1,2,3-cd) Pyrene	ND	ug/l	5	8270A	jp	01/19/97
2-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/19/97
3-Methylcholanthrene	ND	ug/l	5	8270A	jp	01/19/97
1-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/19/97
Naphthalene	ND	ug/l	5	8270A	jp	01/19/97
Phenanthrene	ND	ug/l	5	8270A	jp	01/19/97

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FINAL REPORT

Client Information

Account:	Ecosystems Strategies	Project Name:	SB96152.20 (1-16-97)
Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-007	Date Sampled:	01/15/97 13:25
Client ID:	RD-K2	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Pyrene	ND	ug/l	5	8270A	jp	01/19/97
SURROGATE STUDIES - BASE NEUTRALS						
2-Fluorobiphenyl	55	Percent			jp	01/19/97
Nitrobenzene-D5	55	Percent			jp	01/19/97
p-Terphenyl-D14	82	Percent			jp	01/19/97

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FINAL REPORT

Client Information

Account:	Ecosystems Strategies	Project Name:	SB96152.20 (1-16-97)
Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-008	Date Sampled:	01/15/97 13:40
Client ID:	RD-2	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
VOLATILE ORGANICS						
Benzene	ND	ug/l	1	8020	sh	01/21/97
Chlorobenzene	ND	ug/l	1	8020	sh	01/21/97
1,2-Dichlorobenzene	ND	ug/l	1	8020	sh	01/21/97
1,3-Dichlorobenzene	ND	ug/l	1	8020	sh	01/21/97
1,4-Dichlorobenzene	ND	ug/l	1	8020	sh	01/21/97
Ethylbenzene	ND	ug/l	1	8020	sh	01/21/97
MTBE	ND	ug/l	5	8020	sh	01/21/97
Toluene	ND	ug/l	1	8020	sh	01/21/97
Xylene	ND	ug/l	1	8020	sh	01/21/97
SURROGATE STUDIES - VOLATILES						
Bromofluorobenzene (602/8020)	112	Percent			sh	01/21/97
PAH's						
Extraction Date:	01/17/97				rw	
Acenaphthene	ND	ug/l	5	8270A	jp	01/18/97
Acenaphthylene	ND	ug/l	5	8270A	jp	01/18/97
Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (a) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (b) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (k) Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Benzo (g,h,i) Perylene	ND	ug/l	5	8270A	jp	01/18/97
Chrysene	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Acridine	ND	ug/l	5	8270A	jp	01/18/97

Matrix Analytical, Inc.
106 South Street
Hopkinton, MA 01748-2295
1 (800) 362-8749

FINAL REPORT

Client Information

Account:	Ecosystems Strategies	Project Name:	SB96152.20 (1-16-97)
Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	Brad Fisher/Jay Kaplan

Sample Information

Lab ID:	70160222-008	Date Sampled:	01/15/97 13:40
Client ID:	RD-2	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
PAH's						
Dibenzo (a,j) Acridine	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,h) Anthracene	ND	ug/l	5	8270A	jp	01/18/97
7H-Dibenzo (c,g) Carbazole	ND	ug/l	5	8270A	jp	01/18/97
Dibenzo (a,e) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,i) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Dibenzo (a,h) Pyrene	ND	ug/l	10	8270A	jp	01/18/97
Fluoranthene	ND	ug/l	5	8270A	jp	01/18/97
Fluorene	ND	ug/l	5	8270A	jp	01/18/97
Indeno (1,2,3-cd) Pyrene	ND	ug/l	5	8270A	jp	01/18/97
2-Methyl Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
3-Methylcholanthrene	ND	ug/l	5	8270A	jp	01/18/97
1-Methyl Naphthalene	5	ug/l	5	8270A	jp	01/18/97
Naphthalene	ND	ug/l	5	8270A	jp	01/18/97
Phenanthrene	ND	ug/l	5	8270A	jp	01/18/97
Pyrene	ND	ug/l	5	8270A	jp	01/18/97
SURROGATE STUDIES - BASE NEUTRALS						
2-Fluorobiphenyl	37	Percent			jp	01/18/97
Nitrobenzene-D5	35	Percent			jp	01/18/97
p-Terphenyl-D14	62	Percent			jp	01/18/97

One of the surrogates is outside the acceptance range, possibly due to matrix interference.

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FINAL REPORT

Client Information

Account:	Ecosystems Strategies	Project Name:	SB96152.20 (1-16-97)
Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	

Sample Information

Lab ID:	70160222-009	Date Sampled:	/ / :
Client ID:	QC Report-Water	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
METHOD BLANKS						
Method Blank - Semi Volatile	ND	ug/l		625/8270A		
Method Blank - Volatile	ND	ug/l		8020/602		
MATRIX SPIKE STUDIES - VOLATILES						
Sample ID:	0239-001					
Benzene	82	Percent				
Chlorobenzene	89	Percent				
Toluene	90	Percent				
MATRIX SPIKE STUDIES BASE/NEUTRALS						
Sample ID:	0207-001					
Acenaphthene	68	Percent				
Pyrene	74	Percent				

METHOD SUMMARIES

Acid/Base Neutral analysis is performed using H/P 5970 GC/MS systems with autosampler. Analysis is performed with J&W megabore column. Tuning is based on DFTPP criteria. Procedural guidelines described in SW846 are used for all analysis. Data reduction is accomplished using H/P RTE 1000 computer systems.

Volatile organic analysis is performed using H/P 5995 or 5970 GC/MS, Tekmar purge and trap, and ALS autosampler. Chromatography incorporates packed and megabore columns. Data reduction is performed on RTE 1000 and ChemStation systems. Tuning is based on BFB standards. Procedural guidelines follow EPA or SW846 for all analyses.

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FINAL REPORT

Client Information

Account:	Ecosystems Strategies	Project Name:	SB96152.20 (1-16-97)
Address:	60 Worrall Ave.	Project Number:	SB96152.20
	Poughkeepsie, NY 12603	Project Manager:	Brad Fisher
		Sampler Name:	

Sample Information

Lab ID:	70160222-009	Date Sampled:	/ / :
Client ID:	QC Report-Water	Date Received:	01/16/97 : 0
Matrix:	Water	Date Reported:	01/22/97

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed

METHOD REFERENCES

1. Test Methods For Evaluating Solid Waste: Physical Chemical Methods. EPA SW 846. November 1986.
2. Methods For Chemical Analysis of Water and Wastes. EPA 600/4-79-200. Revised March 1983.
3. Standard Methods For Examination of Water and Wastewater. APHA-AWWA-WACF., 18th Edition. 1992.
4. EPA Methods For The Determination of Organic Compounds in Drinking Water.

Project Information		Client Information	
Project Name:	SB96152.20	Send Reports to:	BRAD FISHER
Project No.:	SB96152.20	Company:	Ecosystems Strategies
Project Location:	—	Address:	60 Worrall Ave.
Project Manager:	BRAD FISHER		Pough., NY 12603
Sampler(s):	BRAD FISHER	Phone:	(914) 452-1658
	JAY KAPLAN	Fax:	(914) 485-7083
PO #:	Lab Quote #:	Account # (Lab Use Only)	

Turn-Around: ~~☑ Standard-10 business~~ days
☑ Other (specify):
Note: Less than 10 days must be pre-approved!

Final Report: ☑ Mail ☐ Overnight ~~☐ Fax~~
☐ EDT Diskette (If checked, call for pricing)
Disk format:

Form No. | Page 1

FILTRATION (0.45 um) & PRESERVATION INFORMATION

FILTRATION	PRESERVATION
☐ DONE	☐ DONE
☐ NOT NEEDED	☐ NOT NEEDED
☐ LAB TO DO*	☐ LAB TO DO*

**Please specify which samples need to be filtered and/or preserved by the lab.*

IF SPECIAL OR NON-ROUTINE DETECTION LIMITS ARE REQUIRED, PLEASE CALL THE LAB.

Lab ID (Lab Use Only)	Client/Field Sample ID	Collection Date	Collection Time	Sample Source / Matrix	PAHs	8020	Sample Remarks (below)	TOTAL # OF BOTTLES
	RD-3	1/15/97	11:35	WATER	X			1
	RD-4	1/15/97	11:50	WATER	X			1
	RD-6	1/15/97	1:30	WATER	X	X	high concentrations of analytes likely	3
	RD-7	1/15/97	11:45	WATER	X			1
	RD-9	1/15/97	12:00	WATER	X			1
	RD-K1	1/15/97	1:15	WATER	X			1
	RD-K2	1/15/97	1:25	WATER	X			1
	RD-2	1/15/97	1:40	WATER	X	X	high concentrations of analytes likely	3

Analyses (write test methods above & "x's" below for each sample to be tested)

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Hopkinton, MA 01748
Phone: (800) 362-8749
Fax: (508) 435-2497

NOTES:
RUSH on ALL SAMPLES

CHAIN-OF-CUSTODY RECORD

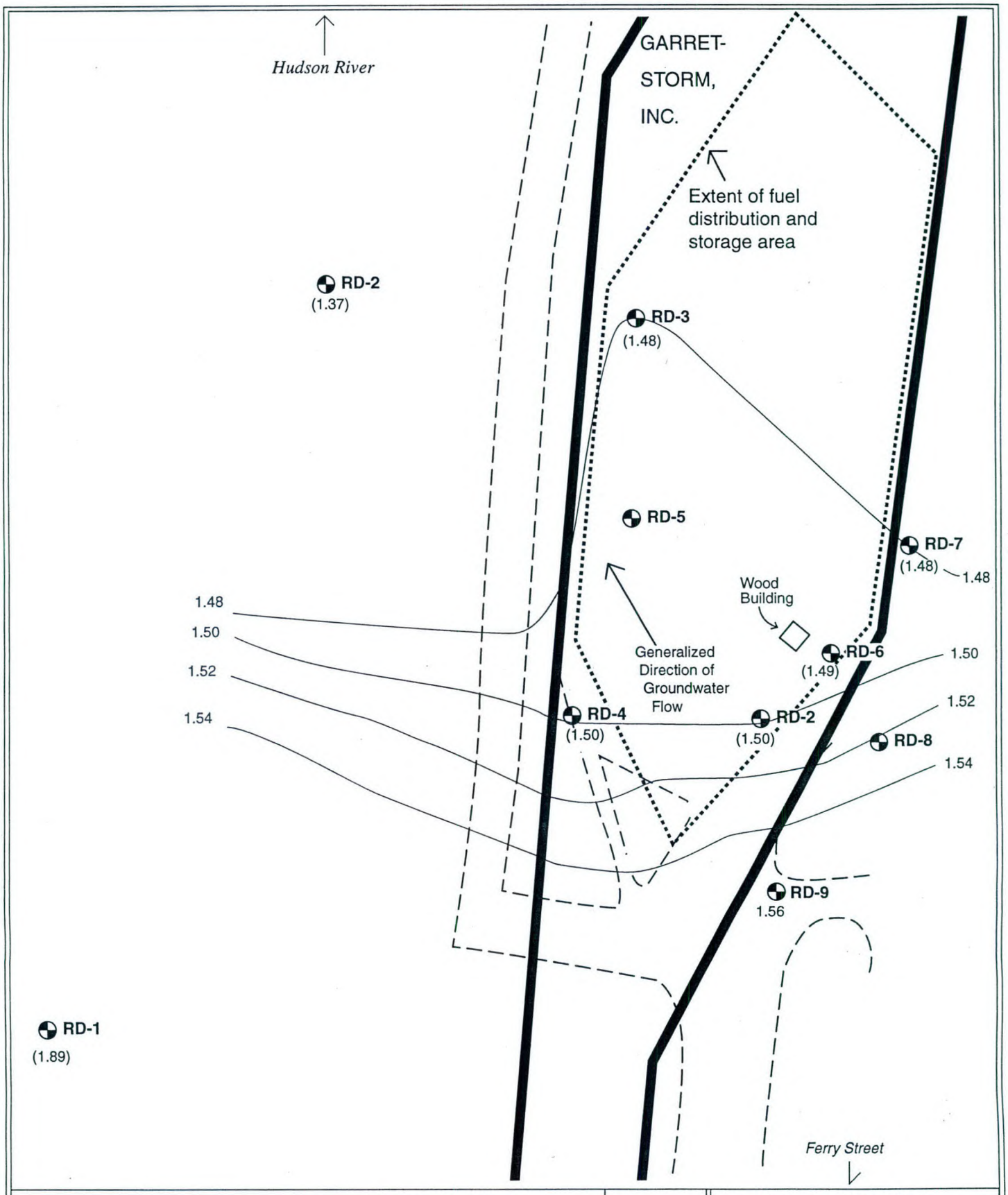
Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	1/15/97 4:00	[signature]	1-16-97/3:00

Condition of Samples Upon Arrival
☐ Okay ☐ Problem(s)

Distribution of Copies
White-Lab Yellow-Report Pink-Client

APPENDIX F

Direction of Groundwater Flow Maps



Direction of Groundwater Flow Map

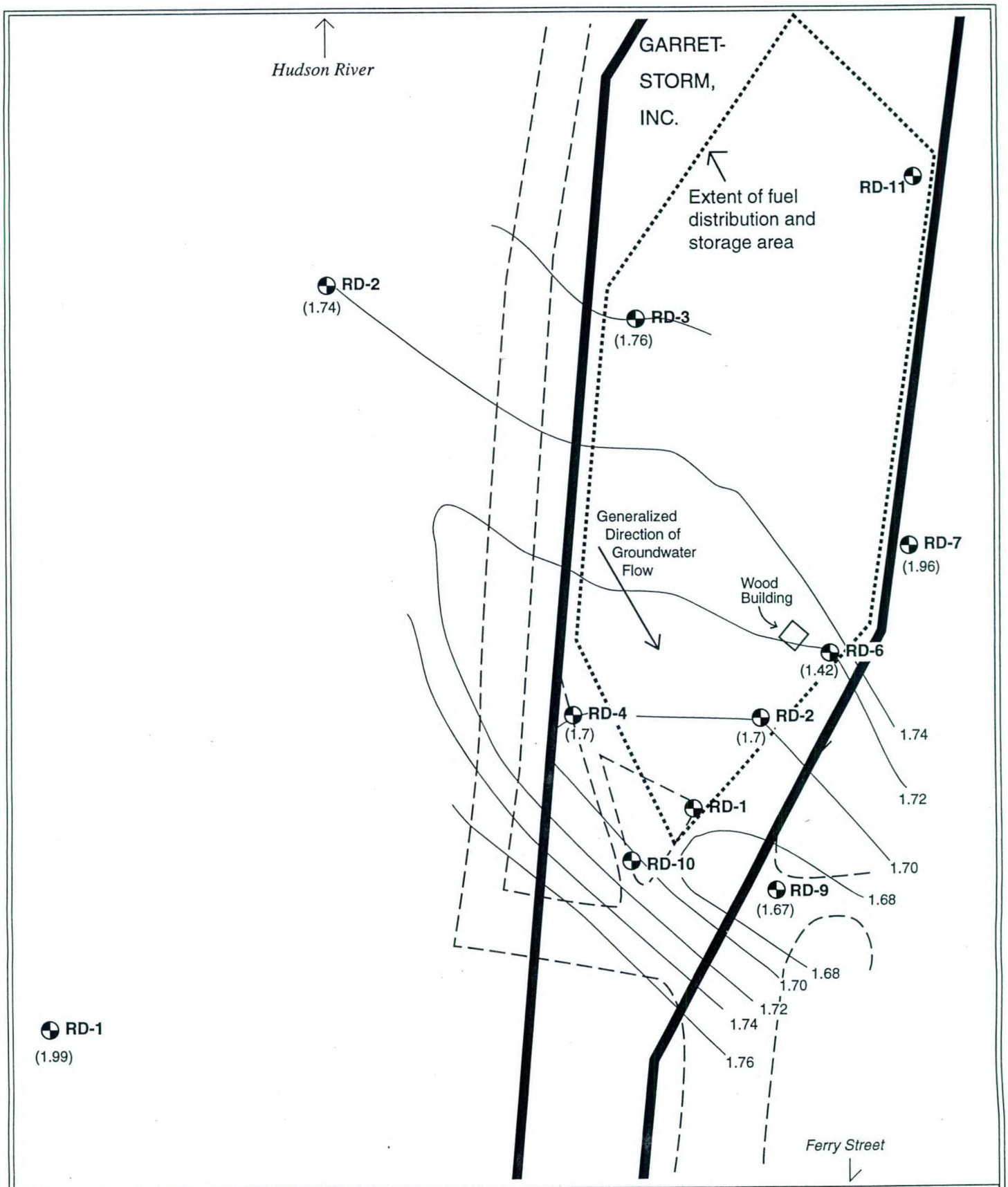
(October 4, 1994 morning)

N

Job Number: **RL9442.10**

Date: November 1994

Scale: 1"= 70'



Direction of Groundwater Flow Map

(October 3, 1994, afternoon)

N

Job Number: **RL9442.10**

Date: November 1994

Scale: 1"= 70'