

REVISED SUPPLEMENTAL INVESTIGATION WORKPLAN

**250 South Washington Avenue
Block 1885, Lot 35
Staten Island, New York**

December 7, 2009

Prepared for

**Walter Baker
1 Globe Court
Red Bank, New Jersey 07701**



1913 Atlantic Avenue, Suite R5
Manasquan, New Jersey 08736

Tel: (732) 223-2225
Fax: (732) 223-3666
www.brinkenv.com

PROJECT NO. 08BR049

REVISED SUPPLEMENTAL INVESTIGATION WORKPLAN

**250 South Washington Avenue
Block 1885, Lot 35
Staten Island, New York**

December 7, 2009

Prepared for

**Walter Baker
1 Globe Court
Red Bank, New Jersey 07701**

REVISED SUPPLEMENTAL INVESTIGATION WORKPLAN

**250 South Washington Avenue
Block 1885, Lot 35
Staten Island, New York**

TABLE OF CONTENTS

1.0	Introduction and Purpose	1
2.0	Site History and Description.....	1
3.0	Proposed Objectives and Remedial Investigation Workplan	3
3.1	Soil Investigation	3
3.1.1	Site Location	3
3.1.2	Soil Characterization	3
3.1.3	Proposed Number and Locations of Samples	3
3.1.4	Boring Installation and Soil Sample Collection	4
3.2	Groundwater Investigation	5
3.2.1	Groundwater Characterization.....	5
3.2.2	Proposed Groundwater Monitoring Wells.....	5
3.2.3	Proposed Groundwater Sampling and Analysis	6
3.3	Sediment Investigation	6
3.3.1	Sediment Characterization.....	6
3.3.2	Sediment Sampling.....	6
4.0	Quality Assurance for Sampling and Laboratory Analysis	6
4.1	Decontamination Procedures for Drilling Equipment	6
4.2	Soil Sampling Protocol.....	6
4.3	Groundwater Sampling Protocol	7
4.4	Sample Management/Quality Control	7
4.5	Laboratory Analysis.....	8
5.0	Site-Specific Health and Safety Plan (HASP).....	8
6.0	Report Preparation	8
7.0	Quality Control	9

FIGURES

Figure 1 – Site Location Map

Figure 2 – Recent Aerial Photograph

Figure 3 – Proposed Sample Location Map

Figure 4 – Monitoring Well Plan

REVISED SUPPLEMENTAL INVESTIGATION WORKPLAN

**250 South Washington Avenue
Block 1885, Lot 35
Staten Island, New York**

December 7, 2009

1.0 INTRODUCTION AND PURPOSE

Brinkerhoff Environmental Services, Inc. (Brinkerhoff) was retained by Walter Baker to develop a Supplemental Investigation Workplan defined in the Order of Consent as a “workplan whose objective is to perform additional site investigations” for the property located at 250 South Washington Avenue, Staten Island, New York. The location of the site is shown on Figure 1 - Site Location Map and Figure 2 - Recent Aerial Photograph. Previous sampling and analysis, reportedly conducted by the New York State Department of Environmental Conservation (NYSDEC) in the 1970s and 1980s and by the Port Authority of New York and New Jersey (Port Authority) in the 1990s, allegedly identified the presence of polychlorinated biphenyls (PCBs) in certain soil at the site. Groundwater sampling also allegedly suggested that PCBs may be present in groundwater beneath the site. However, due to questions concerning the investigations and data, the results are considered unreliable.

On behalf of Walter Baker and subject to the express terms of the Consent Order, Brinkerhoff is proposing the following Supplemental Investigation Workplan to investigate both soil and groundwater based upon the nature of site contamination, the mobility of compounds previously detected, and areas of environmental concern. The plan proposes the collection of soil and sediment samples, the installation of groundwater monitoring wells, and the collection of representative groundwater samples for laboratory analyses. Sample locations have been chosen biased toward previous sample locations with reported PCBs and additional locations representative of the remaining portions of the property.

The groundwater investigation will concentrate on the shallow aquifer. The need for a Baseline Ecological Evaluation will be considered upon review of the data.

2.0 SITE HISTORY AND DESCRIPTION

The NYSDEC conducted an inspection of the property in 1977. In 1985, on behalf of the NYSDEC, Woodward-Clyde Consultants, Inc. (Woodward-Clyde) conducted a Phase II Site Investigation. Additional soil and groundwater samples were taken in 1987. In 1994, as part of the Goethals Bridge Expansion Project, the Port Authority installed two

(2) soil borings at the site. In 1995-1996, the Port Authority performed additional subsurface investigations.

While the subject property owner has made requests to the NYSDEC under the Freedom of Information Act for all documents pertaining to the site, the records received from the NYSDEC are incomplete and do not contain the reports and/or other necessary information relative to the above investigative activities. Accordingly, without a review of all necessary information regarding the investigation, Brinkerhoff is unable to determine the reliability and accuracy of these results.

In the mid-1990s, sampling and laboratory analysis were conducted at the site under the direction of the NYSDEC and the Port Authority. Brinkerhoff does not have copies of reports detailing collection procedures or copies of laboratory analytical data.

According to data tables presented in a January 1986 report prepared by Woodward-Clyde and in a report dated October 1996 prepared by Berger/Sverdrup for the Port Authority, multiple soil and groundwater samples were collected and analyzed. The predominant focus of the sampling and analysis was to investigate possible PCB contamination allegedly associated with alleged past operations at the site. A summary of the data from said reports follows.

Six (6) groundwater monitoring wells were installed in 1985. Monitoring Wells MW-1, MW-3 and MW-5 were identified as deeper bedrock wells and MW-2, MW-4 and MW-6 were identified as shallow wells. The approximate locations of those wells are shown on Figure 3 - Proposed Sample Location Map.

The groundwater analytical results for PCBs were reported as outlined below. Given, among other things, the absence of all information necessary to evaluate the accuracy of the limited information provided to Mr. Baker, the reliability of these results is questionable.

MW-1D	0.9 parts per billion (ppb)
MW-3D	Not Detected (ND)
MW-5D	4.9 ppb
MW-2S	ND
MW-4S	21,500 ppb
MW-6S	ND

Soil sampling and analysis were also reportedly completed during the previous investigations. Soil samples were reportedly collected at various depths and locations. Data, such as accurate maps showing soil sample locations, laboratory analytical data, and summary tables, were not available, therefore limiting the use of the soil data.

There presently exist several steel framed garage structures and trailers on the property. These structures are not occupied except for short periods of time for working on machinery. The facility is used only for storage of equipment at the present time.

3.0 PROPOSED OBJECTIVES AND REMEDIAL INVESTIGATION WORKPLAN

3.1 Soil Investigation

3.1.1 Site Location

The site is located adjacent to the southern side of the Goethals Bridge and consists of approximately five-and-one-half (5.5) acres of land. The property is bounded to the north, west, and south by wetlands which are tidally influenced by Old Place Creek and the Arthur Kill, leaving portions of the property flooded by these surface water bodies at times of high tide.

3.1.2 Soil Characterization

Subsurface sediments consist of urban historic fill material comprised of sand, silt, clay, bricks, and wood fragments averaging three (3) to eight (8) feet in the eastern portion of the site. The western portion of the site appears to have limited fill material, with peat, silt, and clay as the surface sediments.

Below the fill are five (5) to 10 feet of peat and clay followed by approximately 10 feet of a brown fine to medium sand. Reddish silty clay is present below the brown sand. Below the reddish silty clay is weathered bedrock. Bedrock is found at an average depth of 50 feet below grade.

Tidal wetlands cover much of the western portion of the property. Flooding of the site frequently occurs at times of high tide. Average depth to groundwater is projected at one (1) to five (5) feet below grade.

Previous laboratory analysis included full priority pollutants along with PCBs. Various metals and semivolatile organics (SVOCs), specifically polynuclear aromatic hydrocarbons (PAHs), were detected in groundwater samples collected at the site. The metals and PAHs detected in the samples are compounds associated with urban historic fill. According to the October 1996 report prepared by Berger/Sverdrup, based upon soil borings installed, fill has been documented to be present at the site; therefore, these compounds are related to the urban historic fill and not site operations.

3.1.3 Proposed Number and Locations of Samples

Seven (7) soil borings will be installed within the fill material identified at the site. The proposed locations of the borings are shown on Figure 3. Each boring will be installed using a Geoprobe® drill rig as outlined in Section 3.1.4 below. The boring locations chosen are biased to the location of site operations, possible previous sampling locations with reported PCBs, and additional locations to be representative of remaining site conditions.

A soil sample will be collected from a discrete interval within the following stratigraphic zones of each boring:

Surface Sediments	A soil sample will be collected from zero (0) to two (2) inches below grade at the location with the highest evidence of contamination based upon field observations.
Intermediate Sediments	A soil sample will be collected from the urban historic fill material at the interface with the underlying native sediments. The sampling data will be used to evaluate contaminant migration at the top of the native sediments.
Native Sediments	A soil sample will be collected at the top of the silt/clay layer to determine whether contamination may have accumulated on top of the aquitard.

Since the contaminants of concern are PCBs, laboratory analysis will target PCBs. To confirm the presence of urban historic fill, two (2) shallow and two (2) intermediate soil samples will also be analyzed for the United States Environmental Protection Agency's (USEPA's) Target Compound List/Target Analyte List (TCL/TAL). The sample locations will be dependent upon field observations, with samples collected from those borings with the highest evidence of contamination in the field. The following number of samples is proposed for the fill area:

Surface Sediments	7 TCL/TAL*
Intermediate Sediments	7 PCBs/pesticides, three (3) TCL/TAL
Native Sediments	7 PCBs

* TCL/TAL includes PCBs, pesticides, volatile organic compounds (VOCs), SVOCs, and metals.

In order to investigate the sediments within the adjacent wetlands/tidal area, three (3) soil sample locations are proposed as outlined in Section 3.3.2 below. The soil samples will be collected along the parameter of the fill material as shown on Figure 3.

Each sample will be collected from the upper six (6) inches of material and subjected to PCB analysis. One (1) sample will also be analyzed for TCL/TAL. The total number of samples proposed for this area is as follows:

Wetlands/Tidal Area	Five (5) PCBs, one (1) TCL/TAL
---------------------	--------------------------------

3.1.4 Boring Installation and Soil Sample Collection

A certified Environmental Professional from Brinkerhoff will be present during the field investigation and will direct field activities. A properly calibrated photoionization detector (PID) will be used to field screen soil for evidence of contamination. Soil from

each boring will be inspected in the field for visual evidence of contamination. Soil boring logs will be prepared following completion of the field investigation.

A Geoprobe[®] drill rig utilizing direct push technology will be used to install the borings. Soil from each boring will be retrieved using disposable liners, each four (4) feet in length. Soil from each four (4)-foot core will be screened with a PID at six (6)-inch intervals for evidence of contamination.

3.2 Groundwater Investigation

3.2.1 Groundwater Characterization

Based upon the investigations completed to date, groundwater is present beneath the site at a depth of approximately one (1) to five (5) feet below grade. Wetlands incorporate the majority of the central and western portions of the parcel. Groundwater is tidally influenced.

Groundwater flows under water table conditions and is tidally influenced. Predominant groundwater flow direction appears to be toward the south to southwest based upon topography and surface water flow direction.

The VOC chlorobenzene was reported in at least one (1) sampling point associated with the site (Well MW-4 at 300 ppb and at the water seep, S-2, at 16 ppb). Benzene and chlorobenzene were reported at Sample Location 303E at seven (7) ppb and 920 ppb, respectively. Since VOCs were reportedly identified in the groundwater at the site and urban historic fill issues may exist, it is proposed that groundwater analysis include TCL/TAL analysis, with metal analysis from both filtered and nonfiltered samples.

3.2.2 Proposed Groundwater Monitoring Wells

Previously installed Monitoring Wells MW-1 through MW-6 could not be located. The installation of three (3) shallow water table aquifer groundwater monitoring wells is proposed. The monitoring wells will be installed using typical 6 5/8-inch hollow stem augers and will extend to a projected depth of 15 feet below grade. Each monitoring well will be two (2) inches in diameter and will be constructed of 10 feet of 0.010 slotted polyvinyl chloride (PVC) screen and two (2) to five (5) feet of solid PVC riser. A sand pack of Morie No. 1 sand and a bentonite seal above the sand will be utilized. The wells will be finished with stickup steel protective casing. With the installation of three (3) monitoring wells, the direction of groundwater flow can be calculated. Proposed locations are shown on Figure 3. A Monitoring Well Schematic diagram is provided as Figure 4.

A Geoprobe[®] drill rig will be used to collect continuous soil samples at the location of each proposed monitoring well. Soil samples will be collected to the proposed depth of each well. Sediments will be logged using the Unified Soil Classification System.

Once installed, the casing elevation of each groundwater monitoring well will be surveyed to an on-site arbitrary benchmark. The survey data, along with depth to groundwater data, will be used to calculate groundwater flow direction.

3.2.3 Proposed Groundwater Sampling and Analysis

At least 24 hours after installation, the wells should be developed until the temperature, conductivity, and pH have stabilized and turbidity has reached 50 nephelometric turbidity units (NTUs), if possible. Representative groundwater samples will then be collected from each monitoring well. Prior to purging, an interface probe, capable of detecting free-phase product thickness of 0.01 feet, will be used to gauge each well.

Representative groundwater samples will then be collected for laboratory analyses. Each sample will be analyzed for TCL/TAL, which includes SVOCs, VOCs, TAL metals and PCBs/pesticides. Metal analysis will be conducted for both filtered and nonfiltered samples.

3.3 Sediment Investigation

3.3.1 Sediment Characterization

Tidally influenced surface water covers much of the central and western portions of the parcel. Surface water flows from Old Place Creek, which borders the western corner of the parcel. During high tide events, the central and southern portions of the property are flooded with water from Old Place Creek and the Raritan River.

3.3.2 Sediment Sampling

It is proposed that three (3) sediment samples be collected at the edge of the fill material. Samples will be collected at zero (0) to six (6) inches below grade using stainless steel hand augers. Sample locations are shown on Figure 3. All samples will be analyzed for PCBs.

4.0 QUALITY ASSURANCE FOR SAMPLING AND LABORATORY ANALYSIS

4.1 Decontamination Procedures for Drilling Equipment

The hollow stem augers will be properly decontaminated using a high pressure wash between well installations. Wash water, purge water, and drill cuttings will be placed in 55-gallon drums for proper off-site disposal.

4.2 Soil Sampling Protocol

Samples will be collected in accordance with accepted sampling protocol. Expendable dedicated disposal liners will be used to collect soil samples via Geoprobe®. If sampling equipment, such as stainless steel augers or trowels, is used, the following

decontamination procedures will apply:

- Nonphosphate Soap;
- Tap Water Rinse;
- 10 Percent Nitric Acid Rinse;
- Tap Water Rinse;
- Methanol Rinse;
- Air Dry; and,
- Deionized Water Rinse.

Once the soil samples are collected and placed in laboratory-prepared glassware, the sample bottles will be placed in a cooler on ice, transported to Brinkerhoff's office, and placed in a designated refrigerator until picked up by Accredited Analytical Resources, LLC (Accredited), a New York State Department of Health-certified laboratory, which is the laboratory chosen for this project.

4.3 Groundwater Sampling Protocol

Approximately two (2) weeks after well installation, representative groundwater samples will be collected from each monitoring well. Prior to purging, an interface probe, capable of detecting free-phase product thickness of 0.01 feet, will be used to gauge each well.

Three (3) to five (5) volumes of water will be purged from the wells prior to sample collection via submersible pumps with dedicated polytubing. Purged water will be placed in 55-gallon drums for future off-site disposal. The slow purge sampling procedure will be used to reduce turbidity of the groundwater samples.

Samples will be collected using disposable dedicated bailers and transferred directly into laboratory-supplied glassware. The sample bottles will be placed in a cooler on ice, transported to Brinkerhoff's office, and placed in a designated refrigerator until picked up by Accredited.

4.4 Sample Management/Quality Control

Once collected, the samples will be placed in laboratory-prepared bottles, labeled, and placed in a cooler on ice chilled to approximately four (4) degrees Celsius. Each sample will be logged onto a chain-of-custody form, and the time of sample collection, location, and depth will be logged in a field book. The samples will be transported to Accredited for analyses.

Field blanks, consisting of laboratory-supplied water, will be poured over the decontaminated sampling equipment prior to sampling. Trip blanks consisting of laboratory-supplied vials of water will accompany the samples to the laboratory. These samples will be analyzed for VOCs.

4.5 Laboratory Analysis

It is proposed that each soil sample be analyzed for PCBs, using USEPA Test Method 8081/8082. Some soil samples will also be analyzed for TCL/TAL compounds. It is also proposed that each groundwater sample be analyzed for TCL/TAL compounds, with analyses of metals from both filtered and unfiltered samples. Surface water sediments would be analyzed for PCBs.

5.0 SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP)

Strict health and safety procedures will be followed during all field investigation activities. A detailed site-specific HASP will be developed prior to the implementation of fieldwork.

6.0 REPORT PREPARATION

After completion of the field investigation, a Supplemental Investigation Report will be prepared which will identify and characterize the contaminants (if any), concentrations, and environmental fate and transport as necessary. Summary tables will be included along with sample and contaminant concentration maps. Stratigraphic logs will also be prepared.

Groundwater contour maps will be prepared to identify groundwater flow direction. Groundwater tables will be prepared outlining contaminant concentrations.

The results and the exposure pathway will be evaluated. A quantitative risk assessment will be performed consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and will be included in the risk assessment.

7.0 QUALITY CONTROL


Brinkerhoff maintains a basic commitment to quality management, which includes the following minimum standards:

- All technical personnel have received 40 hours of training in health and safety while working on sites with environmental contamination as per the Occupational Safety and Health Administration (OSHA), maintain eight (8)-hour annual refresher courses in OSHA compliance, and are on medical monitoring;
- A site-specific HASP is prepared for each project site which is reviewed with and signed off by the field technical staff working at each site;
- Laboratory analytical samples are collected, managed, and transported, as per the appropriate field sampling procedure manuals, with preparation of chain-of-custody documentation for all sampling events; and,
- Review of laboratory quality assurance/quality control to validate and verify sampling results.

The NYSDEC will be notified at least two (2) weeks prior to implementing field investigations.


This report has been prepared and is respectfully submitted by

BRINKERHOFF ENVIRONMENTAL SERVICES, INC.


KATE M. MESEROLL
Project Manager

12/7/09

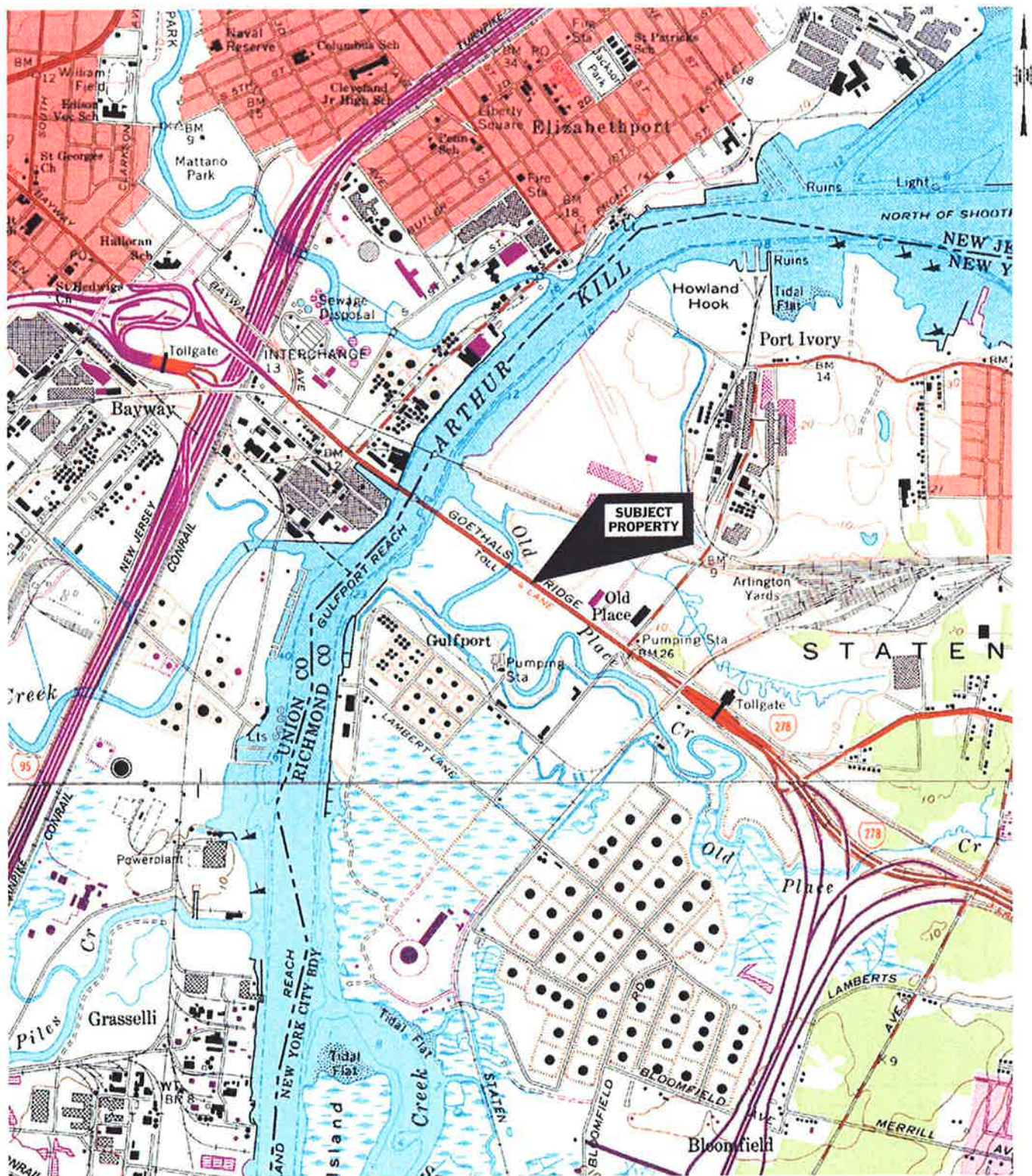
Date


DOUG HARM, P.G.
Vice President, Technical Services
Registered Professional Geologist

12/7/09

Date

FIGURES



Scale: 1 : 24,000

BRINKERHOFF

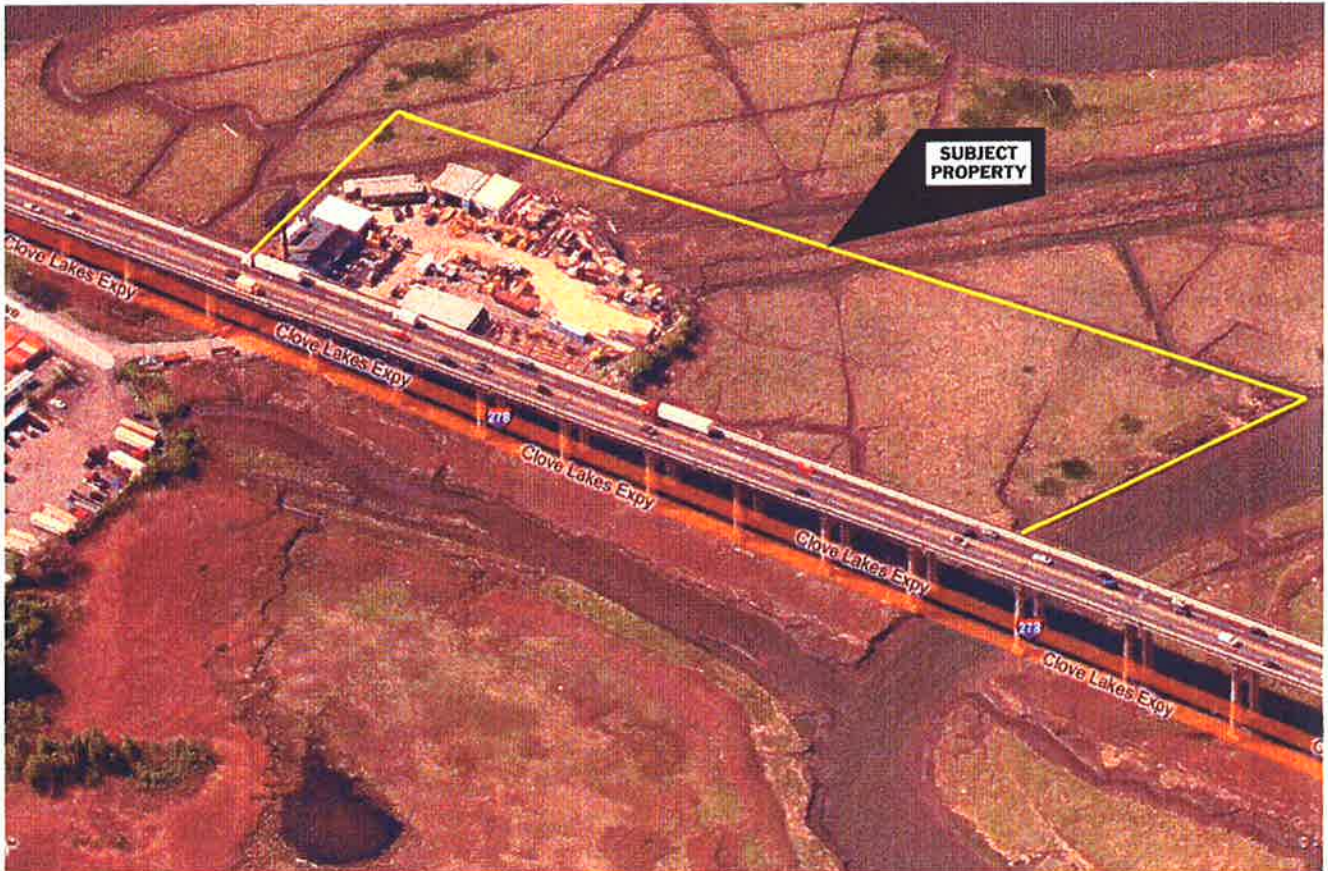
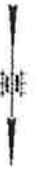
ENVIRONMENTAL SERVICES, INC.



Figure 1 - Site Location Map
U.S.G.S. Topographic Elizabeth, NJ Quad

250 South Washington Avenue
Staten Island, New York

Contour Interval: 10' Job No. 08BR049 Photo Revised: 1981



BRINKERHOFF

ENVIRONMENTAL SERVICES, INC.



Figure 2 - Recent Aerial Photograph

250 South Washington Avenue
Staten Island, New York

Note:
Date of Aerial Unknown

Date: 5/14/2008

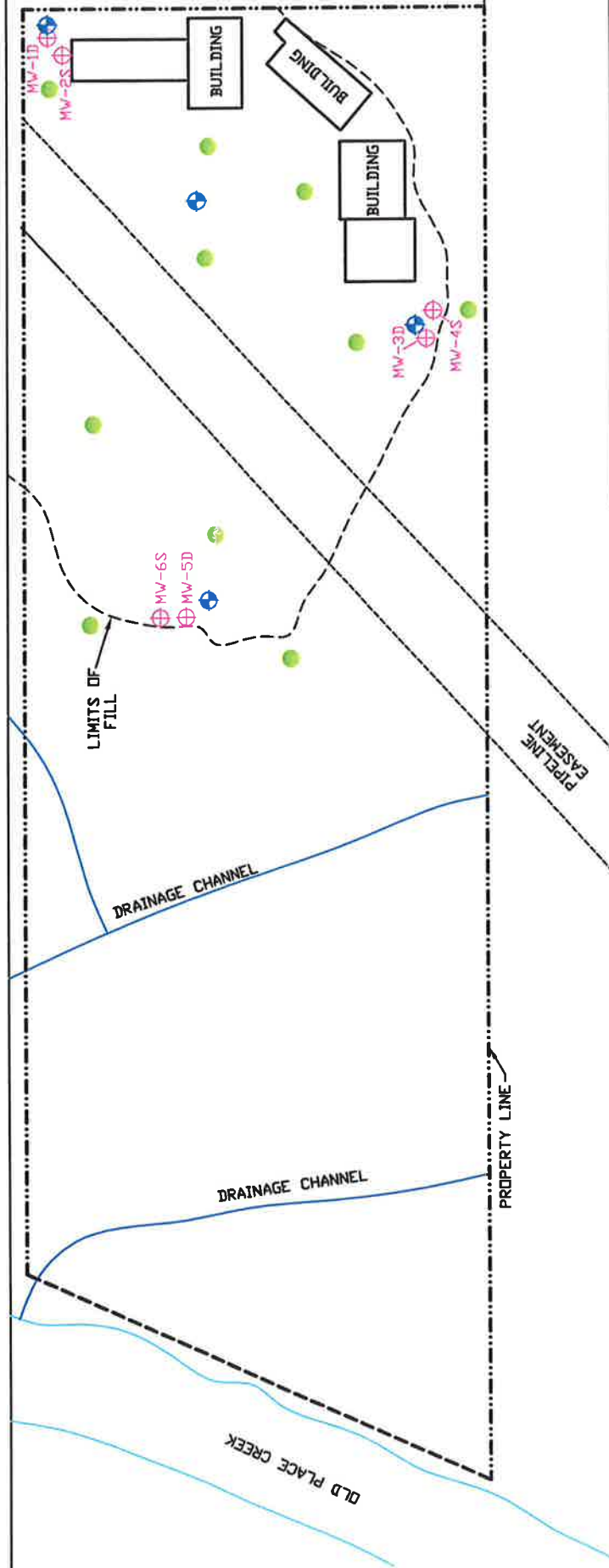
Job No. 08BR049

Source: Virtual Earth



GOETHAL'S
BRIDGE

INTERSTATE HIGHWAY 278



BRINKERHOFF
ENVIRONMENTAL SERVICES, INC.

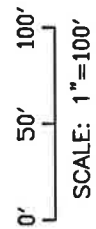
FIGURE 3

PROPOSED SAMPLE LOCATION MAP
250 SOUTH WASHINGTON AVENUE
STATEN ISLAND, NEW YORK

DATE: 10/16/09

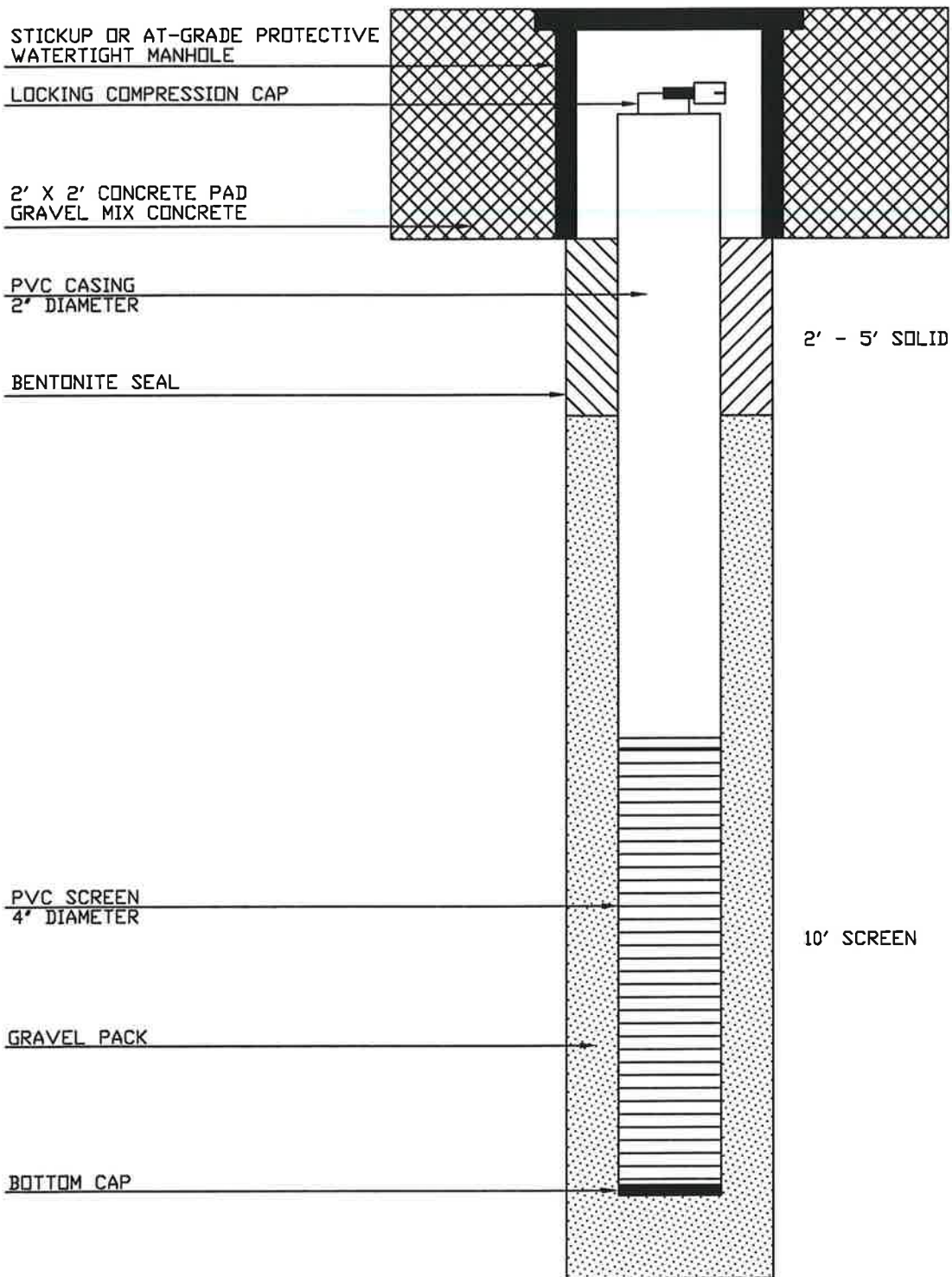
JOB NO.: 08BR049

SCALE: 1" = 100'



LEGEND

- PROJECTED LOCATION OF FORMER MONITORING WELLS
- PROJECTED LOCATION OF FORMER MONITORING WELLS
- PROPOSED SAMPLE LOCATION
- PROPOSED WELL LOCATION



BRINKERHOFF
ENVIRONMENTAL SERVICES, INC.

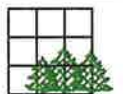


FIGURE 4

MONITORING WELL PLAN
250 SOUTH WASHINGTON AVENUE
STATEN ISLAND, NEW YORK

DATE: 12/1/09

JOB NO.: 08BR049

SCALE: NTS



BRINKERHOFF ENVIRONMENTAL SERVICES, INC.
www.brinkenv.com

1913 Atlantic Avenue, Suite R5
Manasquan, New Jersey 08736
TEL: 732-223-2225 FAX: 732-223-3666

133 Jackson Road, Suite D
Medford, New Jersey 08055
TEL: 609-714-2141 FAX: 609-714-2143