New York State Department of Environmental Conservation
625 Broadway • Albany, New York 12233

Remedial Investigation Work Plan Executive Summary

21-03 44th Avenue
Long Island City, New York
Site # 241107

Work Assignment # D-004439-26

April 2011

Prepared By:

Malcolm Pirnie, Inc.

855 Route 146, Suite 210
Clifton Park, New York 12065
518-250-7300

0266391

Contents

Figures

Tables

1. Introduction

On behalf of the New York State Department of Environmental Conservation (NYSDEC), Malcolm Pirnie, Inc. (Malcolm Pirnie) has prepared this Executive Summary for investigation activities at the 21-03 44th Avenue Site (ID # 241107), in Long Island City, Queens County, New York (Figure 1). The nature and extent of a groundwater plume of chlorinated volatile organic compounds (VOCs) and hexavalent chromium emanating from the north side of 44th Avenue between 21st Street and 22nd Street will be assessed during a remedial investigation (RI). This Executive Summary presents the understanding of site conditions to-date, site characterization approach, and field investigation activities necessary to complete the investigation..

2. Site Background

2.1. Site Description

The site is located in an urban area of Long Island City, Queens County, New York (Figures 1 and 2). It includes the sidewalk/street area immediately above and in the vicinity of a broken sewer line near the location of three groundwater monitoring points placed on the sidewalk in front of the building at 21-03 44th Avenue. The immediate surrounding land uses are commercial and industrial. The building at 21-03 44th Avenue is currently in use as commercial office space and as a taxi leasing business, and prior uses of the building include metal plating. A New York City high school is located approximately three hundred fifty feet to the south of the site. There are isolated residential properties located approximately five hundred feet to both the southeast and southwest along 44th Drive, and the closest primarily residential block is approximately seven hundred feet to the south along 45th Avenue. The site is almost entirely paved, with the exception of tree wells and the gravel-covered alley on the south side of 44th Avenue.

Contamination appears to have entered the environment from the broken sewer pipe that connects the building at 21-03 44th Avenue and the main sewer beneath 44th Avenue. The site was listed on the NYS Registry of Inactive Hazardous Waste Sites in August of 2008. A pre-design investigation was conducted in 2009 (Malcolm Pirnie, 2010), and interim remedial measures (IRMs) in the form of a zero-valent iron (ZVI) permeable reactive barrier (PRB) emplaced using injection techniques are scheduled for installation in the Spring of 2011.

2.2. Geology/Hydrogeology

Overburden materials observed during the pre-design investigation and during previous work (by others), are generally composed of fine to medium sand, trace amounts of coarse sand and fine gravel, and concrete and brick debris. Overburden materials are largely assumed to be either non-native fill materials or re-worked native materials. Consistent with previous work, bedrock was encountered between 17 and 20 feet below ground surface (bgs) during the 2009 pre-design investigation, with overburden groundwater encountered between 14 and 15 feet bgs. Previous investigations documented overburden groundwater flow to the south-southeast. The hydraulic gradient measured during the pre-design investigation was approximately 0.003.

2.3. Site History and Previous Investigations

Based on information provided by NYSDEC, the surrounding area was historically used for industrial and commercial purposes. Past occupants of the property located at 21- 03 44th Avenue, Block 441, Lot 9 (owned by Exclusive Realty Services, LLC), include Premier Metal Etching Company (1st floor) and the Radium Dial Company (2nd floor) (1936-1950), Ernst Industries Slide Fastener Manufacturer (1970) and ACME Associates, Inc. (1977-1996). Past use of the surrounding properties included a carpet cleaning company and metal novelties manufacturer. The Information Technology High School (ITHS) located down-gradient of the site was once occupied by a metal plating and finishing facility that later became a drapery hardware manufacturer and distributor.

Investigation and subsequent remediation of sewer system clean outs and subsurface structures in 2004 were followed by additional sampling and remedial work in 2005, including excavation of sump drain piping and additional soil north and east of the sump pit. Analysis of groundwater samples from the seven groundwater monitoring wells installed in around the property revealed the presence of VOCs and metals at concentrations that exceeded NYSDEC Class GA Standards. Additionally, a 7,500 gallon #4 heating oil underground storage tank (UST), located in the courtyard between the Bern Associates property and the Thomas C. Wilson property (near MW-7), was also closed in-place. Inspection of the tank and the absence of impacted soils excavated from above the tank, were cited as evidence that there had not been a release from the tank.

The former owner, Bern Associates, LLC, conducted a series of site investigations, characterizations and remedial activities (over the course of several years). Detailed information about the work performed is included in the reports titled "Phase I Environmental Site Assessment 21-03 44th Avenue Long Island City, New York" and "Phase II Environmental Evaluation 21-03 44th Avenue, Long Island City, New York" prepared by Leggette, Brashears, and Graham, Inc. (LBG). These activities identified the presence of PCE in groundwater up-gradient and side-gradient of the site with increasing PCE concentrations in monitoring well #1 (MW-1) between June 2005 and January 2007 and compromised sewer system piping. According to the NYSDEC, the building is now owned by Exclusive Realty Services, LLC.

As summarized in the most recent site investigation reports (CDM, 2009 and Malcolm Pirnie, 2010), previous investigation and remedial activities have revealed a groundwater plume of CVOCs (primarily tetrachloroethene (PCE)) and hexavalent chromium, which appears to emanate from a broken sewer pipe that connects the building at 21-03 44th Avenue and the sanitary sewer beneath 44th Avenue.

The 2009 pre-design investigation concluded that chlorinated VOCs, consisting primarily of PCE and TCE, were present in groundwater samples at concentrations greater than the corresponding NYSDEC Class GA Groundwater Standards in five of the site monitoring wells on 44th Avenue (MW-211S, MW-211D, MW-1BA, MW-8BA, and MW-217). Groundwater samples from two of the five wells also contained hexavalent chromium at concentrations greater than the corresponding NYSDEC Class GA Groundwater Standard. The two wells containing the highest PCE and TCE concentrations also contained the highest hexavalent chromium concentrations, suggesting a similar source. Based on pre-design investigation groundwater sampling, the CVOC groundwater plume at the site is of comparable horizontal (lateral) extent as previous sampling and total CVOC concentrations are comparable or lower than the previous sampling event. PCE and TCE were also detected in sub-slab soil vapor samples collected from buildings on the south side of 44th Avenue in the area of the CVOC groundwater plume, however the New York State Department of Health (NYSDOH) has recommended no further action at these locations.

3. Site Investigation

The scope of work for the site investigation is designed to further characterize the magnitude and extent of contaminants associated with the groundwater plume of CVOCs and hexavalent chromium emanating from the north side of 44th Avenue between 21st Street and 22nd Street and assess the potential for vapor intrusion in the suspected source area. The base scope of work includes a geophysical survey, hollow-stem auger soil borings, soil sampling, installation of shallow bedrock monitoring wells, the sampling of existing and new monitoring wells, and sub-slab and indoor air sampling.

An analytical laboratory approved by the New York State Department of Health (NYSDOH) under the Environmental Laboratory Approval Program (ELAP), and certified to perform NYSDEC Analytical Services Protocol (ASP) will analyze all samples collected during the investigation. Analytical results will be reported in ASP Category B data packages. A Data Usability Summary Report (DUSR) will be prepared upon the receipt of all analytical data to ensure that the quality of the data is sufficient to evaluate remedial alternatives. Sample collection, handling activities, and QA/QC sampling will be conducted in accordance with Malcolm Pirnie's Generic Quality Assurance Project Plan (QAPP), which has previously been submitted to the NYSDEC for work conducted under the NYSDEC State Superfund Standby Contract No. D004439.

3.1. Geophysical Survey

A geophysical survey will be conducted at the site using electromagnetic resistivity (ERM) and ground penetrating radar (GPR) methods to locate on-site utilities in the proposed drilling areas. Tracing of sewer line connections from buildings on the north side of 44th Avenue to the sewer mainline will also be conducted if access is granted and sewer cleanouts are accessible. The locations of the identified utilities will be marked in the field and on the site base map.

3.2. Subsurface Soil Sampling

Subsurface soil samples will be collected from approximately 10 locations, as shown on Figure 2, to evaluate potential sources of subsurface contaminants. The exact location and number of borings drilled at the site will be determined in the field based on the observations made by the field geologist and accessibility to the drilling location.

Soil borings will be drilled using 2 ¼" inner-diameter hollow-stem auger drilling methods. Soil samples will be collected continuously from the ground surface to the

depth of bedrock at approximately 20 feet below ground surface (bgs) using a split-spoon sampler. Upon retrieval, each split-spoon will be opened and the soil will be screened using a photoionization detector (PID), visually inspected for indications of contamination (e.g., staining and/or sheens) and buried debris, and classified by the on-site field geologist. Up to two soil samples from each boring will be collected from the unsaturated interval containing the highest PID measurement and/or the greatest evidence of contamination (e.g., staining, sheens, and/or odor). If no contamination is evident, only the depth interval immediately above the water table or refusal depth will be submitted for laboratory analysis. Soil samples will be analyzed for the following parameters:

- Target Compound List (TCL) + Tentatively Identified Compounds (TICs) volatile organic compounds (VOCs) by USEPA Method 8260B;
- TCL semi-volatile organic compounds (SVOCs) + TICs by USEPA Method 8270C;
- Target Analyte List (TAL) metals by USEPA Methods 6010C and 7471B;
- Hexavalent Chromium by Method 218.5;
- Polychlorinated Biphenyls (PCBs) by USEPA Method 8082; and
- Organochlorine Pesticides by USEPA Method 8081A.

3.3. Groundwater Well Installation

Five bedrock groundwater monitoring wells will be installed at the locations shown on Figure 2 to characterize groundwater conditions in shallow bedrock within the known overburden plume area. The monitoring wells will be installed using hollow-stem auger and water/mud rotary drilling methods and will be completed with flush-mount protective covers. Each well will be constructed of 4-inch inner diameter (ID) steel or PVC casing from ground surface to approximately five feet into competent bedrock (approximately 25 feet bgs). Four of the wells will be completed to the final depth of approximately 35 feet bgs (one to approximately 50 feet bgs) using a 3- 7/8 inch O.D. roller bit and mud, water, or air rotary drilling techniques. The fifth well will be completed to the final depth of approximately 35 feet bgs using HQ wire-line rock coring techniques.

Three overburden groundwater monitoring wells will be installed at the locations shown on Figure 2 to further characterize groundwater conditions to the north and east of the known area of groundwater containing chlorinated VOCs and hexavalent chromium. The monitoring wells will be installed using hollow-stem auger drilling methods and will be completed with flush-mount protective covers. Each well will be constructed of 2-inch

ID PVC casing and screen. The final depth of each well will be the top of bedrock (based of refusal), which is estimated to be approximately 20 bgs.

Upon completion, monitoring wells will be developed to minimize turbidity in groundwater samples collected from each well and to improve their hydraulic properties. Development water generated will be collected in UN-approved 55-gallon steel drums and staged at the wellhead for daily pickup and proper disposal.

3.4. Groundwater Sampling

Upon the completion of well installation and development, the eight new wells and the following existing wells will be sampled during two groundwater monitoring events (Figure 2 and Table 1).

- Two wells planned for installation within the ZVI PRB treatment zone

- MW-5BA
- MW-214D
- MW-6BA
- MW-215D
- MW-1BA
- MW-2BA
- MW-8BA
- MW-217
- MW-210D
- MW-211S
- MW-211D
- MW-212D
- MW-213D
- MW-205D
- MW-206D

Prior to groundwater purging and sampling the depth to water and light non-aqueous phase liquid (LNAPL), if present, in each monitoring well will be measured using an oil/water interface probe and recorded. Groundwater sampling will be conducted in accordance with the USEPA Low-Flow/Low-Purge Sampling Protocol (USEPA, 1998). To the extent practicable, groundwater purging rates will be low enough to prevent significant drawdown of the groundwater level in the monitoring well. Water levels will be monitored during sampling to ensure that excessive draw down is not occurring. Each groundwater sample will be analyzed for the following parameters, with the exception of PCBs and organochlorine pesticides, which will only be collected from select wells (Table 1):

- TCL + TICs VOCs by USEPA Method 8260B;
- TCL + TICs SVOCs by USEPA Method 8270C;
- TAL metals by USEPA Methods 6010C and 7470A;
- Hexavalent Chromium by Method 218.5;

- PCBs by USEPA Method 8082; and
- Organochlorine Pesticides by USEPA Method 8081A.

3.5. Investigation-Derived Waste

Investigation derived wastes will be handled in accordance with the NYSDEC Proposed Decision TAGM Disposal of Contaminated Groundwater Generated During Site Investigations and the Final TAGM – Disposal of Drill Cuttings. Soil and groundwater will be contained in U.N.-approved 55-gallon drums. It is assumed that a central drum staging area will not be available during field activities. Therefore investigation-derived waste will be characterized at the beginning of the project and the waste disposal subcontractor will pickup drums each day directly from the drilling location for transportation to the disposal facility.

3.6. Vapor Intrusion Assessment

If access allows, sub-slab soil vapor and indoor air samples will be collected from buildings located between 43rd Avenue and 44th Avenue in the area of the groundwater plume. Up to 18 sub-slab soil vapor samples, three indoor air samples, and one outdoor air sample will be collected.

Prior to sample collection, the NYSDOH Indoor Air Quality Questionnaire and Building Inventory will completed for each building. As part of the questionnaire, a product inventory will be prepared to identify potential confounding sources.

Each sample will be collected concurrently using sampling procedures in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006. All air samples will be collected using 6-liter summa canisters equipped with pre-calibrated flow controllers. All sub-slab vapor samples will be collected over a 1-hour time period and all indoor and outdoor air samples will be collected over a 24-hour time period. Samples from each monitoring point will be sent to a NYSDOH ELAP and NYSDEC ASP-certified analytical laboratory under chain-of-custody procedures for analysis of VOCs by USEPA Method TO-15.

3.6.1. Tracer Gas Test

A tracer gas test will be performed in accordance with NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH, 2006) to confirm that the soil vapor probes were constructed in a manner that minimize the entrainment of ambient air into the soil vapor samples. Helium will be used as the tracer gas since it is non-toxic, non-reactive, and provides a sensitive response that can be monitored using a portable helium detector. Tracer gas testing will be performed at all proposed soil vapor sampling locations. A small plastic container will be placed over the sampling point, filled with helium, and measured using a helium detector to ensure 100 percent concentration of helium in the enclosure. A syringe will be used to purge the sampling

tube into a Tedlar® bag which will be tested using the helium detector and a PID. If high concentrations (greater than 10 percent) of tracer gas are observed in the Tedlar® bag, the probe seal will be enhanced to reduce the infiltration of air. Once the probe seal's integrity is confirmed, the 6-liter sampling canister with a vacuum gauge and flow controller will be connected to the sample tubing and the point sampled.

3.7. Survey

Upon completion of the field investigation activities, the location and elevation of each new groundwater monitoring well installed during the RI and IRM field activities will be surveyed to the nearest 0.01-foot vertically and 0.1-foot horizontally and will be added to an AutoCAD base map for the site. The locations of the subsurface soil samples will also be surveyed to the nearest 0.1-foot horizontally and added to the AutoCAD base map.

4. Reporting

4.1. Remedial Investigation

The results of the investigation activities will be provided to the NYSDEC in a Remedial Investigation (RI) report prepared based upon "DER-10 Technical Guidance for Site Investigation" (DER-10) (NYSDEC, 2010) and submitted to the NYSDEC for review and comment. The report will include the following:

- Discussion of field investigation activities and technologies.
- Discussion of the physical characteristics of the site, including groundwater flow patterns.
- Presentation of analytical results for all media sampled.
- Quality assurance/quality control evaluation of the analytical data including the results of the data quality review.
- Discussion of the nature and extent of contaminants.
- Comparison of analytical results to background concentrations and applicable regulatory standards and objectives.
- Supporting data, including analytical data packages, field log forms, and monitoring well construction diagrams.

4.2. Feasibility Study

A Feasibility Study (FS) Report will be prepared based upon DER-10 and submitted to the NYSDEC for review and comment. The report will summarize the activities performed and present the results and conclusions of the RI and the remedial action alternatives screening. An evaluation of remedial alternatives with respect to each of the required evaluation criteria will be presented, as well as a comparison between the alternatives.

5. References

Camp Dresser and McKee, 2009. Site Characterization/Plume Tracking Report for 21-03 44th Avenue.

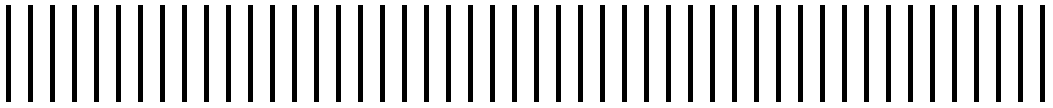
Malcolm Pirnie, 2010, Pre-Design Investigation Report and Interim Remedial Measures Evaluation/Work Plan, 21-03 44th Avenue, Long Island City, New York, June 2010.

New York State Department of Environmental Conservation, 2002. Draft DER-10 Technical Guidance for Site Investigation and Remediation.

United States Environmental Protection Agency (USEPA), Region II, 1998. Ground Water Sampling Procedure, Low Stress (Low Flow) Purging and Sampling Standard Operating Procedure.

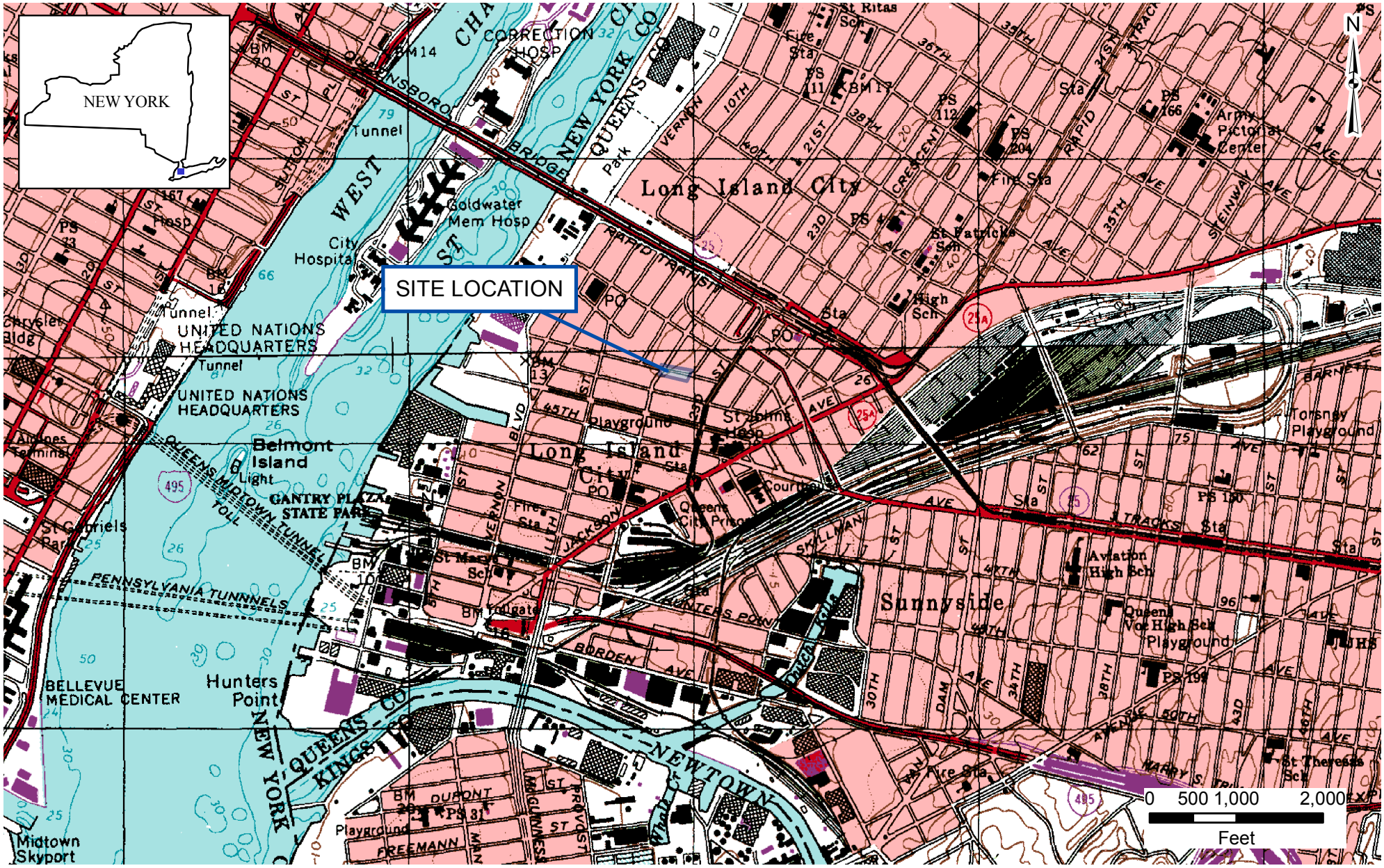
New York State Department of Environmental Conservation
Executive Summary
21-03 44th Avenue Site

Figures



0266391 / ALB

MALCOLM PIRNIE



M:\GISMOD\0266383\Site Location.mxd

MALCOLM PIRNIE

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

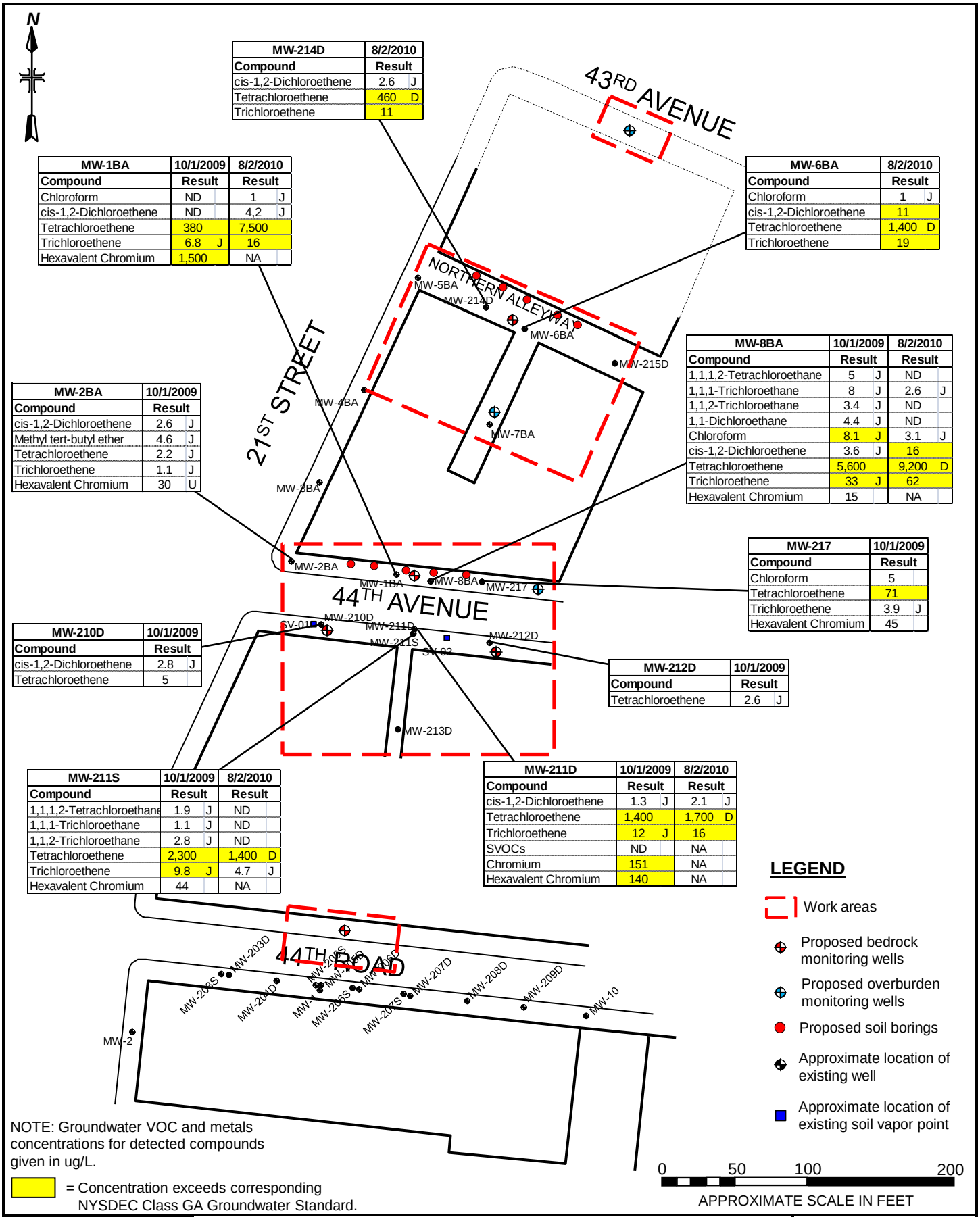
21-03 44TH AVENUE SITE (#241107)
LONG ISLAND CITY, NEW YORK

SITE LOCATION

MALCOLM PIRNIE, INC.

JUNE 2009

FIGURE 1



MW-214D	8/2/2010	
Compound	Result	
cis-1,2-Dichloroethene	2.6	J
Tetrachloroethene	460	D
Trichloroethene	11	

MW-1BA	10/1/2009		8/2/2010	
Compound	Result		Result	
Chloroform	ND		1	J
cis-1,2-Dichloroethene	ND		4.2	J
Tetrachloroethene	380		7,500	
Trichloroethene	6.8	J	16	
Hexavalent Chromium	1,500		NA	

MW-6BA	8/2/2010	
Compound	Result	
Chloroform	1	J
cis-1,2-Dichloroethene	11	
Tetrachloroethene	1,400	D
Trichloroethene	19	

MW-8BA	10/1/2009		8/2/2010	
Compound	Result		Result	
1,1,1,2-Tetrachloroethane	5	J	ND	
1,1,1-Trichloroethane	8	J	2.6	J
1,1,2-Trichloroethane	3.4	J	ND	
1,1-Dichloroethane	4.4	J	ND	
Chloroform	8.1	J	3.1	J
cis-1,2-Dichloroethene	3.6	J	16	
Tetrachloroethene	5,600		9,200	D
Trichloroethene	33	J	62	
Hexavalent Chromium	15		NA	

MW-2BA	10/1/2009	
Compound	Result	
cis-1,2-Dichloroethene	2.6	J
Methyl tert-butyl ether	4.6	J
Tetrachloroethene	2.2	J
Trichloroethene	1.1	J
Hexavalent Chromium	30	U

MW-217	10/1/2009	
Compound	Result	
Chloroform	5	
Tetrachloroethene	71	
Trichloroethene	3.9	J
Hexavalent Chromium	45	

MW-210D	10/1/2009	
Compound	Result	
cis-1,2-Dichloroethene	2.8	J
Tetrachloroethene	5	

MW-212D	10/1/2009	
Compound	Result	
Tetrachloroethene	2.6	J

MW-211S	10/1/2009		8/2/2010	
Compound	Result		Result	
1,1,1,2-Tetrachloroethane	1.9	J	ND	
1,1,1-Trichloroethane	1.1	J	ND	
1,1,2-Trichloroethane	2.8	J	ND	
Tetrachloroethene	2,300		1,400	D
Trichloroethene	9.8	J	4.7	J
Hexavalent Chromium	44		NA	

MW-211D	10/1/2009		8/2/2010	
Compound	Result		Result	
cis-1,2-Dichloroethene	1.3	J	2.1	J
Tetrachloroethene	1,400		1,700	D
Trichloroethene	12	J	16	
SVOCs	ND		NA	
Chromium	151		NA	
Hexavalent Chromium	140		NA	

LEGEND

- Work areas
- Proposed bedrock monitoring wells
- Proposed overburden monitoring wells
- Proposed soil borings
- Approximate location of existing well
- Approximate location of existing soil vapor point

NOTE: Groundwater VOC and metals concentrations for detected compounds given in ug/L.

= Concentration exceeds corresponding NYSDEC Class GA Groundwater Standard.

MALCOLM PIRNIE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROPOSED SAMPLING LOCATIONS

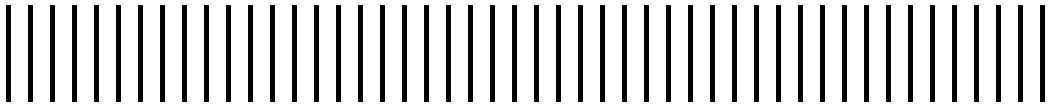
21-03 44TH AVENUE SITE (#241107)
LONG ISLAND CITY, QUEENS COUNTY, NEW YORK

APRIL 2011

FIGURE 2

New York State Department of Environmental Conservation
Executive Summary
21-03 44th Avenue Site

Tables



0266391 / ALB

MALCOLM PIRNIE

Table 1
Proposed Sampling Locations
21-03 44th Ave RI/FS
Long Island City, New York

GROUNDWATER

Well ID	Screened Interval	Well Status	VOCs	SVOCs	TAL Metals	Hex. Cr	Pesticides	PCBs
43rd Ave	Overburden	**Proposed**	X	X	X	X	X	X
MW-5BA	Overburden	Existing	X		X	X		
MW-214D	Overburden	Existing	X		X	X		
MW-6BA	Overburden	Existing	X	X	X	X	X	X
MW-215D	Overburden	Existing	X		X	X		
MW-7BA	Overburden	**Proposed Replacement**	X		X	X		
MW-2BA	Overburden	Existing	X		X	X		
MW-1BA	Overburden	Existing	X		X	X		
MW-8BA	Overburden	Existing	X	X	X	X	X	X
MW-217	Overburden	Existing	X		X	X		
East of MW-217	Overburden	**Proposed**	X		X	X		
MW-210D	Overburden	Existing	X		X	X		
MW-211S	Overburden	Existing	X		X	X		
MW-211D	Overburden	Existing	X		X	X		
MW-212D	Overburden	Existing	X		X	X		
S. 44th Ave	Overburden	IRM monitoring	X					
S. 44th Ave	Overburden	IRM monitoring	X					
MW-213D	Overburden	IRM Replacement	X		X	X		
MW-205D	Overburden	Existing	X		X	X		
MW-206D	Overburden	Existing	X	X	X	X	X	X
N. Alley	Bedrock	**Proposed**	X		X	X		
N. 44th Ave	Bedrock	**Proposed**	X		X	X		
S. 44th Ave -1	Bedrock	**Proposed**	X		X	X		
S. 44th Ave-2	Bedrock	**Proposed**	X		X	X		
44th Rd.	Bedrock	**Proposed**	X		X	X		
	Sub-Total (Per Sampling Round)		**25**	**4**	**23**	**23**	**4**	**4**
	QA/QC Samples (Per Sampling Round)		**2**	**1**	**2**	**2**	**1**	**1**
		Total	**54**	**10**	**50**	**50**	**10**	**10**

VAPOR INTRUSION

Sample Type	Sub-slab Points	Indoor Air	Outdoor Air
Building	18	3	
Duplicate	1		
Outdoor Air			1
Total	**19**	**3**	**1**

SOIL

Location	Number of Samples	VOCs	SVOCs	TAL Metals	Hex. Cr	Pesticides	PCBs
Northern Alleyway	10	X	X	X	X	X	X
44th Avenue	10	X	X	X	X	X	X
QA/C Samples	3	X	X	X	X	X	X