

**OFFSITE SOIL VAPOR INVESTIGATION  
WORK PLAN**

**TEITELBAUM DRY CLEANING INC.  
35-45 35<sup>TH</sup> STREET  
Queens, NY 11106  
NYSDEC BCP No. C241149**

*Prepared for*  
S & C Properties, LLC  
2 Bay Club Drive, Apt. 10G  
Bayside, NY 11360



61 Broadway  
Suite 1601  
New York, NY 10006

FINAL  
June 2, 2015

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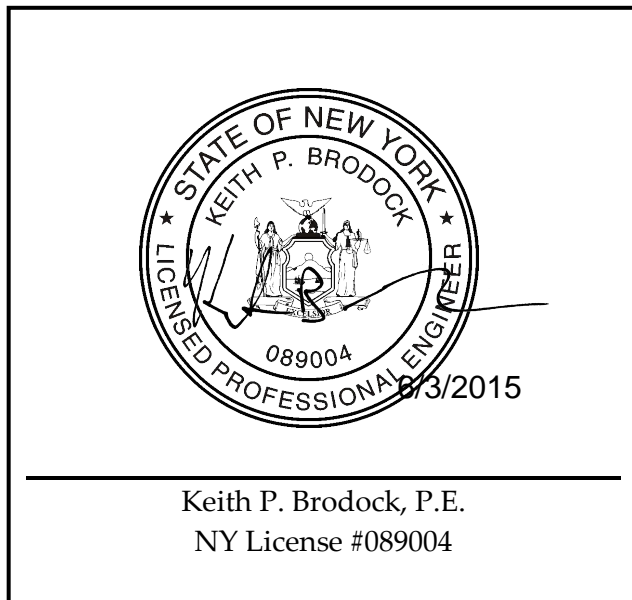
- Figure 1. Site Location Map
- Figure 2. Surrounding Properties
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## CERTIFICATION

*I Keith P. Brodock, P.E. certify that I am currently a NYS registered professional engineer (#089004) as defined in 6 NYCRR Part 375 and that this Soil Vapor Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Final 2006).*

It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

Date signed and sealed:



# 1 INTRODUCTION

In accordance with the requirements set forth by the New York State Department of Environmental Conservation (NYSDEC) in the Brownfield Cleanup Program, which S & C Properties, LLC (S & C) entered as a Participant on December 18, 2013, Integral Engineering, P.C. (Integral) has prepared this Offsite Soil Vapor Work Plan (Work Plan) for the property located at 35-45 35<sup>th</sup> Street (Site) (Block 639, Lot 4).

This Work Plan has been prepared at the request of the NYSDEC to assess the potential for offsite contamination migration and vapor intrusion into the buildings of adjacent properties. Access letters were sent to six adjacent property owners between October 9 and October 13, 2014 (included as Appendix A). Adjacent properties are shown on Figure 2 (surrounding properties).

After multiple efforts made by Integral, NYSDEC, and NYSDOH, consent for access to conduct indoor air and soil vapor sampling was not authorized by any of the adjacent property owners. However, the property owner of Block 638 Lots 43 and 46 agreed to provide access to his buildings contingent upon the collection and analysis of soil vapor samples from the sidewalk adjacent to the aforementioned lots. The owner of Block 638 Lot 42 had previously provided authorization for access, but has not allowed Integral to conduct a preliminary site walk-through to date. Integral and the Participant's counsel attempted to negotiate an access agreement to perform sampling with the owner of Block 639 Lot 41, but ultimately the owner denied access. After three attempts to contact the owners of Block 639 Lot 1 and Block 639 Lot 7 via certified mail, Integral has yet to receive a response.

## 1.1 SITE BACKGROUND

The Site is located in a mixed use area of Astoria in the Borough of Queens. The Site is comprised of an approximately 9,950 square foot parcel (0.23 acres) located near the southwest corner of the block and is bound to the northwest by 35<sup>th</sup> Street, to the south by 36<sup>th</sup> Avenue, to the east by 36<sup>th</sup> Street, and to the northeast by 35<sup>th</sup> Avenue. The Site is identified on the New York City tax map as Block 639, Lot 4. Adjacent properties include mixed use commercial and residential buildings to the northwest, industrial and manufacturing to the south and northeast, and commercial and office buildings to the east. The Site is currently improved with one high-ceilinged commercial/manufacturing building (measuring approximately 100' x 100'). The ground floor of the building is currently utilized as an industrial dry cleaner not open to the public. A Site location map is provided as Figure 1.

Sanborn maps show that the property was first occupied by a commercial wagon and automobile garage as early as 1936. Building operations at this time included the use of a cleaning pit and automobile painting. In 1947 a machine shop and iron works business

occupied the Site. Dry cleaning operations are first noted on Sanborn maps in 1970 and continue to be in operation to date. Additional records searches on the NYC Department of Buildings (DOB) Buildings Information System (BIS) provided Certificates of Occupancy from 1965 stating the Site was occupied by a commercial business that included cleaning, drying, pressing and storage. Interviews with the current Site owner indicate that a drycleaner has occupied the Site since at least 1952.

## 1.2 GEOLOGY AND HYDROGEOLOGY

The Site is mapped on the *Central Park, NY-NJ and Brooklyn* Quadrant 7.5 Minute Topographic Map, published by the United States Geological Survey (USGS). It entails approximately 0.23 acres (9,950 square feet) of relatively level land and is located approximately 37 feet above sea level (NAVD 88). The Site is situated within the Atlantic Coastal Plain region of the Long Island Coastal Lowlands characterized by glacial till and outwash sands of the Pleistocene Epoch.

The regional stratigraphy of Long Island from surface to bedrock includes: glacial and alluvial deposits of Quaternary age; the Raritan Formation of Upper Cretaceous age consisting of clay, silty clay, sand, and gravel; The Monmouth Group, Matawan Group and Magothy Formation of Upper Cretaceous age consisting of silty clay, glauconitic sandy clay, sand, and gravel; Fordham Gneiss of Precambrian to Middle Proterozoic age consisting of garnet-biotite-quartz-plagioclase gneiss, and amphibolite; Inwood Marble of Early Cambrian to Lower Ordovician age consisting of dolomite marble, calc-schist, granulite, and quartzite, overlain by calcite marble; and Harrison/Ravenswood Gneiss of Ordovician age consisting of biotite-hornblende-quartz-plagioclase gneiss with accessory garnet and sphene (USGS, 2014).

The shallow subsurface at the Site was investigated during the Remedial Investigation (RI) conducted in September 2014. Historic fill is present across the Site from approximately 0-2 feet below site grade (ft-bsg) followed by a mixture of fine to medium-grained sand with some silt. A clay layer was observed at various (inconsistent) intervals and was generally present in the shallow subsurface 2-4 ft-bsg within the southern portion of the Site and found in deeper intervals 18-22' ft-bsg within the northern portion of the Site. Southern bedrock was not encountered during the performance of the RI.

Groundwater was encountered at approximately 20 ft-bsg. According to information provided by NYSDEC on downgradient properties, the groundwater flow direction is south/southwest towards Newtown Creek (approximately 1.0 miles to the south). Regional groundwater flow of the area is expected to be towards the west, towards the East River, located approximately 0.9 miles from the Site.

No wetlands or surface water bodies are present at the Site.

### **1.3 SURROUNDING PROPERTY INFORMATION**

Land Uses for the Long Island City and Astoria sections of Queens have historically been industrial and manufacturing. Adjacent properties include mixed use commercial and residential buildings to the northwest, industrial and manufacturing to the south and northeast, and commercial and office buildings to the east. The surrounding properties are depicted in Figure 2. Based on a review of the New York City Mayor's Office of Environmental Remediation's (OER's) Searchable Property Environmental E-Database (SPEED), no hospitals or day care facilities are present within 500 feet of the Site. One school, the Baccalaureate School for Global Education, is present 160 feet (0.3 miles) southwest of the Site.

### **1.4 ENFORCEMENT HISTORY**

On October 14, 2014, S & C Properties, LLC applied to the Brownfield Cleanup Program as a Volunteer and was accepted by the NYSDEC as a Participant (Site No. C241149) on December 18, 2013. The Remedial Investigation was performed at the Site in September 2014, the results of which are summarized in this Work Plan. Prior to the RI, data was reviewed from investigations performed by TRC Engineers, Inc. (TRC) approximately 160 feet south of the Site at 34-12 36<sup>th</sup> Avenue, the former Luft Co. Inc. Cosmetics Manufacturer (site No. 241139), and current home to the Baccalaureate School for Global Education.

Data collected as part of these investigations in 2012 indicated that elevated concentrations of chlorinated solvents are present in the soil vapor and groundwater downgradient and adjacent to the Site. The results of the 2012 investigations were summarized in a New York State Department of Environmental Conservation (NYSDEC) letter to S & C dated May 20, 2013, at which point the Site was designated as a potential inactive hazardous waste disposal site. A comprehensive summary of TRC's findings and former investigations are provided in the Remedial Investigation Work Plan (RIWP) approved by the Department in May 2014.

### **1.5 OFFSITE SAMPLING OBJECTIVES**

Data from the onsite Remedial Investigation indicated that tetrachloroethene (PCE) is present in Site soils, groundwater, and indoor air at concentrations exceeding their respective applicable guidance values or standards. While there are no standards for volatile organic compounds in soil vapor, PCE and trichloroethene (TCE) were detected in soil vapor samples with concentrations of PCE ranging from 10.3 - 328,000 µg/m<sup>3</sup> and TCE ranging from 1.17 - 14,500 µg/m<sup>3</sup>. RI sampling locations are depicted on Figure 3.

The purpose of this offsite soil vapor investigation is to evaluate if onsite soil vapor contamination is impacting adjacent properties. All soil vapor samples collected from this investigation will be analyzed for VOCs by USEPA Method TO-15 at a NYSDOH ELAP-

certified analytical laboratory. Only site specific contaminants of concern will be reported (PCE and TCE).

## 2 SCOPE OF WORK

This section presents the approach and methods for performing the offsite soil vapor investigation. The bases for proposed investigative methodologies and laboratory analyses are derived from the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Final 2006) and NYSDEC Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10, 2010).

Prior to sampling, all soil vapor point locations will be hand cleared for utilities and subsurface infrastructure.

A Health and Safety Plan (HASP) has been prepared (Appendix B) to provide specific guidelines and establish procedures to protect Integral personnel during the investigation activities planned at the Site and adjacent properties. The HASP will be reviewed and signed by each Integral staff member prior to the commencement of the investigation.

Sampling protocols are provided in the following sections. Quality assurance/quality control (QA/QC) procedures will be followed in accordance with the Quality Assurance Project Plan (QAPP) included as Appendix C of the RIWP.

### 2.1 OFFSITE SOIL VAPOR SAMPLING

Offsite soil vapor samples will be collected from four (4) temporary soil vapor points located in the sidewalk along the northwest side of 35<sup>th</sup> Street and directly adjacent to Block 638 Lots 42, 43 and 46. Proposed sampling locations are provided on Figure 4. The results from the offsite soil vapor analysis will support the evaluation for determining whether chlorinated solvent has migrated to the opposite side of 35<sup>th</sup> Street and to what extent the chlorinated solvents may have migrated. Evidence of contamination across the street from the Site may suggest the need for sub-slab soil vapor and indoor air sampling within one or more buildings on that side of 35<sup>th</sup> Street.

The soil vapor points will be installed by advancing a 1-inch diameter hole through the sidewalk slab. The holes will be drilled via hammer drill or remote Geoprobe. The core hole will extend through the slab and terminate at the approximate depth of the adjacent buildings basements (approximately 6-7 ft-bsg)<sup>1</sup>. If the building adjacent to a given soil vapor point is a slab-on-grade, then the temporary point will terminate approximately 12" beneath the sidewalk. At each temporary soil vapor sample point, soil vapor samples will be collected using a 5/8-inch diameter retractable stainless steel sampling probe. The sampling probe consists of a

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<sup>1</sup> Depth to basement is an estimate. Integral will attempt to confirm the actual depth onsite.



1.5-inch long hardened point and a 2-inch long perforated vapor intake. Each temporary soil vapor point will be installed using dedicated 1/8" Teflon tubing. The tubing will be implanted into the hole and the annular space sealed with bentonite to prevent ambient air from entering the area around the probe. Once the seal is secure, a "T" fitting and valve will be connected on the above-surface end of the tubing. A syringe will be used to purge the vapors in the probe and tubing of three volumes. As required by the NYSDOH, a helium (He) tracer (with shroud) will be used as part of the sampling process and all testing will follow the NYSDOH Soil Vapor Guidance. Prior to sample collection, the He vapor will be screened using a field meter and the measurement recorded at each soil vapor sampling location (NYSDOH allows for 10% He of the shroud He concentration as a measure to determine a competent seal). Prior to sample collection, a multi-gas meter will be used to measure the concentration of O<sub>2</sub>, CO<sub>2</sub>, and CH<sub>4</sub> in each probe, to assess the persistence of hydrocarbon vapors. Following this procedure, the soil vapor samples will be collected in clean, batch-certified, one (1) liter Summa™ canisters, fitted with two (2) hour regulators, at flow rates no greater than 200 ml/min.

Soil vapor samples will be collected over a period of two (2) hours. Soil vapor samples will be analyzed for VOCs USEPA Method TO-15 at a NYSDOH ELAP-certified analytical laboratory. Only site specific contaminants of concern will be reported (PCE and TCE).

### Ambient Air Sample

Background (ambient) air commonly contains VOCs at measurable but low concentrations, and can contribute a positive bias to soil vapor samples. To characterize "background" concentrations, an ambient working conditions air sample will be collected along with the soil vapor samples. One background ambient air sample will also be collected per day along 35<sup>th</sup> Street, in front of either Lot 43 or Lot 46. The ambient air sample will be collected using a clean, batch certified Summa™ canister over a 2-hour period. The Summa™ canister will be placed at a height of 4-6 feet above grade to simulate breathing zone elevation.

## **2.2 REPORTING**

Following the receipt of all laboratory results, an Offsite Soil Vapor Report will be prepared. The report will include details of the sampling, tabulated sample results, and an assessment of the findings and conclusions. If warranted, recommendations for additional actions will be included.

A Data Usability Summary Report (DUSR) will be provided in accordance with the BCP and DER-10.

All data will be submitted electronically to NYSDEC via the Environmental Information Management System (EIMS) in EQuIS format.

### 3 SCHEDULE

<b>Task</b>	<b>Task Duration</b>	<b>Total Duration</b>
NYSDEC/NYSDOH Approval of Work Plan	0	0
Mobilization	1 Week	1 Week
Implement Work Plan	3 Days	1 Week 3 Days
Laboratory Analysis	1 Week	2 Weeks 3 Days
Draft Report Submittal	4 Weeks	6 Weeks 3 Days

## 4 KEY PROJECT CONTACT LIST

<b>Name</b>	<b>Title</b>	<b>Phone Number</b>	<b>Email</b>
Shaun Bollers	NYSDEC Project Manager	718-482-4096	shaun.bollers@dec.ny.gov
Christopher Doroski	NYSDOH Project Manager	518-402-7860	christopher.doroski@health.ny.gov
Alana Carroll	Integral Project Manager	212-440-6706	acarroll@integral-corp.com
Andrea Pampillonio	Participant (S & C Properties, LLC)	917-543-8513	apapap13@yahoo.com

## 5 REFERENCES

New York State Department of Environmental Conservation, Division of Environmental Remediation. DER Technical Guidance for Site Investigation and Remediation (DER-10). 2010.

New York State Department of Environmental Conservation 2010. New York State Department of Environmental Conservation DEC Policy. Commissioner's Policy 51 – Soil Cleanup Guidance. October 21, 2010.

New York State Department of Environmental Conservation, (2006). 6 NYCRR Part 375 Environmental Remediation Programs. Division of Environmental Remediation, December, 2006.

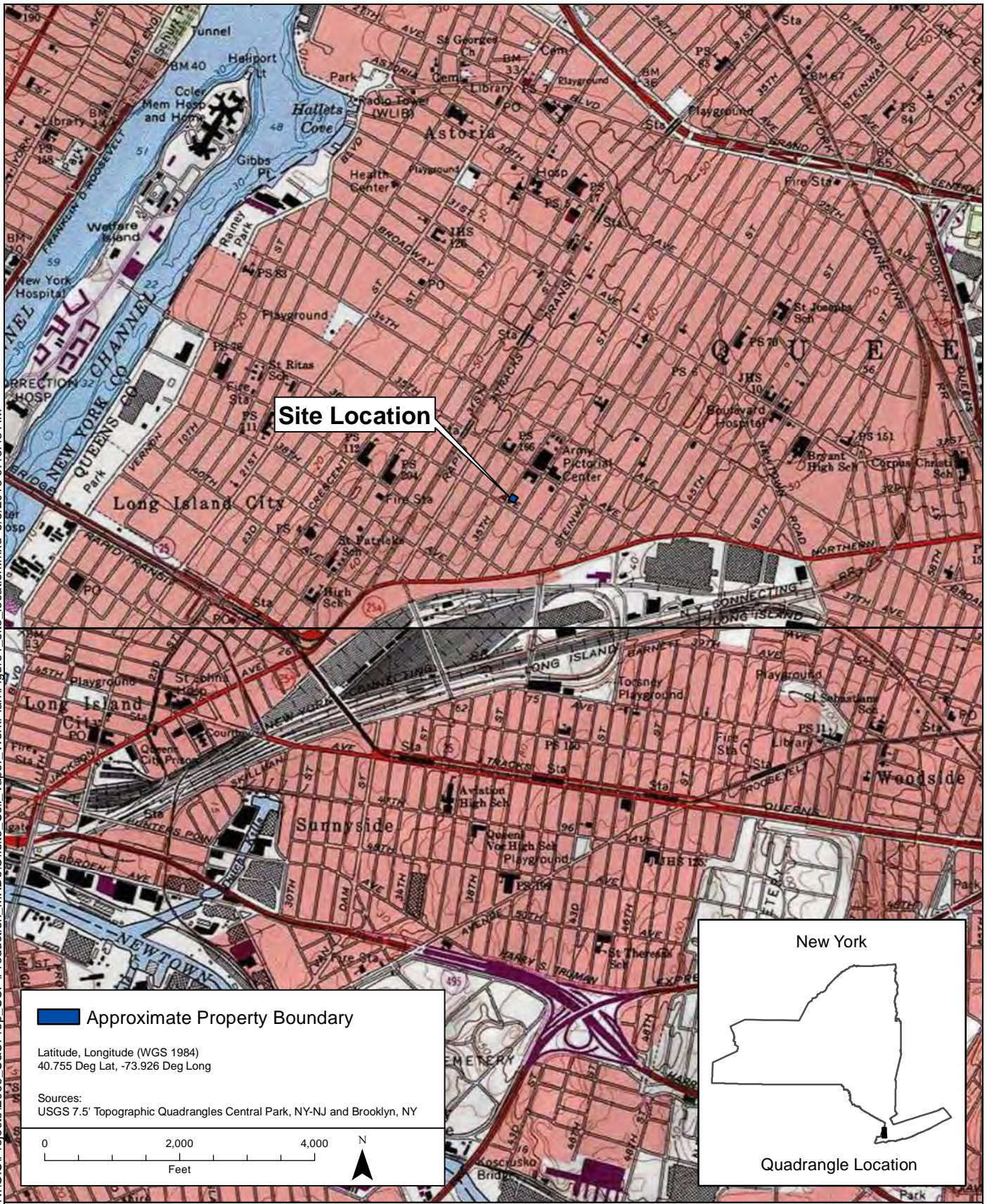
New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Final. October 2006.

United States Geological Survey (USGS). *Central Park, NY-NJ and Brooklyn* Quadrant 7.5 Minute Topographic Map. 2014

# FIGURES

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**Figure 1.**  
Site Location Map  
Offsite Soil Vapor Investigation  
Teitelbaum Dry Cleaning, Inc.  
35-45 35th Street  
Astoria, New York



61 Broadway, Suite 1601  
New York, New York 10006  
www.integral-corp.com

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**Site Boundary**

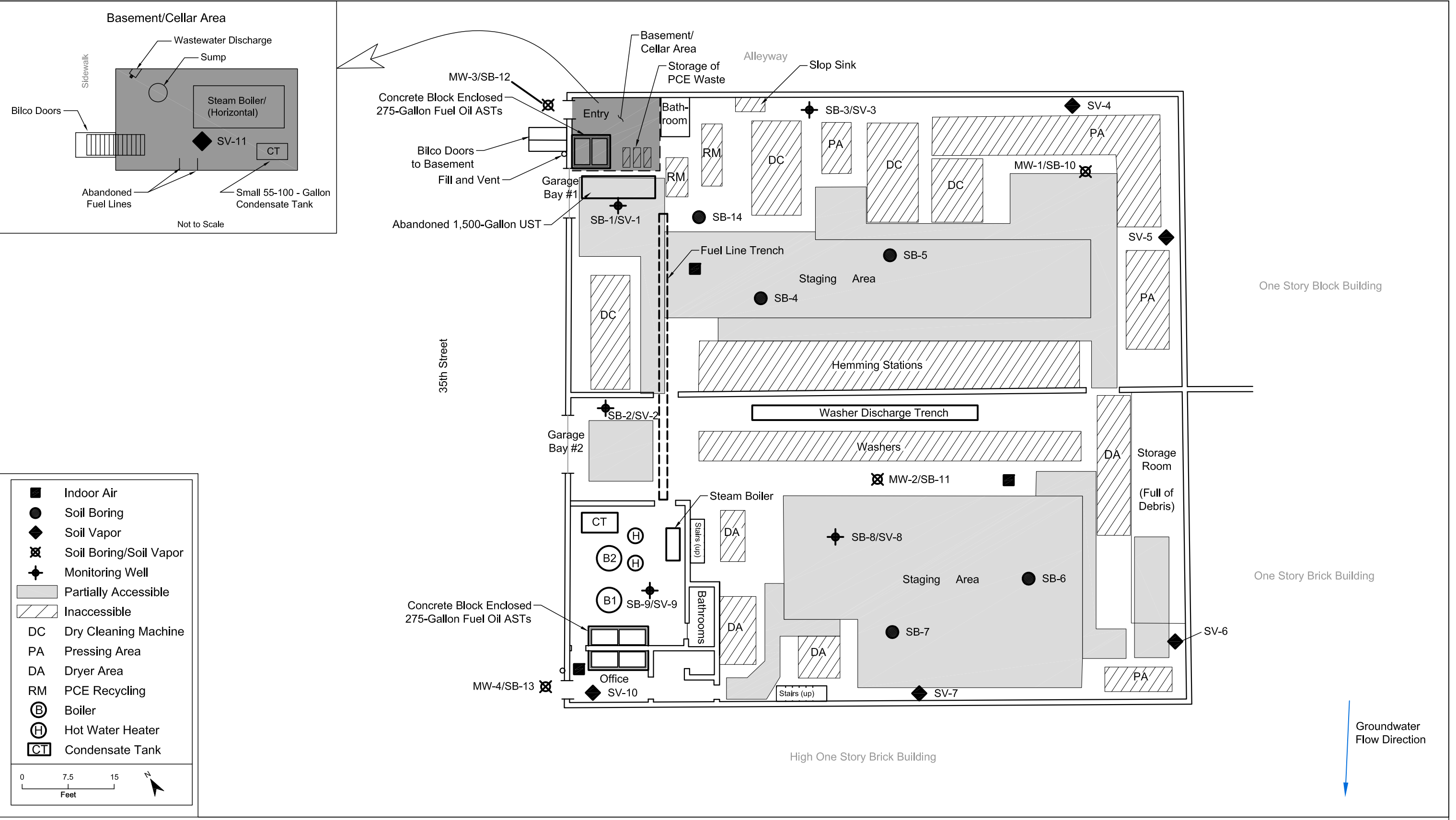
- One and Two Family Residence
- Multi-Family Residence
- Mixed Residential and Commercial
- Commercial
- Industrial/Manufacturing
- Transportation/Utility
- Public Facilities and Institutions
- Open Space and Recreation
- Parking
- Vacant Land
- School

Sources:  
Manhattan Tax Parcels: NYC Department of City Planning, 2013  
Aerial: ESRI Mapping Services, Microsoft, 2012

0 200 400  
Feet

**Figure 2.**  
Surrounding Properties  
Offsite Soil Vapor Investigation  
Teitelbaum Dry Cleaning, Inc.  
35-45 35th Street  
Astoria, New York

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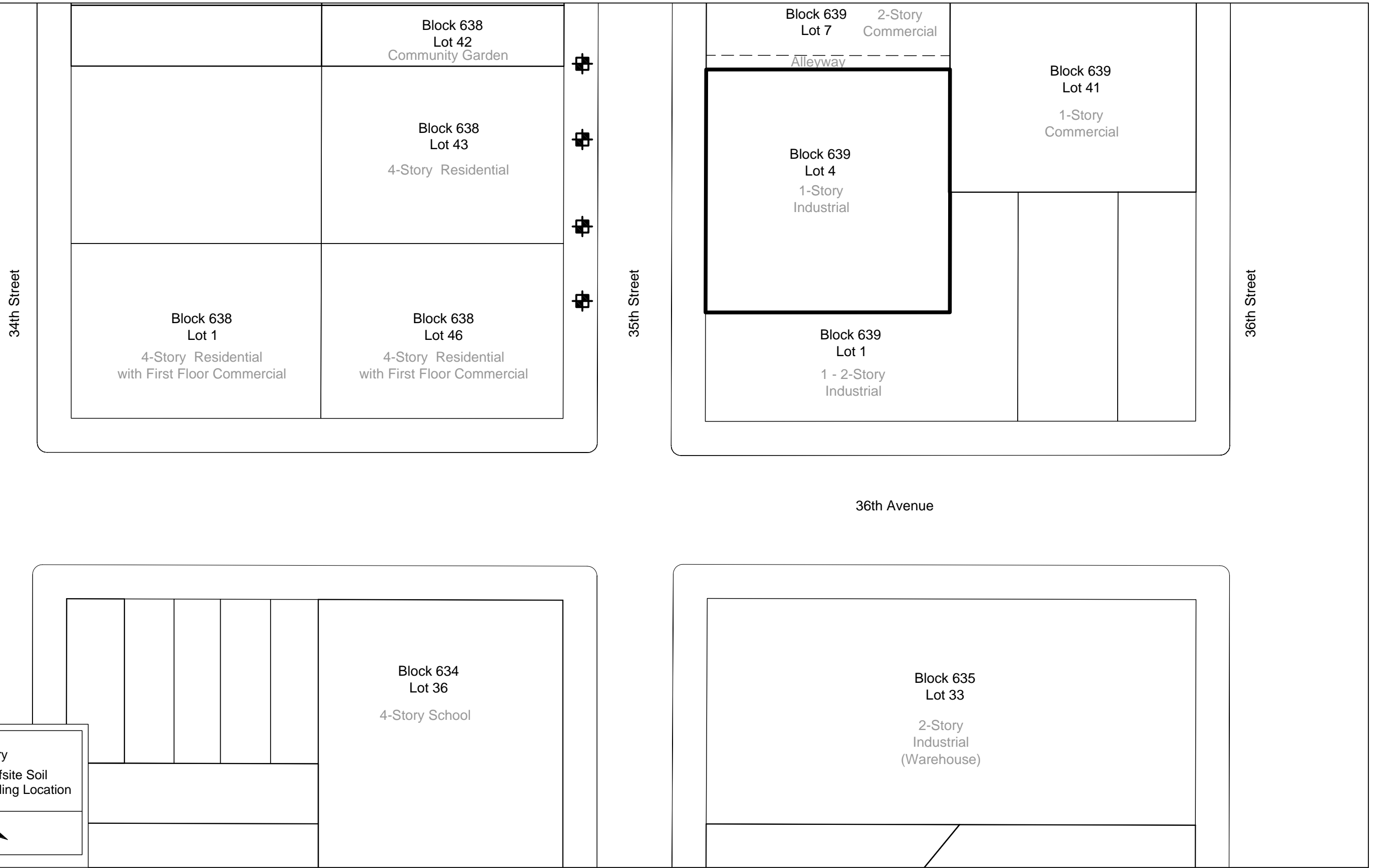
**NOTES:**

1. Staging areas may be accessible with prior notice
2. Sample locations are approximate
3. Placement and size of equipment and staging areas is approximate

**Figure 3.**  
RI Sample Locations  
Offsite Soil Vapor Investigation  
Teitelbaum Dry Cleaning, Inc.  
35-45 35th Street  
Astoria, New York



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**Figure 4.**  
 Proposed Soil Vapor Sampling Locations  
 Offsite Soil Vapor Investigation  
 Teitelbaum Dry Cleaning, Inc.  
 35-45 35th Street  
 Astoria, New York

# **Appendix A**

## **Adjacent Property Owners**

### **Access Letters**

#### **Offsite Soil Vapor Work Plan**

For the Property Located at 35-45 35<sup>th</sup> Street  
Queens, NY 11106  
Block 639, Lots 4  
NYSDEC BCP No. C241149

Submitted to:  
New York State Department of Environmental Conservation  
Division of Environmental Remediation  
Hunters Point Plaza  
47-40 21<sup>st</sup> Street  
Long Island City, NY 11101

Prepared for:  
S & C Properties, LLC  
2 Bay Club Drive, Apt. 10G  
Bayside, New York 11360

Prepared by:



61 Broadway  
Suite 1601  
New York, NY 10006

May 2015

*Affiliated with Integral Consulting Inc.*



Integral Engineering, P.C.  
61 Broadway  
Suite 1601  
New York, NY 10006

telephone: 212.962.4303  
facsimile: 212.962.4302  
www.integral-corp.com

October 7, 2014

**Via Federal Express – Return Receipt Requested**

Miledy Perez  
35-42 35<sup>th</sup> Street  
Long Island City, NY 11106

Subject: **Environmental Sampling at 35-42 35<sup>th</sup> Street, Astoria, NY**

Dear Ms. Perez:

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have recommended that sub-slab soil vapor and indoor air sampling be conducted at the above-mentioned property, in order to assess potential impacts from the adjacent building (the Site) located at 35-45 35<sup>th</sup> Street. As a result of historical operations, soil vapor contaminated with Volatile Organic Compounds (VOCs) is believed to be emanating from the Site. On behalf of the Remedial Party responsible for the Site (S & C Corp.), Integral Engineering P.C. is contacting you to request access to your property to perform the recommended sampling.

The assessment at your property would involve accessing the building to collect an indoor air sample and sub-slab soil vapor sample through the basement floor, as well as the collection of an outdoor air sample.

To obtain the sub-slab vapor sample, a small diameter hole would be drilled through the concrete slab floor. Upon obtaining the sample, the finished condition of the floor would be restored. All samples would be analyzed by a laboratory to assess whether VOCs may be migrating in soil vapor beneath your property and infiltrating the building. The sampling and analysis is similar to a basement radon assessment. You will be provided with the results of this sampling. **At no time will you be responsible for any costs associated with this assessment.**

Please review, sign, and return the attached consent form in the enclosed stamped and pre-addressed envelope. Please note that authorization to collect sub-slab soil vapor sample

Miledy Perez  
January 15, 2015  
Page 2

from the property will only be acknowledged by receipt of the consent form signed by the property owner or the property owner's representative. As noted on the attached consent form, please provide a time when you can be reached so that the specific activities to be conducted at your property may be discussed with you.

Should you have any questions or concerns, please feel free to contact me at 212-440-6706 or at acarroll@integral-corp.com. If you have any questions regarding environmental concerns, please contact Shaun Bollers of NYSDEC at 718-482-4096 or at shaun.bollers@dec.ny.gov. If you have any questions regarding public health concerns, please contact Christopher Doroski of NYSDOH at 518-402-7860 or at christopher.doroski@health.ny.gov. Thank you very much for your cooperation.

Sincerely,



Alana Carroll  
Senior Geologist/Manager

Enclosure

CC: Shaun Bollers, NYSDEC  
Christopher Doroski, NYSDOH

### CONSENT FOR ACCESS TO PROPERTY

NAME:	Miledy Perez
ADDRESS OF PROPERTY:	35-42 35 <sup>th</sup> Street, Astoria, NY

I (We) consent to allow Integral Engineering P.C. (working on behalf of S & C Corp) and its authorized representatives and contractors to enter and have continued access to the above-referenced property to: (i) collect a sub-slab soil vapor sample through the concrete slab basement floor; and (ii) collect outdoor and indoor air samples.

I (We) understand that upon obtaining the sample, the finished condition of the floor will be restored.

I (We) understand that Integral Engineering P.C. will notify us at least seven days prior to initially accessing my (our) property. This written permission is given by me (us) voluntarily with knowledge of our right to refuse and without threats or promises of any kind.

1/29/15  
Date

Miledy Perez  
Signature of Property Owner or Owner's Authorized Representative

Owner Name:

Miledy Perez

Address:

35-42-35<sup>th</sup> St.

Phone

347-247-3050

Preferred Meeting Date and Time:

Feb-2-2015. ALL DAY



Integral Engineering, P.C.  
61 Broadway  
Suite 16010  
New York, NY 10006

telephone: 212.962.4303  
facsimile: 212.962.4302  
www.integral-corp.com

October 7, 2014

**Via Federal Express – Return Receipt Requested**

Dimitrios Tsakonas  
31-61 38<sup>th</sup> Street  
Astoria, NY 11103

Subject: **Environmental Sampling at 35-48 35<sup>th</sup> Street, Astoria, NY**

Dear Mr. Tsakonas:

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have recommended that sub-slab soil vapor and indoor air sampling be conducted at the above-mentioned property, in order to assess potential impacts from the adjacent building (the Site) located at 35-48 35<sup>th</sup> Street. As a result of historical operations, soil vapor contaminated with Volatile Organic Compounds (VOCs) is believed to be emanating from the Site. On behalf of the Remedial Party responsible for the Site (S & C Corp.), Integral Engineering P.C. is contacting you to request access to your property to perform the recommended sampling.

The assessment at your property would involve accessing the building to collect an indoor air sample and sub-slab soil vapor sample through the basement floor, as well as the collection of an outdoor air sample.

To obtain the sub-slab vapor sample, a small diameter hole would be drilled through the concrete slab floor. Upon obtaining the sample, the finished condition of the floor would be restored. All samples would be analyzed by a laboratory to assess whether VOCs may be migrating in soil vapor beneath your property and infiltrating the building. The sampling and analysis is similar to a basement radon assessment. You will be provided with the results of this sampling. **At no time will you be responsible for any costs associated with this assessment.**

Please review, sign, and return the attached consent form in the enclosed stamped and pre-addressed envelope. Please note that authorization to collect sub-slab soil vapor sample

Dimitrios Tsakonas  
October 7, 2014  
Page 2

from the property will only be acknowledged by receipt of the consent form signed by the property owner or the property owner's representative. As noted on the attached consent form, please provide a time when you can be reached so that the specific activities to be conducted at your property may be discussed with you.

Should you have any questions or concerns, please feel free to contact me at 212-440-6706 or at acarroll@integral-corp.com. If you have any questions regarding environmental concerns, please contact Shaun Bollers of NYSDEC at 718-482-4096 or at shaun.bollers@dec.ny.gov. If you have any questions regarding public health concerns, please contact Christopher Doroski of NYSDOH at 518-402-7860 or at christopher.doroski@health.ny.gov. Thank you very much for your cooperation.

Sincerely,



Alana Carroll  
Senior Geologist/Manager

Enclosure

CC: Shaun Bollers, NYSDEC  
Christopher Doroski, NYSDOH

Dimitrios Tsakonas  
October 7, 2014  
Page 3

### CONSENT FOR ACCESS TO PROPERTY

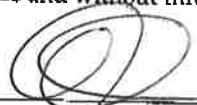
NAME:	Dimitrios Tsakonas
ADDRESS OF PROPERTY:	35-48 35 <sup>th</sup> Street, Astoria, NY

I (We) consent to allow Integral Engineering P.C. (working on behalf of S & C Corp) and its authorized representatives and contractors to enter and have continued access to the above-referenced property to: (i) collect a sub-slab soil vapor sample through the concrete slab basement floor; and (ii) collect outdoor and indoor air samples.

I (We) understand that upon obtaining the sample, the finished condition of the floor will be restored.

I (We) understand that Integral Engineering P.C. will notify us at least seven days prior to initially accessing my (our) property. This written permission is given by me (us) voluntarily with knowledge of our right to refuse and without threats or promises of any kind.

10/13/14  
Date

  
Signature of Property Owner or Owner's Authorized Representative

Owner Name:

Dimitrios Tsakonas

Address:

415 E 75<sup>th</sup> St NYC 10021

Phone

212 249-1400

Preferred Meeting Date and Time: \_\_\_\_\_

*Please call*

*917 907 9084*

*for access*

Affiliated with Integral Consulting Inc.

**integral**  
Engineering & Consulting





Integral Engineering, P.C.  
61 Broadway  
Suite 16010  
New York, NY 10006

telephone: 212.962.4303  
facsimile: 212.962.4302  
www.integral-corp.com

October 7, 2014

**Via Federal Express – Return Receipt Requested**

Dimitrios Tsakonas  
c/o ASA Properties  
415 East 75<sup>th</sup> Street  
New York, NY 10021

Subject: **Environmental Sampling at 34-11 35<sup>th</sup> Street, Astoria, NY**

Dear Mr. Tsakonas:

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have recommended that sub-slab soil vapor and indoor air sampling be conducted at the above-mentioned property, in order to assess potential impacts from the adjacent building (the Site) located at 34-11 35<sup>th</sup> Street. As a result of historical operations, soil vapor contaminated with Volatile Organic Compounds (VOCs) is believed to be emanating from the Site. On behalf of the Remedial Party responsible for the Site (S & C Corp.), Integral Engineering P.C. is contacting you to request access to your property to perform the recommended sampling.

The assessment at your property would involve accessing the building to collect an indoor air sample and sub-slab soil vapor sample through the basement floor, as well as the collection of an outdoor air sample.

To obtain the sub-slab vapor sample, a small diameter hole would be drilled through the concrete slab floor. Upon obtaining the sample, the finished condition of the floor would be restored. All samples would be analyzed by a laboratory to assess whether VOCs may be migrating in soil vapor beneath your property and infiltrating the building. The sampling and analysis is similar to a basement radon assessment. You will be provided with the results of this sampling. **At no time will you be responsible for any costs associated with this assessment.**

Dimitrios Tsakonas  
October 7, 2014  
Page 2

Please review, sign, and return the attached consent form in the enclosed stamped and pre-addressed envelope. Please note that authorization to collect sub-slab soil vapor sample from the property will only be acknowledged by receipt of the consent form signed by the property owner or the property owner's representative. As noted on the attached consent form, please provide a time when you can be reached so that the specific activities to be conducted at your property may be discussed with you.

Should you have any questions or concerns, please feel free to contact me at 212-440-6706 or at acarroll@integral-corp.com. If you have any questions regarding environmental concerns, please contact Shaun Bollers of NYSDEC at 718-482-4096 or at shaun.bollers@dec.ny.gov. If you have any questions regarding public health concerns, please contact Christopher Doroski of NYSDOH at 518-402-7860 or at christopher.doroski@health.ny.gov. Thank you very much for your cooperation.

Sincerely,



Alana Carroll  
Senior Geologist/Manager

Enclosure

CC: Shaun Bollers, NYSDEC  
Christopher Doroski, NYSDOH

### CONSENT FOR ACCESS TO PROPERTY

NAME:	Dimitrios Tsakonas
ADDRESS OF PROPERTY:	34-11 35 <sup>th</sup> Street, Astoria, New York

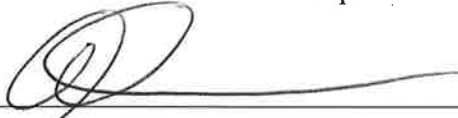
I (We) consent to allow Integral Engineering P.C. (working on behalf of S & C Corp) and its authorized representatives and contractors to enter and have continued access to the above-referenced property to: (i) collect a sub-slab soil vapor sample through the concrete slab basement floor; and (ii) collect outdoor and indoor air samples.

I (We) understand that upon obtaining the sample, the finished condition of the floor will be restored.

I (We) understand that Integral Engineering P.C. will notify us at least seven days prior to initially accessing my (our) property. This written permission is given by me (us) voluntarily with knowledge of our right to refuse and without threats or promises of any kind.

10/13/14

Date

  
\_\_\_\_\_  
Signature of Property Owner or Owner's Authorized Representative

Owner Name:

Dimitrios Tsakonas

Address:

415 E. 75<sup>th</sup> St NYC 10021

Phone

(212) 249-1400

Preferred Meeting Date and Time: \_\_\_\_\_

call (917) 807 9084

for access



Integral Engineering, P.C.  
61 Broadway  
Suite 16010  
New York, NY 10006

telephone: 212.962.4303  
facsimile: 212.962.4302  
www.integral-corp.com

October 7, 2014

**Via Federal Express – Return Receipt Requested**

M & L Estates Inc.  
c/o Max and Lila Rehus  
75-14 137<sup>th</sup> Street  
Flushing, NY 11367

Subject: **Environmental Sampling at 35-01 36<sup>th</sup> Avenue, Astoria, NY**

Dear Mr. and Mrs. Rehus:

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have recommended that sub-slab soil vapor and indoor air sampling be conducted at the above-mentioned property, in order to assess potential impacts from the adjacent building (the Site) located at 35-01 36<sup>th</sup> Avenue. As a result of historical operations, soil vapor contaminated with Volatile Organic Compounds (VOCs) is believed to be emanating from the Site. On behalf of the Remedial Party responsible for the Site (S & C Corp.), Integral Engineering P.C. is contacting you to request access to your property to perform the recommended sampling.

The assessment at your property would involve accessing the building to collect an indoor air sample and sub-slab soil vapor sample through the basement floor, as well as the collection of an outdoor air sample.

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M & L Estates Inc.  
October 7, 2014  
Page 2

Please review, sign, and return the attached consent form in the enclosed stamped and pre-addressed envelope. Please note that authorization to collect sub-slab soil vapor sample from the property will only be acknowledged by receipt of the consent form signed by the property owner or the property owner's representative. As noted on the attached consent form, please provide a time when you can be reached so that the specific activities to be conducted at your property may be discussed with you.

Should you have any questions or concerns, please feel free to contact me at 212-440-6706 or at acarroll@integral-corp.com. If you have any questions regarding environmental concerns, please contact Shaun Bollers of NYSDEC at 718-482-4096 or at shaun.bollers@dec.ny.gov. If you have any questions regarding public health concerns, please contact Christopher Doroski of NYSDOH at 518-402-7860 or at christopher.doroski@health.ny.gov. Thank you very much for your cooperation.

Sincerely,



Alana Carroll  
Senior Geologist/Manager

Enclosure

CC: Shaun Bollers, NYSDEC  
Christopher Doroski, NYSDOH

## CONSENT FOR ACCESS TO PROPERTY

<b>NAME:</b>	M & L Estates Inc. c/o Max and Lila Rehus
<b>ADDRESS OF PROPERTY:</b>	35-01 36 <sup>th</sup> Avenue, Astoria, NY

I (We) consent to allow Integral Engineering P.C. (working on behalf of S & C Corp) and its authorized representatives and contractors to enter and have continued access to the above-referenced property to: (i) collect a sub-slab soil vapor sample through the concrete slab basement floor; and (ii) collect outdoor and indoor air samples.

I (We) understand that upon obtaining the sample, the finished condition of the floor will be restored.

I (We) understand that Integral Engineering P.C. will notify us at least seven days prior to initially accessing my (our) property. This written permission is given by me (us) voluntarily with knowledge of our right to refuse and without threats or promises of any kind.

\_\_\_\_\_

Date

\_\_\_\_\_

Signature of Property Owner or Owner's Authorized Representative

Owner Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone \_\_\_\_\_

Preferred Meeting Date and Time: \_\_\_\_\_



Integral Engineering, P.C.  
61 Broadway  
Suite 16010  
New York, NY 10006

telephone: 212.962.4303  
facsimile: 212.962.4302  
www.integral-corp.com

October 7, 2014

**Via Federal Express – Return Receipt Requested**

Mark Katsigeorges  
33 Merrick Road  
Valley Stream, NY 11580

Subject: **Environmental Sampling at 35-35 35<sup>th</sup> Street, Astoria, NY**

Dear Mr. Katsigeorges:

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have recommended that sub-slab soil vapor and indoor air sampling be conducted at the above-mentioned property, in order to assess potential impacts from the adjacent building (the Site) located at 35-35 35<sup>th</sup> Street. As a result of historical operations, soil vapor contaminated with Volatile Organic Compounds (VOCs) is believed to be emanating from the Site. On behalf of the Remedial Party responsible for the Site (S & C Corp.), Integral Engineering P.C. is contacting you to request access to your property to perform the recommended sampling.

The assessment at your property would involve accessing the building to collect an indoor air sample and sub-slab soil vapor sample through the basement floor, as well as the collection of an outdoor air sample.

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Mark Katsigeorges  
October 7, 2014  
Page 2

Please review, sign, and return the attached consent form in the enclosed stamped and pre-addressed envelope. Please note that authorization to collect sub-slab soil vapor sample from the property will only be acknowledged by receipt of the consent form signed by the property owner or the property owner's representative. As noted on the attached consent form, please provide a time when you can be reached so that the specific activities to be conducted at your property may be discussed with you.

Should you have any questions or concerns, please feel free to contact me at 212-440-6706 or at acarroll@integral-corp.com. If you have any questions regarding environmental concerns, please contact Shaun Bollers of NYSDEC at 718-482-4096 or at shaun.bollers@dec.ny.gov. If you have any questions regarding public health concerns, please contact Christopher Doroski of NYSDOH at 518-402-7860 or at christopher.doroski@health.ny.gov. Thank you very much for your cooperation.

Sincerely,



Alana Carroll  
Senior Geologist/Manager

Enclosure

CC: Shaun Bollers, NYSDEC  
Christopher Doroski, NYSDOH



## CONSENT FOR ACCESS TO PROPERTY

<b>NAME:</b>	Mark Katsigeorges
<b>ADDRESS OF PROPERTY:</b>	35-35 35 <sup>th</sup> Street, Astoria NY

I (We) consent to allow Integral Engineering P.C. (working on behalf of S & C Corp) and its authorized representatives and contractors to enter and have continued access to the above-referenced property to: (i) collect a sub-slab soil vapor sample through the concrete slab basement floor; and (ii) collect outdoor and indoor air samples.

I (We) understand that upon obtaining the sample, the finished condition of the floor will be restored.

I (We) understand that Integral Engineering P.C. will notify us at least seven days prior to initially accessing my (our) property. This written permission is given by me (us) voluntarily with knowledge of our right to refuse and without threats or promises of any kind.

\_\_\_\_\_

Date

\_\_\_\_\_

Signature of Property Owner or Owner's Authorized Representative

Owner Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone \_\_\_\_\_

Preferred Meeting Date and Time: \_\_\_\_\_



Integral Engineering, P.C.  
61 Broadway  
Suite 16010  
New York, NY 10006

telephone: 212.962.4303  
facsimile: 212.962.4302  
www.integral-corp.com

October 7, 2014

**Via Federal Express – Return Receipt Requested**

DAG LLC  
35-40 36<sup>th</sup> Street  
Long Island City, NY 11106

Subject: **Environmental Sampling at 35-40 36<sup>th</sup> Street, Astoria, NY**

Dear DAG LLC:

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have recommended that sub-slab soil vapor and indoor air sampling be conducted at the above-mentioned property, in order to assess potential impacts from the adjacent building (the Site) located at 35-40 36th Street. As a result of historical operations, soil vapor contaminated with Volatile Organic Compounds (VOCs) is believed to be emanating from the Site. On behalf of the Remedial Party responsible for the Site (S & C Corp.), Integral Engineering P.C. is contacting you to request access to your property to perform the recommended sampling.

The assessment at your property would involve accessing the building to collect an indoor air sample and sub-slab soil vapor sample through the basement floor, as well as the collection of an outdoor air sample.

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Please review, sign, and return the attached consent form in the enclosed stamped and pre-addressed envelope. Please note that authorization to collect sub-slab soil vapor sample

DAG LLC  
October 7, 2014  
Page 2

from the property will only be acknowledged by receipt of the consent form signed by the property owner or the property owner's representative. As noted on the attached consent form, please provide a time when you can be reached so that the specific activities to be conducted at your property may be discussed with you.

Should you have any questions or concerns, please feel free to contact me at 212-440-6706 or at acarroll@integral-corp.com. If you have any questions regarding environmental concerns, please contact Shaun Bollers of NYSDEC at 718-482-4096 or at shaun.bollers@dec.ny.gov. If you have any questions regarding public health concerns, please contact Christopher Doroski of NYSDOH at 518-402-7860 or at christopher.doroski@health.ny.gov. Thank you very much for your cooperation.

Sincerely,



Alana Carroll  
Senior Geologist/Manager

Enclosure

CC: Shaun Bollers, NYSDEC  
Christopher Doroski, NYSDOH

### CONSENT FOR ACCESS TO PROPERTY

<b>NAME:</b>	DAG LLC
<b>ADDRESS OF PROPERTY:</b>	35-40 36 <sup>th</sup> Street, Astoria NY

I (We) consent to allow Integral Engineering P.C. (working on behalf of S & C Corp) and its authorized representatives and contractors to enter and have continued access to the above-referenced property to: (i) collect a sub-slab soil vapor sample through the concrete slab basement floor; and (ii) collect outdoor and indoor air samples.

I (We) understand that upon obtaining the sample, the finished condition of the floor will be restored.

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\_\_\_\_\_

Date

\_\_\_\_\_

Signature of Property Owner or Owner's Authorized Representative

Owner Name:

\_\_\_\_\_

Address:

\_\_\_\_\_

Phone

\_\_\_\_\_

Preferred Meeting Date and Time:

\_\_\_\_\_

**Appendix B**  
**Site Health and Safety Plan and**  
**Community Air Monitoring Plan**  
**Offsite Soil Vapor Work Plan**

Teitelbaum Dry Cleaning Inc.  
35-45 35<sup>th</sup> Street  
Queens, NY 11106  
NYSDEC BCP No. C241149

Submitted to:  
New York State Department of Environmental Conservation  
Division of Environmental Remediation, Region 2  
Hunters Point Plaza  
47-40 21<sup>st</sup> Street  
Long Island City, NY 11101

Prepared for:  
S&C Properties, LLC  
2 Bay Club Drive, Apt. 10G  
Bayside, New York 11360

*Prepared by*  
The logo for Integral Consulting Inc. features the word "integral" in a bold, lowercase, sans-serif font. A thin, curved line starts under the 'i' and sweeps under the 'l', ending under the 'a'. Below the word "integral", the words "consulting inc." are written in a smaller, lowercase, sans-serif font.

61 Broadway,  
Suite 1601  
New York, NY 10006

May 2014

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Hospital Route Map
- Attachment 2. Regulatory Notices**  
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- Attachment 3. Safety Procedures**
- Attachment 4. Material Safety Data Sheets**  
Liquinox®  
Alconox®  
Hydrochloric Acid (HCL)  
Nitric Acid (HNO<sub>3</sub>)
- Attachment 5. Near-Miss Incident Report**
- Attachment 6. Employee Exposure/Injury Incident Report**



## ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CHSM	Corporate Health and Safety Manager
CPR	cardiopulmonary resuscitation
FBSG	feet below site grade
HAZWOPER	hazardous waste operations and emergency response
HDPE	high density polyethylene
HEPA	high-efficiency particulate air
IDLH	immediately dangerous to life and health
Integral	Integral Engineering, P.C.
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
PPE	personal protective equipment
RAWP	Remedial Action Work Plan
SHSP	site health and safety plan
SSO	site safety officer
STEL	short-term exposure limit
SVOCs	semi-volatile organic compounds
VOCs	volatile organic compounds

## SITE HEALTH AND SAFETY PLAN APPROVAL

This site health and safety plan (SHSP) has been reviewed and approved for the proposed Remedial Investigation Work plan to be completed at Teitelbaum Dry Cleaning Inc., located at 35-45 35<sup>th</sup> Street, Queens NY 11106.

\_\_\_\_\_  
Project Manager

\_\_\_\_\_  
Date



\_\_\_\_\_  
Corporate Health and Safety Manager

February 5, 2014

\_\_\_\_\_  
Date

## SITE HEALTH AND SAFETY PLAN ACKNOWLEDGMENT

In the absence of an appropriate subcontractor or consultant health and safety plan, and with the written approval of Integral Consulting Inc. (Integral) corporate health and safety manager (CHSM), the subcontractor or consultant may utilize the Integral site health and safety plan (SHSP), provided there is written concurrence from the subcontractor or consultant that they will directly administer the plan for its employees. The Integral SHSP is a minimum standard for the site and will be strictly enforced for all Integral personnel, or its subcontractors or consultants where applicable.

I have reviewed the SHSP prepared by Integral, dated May 28, 2014 for the fieldwork at the Teitelbaum Dry Cleaning Inc. located in Queens, NY . I understand the purpose of the plan, and I consent to adhere to its policies, procedures, and guidelines while an employee of Integral, or its subcontractors or consultants. I have had an opportunity to ask questions regarding this plan, which have been answered satisfactorily by Integral.

_____ Employee signature	_____ Company	_____ Date
_____ Employee signature	_____ Company	_____ Date
_____ Employee signature	_____ Company	_____ Date
_____ Employee signature	_____ Company	_____ Date
_____ Employee signature	_____ Company	_____ Date
_____ Employee signature	_____ Company	_____ Date
_____ Employee signature	_____ Company	_____ Date

# 1 INTRODUCTION

It is the policy of Integral Consulting Inc. (Integral) to provide a safe and healthful work environment that is compliant with applicable regulations. No aspect of the work is more important than protecting the health and safety of all workers.

This site health and safety plan (SHSP) provides general health and safety provisions to protect workers from potential hazards during field activities performed under the Remedial Investigation Work Plan (RIWP) for the Teitelbaum Dry Cleaners Inc. located in Queens, NY (hereafter referred to as the "site"). This SHSP has been prepared in accordance with local, State, and federal Occupational Safety and Health Administration (OSHA) safety regulations (29 CFR [Code of Federal Regulations] 1910 and 29 CFR 1926).

Work performed under the RIWP will be in full compliance with applicable health and safety laws and regulations, including site-specific and OSHA worker safety requirements and Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) requirements. This SHSP follows both OSHA hazardous waste operations and emergency response and applicable regulations in 29 CFR 1910 and 29 CFR 1926.

Attachments to the SHSP provide a site-specific map and specific routes to the hospital from the site (Attachment 1), regulatory notices (Attachment 2), safety procedures (Attachment 3), material safety data sheets (Attachment 4), and a near-miss incident report form (Attachment 5).

This SHSP has been prepared to identify potential site hazards to the extent possible based on information available to Integral. Integral cannot guarantee the health or safety of any person entering this site. Because of the potentially hazardous nature of this site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards that may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury and illness at this site. The health and safety guidelines in this plan were prepared specifically for this site and should not be used on any other site without prior evaluation by trained health and safety personnel.

A copy of this SHSP must be in the custody of the field crew during field activities. All individuals performing fieldwork must read, understand, and comply with this plan before undertaking field activities. Once the information has been read and understood, the individual must sign the Site Health and Safety Plan Acknowledgment form provided as part of this plan. The signed form will become part of the project file.

This plan may be modified at any time based on the judgment of the Integral site safety officer (SSO) in consultation with the project manager and Integral corporate health and safety manager (CHSM) or designee. Any modification will be presented to the onsite team during a safety briefing and will be recorded in the field logbook.

## 1.1 OBJECTIVES AND METHODS

The primary objective of the RIWP activities is to support the remedial investigation by collecting confirmatory soil, soil vapor, and groundwater samples to evaluate and confirm the nature and extent of possible contamination at the Site.

The primary objectives of the RIWP have been developed to complete the following tasks:

- To define the nature and extent of contamination on and offsite.
- To identify if residual contaminant source areas are present on the Site.
- To determine whether remedial action is needed to protect human health and the environment.
- To produce data of sufficient quantity and quality to support the remediation of the Site, if warranted.

Soil and grab soil samples will be collected and screened with a properly calibrated photo-ionization detector (PID) with visual/olfactory indications noted. Additionally, groundwater samples will also be collected as per DER-10 protocol. All samples will be collected by Integral field personnel who will also document soil and/or groundwater quality, sample location/depth, PID readings and prepare samples for laboratory analysis. Soil vapor samples will be collected as part of this investigation.

Additional details on the objectives and methods are presented in the field sampling plan, Appendix B to the RIWP.

## 1.2 ORGANIZATION

This SHSP covers soil, soil vapor, and groundwater sampling activities, as well as soil boring, vapor point and monitoring well installation activities. Chemical and physical hazard evaluations are presented in Sections 2 and 3, respectively. Specific health and safety guidelines associated with each task, including a brief description of the work, are discussed in Section 11 (Task-Specific Safety Procedures).

## 1.3 ROLES AND RESPONSIBILITIES

All Integral personnel on this site must comply with the requirements of this SHSP. The Integral SHSP is a minimum standard for the site and will be strictly enforced for all Integral personnel, or subcontractors or consultants, where applicable. The specific responsibilities and authority of management, safety and health, and other personnel on this site are detailed in the following paragraphs.

### **1.3.1 Site Safety Officer**

The SSO has full responsibility and authority to implement this SHSP and to verify compliance. He or she reports to the project manager and is onsite or readily accessible to the site during all work operations. The SSO is responsible for assessing site conditions and directing and controlling emergency response activities. The specific responsibilities of the SSO include the following:

- Managing the safety and health functions on this site
- Serving as the onsite point of contact for safety and health concerns
- Assessing site conditions for unsafe acts and conditions and ensuring corrective action
- Ensuring that all Integral employees and subcontractors understand and follow the SHSP
- Ensuring that daily work schedules and tasks are reasonable for the required levels of effort and weather conditions
- Confirming local emergency response phone numbers and locations
- Conducting and documenting the initial and daily or periodic health and safety briefings
- Evaluating and modifying the level of protective apparel and safety equipment, based on site conditions
- Ensuring that the field team observes all necessary decontamination procedures.

If the SSO determines that site conditions are unsafe, he or she has the authority to suspend field operations until the problem is corrected. The SSO can modify SHSP procedures in the field. Any changes must be documented in the field logbook, and field staff must be immediately informed of the change. The project manager and Integral's CHSM must be notified by phone or e-mail within 24 hours of any major changes to the SHSP.

### **1.3.2 Project Manager**

The project manager has overall responsibility to ensure that personnel working onsite are safe. The specific responsibilities of the project manager include:

- Ensuring that the SHSP is developed prior to the field work or site visit
- Reviewing and approving the SHSP prior to the field work or site visit
- Ensuring employee understanding of and compliance with the SHSP.

### **1.3.3 Corporate Health and Safety Manager**

The CHSM provides guidance to the project manager and SSO on SHSP preparation and reviews and approves the SHSP. The CHSM also serves as an arbitrator if there is a conflict between the project manager, SSO, and field personnel. In addition, the CHSM<sup>1</sup> conducts periodic unannounced audits of Integral field operations to ensure compliance with the site-specific health and safety plan.

### **1.3.4 Field Personnel**

All Integral personnel and subcontractors, where applicable, on this site are responsible for reading and complying with this SHSP, using the proper personal protective equipment (PPE), reporting unsafe acts and conditions, and following the work and safety and health instructions of the project manager and SSO. All Integral personnel, subcontractors, or consultants can and are encouraged to suspend field operations if they feel conditions have become unsafe.

## **1.4 SITE HISTORY**

Sanborn maps show that the property was first occupied by a commercial wagon and automobile garage as early as 1936. Building operations at this time included the use of a cleaning pit and automobile painting. In 1947 a machine shop and iron works business occupied the Site. Dry cleaning operations are first noted on Sanborn maps in 1970 and continue to be in operation to date. Additional records searches on the NYC Department of Buildings (DOB) Buildings Information System (BIS) provided Certificates of Occupancy from 1965 stating the Site was occupied by a commercial business that included cleaning, drying, pressing and storage (assumed to be dry-cleaning activities). Interviews with the current Site owner indicate that a drycleaner has occupied the Site since at least 1952. This predates the use indicated on the Sanborn maps, but makes it reasonable to assume that the current use has extended back to at least the period indicated in the DOB BIS records.

## **1.5 SITE DESCRIPTION**

The Site is located in a mixed use area of the Astoria section in the Borough of Queens. The Site is comprised of an approximately 9,950 square foot (sqft) parcel (0.23 acres) located near the southwest corner of the block and is bound to the northwest by 35<sup>th</sup> street, to the south by 36<sup>th</sup> Avenue, to the east by 36<sup>th</sup> Street, and to the northeast by 35<sup>th</sup> Avenue. Adjacent properties include a mixed use commercial and residential buildings to the northwest, industrial, and manufacturing to the south and northeast, and commercial and office buildings to the east. The

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<sup>1</sup> The audit task may be delegated to an office health and safety representative by the CHSM.

Site is identified on the New York City tax maps as Block 639, Lot 4. A Site location map is provided in Attachment 1.

- **Owners/tenants:** *S&C Properties, LLC / Craig Levy, Red Rap Valet*
- **Current site use:** *Dry Cleaner*
- **Hazardous waste site:** *No*
- **Industrial waste site:** *No*
- **Topography (if applicable):** *Flat*
- **Site access:** *35-45-35<sup>th</sup> Street, Queens NY*
- **Nearest drinking water/sanitary facilities:** *On-site or in vicinity*
- **Nearest telephone:** *N/A*
- **Size of site:** *0.23 Acres*
- **Pathways for hazardous substance dispersion:** *Dermal, inhalation*

A detailed site map is provided as Figure 1 in Attachment 1 to this SHSP.

#### Project Manager and Other Key Contacts

	<b>Name (Affiliation)</b>	<b>Work Telephone</b>	<b>Cell Phone</b>
Project manager	Alana Carroll (Integral)	(212) 440-6707	(646) 895-1430
SSO	Samuel McTavey (Integral)	(212) 440-6715	(914) 643-1057
CHSM	Eron Dodak (Integral)	(503) 943-3614	(503) 407-2933
Client contact	Andrea Pampillonio (S&C Properties, LLC)	(917) 543-8513	apapap13@yahoo. com



## 2 CHEMICAL HAZARD EVALUATION

Potentially hazardous chemicals known to exist at the site are primarily chlorinated volatile organic compounds (cVOCs) associated with the historic and present site use. The chemicals of concern, applicable chemical properties, and potential exposure routes are presented in the following sections.

The following table lists the historical site maximum constituent concentrations for constituents at the Site. The table also lists the chemical properties and OSHA permissible exposure limit (PEL), short-term exposure limit (STEL), and immediately dangerous to life and health (IDLH) level. Breathing zone air can be monitored to ensure that the chemicals do not exceed the PEL. If any of the chemicals exceed the PEL, immediate action is required (e.g., don respirators, leave site) as designated in Section 5 (Air Monitoring) in this SHSP.

### Chemical Properties

Chemical of Concern	Concentration (site maximum or range expected)	Medium	OSHA PEL	OSHA STEL	OSHA IDLH	IP(eV)	Carcinogen or Other Hazard
1,1-Dichloroethylene (under Vinylidene Chloride)	9.4µg/L	Groundwater	--	--	--	10.00	Carcinogen
Cis-1,2- Dichloroethylene (under 1,2- Dichloroethylene)	12,000 µg/L	Groundwater	200 ppm (790 mg/m <sup>3</sup> ) (NIOSH REL TWA 200 ppm [790 mg/m <sup>3</sup> ])	--	1,000 ppm	9.65	Carcinogen
Tetrachloroethylene	2,200 µg/L	Groundwater	100 ppm	--	150 ppm	9.32	Carcinogen
Trans-1,2- Dichloroethylene	76 µg/L	Groundwater	--	--	--	--	--
Trichloroethylene	550 µg/L	Groundwater	100 ppm	300 ppm (5 minute max peak in any 2 hours)	1,000 ppm	9.45	Carcinogen
Hydrochloric Acid (HCL)	Concentrated	Preservative	5 ppm (ceiling); NIOSH REL 5 ppm (ceiling)	--	50ppm	12.75	Corrosive
Nitric Acid (HNO <sub>3</sub> )	Concentrated	Preservative	2 ppm; (NIOSH REL 2 ppm)	2 ppm (NIOSH)	25 ppm	11.95	Corrosive

**Notes:** -- = none established  
 Ca = carcinogen  
 IDLH = immediately dangerous to life and health  
 IP(eV) = ionization potential (electron volts)  
 mg/kg = milligrams per kilogram  
 mg/m<sup>3</sup> = milligrams per cubic meter  
 NA = not available  
 PEL = permissible exposure limit  
 ppm = parts per million  
 STEL = short-term exposure limit

The table below summarizes the chemical characteristics and potential chemical exposure routes at the site.

	Likely	Possible	Unlikely
<b>Potential Chemical Exposure Routes at the Site:</b>			
Inhalation		X	
Ingestion			X
Skin absorption		X	
Skin contact		X	
Eye contact		X	
<b>Chemical Characteristics:</b>			
Corrosive	X (HCL, HNO3)		
Flammable			X
Ignitable			X
Reactive	X (HCL, HNO3)		X
Volatile		X (VOCs)	
Radioactive			X
Explosive			X
Biological agent			X
Particulates or fibers		X (dust, metals)	

If likely, describe:

Nitric and hydrochloric acid are corrosive. Always wear nitrile gloves and safety glasses or goggles when handling bottles with acid preservatives

### 3 PHYSICAL HAZARD EVALUATION AND GUIDELINES

The following sections present general physical hazards and guidelines.

#### 3.1 GENERAL PHYSICAL HAZARDS

The following table presents possible physical hazards that are expected to be present during field activities.

Possible Hazard	Yes	No	Proposed Safety Procedure
Heavy equipment	X		Stay back from operating equipment; wear safety vests and hard hats; coordinate and maintain eye contact with equipment operator.
Material handling	X		Lift properly; seek assistance if necessary; do not overfill coolers or boxes. Seek assistance if drums must be moved.
Adverse weather	X		Seek shelter during electrical storms; work in adverse weather conditions only with proper training and equipment.
Plant/animal hazards	X		Know local hazards and take appropriate precautions. Use insect repellent if mosquitoes are persistent.
Uneven terrain/tripping	X		Use caution, wear properly fitting shoes or boots, and keep work area orderly.
Noise	X		Wear ear protection when working around heavy equipment and other noise sources.
Cold/hypothermia	X		Keep warm and dry; bring changes of clothes; do not work in extreme conditions without proper equipment and training. Follow cold stress information (Attachment 3). <i>Note:</i> potential for cold/hypothermia will depend on season and location of the site.
Falling objects	X		Wear hard hats near overhead hazards (i.e., winch).
Drill rigs	X		Avoid all pinch points; do not operate or stand near rig during electrical storms; stay a safe distance (25 ft) from power lines; level drill rig.

Summary of potential physical hazards posed by proposed site activities:

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<b>Activity</b>	<b>Potential Hazard</b>
Soil boring, groundwater monitoring well, soil vapor point installation, and sampling	Heavy equipment, slips/trips/falls, falling objects, drill rigs, noise, plant/animal hazards, material handling, adverse weather, cold/hypothermia
Sample handling/mobilization	Material handling, slips/trips/falls

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## 4 PERSONAL PROTECTIVE EQUIPMENT AND SAFETY EQUIPMENT

The following sections address PPE and safety equipment required for completing the field activities.

### 4.1 PERSONAL PROTECTIVE EQUIPMENT

Based on the hazards identified above in Sections 2 and 3, the following table identifies the PPE required for site activities.

Site Activity	Level of Protection	
	Initial	Contingency <sup>a</sup>
Soil sampling	D	Leave Exclusion Zone and assess situation
Groundwater sampling	D	Leave Exclusion Zone and assess situation
Soil vapor sampling	D	Leave Exclusion Zone and assess situation
Sample handling	D	Leave Exclusion Zone and assess situation

<sup>a</sup> Based on unexpected change in site conditions

Each level of protection will incorporate the following PPE:

Level D	X	Long pants and shirt or work coveralls, hard hat, latex or nitrile gloves, eye protection, traffic safety vest, and steel-toed boots are required. Hearing protection and work gloves are required as needed.
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### Respirator and Respirator Cartridge Information

Is there potential for a respirator to be donned during fieldwork?      Yes    \_\_\_\_\_    No      X

## SAFETY EQUIPMENT

The following safety equipment will be onsite during the proposed field activities.

### Air Monitoring (check the items required for this project)

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> PID                             | <input type="checkbox"/> Air sampling pumps          |
| <input type="checkbox"/> LEL/O <sub>2</sub> meter                   | <input type="checkbox"/> MINIRAM (particle monitors) |
| <input type="checkbox"/> H <sub>2</sub> S meter                     | <input type="checkbox"/> Radiation meter             |
| <input type="checkbox"/> Detector pump and tubes<br>(e.g., benzene) | <input type="checkbox"/> Other: _____<br>_____       |

### First Aid Kit (mandatory, including absorbent compress, adhesive bandages, adhesive tape, antiseptic, burn treatment, medical exam gloves, sterile pad, CPR shield, triangle bandage, scissors [for cutting off the PPE from an injured person]) (check additional items required for the site)

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Emergency blanket | <input checked="" type="checkbox"/> Sunscreen  |
| <input checked="" type="checkbox"/> Insect repellent  | <input type="checkbox"/> Other: _____<br>_____ |

### Other (check the items required for this project)

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Eyewash   | <input type="checkbox"/> Fit test supplies                         |
| <input checked="" type="checkbox"/> Drinking water  | <input checked="" type="checkbox"/> Fire extinguisher (drill rigs) |
| <input type="checkbox"/> Stopwatch for monitoring heart rate<br>for heat stress monitoring <sup>2</sup> | <input type="checkbox"/> Windssock                                 |
| <input type="checkbox"/> Thermoscan <sup>®</sup> thermometer for heat<br>stress monitoring              | <input checked="" type="checkbox"/> Cellular phone                 |
| <input type="checkbox"/> Survival kit <sup>3</sup>  | <input type="checkbox"/> Radio sets                                |
| <input type="checkbox"/> Personal flotation device  | <input checked="" type="checkbox"/> Global positioning system      |
| <input type="checkbox"/> Cool vests   | <input type="checkbox"/> Other: <u>Hand sanitizer</u><br>_____     |

<sup>2</sup> Heart rate monitoring requires special training.

<sup>3</sup> Consult the CHSM for guidance for site-specific survival kits.

## 5 AIR MONITORING

The purpose of the air monitoring program is to avoid or minimize exposure of the field personnel and the public to potential environmental hazards in the soil during remedial investigation activities. Results of the air monitoring will be used to determine the appropriate response action, if needed.

29 CFR 1910.120(h) specifies that monitoring shall be performed where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.

Air monitoring will be conducted when entering previously uncharacterized sites, when working in the vicinity of uncontained chemicals or spills, when opening containers and well casings, and prior to opening confined spaces. (Note: Integral personnel are not trained or authorized to enter confined spaces under any circumstances.) Air monitoring must be conducted to identify potentially hazardous environments and determine reference or background concentrations. Air monitoring can sometimes be used to augment judgment in defining exclusion zones.

### 5.1 INTRODUCTION

Personal air monitoring involves collection of samples within the breathing zone of the field personnel to better understand exposures, ensure appropriate levels of PPE, and document compliance with regulation. Such samples may be full shift for comparison to PELs (or other applicable occupational exposure limits) or short term, for comparison to STELs. Some chemicals in soil or aqueous media may volatilize or become aerosolized and be inhaled by field personnel.

Breathing zone air can be monitored to ensure that the chemicals do not exceed a regulatory or project-specific action level (generally 50 percent of the PEL). Integral commonly uses photoionization detectors (PIDs) and dust meters (e.g., MINIRAM [Miniature Real-time Aerosol Monitor]) for monitoring volatile organic compounds and particle constituents, respectively. In practice, the air directly in the field personnel's breathing zone is monitored with the PID or dust meter for 10-15 seconds. The highest reading is recorded in the project logbook and checked against the site-specific action level in the table below. If any of the constituents exceed



the action level presented in Section 5.3, immediate action is required (e.g., don respirators, leave site, etc.) as designated<sup>4</sup>.

The following sections provide general guidance on the selection and calibration of PIDs and dust meters, which are typically rented for Integral field projects.

## 5.2 PHOTOIONIZATION DETECTORS

It is critical to order a PID with a detector lamp with the appropriate ionization energy to detect chemicals of interest at the site. The ionization energy of the lamp must be greater than the ionization potential of the chemicals of interest. (Ionization potentials are listed in the National Institute of Occupational Safety and Health [NIOSH] pocket guide to chemicals and are presented in Section 2). Be sure that the meter arrives at least a day prior to the start of the fieldwork so field personnel can familiarize themselves with the operation of the meter and confirm that it was not damaged during shipping. Field personnel must also read the operation manual to become familiar with operation of the PID prior to use in the field. Note that moisture may damage the detector lamp and/or provide erroneous readings, so a moisture filter is used on the probe. Also note that the PID will only accurately quantitate the material used in the calibration process. A response factor is used to measure the sensitivity of the PID to a particular chemical present at the site. Response factors are normally presented in the operation manual for the PID.

The PID must be calibrated daily in accordance with the manufacturer's specifications, which are provided in the operation manual. The calibration typically requires the use of a span gas (generally 100 ppm isobutylene) and zero gas (generally fresh air). Be sure that all the required calibration equipment/supplies are provided with the PID (e.g., span gas cylinder, regulator, tubing, and Tedlar™ bag). Record calibration data in the field logbook.

Monitoring for organic vapors should be conducted in the breathing zone of employees using a PID during remedial activities in contaminated areas. If sustained total organic vapors are measured in the breathing zone above 5 ppm, engineering controls (e.g., box fans) will be initiated in the work area and/or site evacuation.

## 5.3 ACTION LEVELS

The following action levels have been established to determine appropriate actions to be taken during site investigation activities:

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<sup>4</sup> Note that neither the PID nor the MINIRAM can identify chemicals. The PID detects total ionizable volatile organic compounds and the MINIRAM detects total particles of sufficient diameter to be detected.

Instrument	Observation	Action <sup>a</sup>	Comments
PID	≤5 ppm over background sustained for 1 minute	Continue working	
PID	≥5 ppm over background sustained for 1 minute	Initiate engineering controls (e.g., fans)	If engineering controls fail to control the vapors, evacuate the site and reassess the situation.

Air monitoring with the PID will be conducted every 30 minutes or more frequently if odors are observed by the field crew.

**Note:**

<sup>a</sup> Examples: “upgrade to Level C” or “leave site.”

Maintain, calibrate, and field check all air monitoring equipment in accordance with the manufacturer’s recommendations.

## 6 HEALTH AND SAFETY TRAINING AND MEDICAL MONITORING

The following sections present requirements for health and safety training and medical monitoring.

### 6.1 HEALTH AND SAFETY TRAINING AND MEDICAL MONITORING

State and federal laws establish training requirements for workers at uncontrolled hazardous waste sites (including areas where accumulations of hazardous waste create a threat to the health and safety of an individual, the environment, or both). Integral and subcontractor personnel are required to complete the following training requirements prior to working at the site.

### 6.2 TRAINING REQUIREMENTS

Task	No Training	24-hour	40-hour <sup>a</sup>	Supervisor <sup>b</sup>	First Aid/CPR <sup>c</sup>	Medical Monitoring
<b>Integral Field Personnel</b>						
Samuel McTavey			X	X	X	X
James L'Esperance			X		X	X

**Notes:**

- <sup>a</sup> Must have current OSHA 8-hour refresher if it has been more than a year since the OSHA 40-hour training.
- <sup>b</sup> At least one person onsite must be OSHA HAZWOPER supervisor trained if this is a hazardous waste site.
- <sup>c</sup> At least one member of each team of two or more people onsite must be first aid/CPR trained.
- <sup>d</sup> Integral subcontractors and consultants may have requirements that are more stringent than those listed above. These are minimum training and monitoring requirements required to work on this site.

#### 6.2.1 Site Safety Meetings

Site safety meetings must be held before beginning new tasks or when new staff enter the site. Site safety meetings should be held at a minimum of once a week and should be held daily on complex or high hazard projects. Tailgate safety meetings should occur every morning during review of the day's work plan, covering specific hazards that may be encountered. Additional meetings will be held at any time health and safety concerns are raised by any of the personnel. Attendance and topics covered, including tailgate meetings, are to be documented in the field logbook.

### 6.3 MEDICAL MONITORING

OSHA requires medical monitoring for personnel potentially exposed to chemical hazards in concentrations in excess of the PEL for more than 30 days per year and for personnel who must use respiratory protection for more than 30 days per year. Integral requires medical monitoring for all employees potentially exposed to chemical hazards.

Will personnel working at this site be enrolled in a medical monitoring program?

Yes     X     No

## 7 EMERGENCY RESPONSE PLAN

The following sections discuss emergency recognition and prevention, emergency response and notification, emergency decontamination, and site communications.

### 7.1 EMERGENCY RECOGNITION AND PREVENTION

It is the responsibility of all personnel to monitor work at the site for potential safety hazards. All personnel are required to immediately report any unsafe conditions to the SSO. The SSO is responsible to immediately take steps to remedy any unsafe conditions observed at the work site.

The following are examples of some emergency situations that could occur during the field activities:

- Slips, trips and falls (on sloped areas, steel stairs, etc.)
- Lacerations from scrap metal (in soil, waste piles, etc.)
- The air monitoring action level is exceeded
- Entrainment of clothes or objects in moving equipment or parts
- Serious injury or illness (e.g., physical injury, heart attack)
- Severe thunderstorm with lightning.

Immediate actions will be taken by the field team under the leadership of the SSO in response to these emergencies.

### 7.2 EMERGENCY RESPONSE AND NOTIFICATION

If an emergency at the site warrants it, all personnel must immediately evacuate the affected work area and report to the SSO at the predetermined emergency assembly location:

#### **Field vehicle**

In case of injury, field personnel should take precautions to protect the victim from further harm and notify local or facility emergency services. In remote areas, it will be necessary to have first aid-trained personnel on the field team. The victim may require decontamination prior to treatment if practicable—requirements will vary based on site conditions.

Emergency medical care will be provided by:

- Local emergency medical provider (NYPD/FDNY)
- Facility emergency medical provider
- First aid-trained field staff (for remote areas only)

Local Resources	Name	Telephone	Notified Prior to Work (Yes/No)?
Fire	FDNY	911	No
Police	NYPD	911	No
Ambulance	FDNY	911	No
Hospital	Mount Sinai Queens	(718) 932-1000	No
Site phone	N/A		
Directions to the hospital:	See attached maps.		

The SSO must confirm that the hospital listed is still in operation and that it has an emergency room. **It is required that the SSO drive to the hospital so that the directions are practiced and understood prior to initiating fieldwork.**

Corporate Resources	Name	Work Telephone	Cell Phone
Integral CHSM <sup>a</sup>	Eron Dodak	Office: (503) 943-3614	(503) 407-2933
Integral President	Lucinda Jacobs	Office: (206) 957-0328	(206) 999-3061
Integral Human Resources Manager	Amy Logan	Office: (303) 404-2944 ext. 12	NA
Medical Consultant	Dr. Calvin Jones (HealthForce Partners)	Office: (425) 806-5700	NA

**Notes:**

<sup>a</sup> If the CHSM cannot be reached, call Ian Stupakoff—Office: (360)705-3534, ext. 20; Cell: (360)259-2518. If Ian Stupakoff cannot be reached, call David Livermore—Office: (503)943-3613; Cell: (503)806-4665. If David Livermore cannot be reached, call Barbara Trenary—Office: (206) 248-9645; Cell: (206) 849-0882.

In case of serious injuries, death, or other emergency, the Integral CHSM must be notified immediately at the phone numbers listed above. The Integral CHSM will notify the project manager and Integral’s president. The project manager will notify the client.

### **7.3 EMERGENCY DECONTAMINATION PROCEDURES**

In case of an emergency, if possible, gross decontamination procedures will be promptly implemented. If a life-threatening injury occurs and the injured person cannot undergo decontamination procedures onsite, then the medical facility will be informed that the injured person has not been decontaminated and given information regarding the most probable chemicals of concern. Decontamination procedures should not be implemented if there is not a reasonable possibility that the injured party requires such intervention.

Decontamination procedures will only be used if practical and if they will not further injure the person or delay treatment. Decontamination procedures should not be implemented if there is not a reasonable possibility that the injured party requires such intervention. The SSO will make the determination on whether or not to decontaminate the injured person. The following steps will be followed for decontaminating injured personnel while onsite:

- If it will not injure the person further, cut off PPE using scissors or scrub the gross contamination from the injured person's PPE (e.g., Tyvek® coveralls, work boots) with a Liquinox® or Alconox® solution followed by a rinse with tap or deionized/distilled water
- Remove PPE if feasible without further injuring the person.

### **7.4 SITE COMMUNICATIONS**

Each field team will carry a cell phone or satellite phone that is in good working order. If there is any type of emergency that requires the site to be evacuated (e.g., severe thunderstorm with lightning, chemical release), the field team leader will blow the air horn three times. When the horn sounds, all personnel will meet at the predetermined emergency assembly location (35th Street). All other emergency notifications that do not require evacuation (e.g., a person falling overboard) will be conducted using a cell or satellite phone. Emergency phone numbers are listed above in Section 7.2.

### **7.5 BUDDY SYSTEM**

The buddy system will be used at the site at all times. The buddy system is a system of organizing employees into field teams in such a manner that each employee of the field team is designated to be observed by at least one other employee in the field team. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

## 8 WORK ZONES

Work zones are defined as follows:

<b>Exclusion zone</b>	Any area of the site where hazardous substances are present, or are reasonably suspected to be present, and pose an exposure hazard to personnel
<b>Contamination reduction zone</b>	Area between the exclusion and support zones that provides a transition between contaminated and clean zones
<b>Support zone</b>	Any area of the site, so designated, that is outside the exclusion and contamination reduction zones

Site control measures in work zones are described below for each type of field activities.

### 8.1 SOIL BORING AND SAMPLING

**Exclusion zone:** An approximate 12-ft radius around the drilling rig will be clearly marked with orange traffic safety cones and/or caution tape. Only properly equipped (i.e., wearing level D PPE) and trained personnel will be allowed in this area.

**Contamination reduction zone:** After sampling is completed at a station, the exclusion zone will become the contamination reduction zone.

**Support zone:** All areas outside the exclusion and contaminant reduction zones.

**Controls to be used to prevent entry by unauthorized persons:** No unauthorized personnel will be allowed into the exclusion/contaminant reduction zones.

### 8.2 MONITORING WELL INSTALLATION AND GROUNDWATER SAMPLING

**Exclusion zone:** An approximate 12-ft radius around the drilling rig will be clearly marked with orange traffic safety cones and/or caution tape. Only properly equipped (i.e., wearing level D PPE) and trained personnel will be allowed in this area.

**Contamination reduction zone:** After sampling is completed at a station, the exclusion zone will become the contamination reduction zone.

**Support zone:** All areas outside the exclusion and contaminant reduction zones.



**Controls to be used to prevent entry by unauthorized persons:** No unauthorized personnel will be allowed into the exclusion/contaminant reduction zones.

### **8.3 SOIL VAPOR POINT INSTALLATION AND SAMPLING**

**Exclusion zone:** An approximate 12-ft radius around soil vapor point installation activities will be clearly marked with orange traffic safety cones and/or caution tape. Only properly equipped (i.e., wearing level D PPE) and trained personnel will be allowed in this area.

**Contamination reduction zone:** After sampling is completed at a station, the exclusion zone will become the contamination reduction zone.

**Support zone:** All areas outside the exclusion and contaminant reduction zones.

**Controls to be used to prevent entry by unauthorized persons:** No unauthorized personnel will be allowed into the exclusion/contaminant reduction zones.

## 9 EQUIPMENT DECONTAMINATION AND PERSONAL HYGIENE

### 9.1 EQUIPMENT DECONTAMINATION PROCEDURES

After sampling is completed, the exclusion zone will be used as the contaminant reduction zone for decontamination activities, provided there is no contamination remaining after the sampling is completed. To minimize or prevent personal exposure to hazardous materials, all personnel working in the exclusion zone and contaminant reduction zone will comply with the following decontamination procedures:

- All gloves, rain gear, and boots will be removed prior to entering the field vehicle.

Decontamination equipment required at the site includes the following:

- Buckets or tubs
- Laboratory grade distilled/deionized water
- Site water
- Scrub brushes (long-handled)
- Liquinox or Alconox detergent
- Plastic bags
- Foil
- Paper towels
- Garbage bags
- Clean garden sprayer

All non-disposable components of the sampling equipment (e.g., stainless steel spoons and bowls used for sample composting) that contact the sediment will be decontaminated using the following steps:

1. Rinse with site water/tap water
2. Wash with Alconox or Liquinox detergent
3. Rinse with site water/tap water
4. Allow to air dry
5. Wrap up composting equipment in aluminum foil.

### 9.2 PERSONAL HYGIENE

The following personal hygiene practices will be used at the site to reduce exposure to chemicals.

- Long hair will be secured away from the face so it does not interfere with any activities.

- All personnel leaving potentially contaminated areas will wash their hands, forearms, and faces in the contaminant reduction zone prior to entering any clean areas or eating areas.
- Personnel leaving potentially contaminated areas will shower (including washing hair) and change to clean clothing as soon as possible after leaving the site.
- No person will eat, drink, or chew gum or tobacco in potentially contaminated areas. Single portion drink containers and drinking of replacement fluids for heat stress control will be permitted only in support areas.
- Smoking is prohibited by Integral personnel and subcontractors in all areas of the site because of the potential for contaminating samples and for the health of the field team.

## **10 VEHICLE SAFETY, SPILL CONTAINMENT, AND SHIPPING INSTRUCTIONS**

### **10.1 VEHICLE SAFETY**

Integral's vehicle safety program requires the following:

- Cell phone usage while driving is not allowed, including the use of hands-free devices. If it not feasible to wait to use the cell phone until arriving at your destination, pull off the road and park in a safe location to use the cell phone. Do not pull to the side of the road to use a cell phone because this significantly increases the risk of a rear-end collision.
- All vehicles are to be operated in a safe manner and in compliance with local traffic regulations and ordinances.
- Drivers are to practice defensive driving and drive in a courteous manner.
- Drivers are required to have a valid driver's license and liability insurance (per local state laws).
- Seat belts are to be worn by the driver and all passengers.
- No persons are allowed to ride in the back of any trucks or vans, unless equipped with seatbelts.
- Vehicles are to be driven in conformance with local speed limits.
- Personnel who are impaired by fatigue, illness, alcohol, illegal or prescription drugs, or who are otherwise physically unfit, are not allowed to drive or work on Integral field sites.
- Personnel are to avoid engaging in other distractions such as changing radio stations while driving.
- Motor vehicle accidents are to be reported to the responsible law enforcement agency, the Integral human resources manager, and the Integral CHSM on the same day of occurrence. Documentation of damage should be photographed.
- Personnel who have experienced work-related vehicle accidents or citations may be required to complete a defensive driving program.

### **10.2 SPILL CONTAINMENT**

No bulk chemicals will be used at the site.

### 10.3 SHIPPING INFORMATION

Federal laws and international guidelines place restrictions on what materials may be shipped by passenger and cargo aircraft. In addition, 49 CFR regulates labeling, manifesting, and shipment of all packages containing potentially hazardous materials. In the course of this field investigation, the following items will be shipped to and from the site as shown below:

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<b>1.2 Item</b>	<b>Hazardous Constituent</b>	<b>Quantity</b>	<b>Packaging</b>	<b>How Shipped</b>
Samples	None	(various quantities) solid and liquid matrix samples	Coolers	Laboratory courier

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A 24-hour emergency response number (on any shipping documents such as a Uniform Hazardous Waste Manifest, Shipper's Declaration of Dangerous Goods, etc.) is required for shipments of all dangerous or hazardous goods. Integral does not have a 24-hour emergency contact number for dangerous or hazardous goods shipment. No dangerous or hazardous goods may be shipped by Integral until an account is set up with a 24-hour emergency response service, such as CHEM-TEL (1-813-248-0573). If any hazardous or dangerous goods need to be shipped for a project, they must be shipped directly to the site by the supplier. Any hazardous or dangerous goods that are not used in the course of the field effort must remain at the site.

The samples will be prepared and labeled for shipment in accordance with the sampling and analysis plan developed for the site.

Air shipment of equipment with lithium batteries is required to note the presence of these batteries. Warning labels are available from the equipment rental agency and can be copied.

## **11 TASK-SPECIFIC SAFETY PROCEDURE SUMMARY**

### **11.1 SOIL BORING, MONITORING WELL, AND SOIL VAPOR POINT INSTALLATION**

Notify the proper utility locating service (Dig Safely New York) 48 hours prior to initiating field work (Call 811) and obtain a utility locating ticket. Confirm the absence of underground and overhead utilities before starting drilling activities. Be sure that all utilities are marked or have a designation that they are not present in the area. Take a few minutes to examine the locations of fire hydrants, gas meters, etc. to make sure that the utility locating marks make sense. If there is any doubt as to the location of underground utilities, call the public or a private utility locator. Finally, check for overhead utilities and obstructions such as trees.

Integral personnel will wear the appropriate PPE at the Site as outlined in Section 4 while working outside field vehicles and when around or in contact with contaminated media. The work area breathing zone will be monitored at least every 30 minutes using a PID and dust meter as outlined in Section 5. Care will be exercised while lifting, assembling, and decontaminating equipment. Personnel will wear high visibility vests or clothing while working around vehicular traffic and heavy equipment operation. Hearing protection will be worn at all times while working in proximity to noisy equipment.

Integral personnel will wear a hard hat, safety glasses, traffic safety vests, and steel-toe boots at all times. The exclusion zone around the drill rig will be marked with orange traffic cones or caution tape and personnel will police the area to make sure no unauthorized personnel enter the exclusion zone. Avoid getting soil and sample preservatives (nitric and hydrochloric acid) on clothes or skin. Exercise care when lifting, assembling, and decontaminating equipment. Always stay clear of the drilling rig and be aware of its location. Keep in eye contact with the driller. Stay away from pinch points. Know the location of the "kill switch" on the rig. Keep equipment organized.

### **11.2 SOIL, GROUNDWATER, AND SOIL VAPOR SAMPLING**

Integral personnel will wear the appropriate PPE at the Site as outlined in Section 4 while working outside field vehicles and when around or in contact with contaminated media. The work area breathing zone will be monitored at least every 30 minutes using a PID as outlined in Section 5. The work area breathing zone will be monitored using a dust meter during soil sampling as outlined in Section 5. Care will be exercised while lifting, assembling, and decontaminating equipment. Personnel will wear high visibility vests or clothing while working around vehicular traffic and heavy equipment operation. Hearing protection will be worn at all times while working in proximity to noisy equipment.

Integral personnel will wear a hard hat, safety glasses, traffic safety vests, and steel-toe boots at all times. The exclusion zone around the drill rig will be marked with orange traffic cones or caution tape and personnel will police the area to make sure no unauthorized personnel enter the exclusion zone. Avoid getting soil and sample preservatives (nitric and hydrochloric acid) on clothes or skin. Exercise care when lifting, assembling, and decontaminating equipment.

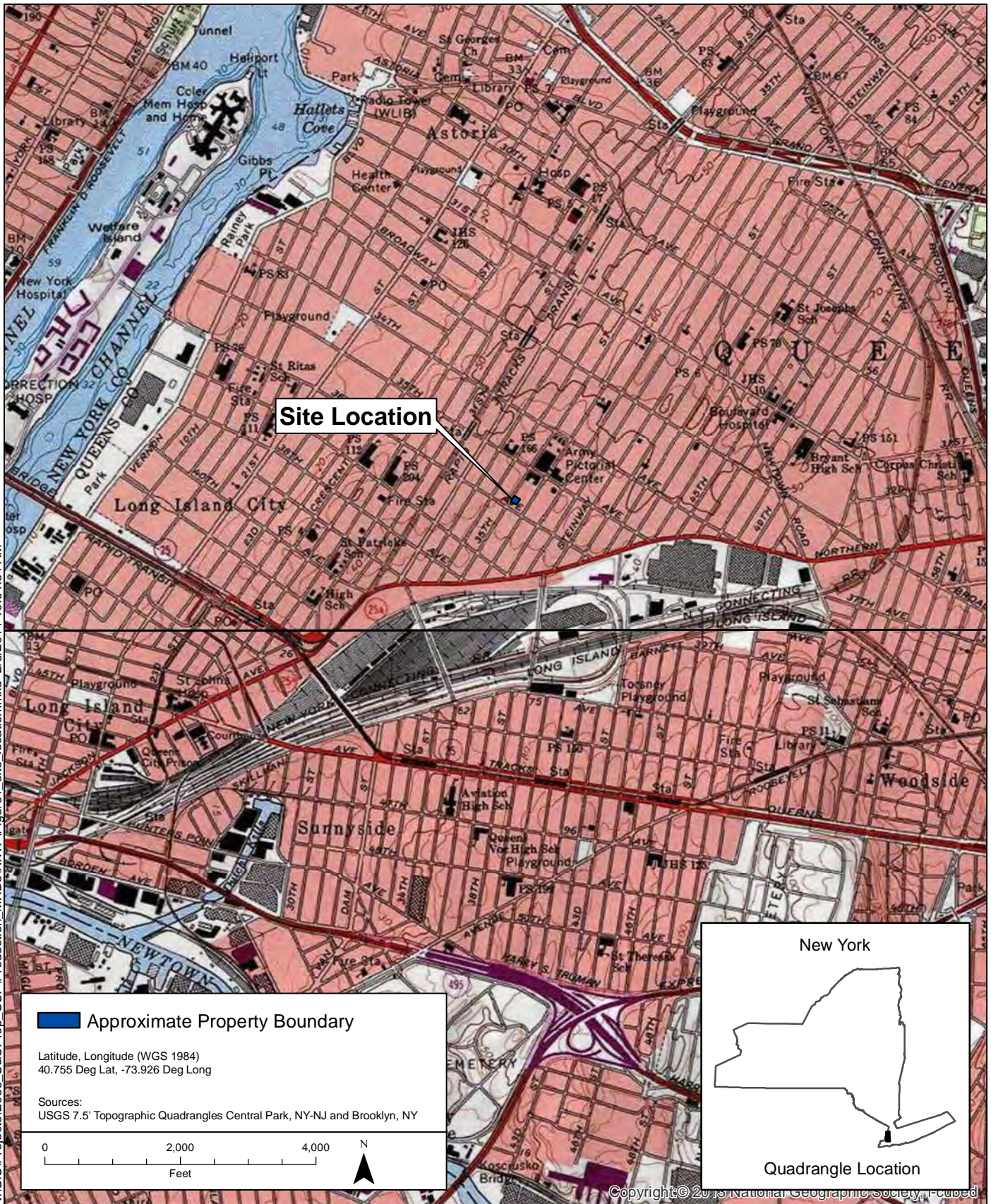
# **ATTACHMENT 1**

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## **SITE MAP AND HOSPITAL ROUTE**



N:\GIS\Projects\E056\_S&C\Prop\_SCP\Production\_MXDs\RIW\Figure1\_site\_location.mxd 2/3/2014 10:04:34 AM



**Approximate Property Boundary**

Latitude, Longitude (WGS 1984)  
40.755 Deg Lat, -73.926 Deg Long

Sources:  
USGS 7.5' Topographic Quadrangles Central Park, NY-NJ and Brooklyn, NY

0 2,000 4,000  
Feet

N

New York

Quadrangle Location

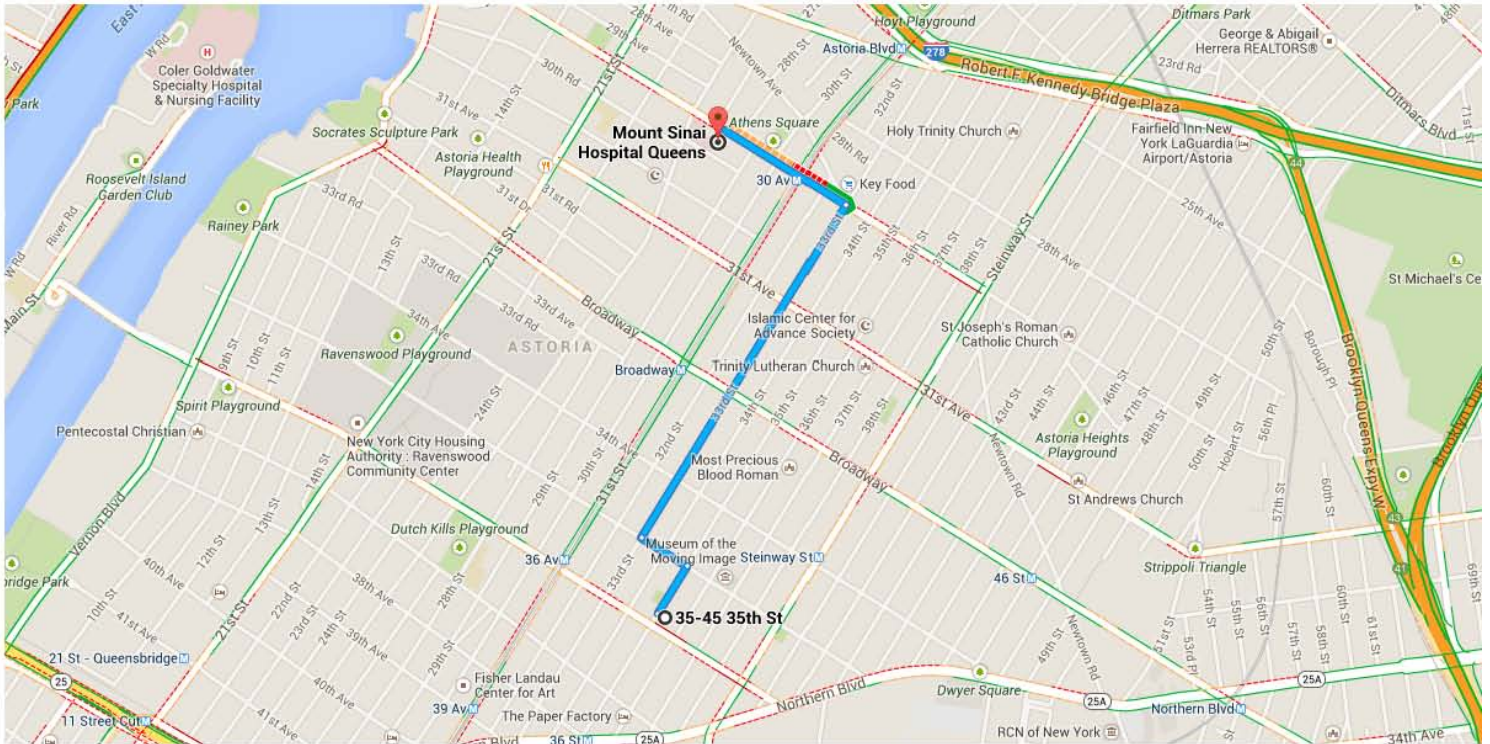
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61 Broadway, Suite 1601  
New York, New York 10006  
www.integral-corp.com

**Figure 1.**  
Site Location Map  
Remedial Investigation Work Plan  
Teitelbaum Dry Cleaning, Inc.  
35-45 35th Street  
Astoria, New York

### Directions from 35-45 35th St to Mount Sinai Hospital Queens



#### ○ 35-45 35th St

Astoria, NY 11106

- ↑ 1. Head **northeast** on **35th St**  
0.1 mi
- ↶ 2. Take the **1st left** onto **35th Ave**  
0.1 mi
- ↷ 3. Turn **right** at the 2nd cross street onto **33rd St**  
0.7 mi
- ↶ 4. Turn **left** onto **30th Ave**  
0.3 mi  
 Destination will be on the left

#### ⊙ Mount Sinai Hospital Queens

25-10 30th Ave, Long Island City, NY 11102

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or

## **ATTACHMENT 2**

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### **REGULATORY NOTICES**

# You Have a Right to a Safe and Healthful Workplace. IT'S THE LAW!

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in the inspection.
- You can file a complaint with OSHA within 30 days of discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have a right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violation.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records or records of your exposure to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.



The *Occupational Safety and Health Act of 1970 (OSH Act)*, P.L. 91-596, assures safe and healthful working conditions for working men and women throughout the Nation. The Occupational Safety and Health Administration, in the U.S. Department of Labor, has the primary responsibility for administering the *OSH Act*. The rights listed here may vary depending on the particular circumstances. To file a complaint, report an emergency, or seek OSHA advice, assistance, or products, call 1-800-321-OSHA or your nearest OSHA office: • Atlanta (404) 562-2300 • Boston (617) 565-9860 • Chicago (312) 353-2220 • Dallas (214) 767-4731 • Denver (303) 844-1600 • Kansas City (816) 426-5861 • New York (212) 337-2378 • Philadelphia (215) 861-4900 • San Francisco (415) 975-4310 • Seattle (206) 553-5930. Teletypewriter (TTY) number is 1-877-889-5627. To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA's website at [www.osha.gov](http://www.osha.gov). If your workplace is in a state operating under an OSHA-approved plan, your employer must post the required state equivalent of this poster.

## 1-800-321-OSHA [www.osha.gov](http://www.osha.gov)

## **ATTACHMENT 3**

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### **SAFETY PROCEDURES**

## FROSTBITE

### What happens to the body:

Freezing in deep layers of skin and tissue; pale, waxy-white skin color; skin becomes hard and numb; usually affects fingers, hands, toes, feet, ears, and nose.

### What to do: (land temperatures)

- Move the person to a warm, dry area. Don't leave the person alone.
- Remove wet or tight clothing that may cut off blood flow to the affected area.
- **Do not** rub the affected area because rubbing damaged the skin and tissue.
- Gently place the affected area in a warm water bath (105°) and monitor the water temperature to **slowly** warm the tissue. Don't pour warm water directly on the affected area because it will warm the tissue too fast, causing tissue damage. Warming takes 25-40 minutes.
- After the affected area has been warmed, it may become puffy and blister. The affected area may have a burning feeling or numbness. When normal feeling, movement, and skin color have returned, the affected area should be dried and wrapped to keep it warm.  
**Note:** If there is a chance the affected area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.
- Seek medical attention as soon as possible.

## How to Protect Workers

- Recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries.
- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help the worker.
- Train workers about cold-induced illnesses and injuries.
- Select proper clothing for cold, wet, and windy conditions. Layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene.)
- Take frequent short breaks in warm, dry shelters to allow the body to warm up.
- Perform work during the warmest part of the day.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Use the buddy system (work in pairs.)
- Drink warm, sweet beverages (sugar water, sports-type drinks.)  
**Avoid drinks with caffeine** (coffee, tea, or hot chocolate) **or alcohol.**
- Eat warm, high-calorie foods like hot pasta dishes.

### Workers are at increased risk when...

- They have predisposing health conditions such as cardiovascular disease, diabetes, and hypertension.
- They take certain medications. Check with your doctor, nurse, or pharmacy and ask if medicines you take affect you while working in cold environments.
- They are in poor physical condition, have a poor diet, or are older.

## HYPOTHERMIA - (Medical Emergency)

### What happens to the body:

Normal body temperature (98.6°F/37°C) drops to or below 95°F/35°C; fatigue or drowsiness; uncontrolled shivering; cool, bluish skin; slurred speech; clumsy movements; irritable, irrational, or confused behavior.

### What to do: (land temperatures)

- Call for emergency help (i.e., ambulance or 911).
- Move the person to a warm, dry area. Don't leave the person alone.
- Remove wet clothing and replace with warm, dry clothing or wrap the person in blankets.
- Have the person drink warm, sweet drinks (sugar water or sports-type drinks) if he is alert. **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) **or alcohol.**
- Have the person move his arms and legs to create muscle heat. If he is unable to do this, place warm bottles or hot packs in the armpits, groin, neck, and head areas. **Do not** rub the person's body or place him in a warm water bath. This may stop his heart.

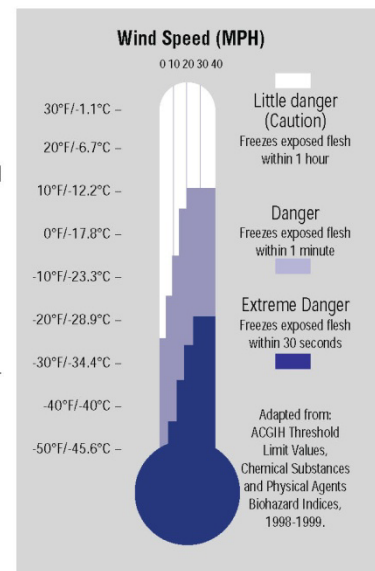
### What to do: (water temperatures)

- Call for emergency help (i.e., ambulance or 911). Body heat is lost up to 25 times faster in water.
- **Do not** remove any clothing. Button, buckle, zip, and tighten any collars, cuffs, shoes, and hoods because the layer of trapped water closest to the body provides a layer of insulation that slows the loss of heat. Keep the head out of the water and put on a hat or hood.
- Get out of the water as quickly as possible or climb on anything floating. **Do not** attempt to swim unless a floating object or another person can be reached because swimming or other physical activity uses body heat and reduces survival time by about 50 percent.
- If getting out of the water is not possible, wait quietly and conserve body heat by folding arms across the chest, keeping thighs together, bending knees, and crossing ankles. If another person is in the water, huddle together with chests held closely.

## THE COLD STRESS EQUATION

**LOW TEMPERATURE + WIND SPEED + WETNESS = INJURIES & ILLNESS**

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. Hypothermia can occur when *land temperatures* are above freezing or *water temperatures* are below 98.6°F/37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



## HEAT EXHAUSTION

### What happens to the body:

Headaches, dizziness, or light-headedness, weakness, mood changes, irritability or confusion, feeling sick to your stomach, vomiting, fainting, decreased and dark-colored urine, and pale, clammy skin.

### What should be done:

- Move the person to a cool shaded area. Don't leave the person alone. If the person is dizzy or light-headed, lay him on his back and raise his legs about 6-8 inches. If the person is sick to his stomach, lay him on his side.
- Loosen and remove heavy clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if he is not feeling sick to his stomach.
- Try to cool the person by fanning him. Cool the skin with a cool spray mist of water or wet cloth.
- If the person does not feel better in a few minutes call for emergency help (ambulance or call 911.)

*(If heat exhaustion is not treated, the illness may advance to heat stroke.)*

## How to Protect Workers

- Learn the signs and symptoms of heat-induced illnesses and what to do to help the worker.
- Train workers about heat-induced illnesses.
- Perform the heaviest work during the coolest part of the day.
- Slowly build up tolerance to the heat and the work activity (usually takes up to 2 weeks.)
- Use the buddy system (work in pairs.)
- Drink plenty of cool water (one small cup every 15-20 minutes.)
- Wear light, loose-fitting, breathable (like cotton) clothing.
- Take frequent short breaks in cool, shaded areas (allow your body to cool down.)
- Avoid eating large meals before working in hot environments.
- Avoid caffeine and alcoholic beverages (these beverages make the body lose water and increase the risk of heat illnesses.)

### Workers are at increased risk when...

- They take certain medications. Check with your doctor, nurse, or pharmacy to see if medicines you take affect you when working in hot environments.
- They have had a heat-induced illness in the past.
- They wear personal protective equipment.

## HEAT STROKE - A Medical Emergency

### What happens to the body:

Dry, pale skin (no sweating); hot red skin (looks like a sunburn); mood changes; irritability, confusion, and not making any sense; seizures or fits, and collapse (will not respond).

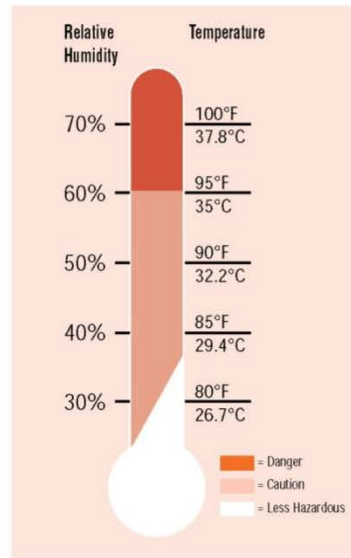
### What should be done:

- Call for emergency help (i.e., ambulance or 911.)
- Move the person to a cool, shaded area. Don't leave the person alone. Lay him on his back and if the person is having seizures, remove objects close to him so he won't hit them. If the person is sick to his stomach, lay him on his side.
- Remove heavy and outer clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if he is alert enough to drink anything and not feeling sick to his stomach.
- Try to cool the person by fanning him or her. Cool the skin with a cool spray mist of water, wet cloth, or wet sheet.
- If ice is available, place ice packs in armpits and groin area.

## THE HEAT EQUATION

### HIGH TEMPERATURE + HIGH HUMIDITY + PHYSICAL WORK = HEAT ILLNESS

When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are **heat exhaustion** and **heat stroke**. If actions are not taken to treat heat exhaustion, the illness could progress to heat stroke and **death**.

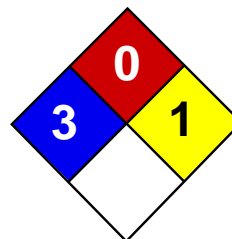


## **ATTACHMENT 4**

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### **MATERIAL SAFETY DATA SHEETS**





Health	3
Fire	0
Reactivity	1
Personal Protection	

## Material Safety Data Sheet

### Hydrochloric acid MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** Hydrochloric acid

**Catalog Codes:** SLH1462, SLH3154

**CAS#:** Mixture.

**RTECS:** MW4025000

**TSCA:** TSCA 8(b) inventory: Hydrochloric acid

**CI#:** Not applicable.

**Synonym:** Hydrochloric Acid; Muriatic Acid

**Chemical Name:** Not applicable.

**Chemical Formula:** Not applicable.

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	20-38
Water	7732-18-5	62-80

**Toxicological Data on Ingredients:** Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

#### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Slightly hazardous in case of skin contact (sensitizer). **CARCINOGENIC EFFECTS:** Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target

organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion:**

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

**Serious Ingestion:** Not available.

#### Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** of metals

**Explosion Hazards in Presence of Various Substances:** Non-explosive in presence of open flames and sparks, of shocks.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:**

Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammable gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrogen gas.

**Special Remarks on Explosion Hazards:**

Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl4 Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca3P2 Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO4 Hexalithium disilicide H2SO4 Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U3P4 , Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

## Section 6: Accidental Release Measures

### Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

### Large Spill:

Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m3) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m3) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m3) [United Kingdom (UK)] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Pungent. Irritating (Strong.)

**Taste:** Not available.

**Molecular Weight:** Not applicable.

**Color:** Colorless to light yellow.

**pH (1% soln/water):** Acidic.

**Boiling Point:**

108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

**Melting Point:**

-62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

**Critical Temperature:** Not available.

**Specific Gravity:**

1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

**Vapor Pressure:** 16 kPa (@ 20°C) average

**Vapor Density:** 1.267 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.25 to 10 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether.

**Solubility:** Soluble in cold water, hot water, diethyl ether.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials, water

**Incompatibility with various substances:**

Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

**Corrosivity:**

Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalis (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothermic reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the following can cause explosion or ignition on contact or

**Special Remarks on Corrosivity:**

Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinum, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation.

**Toxicity to Animals:**

Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

**Chronic Effects on Humans:**

CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

**Other Toxic Effects on Humans:**

Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, . Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

**Special Remarks on Toxicity to Animals:**

Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

**Special Remarks on Chronic Effects on Humans:**

May cause adverse reproductive effects (fetotoxicity). May affect genetic material.

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjunctivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and laryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well as headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure, occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomiting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophageal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel. Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** Class 8: Corrosive material

**Identification:** : Hydrochloric acid, solution UNNA: 1789 PG: II

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

### Federal and State Regulations:

Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

### Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

### Other Classifications:

#### WHMIS (Canada):

CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

#### DSCL (EEC):

R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

#### HMIS (U.S.A.):

**Health Hazard:** 3

**Fire Hazard:** 0

**Reactivity:** 1

**Personal Protection:**

#### National Fire Protection Association (U.S.A.):

**Health:** 3

**Flammability:** 0

**Reactivity:** 1

**Specific hazard:**

#### Protective Equipment:

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

## Section 16: Other Information

**References:**

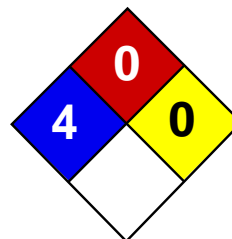
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**Other Special Considerations:** Not available.

**Created:** 10/09/2005 05:45 PM

**Last Updated:** 05/21/2013 12:00 PM

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Health	3
Fire	0
Reactivity	0
Personal Protection	

## Material Safety Data Sheet

### Nitric acid, 65% MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** Nitric acid, 65%

**Catalog Codes:** SLN2161

**CAS#:** Mixture.

**RTECS:** Not applicable.

**TSCA:** TSCA 8(b) inventory: Water; Nitric acid, fuming

**CI#:** Not applicable.

**Synonym:** Nitric Acid, 65%

**Chemical Name:** Not applicable.

**Chemical Formula:** Not applicable.

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Water	7732-18-5	35
Nitric acid, fuming	7697-37-2	65

**Toxicological Data on Ingredients:** Nitric acid, fuming: VAPOR (LC50): Acute: 244 ppm 0.5 hours [Rat]. 344 ppm 0.5 hours [Rat].

#### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to lungs, mucous membranes, upper respiratory



tract, skin, eyes, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion:**

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

**Serious Ingestion:** Not available.

#### Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** of combustible materials

**Explosion Hazards in Presence of Various Substances:**

Explosive in presence of reducing materials, of organic materials, of metals, of alkalis. Non-explosive in presence of open flames and sparks, of shocks.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:**

Flammable in presence of cellulose or other combustible materials. Phosphine, hydrogen sulfide, selenide all ignite when fuming nitric acid is dripped into gas. (Nitric Acid, fuming)

**Special Remarks on Explosion Hazards:**

Reacts explosively with metallic powders, carbides, cyanides, sulfides, alkalies and turpentine. Can react explosively with many reducing agents. Arsine, phosphine, tetraborane all oxidized explosively in presence of nitric acid. Cesium and rubidium

acetylides explode in contact with nitric acid. Explosive reaction with Nitric Acid + Nitrobenzene + water. Detonation with Nitric Acid + 4-Methylcyclohexane. (Nitric acid, fuming)

## Section 6: Accidental Release Measures

### Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

### Large Spill:

Corrosive liquid. Oxidizing material. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up.. Keep container dry. Keep away from heat. Keep away from sources of ignition. Keep away from combustible material.. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

### Storage:

Keep container tightly closed. Keep container in a cool, well-ventilated area. Separate from acids, alkalies, reducing agents and combustibles. See NFPA 43A, Code for the Storage of Liquid and Solid Oxidizers. Do not store above 23°C (73.4°F).

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 2 STEL: 4 (ppm) from ACGIH (TLV) [United States] TWA: 2 STEL: 4 from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Acrid. Disagreeable and choking. (Strong.)

**Taste:** Not available.

**Molecular Weight:** Not applicable.

**Color:** Colorless to light yellow.

**pH (1% soln/water):** Acidic.

**Boiling Point:** 121°C (249.8°F)

**Melting Point:** -41.6°C (-42.9°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 1.408 (Water = 1)

**Vapor Pressure:** 6 kPa (@ 20°C)

**Vapor Density:** 2.5 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.29 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether.

**Solubility:**

Easily soluble in cold water, hot water. Soluble in diethyl ether.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials

**Incompatibility with various substances:**

Highly reactive with alkalis. Reactive with reducing agents, combustible materials, organic materials, metals, acids.

**Corrosivity:**

Extremely corrosive in presence of aluminum, of copper. Non-corrosive in presence of glass, of stainless steel(304), of stainless steel(316), of brass.

**Special Remarks on Reactivity:**

A strong oxidizer. Reacts violently with alcohol, organic material, turpene, charcoal. Violent reaction with Nitric acid + Acetone and Sulfuric acid. Nitric Acid will react with water or steam to produce heat and toxic, corrosive and flammable vapors. (Nitric acid, fuming)

**Special Remarks on Corrosivity:**

In presence of traces of oxides, it attacks all base metals except aluminum and special chromium steels. It will attack some forms of plastics, rubber, and coatings. No corrosive effect on bronze. No corrosivity data for zinc, and steel

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**

LD50: Not available. LC50: Not available.

**Chronic Effects on Humans:**

Contains material which may cause damage to the following organs: lungs, mucous membranes, upper respiratory tract, skin, eyes, teeth.

**Other Toxic Effects on Humans:**

Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

**Special Remarks on Toxicity to Animals:** LDL - Lowest Published Lethal Dose [Human] - Route: Oral; Dose: 430 mg/kg (Nitric acid, fuming)

**Special Remarks on Chronic Effects on Humans:**

May cause adverse reproductive effects (effects on newborn and fetotoxicity) based on animal data. (Nitric acid, fuming)

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Skin: Severely irritates skin. Causes skin burns and may cause deep and penetrating ulcers of the skin with a characteristic yellow to brownish discoloration. May be fatal if absorbed through skin. Eyes: Severely irritates eyes. Causes eye burns. May cause irreversible eye injury. Ingestion: May be fatal if swallowed. Causes serious gastrointestinal tract irritation or burns with nausea, vomiting, severe abdominal pain, and possible "coffee grounds" appearance of the vomitus . May cause perforation of the digestive tract. Inhalation: May be fatal if inhaled. Vapor is extremely hazardous. Vapor may cause nitrous gas poisoning. Effects may be delayed. May cause irritation of the mucous membranes and respiratory tract with burning pain in the nose and throat, coughing, sneezing, wheezing, shortness of breath and pulmonary edema. Other symptoms may include nausea, and vomiting. Chronic Potential Health Effects: Repeated inhalation may produce changes in pulmonary function and/or chronic bronchitis. It may also affect behavior (headache, dizziness, drowsiness, muscle contraction or spasticity, weakness, loss of coordinaton, mental confusion), and urinary system (kidney faillure, decreased urinary output after several hours of

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** Class 8: Corrosive material

**Identification:** : Nitric acid UNNA: 2031 PG: II

**Special Provisions for Transport:** Marine Pollutant

## Section 15: Other Regulatory Information

**Federal and State Regulations:**

New York release reporting list: Nitric acid, fuming Rhode Island RTK hazardous substances: Nitric acid, fuming Pennsylvania RTK: Nitric acid, fuming Florida: Nitric acid, fuming Minnesota: Nitric acid, fuming Massachusetts RTK: Nitric acid, fuming

New Jersey: Nitric acid, fuming TSCA 8(b) inventory: Water; Nitric acid, fuming SARA 302/304/311/312 extremely hazardous substances: Nitric acid, fuming SARA 313 toxic chemical notification and release reporting: Nitric acid, fuming 65% CERCLA: Hazardous substances.: Nitric acid, fuming: 1000 lbs. (453.6 kg);

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**Other Classifications:**

**WHMIS (Canada):**

CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

**DSCL (EEC):**

R8- Contact with combustible material may cause fire. R35- Causes severe burns. S23- Do not breathe gas/fumes/vapour/spray [\*\*\*] S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36- Wear suitable protective clothing. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**HMIS (U.S.A.):**

**Health Hazard:** 3

**Fire Hazard:** 0

**Reactivity:** 0

**Personal Protection:**

**National Fire Protection Association (U.S.A.):**

**Health:** 4

**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 10:59 AM

**Last Updated:** 05/21/2013 12:00 PM

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## **ATTACHMENT 5**

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### **NEAR-MISS INCIDENT REPORT**

**Near-Miss Incident Report**  
(completed by field staff)

Employee: \_\_\_\_\_

Office or site location: \_\_\_\_\_

Near-Miss Incident (check one or more): Exposure ( ) Physical injury ( ) Property damage ( )

Location (city and state): \_\_\_\_\_ Project and Contract No. \_\_\_\_\_

Date of incident: \_\_\_\_\_ Time of incident: \_\_\_\_\_

Fully describe the incident, including how it happened, persons involved, if chemicals were involved in the incident, etc.:

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Was the operation being conducted under an established safety plan? (Yes / No)

If yes, attach a copy. If no, explain: \_\_\_\_\_

---

---

Employee's signature

Date

Project manager's signature

Date

Site safety officer's signature

Date

**Corporate Health and Safety Manager Review and Comments**

Corrective action/procedure changes carried out at the site:

---

---

---

Corrective actions to be taken to prevent similar incidents at other sites:

---

---

---

---

Corporate health and safety manager's signature

---

Date



## **ATTACHMENT 6**

---

### **EMPLOYEE EXPOSURE/INJURY INCIDENT REPORT**

## Employee Exposure/Injury Incident Report

(completed by the CHSM or designee)

Employee: \_\_\_\_\_

Office or field location: \_\_\_\_\_

Incident:

Potential or known exposure (describe): \_\_\_\_\_

Physical injury or illness (describe): \_\_\_\_\_

Location (city and state): \_\_\_\_\_ Project and Contract No. \_\_\_\_\_

Date of incident: \_\_\_\_\_ Time of incident: \_\_\_\_\_

Date incident reported: \_\_\_\_\_ Person to whom incident was reported: \_\_\_\_\_

Weather condition during incident: Temperature: \_\_\_\_\_ Precipitation: \_\_\_\_\_

Wind speed and direction: \_\_\_\_\_ Cloud cover: \_\_\_\_\_

Name of materials potentially encountered (chemical exposure):

Chemical and phase (i.e., liquid, solid, gas, vapor, fume, mist), radiological, etc.: \_\_\_\_\_

Describe the exposure/injury in detail and the parts of the body affected (attach extra sheets if necessary):

Describe exact onsite or offsite location where the incident occurred:

What was the employee doing when the exposure/injury occurred? (Describe briefly as site reconnaissance, soil sampling, etc.):

How did the incident occur? Describe fully the factors that led to or contributed to the incident:

---

---

Was medical treatment given?  Yes  No If yes, when? \_\_\_\_\_

By whom? Name of paramedic: \_\_\_\_\_

Name of physician: \_\_\_\_\_

Other: \_\_\_\_\_

Where? Onsite \_\_\_\_\_ Offsite \_\_\_\_\_

If offsite, name of hospital or clinic: \_\_\_\_\_

Length of inpatient stay (dates): \_\_\_\_\_

Was Integral Consulting management notified?  Yes  No If yes, when? \_\_\_\_\_

Name and title of manager(s) notified: \_\_\_\_\_

Did the exposure/injury result in permanent disability or death?  Yes  No

If yes, explain: \_\_\_\_\_

Number of days away from work \_\_\_\_\_ Number of days of restricted work activity: \_\_\_\_\_

Has the employee returned to work? (Yes / No) If yes, date: \_\_\_\_\_

Names of other persons affected during the incident:

---

Names of persons who witnessed the incident:

---

Name and title of field team leader or immediate supervisor at the site:

---

Was the operation being conducted under an established safety plan?  Yes  No

---

If yes, attach a copy. If no, explain: \_\_\_\_\_

Was personal protective equipment (PPE) used by the employee?  Yes  No

If yes, list items: \_\_\_\_\_

Did any limitations in safety equipment or PPE affect or contribute to exposure?  Yes  No

If yes, explain: \_\_\_\_\_

Attachments to this report: \_\_\_\_\_ Medical report(s) (if not confidential) \_\_\_\_\_ Site safety plan  
\_\_\_\_\_ Other relevant information

Employee's signature \_\_\_\_\_ Date \_\_\_\_\_

Site safety officer's signature \_\_\_\_\_ Date \_\_\_\_\_

Project manager's signature \_\_\_\_\_ Date \_\_\_\_\_

**Corporate health and safety manager review and comments**

Corrective action/procedure changes carried out on the project:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Corrective actions to be taken to prevent similar incidents at other sites:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Corporate Health and Safety Manager's signature \_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_

# Appendix C

## Quality Assurance Project Plan

### Teitelbaum Dry Cleaning Inc.

### Offsite Soil Vapor Work Plan

For the Property Located at 35-45 35<sup>th</sup> Street  
Queens, NY 11106  
Block 639, Lots 4  
NYSDEC BCP No. C241149

Submitted to:  
New York State Department of Environmental Conservation  
Division of Environmental Remediation  
Hunters Point Plaza  
47-40 21<sup>st</sup> Street  
Long Island City, NY 11101

Prepared for:  
S & C Properties, LLC  
2 Bay Club Drive, Apt. 10G  
Bayside, New York 11360

Prepared by:



61 Broadway  
Suite 1601  
New York, NY 10006

May 2014

*Affiliated with Integral Consulting Inc.*

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Appendix A. Resumes

# 1 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been developed for the Remedial Investigation Work Plan (RIWP) prepared for the property located in at 35-45 35<sup>th</sup> Street, Queens, NY (Site).

The Site (Block 639, Lot 4) is approximately 9,950 square feet in area and is currently developed with one high-ceilinged commercial/manufacturing building (measuring approximately 100' x 100'). The ground floor of the building is currently utilized as an industrial dry cleaner not open to the public. The building is divided into two sections (north and south). A portion of the southern section contains a second floor that is used as office space and storage.

## 1.1 PROJECT SCOPE AND QAPP OBJECTIVE

The proposed scope of work includes the following:

- Advancement of borings for soil, groundwater and/or soil vapor sampling at several locations around the site; and,
- Collection of soil, groundwater, soil vapor, and indoor and ambient air samples from soil borings, monitoring wells and temporary soil vapor points.

The objective of the QAPP is to detail the policies, organization, objectives, functional activities and specific quality assurance/quality control (QA/QC) activities designed to achieve the data quality goals or objectives of the Work Plan. This QAPP addresses how the acquisition and handling of samples and the review and reporting of data will be documented for quality control (QC) purposes. Specifically, this QAPP address the following:

- The procedures to be used to collect, preserve, package, and transport samples;
- Field data collection and record keeping;
- Data management;
- Chain-of-custody procedures; and,
- Determination of precision, accuracy, completeness, representativeness, decision rules, comparability and level of QC effort.

## 2 PROJECT ORGANIZATION

The personnel detailed are responsible for the implementation of the QAPP. Integral Engineering PC (Integral) will implement the Work Plan on behalf of S & C Properties LLC (Participant) once approved by the New York State Department of Environmental Conservation (NYSDEC).

The Qualified Environmental Professional will be Kevin McCarty, P.G., principal at Integral. Mr. McCarty is a professional geologist with nearly 20 years of experience in the New York City metropolitan area. He has designed and implemented subsurface investigations and is proficient in groundwater modeling, design of groundwater treatment systems, and soil remediation. He has managed numerous projects focused on compliance with the requirements of the New York State Brownfield Cleanup and spills programs and the New York City “e” designation program. Mr. McCarty also has extensive experience coordinating with New York State and New York City regulatory agencies. Mr. McCarty received his BA in Geology from Western Connecticut State University.

The Quality Assurance Officer will be Mr. Keith Brodock, P.E., managing engineer at Integral. Mr. Brodock is an is a professional engineer with nearly 10 years of experience in environmental risk analysis, real estate portfolio liability estimation, transactional risk evaluation, remediation design, and decision management science. One of his primary responsibilities is managing and quantifying transactional risks for brownfield properties. Mr. Brodock routinely consults purchasers and sellers on the regulatory climate, technical interpretations, and risk mitigation measures. He frequently supports fate and transport modeling of vapor intrusion cases and engineering designs for remediation systems. Mr. Brodock received his BS in Chemical Engineering from Clarkson University. Mr. Brodock has experience with analytical methods, data interpretation and validation, the development of sampling plans, quality control procedures and auditing requirements and techniques. Mr. Brodock will review sampling procedures and certify that the data was collected and analyzed using the appropriate procedures and will not be directly involved in the collection and analysis of samples from the Site. Mr. Brodock has, in conjunction with the Project Manager, developed the sampling and analytical portion of this QAPP.

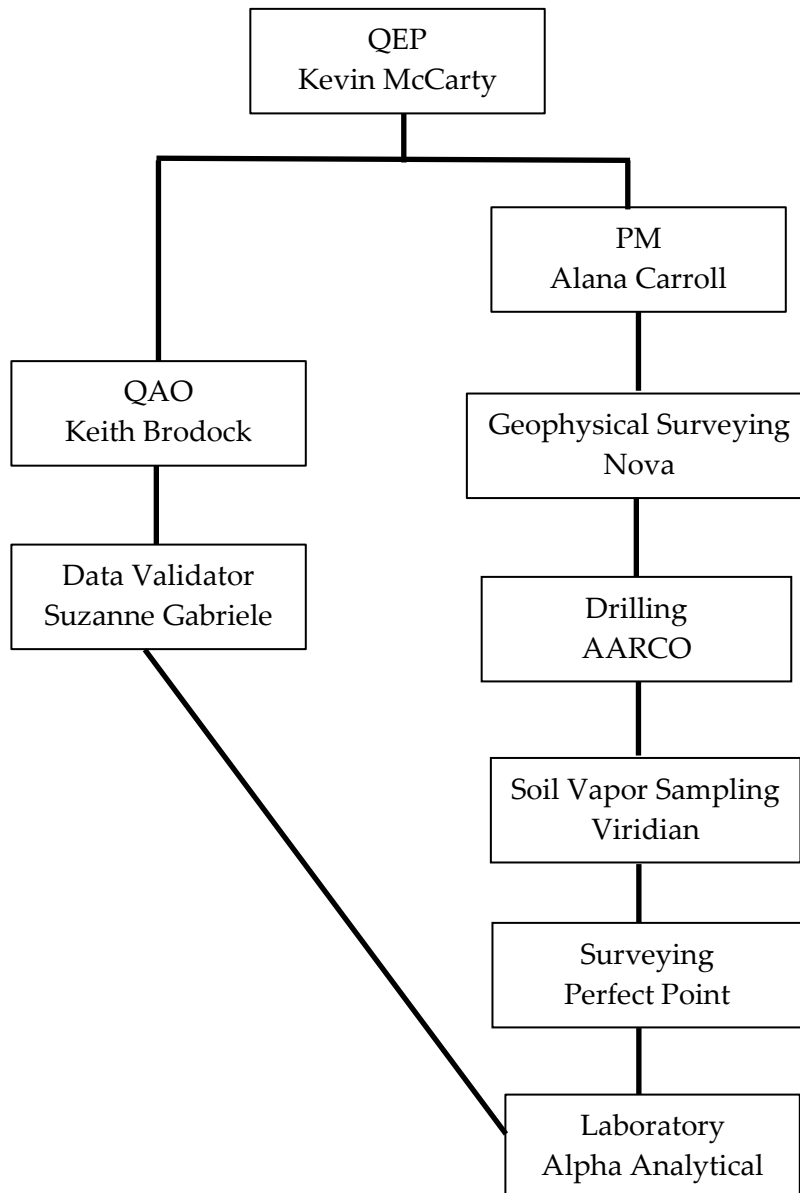
The Project Manager will be Mrs. Alana Carroll, managing scientist at Integral. Mrs. Carroll is an environmental geologist with experience in all aspects of site assessment, development and implementation of remedial strategies. Her experience involves projects from inception through investigation, remediation and closure. Her expertise includes soil, soil vapor and groundwater remediation; remedial selection and design; field/health and safety oversight and preparation of work plans and reports to satisfy the requirements of various regulatory agencies. Mrs. Carroll received her BS in Geology from Hofstra University.



Project personnel resumes are included in Appendix A.

In addition, Integral will utilize subcontractors for drilling (AARCO Environmental of Lindenhurst, NY) soil vapor sampling (Viridian Inc. of Upper Montclair, NJ), geophysical survey (Nova Geophysical Services of Douglaston, NY), surveying (Perfect Point Land Surveying of Brooklyn, NY), laboratory services (Alpha Analytical of Mahwah, NJ) and data validation (Geosyntec Consultants of Centennial, CO).

An organization chart for the implementation of the Remedial Investigation Work Plan and QAPP is below.



### 3 SAMPLING AND DECONTAMINATION PROCEDURES

A detailed description of the procedures to be used during this program for collection of the soil, groundwater, degraded bedrock, soil vapor, and ambient air samples is provided below. Proposed sample locations are shown on Figure 6 of the Work Plan. An Analytical Methods/Quality Assurance Summary is provided in Table 1, included in Section 3.11.

#### 3.1 LEVEL OF EFFORT FOR QC SAMPLES

Field blank, trip blank, field duplicate samples and matrix spike (MS) / matrix spike duplicate (MSD) will be analyzed to assess the quality of the data resulting from the field sampling and analytical programs. Each type of QC sample is discussed below.

- Field and trip blanks consisting of distilled water will be submitted to the analytical laboratories to provide the means to assess the quality of the data resulting from the field-sampling program. Field (equipment) blank samples are analyzed to check for procedural chemical constituents at the facility that may cause sample contamination. Trip blanks are used to assess the potential for contamination of samples due to contaminant migration during sample shipment and storage.
- Duplicate samples are analyzed to check for sampling and analytical reproducibility.
- MS/MSD samples provide information about the effect of the sample matrix on the digestion and measurement methodology

The general level of QC effort will be one (1) field duplicate and one (1) field blank (when non-dedicated equipment is used) for every 20 or fewer investigative samples of a given matrix. Additional sample volume will also be provided to the laboratory to allow one (1) site-specific MS/MSD for every 20 or fewer investigative samples of a given matrix. One (1) trip blank will be included along with each sample delivery group of VOC samples.

The analytical laboratory will be certified under the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) in the appropriate categories. NYSDEC Analytical Services Protocol (ASP) Category B deliverables will be prepared by the laboratory.

#### 3.2 SAMPLE HANDLING

Samples will be picked up by the laboratory or delivered to the laboratory in person by the sampler, or transported to the laboratory by overnight courier. All samples will be shipped to

the laboratory to arrive within 48 hours after collection, and the laboratory will adhere to the analytical holding times for these analyses, as listed in the July 2005 NYSDEC ASP.

### **3.3 CUSTODY PROCEDURES**

Sample custody will be controlled and maintained through the chain-of-custody procedures. The chain of custody is the means by which the possession and handling of samples is tracked from the site to the laboratory. Sample containers will be cleaned and preserved at the laboratory before shipment to the Site. The following sections (Sections 3.4 and 3.5) describe procedures for maintaining sample custody from the time samples are collected to the time they are received by the analytical laboratory.

### **3.4 SAMPLE STORAGE**

Samples will be stored in secure limited-access areas. Iced coolers or refrigerators will be maintained at 4°C, 2°C, or as required by the applicable regulatory program. The temperatures of all refrigerated storage areas are monitored and recorded a minimum of once per day. Deviations of temperature from the applicable range require corrective action, including moving samples to another storage location, if necessary.

### **3.5 SAMPLE CUSTODY**

Sample custody is defined by this document as the following:

- The sample is in someone's actual possession;
- The sample is in someone's view after being in his or her physical possession;
- The sample was in someone's possession and then locked, sealed, or secured in a manner that prevents unsuspected tampering; or,
- The sample is placed in a designated and secured area.
- Samples will be removed from storage areas by the sample custodian or laboratory personnel and transported to secure laboratory areas for analysis. Access to the laboratory and sample storage areas is restricted to laboratory personnel and escorted visitors only; all areas of the laboratory are therefore considered secure.

Laboratory documentation used to establish chain of custody and sample identification may include the following:

- Field chains of custody or other paperwork that arrives with the sample;
- Laboratory chain of custody;

- Sample labels or tags attached to each sample container;
- Sample custody seals;
- Sample preparation logs (i.e., extraction and digestion information) recorded in hardbound laboratory books, filled out in legible handwriting, and signed and dated by the chemist;
- Sample analysis logs (e.g., metals, GC/MS, etc.) information recorded in hardbound laboratory books that are filled out in legible handwriting, and signed and dated by the chemist;
- Sample storage log (same as the laboratory chain of custody); and,
- Sample disposition log, which documents sample disposal by a contracted waste disposal company.

### **3.6 SAMPLE TRACKING**

All samples will be maintained in the appropriate coolers prior to and after analysis. Laboratory analysts will remove and return their samples, as needed. Samples that require internal chain of custody procedures will be relinquished to the analysts by the sample custodians. The analyst and sample custodian will sign the original chain of custody relinquishing custody of the samples from the sample custodian to the analyst. When the samples are returned, the analyst will sign the original chain of custody returning sample custody to the sample custodian. Sample extracts will be relinquished to the instrumentation analysts by the preparatory analysts. Each preparation department will track internal chain of custody through their logbooks/spreadsheets.

Any change in the sample during the time of custody will be noted on the chain of custody (e.g., sample breakage or depletion).

### **3.7 SOIL BORING ADVANCEMENT**

Depending on access, soil borings will be installed using a track mounted or limited access Bobcat Geoprobe® utilizing direct push technology to the groundwater interface depth, approximately 20 ftbg. Continuous soil samples will be collected using four (4) or five (5) foot macrocore samplers fitted with dedicated acetate liners. Proper decontamination procedures will be followed after each sampler is recovered.

New, dedicated disposable acetate sleeves will be used for all soil samples collected using the Geoprobe. The sleeve for each sample interval will be opened and the soil within scanned for volatile organic compounds (VOCs) using a photoionization detector (PID) and geologically described using the Unified Soil Classification System, including documentation of observations

regarding potential contamination such as odors, staining, etc. All descriptions and observations will be documented in a field notebook.

### 3.7.1 Soil Sampling

It is anticipated that one (1) soil sample will be analyzed per boring. As a default, the soil sample selected for analysis will be directly above the groundwater interface (~20 ftbg). However, in the event the soil or fill material at a different interval above the water table/bedrock exhibits obvious signs of impacts, the sample will be analyzed from the area of highest suspected impact. Shallow (0-2 ft below grade) soil samples will only be selected for analysis if obvious signs of impacts are observed. If additional impacted or questionable zones are identified, samples will be collected from those areas for analysis. All samples are expected to be collected from two (2) foot intervals, but the intervals may be expanded or contracted based upon material recovery and identification of impacts.

VOC soil samples will be placed in laboratory provided En Core samplers (En Novative Technologies, Inc.). All other soil samples will be placed in laboratory supplied glass containers. All samples will be sealed, labeled, cooled to 4°C in the field, and transported under chain-of-custody command to the designated laboratory for analysis. Product samples, if encountered, will be submitted for gas chromatography-mass spectrometer fingerprint analysis.

All soil samples will be analyzed for VOCs via EPA Method 8260C. Twenty percent (20%) of soil samples will also be analyzed for: semi-volatile organic compounds (SVOCs) via EPA Method 8270D; Target Analyte List (TAL) Metals via EPA Method 6010C/7471B; Polychlorinated Biphenyls (PCBs) via USEPA Method 8082A; and Pesticides via USEPA 8081B. The samples will be submitted for laboratory analysis with a NYSDEC ASP Category B data package.

## 3.8 MONITORING WELL INSTALLATION AND DEVELOPMENT

Monitoring wells installed within the sidewalk will be installed using a track mounted Geoprobe outfitted with 4¼" hollow-stem auger attachments. Monitoring wells installed within the Site building will be installed using a track mounted or Bobcat Geoprobe, depending on access limitations. Interior wells installed utilizing a Bobcat Geoprobe will be constructed of 1" PVC riser and screen in order to achieve the proper annular space around each well, and will follow the same general construction as the 2" sidewalk wells described below. If any significant impacts are identified, well materials may be altered to prevent detriment to PVC screen material.

Sidewalk wells will be installed approximately 5-6' below the groundwater table (expected to be approximately at 20 ftbg) in order to collect samples in the shallow saturated zone. The wells will be constructed of 2" diameter PVC riser with 10' of .020" slotted PVC screen. The screen interval will straddle the groundwater interface. The annular space around the well will be

filled with No. 2 Morie quartz sand to a depth of 2' above the top of the well screen, followed by 2' of bentonite, then backfilled with screened (unimpacted) soil cuttings to 1' below grade. The wells will be finished with 6" of bentonite pellets placed below a locking flush-mounted road box, set in a cement apron. Development will be performed by purging the water column in order to remove sediment disturbed by the drilling process. Purge water will be collected and containerized for proper management and disposal. Monitoring wells will be developed after a competent bentonite seal has been established.

All wells will be surveyed to a common Site datum.

### **3.8.1 Groundwater Sampling**

Prior to sample collection, static water levels will be measured and recorded from all monitoring wells. Following water level measurement, Integral will purge and sample monitoring wells using low-flow/minimal drawdown purge and sample collection procedures. Prior to sample collection, groundwater will be evacuated from each well at a low-flow rate (typically less than 0.1 L/min). Field measurements for pH, temperature, turbidity, dissolved oxygen, specific conductance, oxidation-reduction potential and water level, as well as visual and olfactory field observations, will be periodically recorded and monitored for stabilization in overburden wells. Purging will be considered complete when pH, specific conductivity, dissolved oxygen and temperature stabilize and when turbidity measurements fall below 50 Nephelometric Turbidity Units (NTU), or become stable above 50 NTU. If stabilization does not occur or the well has been purged and recovery cannot maintain the pace of low flow purging, a sample will be collected and a notation will be made in the field book.

Stability is defined as variation between field measurements of 10 percent or less and no overall upward or downward trend in the measurements. Upon stabilization of field parameters, groundwater samples will be collected and analyzed as discussed below.

Wells will be purged and sampled using dedicated pump tubing following low-flow/minimal drawdown purge and sample collection procedures, as described above. The pump will be decontaminated between samples and the tubing will be replaced.

Groundwater samples will be collected for laboratory analysis through dedicated tubing. Prior to, and immediately following collection of groundwater samples, field measurements for pH, specific conductance, temperature, dissolved oxygen, turbidity and depth-to-water, as well as visual and olfactory field observations will be recorded. All collected groundwater samples will be placed in pre-cleaned, pre-preserved laboratory provided sample bottles, cooled to 4°C in the field, and transported under chain-of-custody command to the designated laboratory for analysis.

All groundwater samples will be analyzed for VOCs via EPA Method 8260C. Twenty percent (20%) of groundwater samples will be also be analyzed for SVOCs via EPA Method 8270D; TAL Metals via EPA Method 6010C/7472B (filtered and unfiltered); PCBs via EPA Method 8082A;

and Pesticides via EPA 8081B. The samples will be submitted for laboratory analysis with a NYSDEC ASP Category B data package.

### **3.9 TEMPORARY SOIL VAPOR POINT INSTALLATION**

Temporary soil vapor points will either be installed concurrent with a soil boring or using a hand held hammer drill. Each soil vapor probe will be installed approximately 2" below the building slab using dedicated 1/8" Teflon tubing. The tubing will be implanted into the hole and the annular space sealed with bentonite to prevent ambient air from entering the area around the probe. The bentonite seal will be left to set overnight. Once the seal is secure, a "T" fitting and valve will be connected on the above-surface end of the tubing. A syringe will be used to purge the vapors in the probe and tubing of three volumes.

#### **3.9.1 Soil Vapor, Indoor, and Ambient Air Sampling**

##### Soil Vapor Samples

As required by NYSDOH, a helium (He) tracer will be used as part of the sampling process and all testing will follow the NYSDOH Soil Vapor Guidance<sup>1</sup>. Prior to sample collection, the He vapor will be screened using a field meter and the measurement recorded at each soil vapor sampling location. Prior to sample collection, a multi-gas meter will be used to measure the concentration of O<sub>2</sub>, CO<sub>2</sub>, and CH<sub>4</sub> in each probe, to assess the subsurface chemistry (e.g. redox state). Following this procedure, the soil vapor samples will be collected in clean, batch certified, two (2) liter Summa™ canisters at flow rates no greater than 200 ml/min.

A sample log sheet will be maintained summarizing sample identification, date and time of sample collection, sampling depth, identity of samplers, sampling methods and devices, soil vapor purge volumes, volume of the soil vapor extracted, vacuum of canisters before and after the samples are collected, apparent moisture content of the sampling zone and chain of custody.

Soil vapor samples will be collected over a period of two (2) hours. Soil vapor samples will be analyzed for VOCs via USEPA Method TO-15 at a NYSDOH ELAP-certified analytical laboratory.

##### Indoor and Ambient Air Samples

In accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion*, three (3) indoor air samples and one (1) ambient air sample (per sampling day) will be collected prior to the collection of sub-slab soil vapor samples<sup>2</sup>. One (1) indoor air sample will be collected from each section of the Site building (north and south). In addition, one (1) indoor air sample will be collected within the occupied office space located on the first floor of the southern section of the

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<sup>1</sup> *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Final*. October 2006.

<sup>2</sup> This limits interference from the soil vapor matrix.

building.

Indoor air samples will be collected in the breathing zone (approximately four (4) to six (6) feet above the floor). One background ambient air sample will also be collected per day along 35<sup>th</sup> Street. Indoor and background air samples will be collected in six (6) liter, batch-certified clean SUMMA™ canisters attached to 8-hour flow controllers. Samples will be collected at flow rates no greater than 200 ml/min.

For each sub-slab soil vapor, soil vapor, indoor, and background sample, the start time, end time, maximum and minimum temperature, and beginning and final ambient temperature will be recorded. Indoor and ambient air samples will be collected over a period of eight (8) hours and will be analyzed for VOCs via USEPA Method TO-15 at a NYSDOH ELAP-certified analytical laboratory.

### **3.10 ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE**

A summary of the analytical methods and quality assurance methods are included in Table 1, below.



Table 1  
Analytical Methods/Quality Assurance Summary

Matrix	Proposed Samples	QA/QC Samples				Total # Samples	Analytical Parameter	Method	Preservative	Holding Time	Container
		TB	FB	DUP	MS/MSD						
Soil	Unknown	0	0	0	0	--	Fingerprint	8100M	Cool to 4°C	14 days to perform analysis on all except VOCs from EnCores (48 hour HT)	(1) 250 mL glass bottle
	14	5	1	1	1/1	23	All VOCs; 20% SVOCs; Metals; PCBs; Pests	8260C; 8270D; 6010C/7471B; 8082A; 8081B			(3) 5-gram En Core; All other parameters: (1) 100ml amber glass jar.
Groundwater	4	2	1	1	1/1	10	All VOCs; 20% SVOCs; Metals; PCBs; Pests	8260C; 8270D; 6010C/7472B; 8082A; 8081B	Cool to 4°C, VOCs: pH<2 with HCl; with HNO3	14 days to perform analysis on all except VOCs from EnCores (48 hour HT)	(3) 40 mL glass vials; (2) 1L amber glass; (1) 500ml plastic bottle preserved; (1) 500ml plastic bottle non preserved; (2) 1L amber glass
Soil Vapor	11	0	0	1	0	12	VOCs	TO-15	None		2 L Summa
Indoor/ Ambient Air	5	0	0	0	0	5					6 L Summa

### 3.11 DECONTAMINATION

Where possible, samples will be collected using new, dedicated sampling equipment so that decontamination is not required. All non-dedicated drilling tools, equipment and sampling equipment will be decontaminated between boring locations using potable tap water and a phosphate-free detergent (e.g., Alconox) and/or a steam cleaner. All non-dedicated sampling equipment will also have a final rinse with deionized water. Decontamination water will be collected and disposed as investigation-derived waste (IDW).

### 3.12 DATA REVIEW AND REPORTING

The NYSDEC ASP Category B data package will be validated by an independent data validation subconsultant (resume provided in Appendix A) and a DUSR summarizing the results of the data validation process will be prepared. All reported analytical results will be qualified as necessary by the data validation and will be reviewed and compared against background concentrations and/or applicable New York State criteria:

*Soil* – Industrial and Protection of Groundwater Soil Cleanup Objectives (SCOs) and Supplemental Soil Cleanup Levels (SCLs) as listed in 6NYCRR Part 375 and NYSDEC Commissioner’s Policy CP-51;

*Groundwater* – NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) (1.1.1) Ambient Water Quality Standards (AWQSs) and Guidance Values and Groundwater Effluent Limitations; and,

*Soil Vapor* – Indoor air sample results.

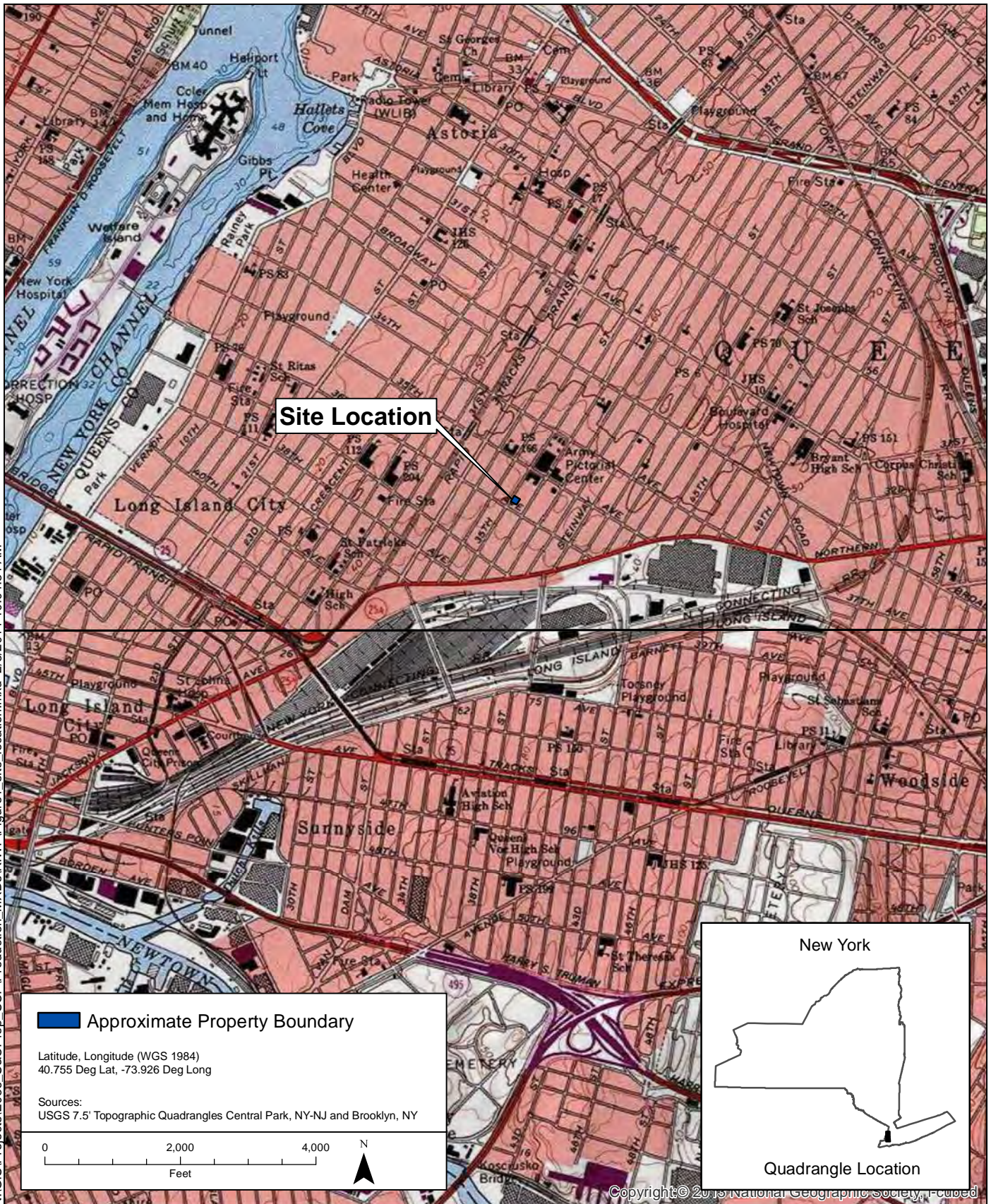
A report documenting the Remedial Investigation will be prepared, and will describe Site conditions and document applicable observations made during the sample collection. In addition, the report will include a description of the sampling procedures, tabulated sample results and an assessment of the data and conclusions. The laboratory data packages, DUSR, soil vapor point construction diagrams, and field notes will be included in the report as appendices. All data will also be submitted electronically to NYSDEC via the Environmental Information Management System (EIMS) in EqUIS format.

## **FIGURE 1**

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### **SITE LOCATION MAP**

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**Figure 1.**  
 Site Location Map  
 Remedial Investigation Work Plan  
 Teitelbaum Dry Cleaning, Inc.  
 35-45 35th Street  
 Astoria, New York

## APPENDIX A

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### RESUMES



Integral Consulting Inc.  
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**Kevin P. McCarty, P.G.**  
**Principal Geologist**

**PROFESSIONAL PROFILE**

Mr. Kevin McCarty is principal geologist with more than 25 years of experience providing investigative and remediation technical advice to project managers, coordinating and supervising all section staff, preparing and commenting on work plans and progress, providing guidance on protocols/equipment/specialty contractors, and organizing/coordinating schedules of staff and equipment in the performance of investigations and remediation on a wide variety of projects. Mr. McCarty worked on a wide variety of project sites that have been involved with regulatory programs and oversight of the New York State Department of Environmental Conservation (NYSDEC). These sites have included each division within NYSDEC and have covered nearly every region within New York State. Mr. McCarty has a long and trusted relationship with all levels of NYSDEC management and works with the department regularly on interpreting and implementing program enhancements. He is highly regarded for his knowledge of solid waste management in construction projects, which encompasses material generated from both upland locations and excavations, demolition of existing structures, and material removed from underwater excavation or dredging. He has worked and continues to work with all three regions of NYSDEC in the application of environmental conservation law and the New York's Solid Waste Management Policy in creating sustainable solutions on large construction efforts.

Mr. McCarty also has extensive environmental construction management experience on above and belowground projects. He has historically managed the environmental construction management aspects for the New York City Department of Environmental Protection (NYCDEP) Bureau of Engineering Design and Construction Combined Sewer Overflow Program. He continues to work with NYCDEP and has recently rewritten the NYCDEP environmental and material management specifications for the Departments \$2.1 billion dollar annual capital construction program.

**CREDENTIALS AND PROFESSIONAL HONORS**

B.A., Geology/Earth Science, Western Connecticut State University, Danbury, Connecticut,  
1985

Professional Geologist, Pennsylvania (License No. PG0024455G)

## CONTINUING EDUCATION AND TRAINING

Hazardous Waste Operations and Emergency Response 40-Hour Certification (1985; refreshers 1988-2012)

Hazardous Waste Operations Management and Supervisor 8-hour Certification (2008)  
First Aid and CPR Certified (1988-2011)

## PROFESSIONAL AFFILIATIONS

Board of Directors for the New York City Partnership of Brownfield Practitioners

Board of Directors for New Partners for Community Revitalization

Member of the Downstate Soil Reuse Committee, New York City Department of Environmental Protection

Member of the New York City Brownfields Task Force

Charter Member of the Hudson Valley Brownfields Partnership Steering Committee

## RELEVANT EXPERIENCE

### *Emergency Response*

*Hurricane Sandy Flood Cleanup in New York City Financial District, New York*—Managed pumping and dewatering operations following the flooding of the lower section of Manhattan. Coordinated numerous contractors with pumping capacity to clear 53 million gallons of flooded office and parking garage space that contained water and ruptured fuel oil tank contents. Effort included NYCDEP and NYSDEC permits, insurance company coordination, and building health and safety coordination for the overall effort.

### *Environmental Investigation*

*Voluntary Cleanup Agreements at a Former Manufactured Gas Plant, New York*—Coordinated with city and state agencies for review and approval of documents related to 13 voluntary cleanup agreements for a former manufactured gas plant site between New York City and the State of New York under Voluntary Cleanup and Brownfields programs.

*Environmental Impact Study for a Planned New York City Jail, New York, New York*—Managed portions of an environmental impact study to locate a New York City jail on a then currently unclosed construction and demolition landfill.

*Environmental Impact Study for a Mixed Use Development, Queens, New York*—Managed portions of an environmental impact study for a mixed use commercial, residential, and open space development on more than 60 acres in Willets Point, Queens, New York. Managed all aspects of redevelopment internal to the project, including costs, subsurface geotechnical conditions, mitigation, remediation, FEMA and floodplain issues, and importation and settlement of fill and energy.

*Environmental Impact Study for a Multiuse Waterfront Port, New York*—Managed portions of an environmental impact study for proposed commercial, residential, and educational facilities at waterfront port and shipping terminal.

*Yankee Stadium Pocket Parks Project, New York*—Conducted an environmental site assessment for two new replacement parks slated to be constructed as part of the much larger Yankee Stadium rebuild. Both sites had petroleum spills that need to be addressed.

*Anheuser Busch/Greenway Remediation and Redevelopment, Bronx, New York*—Managed a project involving the classification and reuse of more than 43,000 cubic yards of material generated on adjacent construction project to raise the development site out of the 100-year floodplain. Successful project completion saved the City of New York more than \$6 million in disposal costs and the developer more than \$0.5 million toward the purchase of new fill. The project was awarded the 2010 Diamond Award for environmental projects in New York State and was a national finalist.

*Development of Fulton Fish Market, New York*—Evaluated most efficient method of beneficial reuse for excavated material taken from an area historically used to dispose of coal tar. Final selection was incineration in a NYSDEC-permitted waste-to-energy facility where the material would be used for fuel. In the end, a total of 7.6 megawatts of electricity was generated and placed into the local electrical grid as well as a significant amount of steam energy that was supplied via underground piping to local industrial facilities. The electrical generation equivalent was enough to supply 10,000 homes with power for 3.5 months. Project received an ACEC Diamond Award, an EPA Region 2 Phoenix Award, and 2011 New York City Sustainable Remediation Award.

#### ***Large Design/Construction Management***

*Corona Vortex Chamber, Queens, New York*—Evaluated the predesign and design of installation of an underground wastewater treatment plant facility within a city street. Prepared a full range of construction specifications, and managed all aspects of material handling, classification, and disposal of more than 70,000 cubic yards of material during construction.

*Combined Sewer Overflow Tank, Flushing, New York*—Assessed pilot locations for a 28 million gallon underground combined sewer tank. Performed soil and geotechnical assessment of chosen locations, prepared construction specifications for entire construction effort. Effort included excavation to depths 45 ft below water table and *in situ* classification of more than 470,000 cubic yards of material. Construction management included oversight of entire excavation, staging, and approval for disposal. Additional effort included working with NYSDEC to create management efforts for fill material and deposition/testimony for construction change order lawsuit.

#### **PUBLICATIONS**

McCarty, K. 2006. Market fresh. *Civil Engineering ASCE*. 76(6):60-65.





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**Alana M. Carroll**  
**Senior Scientist**

**PROFESSIONAL PROFILE**

Ms. Alana Carroll is an environmental geologist with experience on a variety of environmental consulting projects in the New York metropolitan area, specializing in remedial investigations, conceptual site modeling, and remedial design and implementation. Ms. Carroll provides analytical, technical, and regulatory guidance to clients, including developers and environmental attorneys, on a variety of projects in various stages of investigation, remediation, and redevelopment and has managed projects in the New York State Brownfield Cleanup Program, the New York State Department of Environmental Conservation (NYSDEC) Spills and Voluntary Cleanup Programs, and New York City "e" Designation Program.

**CREDENTIALS AND PROFESSIONAL HONORS**

B.S., Geology, Hofstra University, Uniondale, New York, 2003

**CONTINUING EDUCATION AND TRAINING**

Graduate Coursework, Master's Program, Geology, Brooklyn College, Brooklyn, New York  
(anticipated completion in 2013)

Hazardous Waste Operations and Emergency Response 40-Hour Certification (2004;  
refreshers 2005, 2006, 2007, 2009, 2010, 2011, and 2012)

First Aid and CPR Certified (2012)

Amtrak Contractor Safety Training (2010 and 2011)

**PROFESSIONAL AFFILIATIONS**

Member of Geologic Society of America

Member of New Partners for Community Revitalization

**RELEVANT EXPERIENCE**

*New York State Brownfield Cleanup Program, 34th Street and 42nd Street, West Side, Manhattan, New York*—Designed and managed multiple investigations to address New York State Spills and Brownfield Cleanup programs. Prepared scopes of work to address requirements of both state regulations and those agreed to by the former owner. Coordinated with

NYSDEC to modify scopes based on field observations and limitations, which resulted in not having to mobilize for additional investigations. Coordinated with multiple entities for access to perform investigations, including Javits Convention Center, Amtrak, New York City Department of Transportation, Metropolitan Transit Authority, and their contractors. Developed a three-phase analysis plan with the laboratory to determine the minimum required extent of excavation next to an Amtrak line while limiting analytical costs, decreasing in the extent of excavation, and lowering disposal and structural support requirement costs.

*New York State Brownfield Cleanup Program 388 Bridge Street, Downtown Brooklyn, New York*—Designed and managed all on- and off-site investigations of soil, soil gas, groundwater, and indoor air, including coordination of staff and subcontractors. Prepared investigation reports for submittal to client, project team, NYSDEC and the New York State Department of Health (NYSDOH). Involved in project team decision making with clients, lawyers, construction manager, and other consultants. Managed New York City Transit approvals for subsurface investigations near subway lines. Coordinated off-site access in residences, commercial spaces, and a private school. Participated in soil vapor extraction pilot test implementation and reporting. Assisted in the implementation of an off-site sub-slab depressurization system in an existing building; activities included system design/layout, installation oversight, testing, and long-term operation and maintenance. Responsible for NYSDEC/NYSDOH coordination and reporting for all investigations. Tracked project activities for inclusion in NYSDEC/NYSDOH programmatic submittals, including monthly reports and remedial schedules.

*New York State Spills Program, Gotham Center, Queens, New York*—Responsible for proposal and budget development, subcontractor selection and coordination, negotiation, and preparation of subcontractor terms and agreements, budget, and invoice review for a comprehensive subsurface investigation. Prepared and implemented scope of work for delineation of soil contamination and calculation of contaminant mass estimates. Subsequent to interpretation of site data and subgrade characteristics, developed and presented remedial alternatives and associated costs for internal and client project teams. Prepared remedial investigation report in coordination with the New York City Economic Development Corporation and the client for submittal to state regulators.

*New York Department of Environmental Remediation, Class 2 State Superfund, Laurel Hill Site, Queens, New York*—Managed multi-phase, multi-parcel project involving design, installation, and ongoing operation, maintenance, and monitoring of six remedial caps. Site challenges included the division of the site into individual parcels that were independent of one another; subsequently, each parcel had a stormwater management design individual to the surrounding parcels. Other site challenges included the site position in a wetlands area fronting Newtown Creek and working with the New York City Department of Transportation to facilitate its schedule for the adjacent Kosciusko Bridge restoration.

*New York State Brownfield Cleanup Program, Uniforms for Industry, Queens, New York*—Designed and managed an alternative approach to the off-site soil vapor intrusion

investigation. Utilized soil vapor modeling to evaluate potential human health risks and migration probabilities. Provided support for the design of a retrofitted passive venting system.



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## **Keith P. Brodock, P.E., LEED AP Managing Engineer**

### **PROFESSIONAL PROFILE**

Mr. Keith Brodock is a professional engineer with nearly 10 years of experience in environmental risk analysis, real estate portfolio liability estimation, transactional risk evaluation, remediation design, and decision management science. One of his primary responsibilities is managing and quantifying transactional risks for brownfield properties. Mr. Brodock routinely consults purchasers and sellers on the regulatory climate, technical interpretations, and risk mitigation measures. He frequently supports fate and transport modeling of vapor intrusion cases and engineering designs for remediation systems. Mr. Brodock utilizes data management software, including GIS and EQuIS, to conceptualize and simply explain the spatial distribution and meaning of environmental data.

### **CREDENTIALS AND PROFESSIONAL HONORS**

B.S., Chemical Engineering, Clarkson University, Potsdam, New York, 2003

Professional Engineer, New York (License No. 089004)

### **CONTINUING EDUCATION AND TRAINING**

Leadership in Energy and Environmental Design Accredited Professional (2009)

Hazardous Waste Operations and Emergency Response 40-Hour Certification (2003-Present)

Hazardous Waste Operations Management and Supervisor 8-Hour Certification (2004)

OSHA 10-Hour Construction Safety Training (2005)

### **PROFESSIONAL AFFILIATIONS**

Urban Land Institute, Redevelopment and Reuse Product Council (2012–Present)

Urban Land Institute, NY Mentor Program Chair (2011–Present)

National Society of Professional Engineers (2011–Present)

### **RELEVANT EXPERIENCE**

#### ***Real Estate Transactions***

*Superfund Property Disposition and Liability Transfer, Wall, New Jersey*—Advised on the sale of 650-acre encompassing a federal Superfund site and more than 600 historical tenants.

Assisted with development of the selected remediation proposal for a \$1.5 million shooting range cleanup. Provided review of liability transfer offer, including cost/benefit analysis, insurance funding, and remediation cost-overrun risk using Monte Carlo modeling. Supported negotiations with EPA and the U.S. Department of Justice (USDOJ) to allow private takeover of remediation activities. Performed New Jersey Industrial Site Recovery Act investigation of more than 600 historical tenants as a requirement of the transaction.

*Real Estate Portfolio Acquisition Support, Staten Island, New York*—As part of client's acquisition of real estate investment trust, advised on environmental risks of the Staten Island property. With a state Superfund manufactured gas plant (MGP) site adjacent to the property, communicated potential liabilities to client. Worked in conjunction with seller's environmental consultant to conduct a soil gas / indoor air evaluation. Performed critical review of seller's soil vapor report.

*Cypress Equities Land Acquisition, King of Prussia, Pennsylvania*—Advised on pending land acquisition deal after conducting an in-depth environmental review and limited subsurface investigation. Developed a probabilistic cost estimate spanning the identifiable areas of concern for all of the multiple investigation/remediation scenarios applicable under the Act 2 regulations in Pennsylvania.

*Not-for-Profit Land Acquisition and Development, New York, New York*—Supported a not-for-profit organization in the acquisition and development of various tracts of land to build a charter school. Assisted with the Phase I evaluations. Prepared scopes of work for Phase II investigations. Managed the development of the regulatory interaction strategy with the New York City School Construction Authority. Provided sound engineering support for the development of subsurface remediation/mitigation measures for the protection of schoolchildren's health.

*Phase I Investigations, Various Properties, New Jersey, Arkansas, New York, Connecticut*—Conducted Phase I and Phase I/II hybrid investigations according to ASTM standards, both pre- and post-EPA All Appropriate Inquiries. Integrated state requirements into the analyses. Included radon, drinking water, and indoor air analysis, as required.

### ***Brownfields***

*Former Woodhaven Bowl Site, Forest Hills, Queens, New York*—Managed the team to concurrently satisfy five regulatory agencies, a then current landowner inexperienced at brownfield redevelopment, and a demanding future tenant with an extremely tight construction schedule to facilitate redevelopment. Utilized careful, advanced planning to facilitate the evaluation of each stakeholder's objectives. Used direct-sensing equipment (membrane interface probe) to quickly evaluate the potential release areas. Designed and oversaw the construction of a sub-slab depressurization system (SSDS) serving 40,000 square feet of retail space. Achieved the project objectives by delivering a building ready for development by the tenant.

*Residual Light Nonaqueous Phase Liquid (LNAPL) Investigation/Remediation, Long Island City, New York*—Designed and managed the investigation/remedial actions at a former fueling

depot. Identified data gaps in the previous consultant's work and designed a characterization plan to reduce the uncertainties in the conceptual site model. The characterization plan was integrated with the remedial action plan so only one field mobilization was necessary. Design an *in situ* chemical oxidant injection as the remedial action. The remedial action has not yet been completed.

*Subsurface Investigation and Tank Removal, Jersey City, New Jersey*—Managed a subsurface investigation at a warehousing property that contained railroad sidings, improperly closed underground storage tanks (USTs) and an aboveground fueling operation. Coordinated the removal/closure of the fueling operation and building demolition. Provided consultation on the investigation results to assist the client in securing financing for the property.

*Former Oil Terminal Investigation and Remediation, Brooklyn, New York*—Supported the property owner through negotiations with the New York State Department of Environmental Conservation (NYSDEC), as part of a groundbreaking deal where NYSDEC agreed to clean up a state Superfund site that was owned by a private entity. Assisted the inter-governmental team with triad planning and design to achieve a rapid subsurface investigation/characterization. Developed a work plan that included demolition and disposal of PCB-containing equipment.

*Dual-Phase Extraction and Discharge Compliance Engineering, Northern New Jersey*—Led a team to deploy a packaged solution to lower the concentrations of non-compliant water being discharged to a river, in which 60 percent of the chemicals causing the exceedance could not be identified by conventional laboratory techniques. Implemented enhancements to a high-vacuum, dual-phase extraction (DPE) remediation system, resulting in increased mass removal rates and system uptime. Achieved long-term cost savings in the form of decreased time onsite and automated task development. Developing a comprehensive systems management tool that uses engineering statistics to prescribe proactive solutions to maintenance and system exceedance issues. Created a U.S. Securities and Exchange Commission (SEC)-compliant cost estimate model that encompasses various remediation strategies through end-of-project lifecycle.

*Surfactant Soil Remediation, Margate City, New Jersey*—Project engineer and subcontractor manager for the remediation of a #2 fuel oil release beneath a residence. Applied an innovative surfactant flushing program to mobilize and extract adsorbed fuel oil from the soils. Careful planning and immediate reaction to changing site conditions were necessary to prevent further oil migration or the settling of a \$3 million mansion. Successful management of multiple subcontractors led to a soils closure within the project deadline.

*Subsurface MGP Investigation, Manhattan, New York*—Evaluated and interpreted the results of more than 700 samples collected during a subsurface investigation at a former MGP site. Composed the data analysis portion of the site characterization report for submittal to NYSDEC. Also supported subsurface field activities while acting as client liaison to the public.

*Dual-Phase Remediation System Improvements, Newark, New Jersey*—Analyzed performance issues of a catalytic oxidizer, part of a DPE remediation system. Determined that the control system was failing and causing false alarms. Led the team to implement a redesigned alarm system to better diagnose system trouble conditions.

*Heavy Metal Statistical Source Separation, Virginia*—Supported team in separating heavy metal contamination sources through electron microscopy and elemental analysis. Based on the differing elemental properties of various sources of lead, employed the use of statistical analysis to parse the portion of contamination that was likely attributable to the client from the entire mass, thereby saving money in remediation costs.

*Biennial Certification Reporting, Various Locations, New Jersey*—Oversaw biannual monitoring activities and biennial certification filings as part of New Jersey Department of Environmental Protection (NJDEP) agreements. Coordinated scheduling with clients and tenants for biannual property inspections. Completed biennial certification reporting process to NJDEP and various local entities.

### ***Vapor Intrusion***

*Farrand Controls State Superfund Site, Valhalla, New York*—Identified source and fate and transport of vapor-phase chlorinated solvents within a commercial/industrial operation to support the construction of a mitigation action. Traced the airflows from four distinct heating/cooling zones throughout the building to understand mixing and transport of the chlorinated solvents, as the highest readings of vapors did not match the site conditions. Identified the entry point of the vapors from contaminated groundwater beneath the site. Recommended a cost-effective solution for venting the vapors prior to entry into the building.

*Vapor Intrusion Investigation, Cranford, New Jersey*—Managed vapor intrusion investigation on adjoining properties to a chlorinated solvent spill. Negotiated access agreements with abutting property owners and tenants. Organized subcontractors' work to minimize business interruption while still maintaining the integrity of the investigation. Educated the neighboring property owners on the significance of the results and communicated continuing action plans to them.

*Mayflower Cleaners State Superfund Site, Great Neck, New York*—Evaluated the fate and transport of multiple sources of tetrachloroethylene (PCE; dry cleaning fluid) to support the preparation of a remedial action. The fate and transport evaluation included a known source beneath the slab of the building and a potential source from the adjacent dry cleaning operation. Developed a conceptual airflow model. Created the communication strategy with the regulatory agencies. Designed and managed the implementation of an interim remedial measure to mitigate the flow of PCE vapors from beneath the slab to the occupied tenant space.

*Vapor Intrusion Mitigation and Groundwater Investigation, Mahopac, New York*—Designed and installed an SSDS after performing a sub-slab communication test for New York State Department of Health (NYSDOH) and NYSDEC. Responsible for coordination of annual

system inspection and reporting, and tenant/owner education and guidance. Also coordinated quarterly groundwater sample reporting to NYSDEC.

*Chemical Release Investigation with Vapor Intrusion Testing and Mitigation, Ridgefield, New Jersey*—Oversaw field investigation to delineate a diving chlorinated solvent plume in a windowed confining layer. Developed a permanent vapor intrusion mitigation plan after conducting an indoor air investigation that revealed potential impacts to human health. Assisted in designing, permitting, and installing the SSDS intended to disperse organic vapors before entering the office building. Implemented risk mitigation plan that included automatic remote notification if the SSDS failed.

### ***Financial Analysis and Reporting***

*Streamlined SEC Environmental Liability Reporting, Seattle, Washington*—Using Lean techniques, developed a streamlined budgeting and liability reporting process that increases value while adhering to reporting regulations. With focus on increasing stakeholder value, merged the budget process that the consultant team used with the SEC liability reporting process that the client desired. Developed software to automate the reporting and updating procedure. Worked with the corporate liability manager to conform to both SEC and internal accounting policies.

*Real Estate Portfolio Valuation, Long Island, New York*—Developed defensible liability estimates, which led to a \$7 million savings in an IRS settlement. Working with a real estate appraiser, evaluated the assets and environmental liabilities in a 17-property portfolio at three key points in time. A remedial strategies matrix for the different time periods was merged into a decision tree with the properties' contamination characteristics using Monte Carlo simulation. An effective combination of computer estimation/simulation tools (RACER® and Monte Carlo) was used to justifiably support the estimates to the IRS.

*Environmental Remediation Estimates Using Monte Carlo Analysis, Various Locations, U.S.*—Determined and communicated environmental remediation cost risk to clients. Assisted owners with their internal budgeting process to communicate to their management the likely, best, and worst case scenarios. By understanding the range of costs associated with the project, management was equipped to make better decisions on expense allocation. Certain projects incorporated the management science of decision-tree analysis to consider alternate remedial technologies. In fact, the client was able to select a remedy based on the risk profile.

*Remedial Strategy Selection through Probabilistic Estimating, Central Vermont Public Service, Vermont*—Provided probabilistic estimating for different remedial strategies that helped the client to decide which decision-tree path was most appropriate for its business model. Utilized decision management tools in conjunction with cost estimates and sensitivity analyses to provide a full understanding of the likely results of choosing one strategy over another.



*Remedial Scenario Cost Estimating, Various Locations, U.S.* — Developed large-scale remediation cost estimates using RACER® for an automobile-industry client. Based on the remedial investigation data results, created low/medium/high range cost estimates that encompassed a “no further action” option all the way to installing and operating high-end remediation systems for many years. These cost estimates were presented to the court as part of a package to support emerging from bankruptcy.

*Defensible Environmental Liability Reports, Various Locations, U.S.* — Performed multiple mathematical simulations for cost estimation and disclosure under Sarbanes-Oxley reporting requirements for environmental liability. Incorporated decision management structures into multiple-site and multiple-option estimates. Results provided were defensible estimates that evaluated entire liability portfolios.

### ***Geothermal Testing and Design***

*First-Ever Standing Water Column (Open-Loop) Geothermal Study, New Haven, Connecticut* — Designed first-ever geothermal standing water column exchange study to characterize the thermal capacity of the proposed geothermal cooling system. The study simulated system loads and observed subsurface effects to qualify wells to sustain continued operations while preventing emergency discharges (bleed-off) to the local sewer authority. Results include determining the effects of various temperature differentials, load cycling, and high-permeability zones. The study results were subsequently utilized to design the optimal geothermal well network by minimizing the cost of the wells while ensuring adequate thermal capacity during peak loading. This work was performed as part of an overall sustainable design effort under the Leadership in Energy and Environmental Design (LEED) New Construction program. The project awaits certification results from the U.S. Green Building Council.

*Standing Water Column Geothermal Design, New Haven, Connecticut* — Conducted a geothermal response test for a private developer constructing a 700,000 square foot residential/retail complex. The results of the geothermal response test were used to design the optimal geothermal network that would provide an efficient level of heating/cooling for the building. This project has been selected by the U.S. Green Building Council as a pilot project for the LEED Program for Neighborhood Development.

*Automated Closed-Loop Geothermal Analysis, Cambridge, Massachusetts* — Assisted in constructing an automated geothermal closed-loop test that conformed to American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) building specifications. Modified existing open-loop thermal response testing equipment to perform unmanned closed-loop tests of shallow geothermal wells. Automated the system to perpetually adjust to stay in conformance with ASHRAE test methods. The equipment included a remote monitoring component for instantaneous data review and troubleshooting.

### ***Property Management***

*Building Environmental Management, New York, New York*—Oversaw emergency response to building water intrusion events to prevent the growth and subsequent abatement of mold spores. Conducted property visits to review Phase I action item implementation.

### ***Litigation***

*Litigation Support for Lead Impacts, Carteret, New Jersey—Reichhold, Inc. v. United States Metal Refining Company, et al.*, Civ. No. 03-453 (U.S.D.C., D.N.J.): Provided litigation support for a large, multinational mining and refining company against a plaintiff that alleged responsibility for lead impacts at a previously owned site. After review of the data, developed visual aids for court showing that the lead impacts were generally limited to areas where the plaintiff raised the grade with fill. Supported the science and legal teams during trial preparation and throughout the trial by gathering additional supporting evidence and generating opinions on new evidence submitted by plaintiff and testimony by plaintiff's consultants.

*Litigation Support for an Oil Spill Investigation, Long Island City, Queens, New York—DMJ Associates, L.L.C. v. Capasso, et al.*, Civ. No. 07-285 (U.S.D.C., E.D.N.Y.): Provided litigation support for a New York City developer that resulted in rapid settlement of the case. Designed and executed a field investigation to locate preferential pathways for mobilized LNAPL across multiple properties and a local waterway. Examined chemical fingerprints to determine the extent of migration. Scientifically demonstrated that not only did the LNAPL contaminate the property at hand, but also contaminated adjacent properties and was discharging directly into the Newtown Creek.

*Litigation Support for Federal Superfund Site, Lawrence Aviation Industries, Port Jefferson, Long Island, New York—United States of America v. Lawrence Aviation Industries, Inc., et al.* Civ. No. 04-818 (U.S.D.C., E.D.N.Y.): Provided litigation support for Lawrence Aviation Industries (LAI) to defend against a USDOJ lawsuit alleging widespread trichloroethylene contamination. After reviewing the investigation reports, determined that there was no scientific link to a portion of the alleged contamination, and, in fact, there appeared to be a second source. Appeared before USDOJ and EPA to argue these new findings in favor of LAI. Additionally, discussed the potential for EPA to relinquish site control to LAI, so that LAI could implement a more modern and effective remedial strategy, rather than the antiquated, likely-unsuccessful technology mandated in the record of decision.

*Underground Storage Tank Release Date Determination, Southern New Jersey*—Used statistical analysis to determine when a UST began leaking. Conducted a detailed analysis of the fuel delivery receipts as compared to the local weather conditions. Using statistical methods, the initial discharge time frame was determined with 95 percent confidence.

*Litigation Support for a Release Migrating toward I-95, Secaucus, New Jersey*—Provided opinion on remedial investigation and action plans to negotiate a delay in litigation (with client). Worked with opposing party to incorporate additional scope of work into its investigation

plan to fully characterize the release to groundwater. By successfully working with the opposing party's consultant, was able to delay the expense of trial for the client.

*Litigation Support, Various Locations, New Jersey and New York*—Provided technical review and opinions on various legal matters, mostly involving allocating liability for contamination. Disputed claims of scientific certainty for age-dating analyses of various methods. Collected and analyzed samples to produce independent liability allocation opinions.

### **PRESENTATIONS/POSTERS**

Brodock, K., J. Rhodes, and P. Tornatore. 2005. Improving experience-based engineering estimates for environmental liabilities using Decisioneering® software. National Groundwater Association Conference on Remediation: Site Closure and the Total Cost of Cleanup.

Rhodes, J., and K. Brodock. 2005. Estimating environmental liabilities using probabilistic engineering methods. Web seminar.

Brodock, K., and J. Rhodes. 2005. Engineering estimates for environmental liability à la Crystal Ball. Crystal Ball Users Conference.

**SUZANNE V. GABRIELE**

**site assessment and due diligence  
site investigation and remediation  
regulatory compliance and permitting**

## **EDUCATION**

B.S., Industrial Engineering, Lehigh University, Bethlehem, PA, 1988  
The Complete Environmental Regulations Workshop, Lion Technology  
RCRA Fundamentals and Critical Generator Issues, McCoy and Associates, Inc.  
Risk-based Corrective Action  
The Essentials of Colorado Environmental Law for Non-lawyers  
Environmental Auditing Course, Career Development Institute

## **REGISTRATIONS AND CERTIFICATIONS**

ISO 14001: 2004 E.M.S. Lead Auditor for International Environmental Management  
Systems, QAI – Training for Quality  
40 Hour OSHA Health and Safety Training

## **CAREER SUMMARY**

Ms. Gabriele has over 24 years experience in environmental consulting and project management. Her project responsibilities include high level communications with clients, stakeholders and regulators; planning and supervising project implementation at a broad array of facilities under a wide variety of regulatory programs. Ms. Gabriele has experience with the chemical, plastics, ceramics, electronics, rubber, metals, precious metals, and oil and gas industries.

Ms. Gabriele regularly coordinates and implements all aspect of environmental site assessment, investigation and remediation activities including work plan preparation, permitting, sub-contractor management, interaction with business and community representatives, review and evaluation of data, and preparation of reports. Ms. Gabriele also has experience in completing Phase I Environmental Site Assessments (ESAs) in accordance with USEPA's All Appropriate Inquiry/ASTM E1527-05 requirements.

Ms. Gabriele has extensive knowledge of environmental regulations. She conducts environmental compliance audits for internal corporate management and pre-acquisition consideration and helps clients with regulatory compliance at industrial facilities throughout the United States. She has prepared chemical inventories, emissions reports, and permit applications, and developed management and pollution prevention plans for hazardous wastes and materials and storm water.

Ms. Gabriele has prepared Quality Assurance Project Plans and acted as Quality Assurance Manager for complex environmental investigation and remediation projects. She has established in house protocols for conducting and documenting data validation and oversees Data Usability Summary Report preparation.

**Assessments, Investigations, and Remediation**

***Former DuBois Chemical Facility, Rathon Corp., East Rutherford, NJ.*** Managing multi-million dollar, multi-media environmental remediation project for wholly owned subsidiary of Molson-Coors Brewing Company. Rathon Corp. is the former owner/operator of this operating facility in the Meadowlands. Management of this project requires interaction with client, client counsel, site owner/operator, and regulators.

***Former M&P Compounding Facility, Cookson Group, plc, Asbury Park, NJ.*** Managed multi-million dollar, multi-media environmental investigation and remediation project under New Jersey's Environmental Cleanup Responsibility Act. Project involved UST, sump and floor drain closures; soil remediation; evaluation of the vapor intrusion pathway, and monitored natural attenuation.

***Asarco Globe Plant, Denver, CO.*** Managed operations, maintenance and monitoring tasks for a multi-million dollar, multi-media cleanup program at the Asarco Globe Plant CERCLA site.

***Gates Rubber Company Complex, Denver, CO.*** Managed comprehensive Phase 1 Environmental Site Assessments, Phase 2 soil and groundwater investigations, and UST closures and soil remediation efforts at the former Gates Rubber manufacturing complex in Denver, CO as part of Brownfields development of the facility. The Phase 1 assessment included evaluations of historic operations, demolished facilities and existing buildings to define potential environmental conditions and recommendations for future site development.

***Fitzsimons Army Medical Center, New Century Energies, Denver, CO.*** Managed comprehensive Phase I Environmental Site Assessment at the former Fitzsimons Army Medical Center complex in Denver, CO for the local utility who was considering purchase of the existing utility easements as well as future utility easements as part of Base Realignment and Closure process.

***Bullock Station, Public Service Company of Colorado, Montrose, CO.*** Managed a UST closure project that included a site characterization and corrective action due to historic releases from the UST.

***Hayden Station, Public Service Company of Colorado, Hayden, CO.*** Managed a subsurface investigation in the vicinity of two USTs and one AST prior to site redevelopment.

***Leyden Station, New Century Energies, Leyden, CO.*** Managed comprehensive Phase I Environmental Site Assessment at an underground natural gas storage facility in Leyden, CO for the local utility.

***Cummins Rocky Mountain facilities, Cummins Inc., Columbus, IN*** Conducted Phase I ESAs of three Cummins Rocky Mountain facilities in Colorado. Cummins is a corporation of complementary

business units that design, manufacture, distribute and service engines and related technologies, including fuel systems, controls, air handling, filtration, emission solutions and electrical power generation systems.

***Former Lozier Facility, GAF, Cedar City, UT.*** Managed Phase I Environmental Site Assessment at a 78 acre property where furniture and commercial shelving was historically manufactured.

### **Regulatory Compliance and Regulator Negotiations**

***Former DuBois Chemical Facility, Rathon Corp., East Rutherford, NJ.*** Managing environmental remediation project. Operation of the groundwater treatment system includes maintaining and complying with a New Jersey Pollutant Discharge Elimination System permit. Design and implementation of the soil and sediment remediation plan involves multiple jurisdictions and numerous regulations.

***Alpha Natural Resources, Bristol, VA*** Managing the development of a compliance-focused Environmental Management System (EMS) for effective environmental management and to satisfy requirements of a Consent Decree between Alpha and the United States Environmental Protection Agency. Alpha is a leading global coal company and the world's third largest metallurgical coal supplier with the production capacity of nearly 126 million tons of steam and metallurgical coal. Alpha produces, processes and sells steam and metallurgical coal from approximately 150 active mines and 40 coal preparation plants located throughout Virginia, West Virginia, Kentucky, Pennsylvania and Wyoming.

***Asarco Globe Plant, Denver, CO.*** Assisted client with negotiation of a Consent Decree and Statement of Work for site characterization and \$38 million cleanup program at the Asarco Globe Plant CERCLA site.

***Cummins Rocky Mountain facilities, Cummins Inc., Columbus, IN*** Prepared Operations and Compliance Memoranda for three Cummins Rocky Mountain facilities in Colorado. Cummins is a corporation of complementary business units that design, manufacture, distribute and service engines and related technologies, including fuel systems, controls, air handling, filtration, emission solutions and electrical power generation systems.

***Former Redfield Rifle Scope Site, Brown Retail, Inc., Denver, CO.*** Prepared RCRA Contingency Plans, training programs, and Biennial Reports for this multi-million dollar, multi-phase project. Project involves extensive groundwater, soil, and indoor air investigations as part of RCRA site characterization activities including over 8000 indoor air tests, installation and sampling of over 100 monitoring wells, and collection of scores of soil and soil vapor samples.

***West Elk Mine, Mountain Coal Company, Somerset, CO.*** Developed a storm water management plan for an underground coal mining operation.

*Storm Water Best Management Practices, Colorado Springs Utilities, Denver, CO.*  
Prepared a storm water BMP manual for field crews.

*Corporate Storm Water Compliance Program, Cookson America, Inc., approximately 50 facilities throughout the U.S.* Developed and implemented program to assist Cookson's subsidiary with storm water permitting compliance.

*Anzon, Inc., Laredo, TX.* For seven years, managed the preparation of SARA Title III Form R reports for an antimony refining facility.

### **Quality Assurance**

*Asarco Globe Plant, Denver, CO.* Developed Quality Assurance Project Plan and acted as Quality Assurance Manager for the Asarco Globe Plant CERCLA site. Project included investigation of soil, groundwater, surface water, sediment, and ambient air impacts due to releases of arsenic, cadmium, lead, and zinc and remedial design and implementation of over 600 residential and commercial properties, using excavation and replacement, capping, and deep tilling remedies as appropriate. Other remedial actions included design of a slurry wall and RCRA cap around a tailings pile; cleanup of a 1000 foot long drainage ditch and restoration of wetlands; and controls for wet operations and point source emissions.

*Former Redfield Rifle Scope Site, Brown Retail, Inc., Denver, CO.* Developed and maintains Quality Assurance Project Plan and acts as Quality Assurance Manager for this multi-million dollar, multi-phase project. Developed data management procedures for unprecedented indoor air testing program with rush analytical and reporting requirements.

### **PROFESSIONAL EXPERIENCE**

EnviroGroup Limited (a Geosyntec company), Centennial, CO, 2012 - present

EnviroGroup Limited, Centennial, CO, 1992 – 2012

Clayton Environmental Consultants, Inc., Edison, NJ, 1989-1992

Phoenix Safety Associates, Ltd, New York, NY, 1988-1989

### **PUBLICATIONS AND PAPERS**

S. Gabriele and L. A. Sigler, 2000. *Community Reactions Issues related to Residential Site Investigations and Cleanups*, presented Hazardous Waste Research Conference, Denver, May 2000.

### **AFFILIATIONS**

Colorado Environmental Management Society