1299 1ST AVENUE
SOIL VAPOR AND INDOOR AIR INVESTIGATION
WORK PLAN

Including Off-Site Property:
338 East 70th Street

Prepared for
3SK Corporation
27-15 27th Street
Astoria, NY 11102

Prepared by

267 Broadway
Fifth Floor
New York, NY 10007

FINAL
March 14, 2013

Affiliated with Integral Consulting Inc.

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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).

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:

Keith P. Brodock, P.E.
NY License #089004

1 INTRODUCTION

Pursuant to the Order on Consent (Order) executed on October 25, 2011 between 3SK Corporation (the Responsible Party) and the New York State Department of Environmental Conservation (NYSDEC), Integral Engineering, P.C. (Integral) has prepared this Soil Vapor and Indoor Air Investigation Work Plan (Work Plan) for the property located at 1299 1st Avenue (Site) (Block 1444, Lot 30) and westerly adjacent property 338 East 70th Street (Block 1444, Lot 130), New York, New York (Figure 1). This property is immediately adjacent to the west of the Site. Efforts were made by Integral and the New York State Department of Health (NYSDOH) to contact the southern adjacent property owner, located at 1297 1st Avenue (Block 1444, Lot 29), for access to conduct sampling. The property owner verbally denied access to the NYSDOH on March 13. 2013.

This Work Plan has been prepared at the request of the NYSDEC to assess subsurface soil vapor and indoor air quality at the Site, and the aforementioned property adjacent to the Site. In an effort to prevent the listing of the Site and to comply with the remedial objectives stipulated within the Order, NYSDEC has requested that the approved scope of work for the soil vapor and indoor air investigation be performed during the 2013 heating season. Access letters were sent to both adjacent property owners listed above on February 11, 2013 (included as Appendix A). Presently, Integral has received access authorization from the owner of Lot 130 and a denial of access from the owner of Lot 29. Due to the timing of access authorization for Lot 130, as well as the expedited schedule for this investigation, Integral has not been able to conduct a reconnaissance of this adjacent property; therefore, the description of Lot 130 is based on readily available New York City (NYC) Department of Buildings (NYCDOB) documents, NYC tax records, and general access assumptions (for the proposed sample locations). A Site plan is provided as Figure 2.

The purpose of this soil vapor and indoor air investigation is to evaluate the potential for soil vapor intrusion into the onsite building and adjacent building to thewest.

1.1 SITE BACKGROUND INFORMATION (LOT 30)

The Site (Lot 30) is approximately 1,957 square feet in area and is currently developed with a 4-story commercial/residential building (measuring approximately 25'x 65'). The first floor of the building is utilized as a convenience store and pharmacy. The basement is divided into two (2) sections, both of which are used for storage. Two (2) 275-gallon above ground storage tanks containing number two fuel oil are located in the eastern section of the basement. Residential units occupy floors two (2) through four (4) with two (2) units per floor. Within the footprint of the Site is a separate one (1) story building (measuring approximately 12' x 25') located east of the main Site building. This building is presently utilized as a drycleaning drop-off and pick up facility and shares a wall with the main building. According to the current owner of the Site,

there is a small (10'x20') space located beneath the one story building that contains a boiler. Integral understands that this boiler services both the onsite buildings.

A number of previous investigations have been performed at the Site between 2007 and 2011. These investigations primarily consisted of limited subsurface assessments conducted by Hydro Tech Environmental Corp. (Hydro Tech) of Commack, NY. Previous investigations indicated chlorinated solvent contaminant levels in subsurface soil samples and groundwater consistent with historical usage of the Site by a drycleaner. Previous investigations did not include the collection or analysis of soil vapor or indoor air.

According to the Record Review Report prepared by Hydro Tech, historic Sanborn Maps indicated that a drycleaner was present on-Site between 1976 and 1996. City Directory search records list a dry cleaner (NU Brite Cleaners) in operation at the Site between 1950 and 1988 and identified it as a RCRA Non-Generator of hazardous wastes between 1999 and 2007. It can be deduced from the information above, that a drycleaning facility historically occupied the Site between 1950 and 2007.

Additionally, Hydro Tech reported that between 2000 and 2005, the rear portion of the commercial space was leased to Global Entrepreneurship Inc., which provided dry cleaning services with off-Site dry cleaning operations. It is unclear if the "rear portion" of the commercial space refers to the small one (1) story building located east of the main building or to another section of the main commercial space. The Site was utilized as an auto body repair shop from 1927 to 1942.

1.2 ADJACENT PROPERTY INFORMATION

1.2.1 Lot 130 (West)

Lot 130 measures approximately 28' x 100' and abuts Lot 30 to the east. The lot is improved with a five (5) story residential building which is comprised of 19 units. There is a rear yard located south of the building measuring approximately 28' x 25'. According to NYCDOB records, the building does not have an elevator and there is one (1) active boiler. Based on NYCDOB Certificates of Occupancy and visual observation, it is anticipated that the first floor of this building was constructed partially below street grade and consists of three (3) apartments and a partial basement with a boiler room.

1.3 ENFORCEMENT HISTORY

On April 5, 2011, the NYSDEC designated, but did not list, the Site as an Inactive Hazardous Waste Disposal Site. In October 2011, 3SK Corp. entered into an Order on Consent with the NYSDEC. On February 4, 2013, Integral and 3SK Corp. met with the NYSDEC. During this meeting, NYSDEC requested a soil vapor and indoor investigation of the Site and the two (2)

previously mentioned adjacent properties, to be performed under the existing Order on Consent. The New York State Department of Health (NYSDOH) reiterated that request during a conference call with NYSDEC and Integral on February 11, 2013.

1.4 SAMPLING OBJECTIVES

Data from previous investigations indicate tetrachloroethene (PCE) in Site soils at concentrations greater than its Part 375 Residential or Restricted-Residential Soil Cleanup Objectives (SCOs). Breakdown products associated with degraded PCE are also present in Site soil. Groundwater samples collected from MW-1 (onsite within the building) and MW-4 (sidewalk/crossgradient, assumed) indicate the presence of PCE and its breakdown products at concentrations greater than their Groundwater Quality Standards or Guidance Values (GQS).

The purpose of this soil vapor and indoor air investigation is to evaluate the potential for soil vapor intrusion into the onsite building and adjacent building to the west.

1.5 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). Review of the topographic map indicates that the Site is located approximately 50 feet above sea level (NGVD 1995).

Previous reports have characterized the sediment beneath the Site as poorly graded brown sand with some pebbles.

Bedrock geology in the vicinity of the Site is characterized as the Hartland Formation (Middle Ordovician to Lower Cambrian). The Hartland formation consists of interbedded units of fine-grained quartz-feldspar, fine- to coarse-grained quartzofeldspathic, muscovite-biotite-garnet schist, and quartz-biotite-hornblend amphibolite. Much of the schist is magnetic and is in thrust-fault contact with the underlying Manhattan Schist on the Cameron's Line thrust, which goes beneath the Triassic and Triassic Newark basin sediments. Depth to bedrock is expected to be 40 feet below street grade (Baskerville, 1994).

Regional groundwater flow is expected to be east-northeast towards the East River. Previous reports indicate that groundwater is present at 15 to 20 feet below street grade.

2 SCOPE OF WORK

This section presents the approach and methods for performing the soil vapor and indoor air 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 the sub-slab soil vapor, indoor and ambient air sampling, an inventory of any used or stored materials within the building basements that may contain volatile organic compounds (VOCs) will be prepared. The list will include the VOC(s) contained within each product as listed on the Material Safety Data Sheet (MSDS) for that product, assuming MSDSs are readily available.

Prior to sampling, all soil vapor point locations will be cleared for utilities and subsurface infrastructure using Ground Penetrating Radar (GPR).

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 to be followed are described in the Quality Assurance Project Plan (QAPP) included as Appendix C. Sampling locations are provided on Figure 3.

2.1 SUB-SLAB SOIL VAPOR SAMPLING

Sub-slab soil vapor samples will be collected from four (4) or possibly five (5) temporary soil vapor points, in total, located inside the building basements on Lots 30 (3 soil vapor sample points and 130 (1 or 2 soil vapor sample points), as follows.

Lot 30 (Site): One (1) soil vapor point will be installed in the northwest section of the basement within the area of the highest detected PCE concentration in soil; one (1) soil vapor point will be installed along the southern basement wall to assess potential offsite migration of vapors to the south; and one (1) soil vapor point will be installed within the sub-grade utility room located beneath the drop-off drycleaner to assess potential migration of vapors from the main Site building.

Lot 130 (West): One (1) soil vapor point will be installed in either the partial basement, boiler room, first floor hallway or in the building foyer. An additional soil vapor sample may be collected based upon the accessibility of more than one of the aforementioned areas. If a soil vapor point location is not available within the building, or can only be installed in a location

that is not considered representative, then a soil vapor sample point will be installed in the sidewalk in front of the building. The sidewalk sample would be collected at the building's estimated basement depth.

The sub-slab vapor points will be installed by advancing a 1-inch diameter hole through the floor slab. The holes will be drilled via hammer drill. The core hole will extend through the slab and terminate at the interface with underlying material (i.e. gravel base or soil). At each sampling location, a 0.5-inch diameter and 3.5-inch long decontaminated stainless steel sampling probe will be driven approximately two (2) inches into the underlying soil beneath the basement floor slab. The sampling probe will be retracted approximately one (1) inch to expose a sampling screen. Each sub-slab soil vapor probe 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_2, CO_2, and CH_4 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 via USEPA Method TO-15 at a NYSDOH ELAP-certified analytical laboratory. One (1) duplicate sample will be collected for QA/QC. QA/QC procedures to be followed are described in the QAPP included as Appendix C.

2.2 INDOOR AIR SAMPLES AND AMBIENT AIR

In accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion*, four (4) indoor air samples and one (1) ambient air sample (per sampling day) will be collected prior to[1] the sub-slab soil vapor samples. One (1) indoor air sample will be collected from each building's basement. In addition, one (1) indoor air sample will collected within the commercial space located on the first floor of Lot 30 and within the sub-grade utility room located beneath the drop-off drycleaner.

[1] This limits interference from the soil vapor matrix.

Indoor air samples will be collected in the breathing zone (approximately five feet above the floor). One background ambient air sample will also be collected per day in along 70th Street, at the rear of Lot 30. It is anticipated that this investigation will be completed in two to three days. 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.

2.3 REPORTING

Following the receipt of all laboratory results, a Soil Vapor/Indoor Air Quality Report that meets the substantial requirements of DER-10 will be prepared. The report will include details of the sampling, tabulated sample results, and an assessment of the data and conclusions. If warranted, recommendations for additional actions will be included.

DUSR in accordance with the Consent Order & DER-10

Soil vapor, indoor and ambient air sample results will be compared to the NYSDOH Air Guidance Values (AGVs) and Matrices. All data will be submitted electronically to NYSDEC via the Environmental Information Management System (EIMS) in EQuIS format.

3 SCHEDULE

Task	**Task Duration**	**Total Duration**
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	2 Weeks	4 Weeks 3 Days

4 KEY PROJECT CONTACT LIST

Name	Title	Phone Number	Email
Mandy Yau	NYSDEC Project Manager	718-482-4897	mxyau@gw.dec.state.ny.us.
Stephanie Selmer	NYSDOH Project Manager	518-402-7870	slh09@health.state.ny.us.
Alana Carroll	Integral Project Manager	212-9621403	acarroll@integral-corp.com
Sang Kim (3SK Corp.)	Responsible Party	917-656-8095	tkosk1@gmail.com
1299 First LLC	Current Site Owner (Lot 30)	(212) 693-9000	http://www.homestateproperties.com

5 REFERENCES

Baskerville, C.A., 1994, Bedrock and engineering geologic maps of New York County and parts of Kings and Queens Counties, New York, and parts of Bergen and Hudson Counties, New Jersey: U.S. Geological Survey Miscellaneous Investigations Series Map I-2306, scale 1:24,000

Hydro Tech Environmental Corp., Focused Subsurface Investigation Report, September 23, 2008.

Hydro Tech Environmental Corp., Groundwater Investigation Report, May 5, 2010.

Hydro Tech Environmental Corp., Groundwater Investigation Report, July 23, 2010.

Hydro Tech Environmental Corp., Phase II ESA Report, November 20, 2007

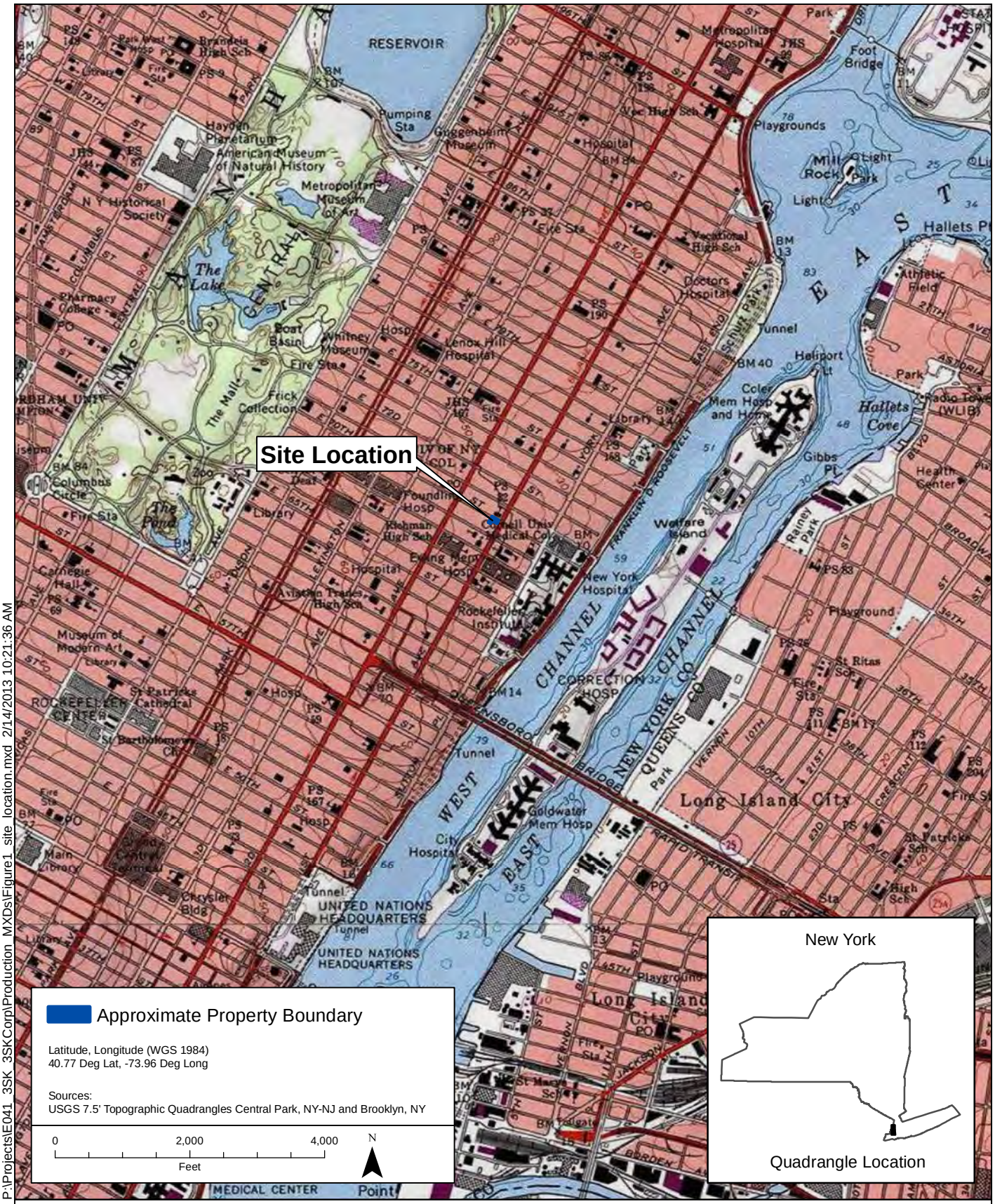
Hydro Tech Environmental Corp., Records Review Report, December 8, 2011.

Merritt Engineering Consultants P.C., Phase I Environmental Site Assessment (ESA), September 7, 2006.

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

FIGURES



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integral engineering pc
267 Broadway, Fifth Floor
New York, New Yorrk 10007
www.integral-corp.com

Figure 1.
Site Location Map
1299 1st Avenue
New York, New York

E 70th Street

1-Story
Dry Cleaner
(Lot 30)

4-Story Commercial/
Residential Building

LOT 30

5-Story
Residental
Building

LOT 130

Rear Yard
(Lot 29)

4-Story Commercial/
Residential Building

LOT 29

1st Avenue

Rear Yard
(Lot 28)

LOT 28

Rear Yard
(Lot 130)

N

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integral engineering pc.
267 BROADWAY, FIFTH FLOOR
NEW YORK, NEW YORK
www.integral-corp.com

0 5 10
Feet

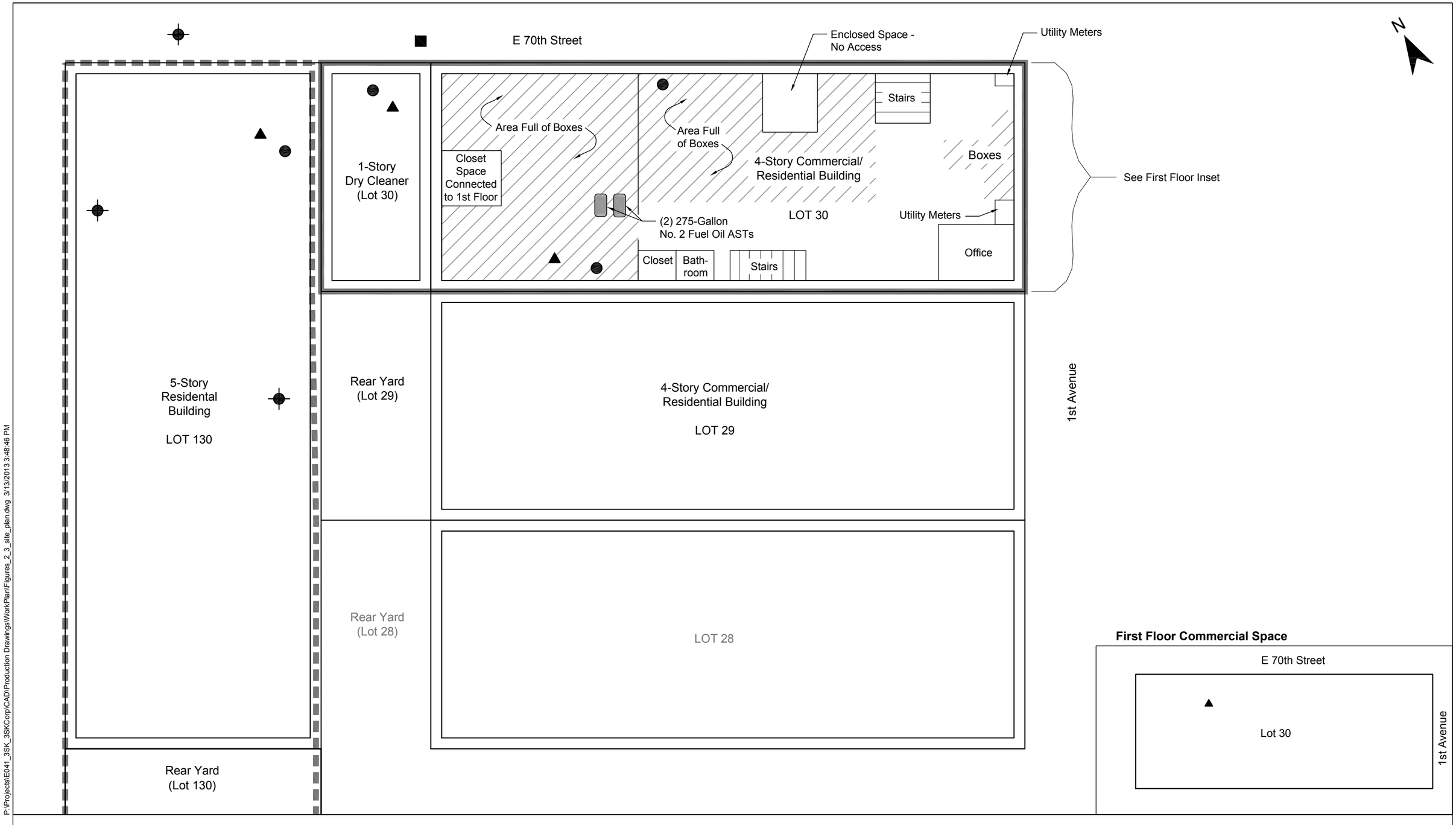
Site Boundary

Adjacent Lot Boundary

Notes:
1. Building locations approximate.

Sources:
1. Figure 1 Site Plan, Hydro Tech Environmental Corp., 9/11/08.

Figure 2.
Site Plan
1299 1st Avenue
New York, New York



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integral engineering p.c.
267 BROADWAY, FIFTH FLOOR
NEW YORK, NEW YORK
www.integral-corp.com

0 5 10
Feet

Site Boundary
Adjacent Lot Boundary

- Sub-Slab Soil Vapor Sampling Point
- Ambient Air Sample
- Indoor Air Sample
- Contingent Sample

Notes:
1. Building and sample locations approximate.

Sources:
1. Figure 1 Site Plan, Hydro Tech Environmental Corp., 9/11/08.

Figure 3.
Proposed Soil Vapor and Indoor Air Sampling Plan
(Basement and First Floor)
1299 1st Avenue
New York, New York

APPENDIX A

Adjacent Property Owner Letters

Integral Engineering, P.C.
267 Broadway
Fifth Floor
New York, NY 10007

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

February 11, 2013 Project No. E041

Via Federal Express – Return Receipt Requested

Sumagli Realty Company LLC
C/O Rialto Management Corp.
872 Madison Avenue, Apt. 2A
New York, NY 10021

Subject: **Environmental Sampling at 338 East 70th Street, New York, NY**

Dear Sumagli Realty Company:

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 1299 1st 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 (3SK Corporation), 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. An assessment of other properties in the area has already been undertaken.

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 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 212-962-4301 ext 306 or at acarroll@integral-corp.com. If you have any questions regarding environmental concerns, please contact Mandy Yau of NYSDEC at 718-482-4897 or at mxyau@gw.dec.state.ny.us. If you have any questions regarding public health concerns, please contact Stephanie Selmer of NYSDOH at 518-402-7870 or at slh09@health.state.ny.us. Thank you very much for your cooperation.

Sincerely,

Alana Carroll
Senior Geologist/Manager

Enclosure

CC: Mandy Yau- NYSDEC
Stephanie Selmer - NYSDOH

CONSENT FOR ACCESS TO PROPERTY

NAME:	Sumagli Realty Company LLC
ADDRESS OF PROPERTY:	C/O Rialto Management Corp. 872 Madison Avenue, Apt. 2A New York, NY 10021

I (We) consent to allow Integral Engineering P.C. (working on behalf of 3SK Corporation) 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: Sumagli Realty Company LLC

Address: 872 Madison Avenue 2A New York NY 10021

Phone 212 744 9644

Preferred Meeting Date and Time: 10-4

Integral Engineering, P.C.
267 Broadway
Fifth Floor
New York, NY 10007

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

February 11, 2013 Project No. E041

Via Federal Express – Return Receipt Requested

Elaine F. Krtil
1297 First Avenue
New York, NY 10021

Subject: **Environmental Sampling at 1297 First Avenue, New York, NY**

Dear Ms. Krtil:

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 1299 1st 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 (3SK Corporation), 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. An assessment of other properties in the area has already been undertaken.

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 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 212-962-4301 ext 306 or at acarroll@integral-corp.com. If you have any questions regarding environmental concerns, please contact Mandy Yau of NYSDEC at 718-482-4897 or at mxyau@gw.dec.state.ny.us. If you have any questions regarding public health concerns, please contact Stephanie Selmer of NYSDOH at 518-402-7870 or at slh09@health.state.ny.us. Thank you very much for your cooperation.

Sincerely,

Alana Carroll
Senior Geologist/Manager

Enclosure

CC: Mandy Yau- NYSDEC
Stephanie Selmer - NYSDOH

CONSENT FOR ACCESS TO PROPERTY

NAME:	Elaine F. Kritl
ADDRESS OF PROPERTY:	1297 First Avenue, New York, NY 10021

I (We) consent to allow Integral Engineering P.C. (working on behalf of 3SK Corporation) 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: _____

APPENDIX B
SITE HEALTH AND SAFETY PLAN AND COMMUNITY AIR MONITORING PLAN

REMEDIAL INVESTIGATION

For the Property Located at 1299 1st Ave, New York, New York, 10021

Prepared for:

3SK Corporation
27-15 27th Street
Astoria, NY 11102

Prepared by

integral consulting inc.
267 Broadway, 5th Floor
New York, NY 10007

FINAL
March 14, 2013

CONTENTS

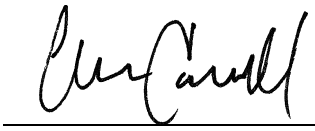
LIST OF ATTACHMENTS

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 Consulting Inc.
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
PPE	personal protective equipment
RIWP	Remedial Investigation 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 Remedial Investigation of the property located at 1299 1st Ave, New York, New York.



Project Manager — March 13, 2013 (Date)

Corporate Health and Safety Manager — February 11, 2013 (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 March 14, 2013 for the fieldwork at the 1299 1st Ave, New York, New York, property. 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 property located at 1299 1st Ave, New York, New York (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 purpose of this soil vapor and indoor air investigation is to evaluate the potential for soil vapor intrusion into the onsite building and adjacent buildings to the south and east.

To meet these objectives, field activities will include:

1. The installation of 6 temporary soil vapor sampling points; and
2. Collection of 5 indoor air samples and 1 ambient air

Each soil vapor probe 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. The soil vapor samples will be collected in clean, batch certified, six (6) liter Summa™ canisters at flow rates no greater than 200 ml/min. Soil vapor samples will be collected over a period of eight (8) hours. Indoor air samples will be collected in the breathing zone (five feet above basement floor). A background ambient air sample will also be collected in the rear yard on Lot 29.

1.2 ORGANIZATION

This SHSP covers three field activities: (1) advancement of soil borings and collection of soil samples, (2) installation of groundwater monitoring wells and collection of groundwater samples, and (3) installation of soil vapor sampling points and collection of soil vapor samples. 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[1] conducts periodic unannounced audits of Integral field operations to ensure compliance with the site-specific health and safety plan.

[1] The audit task may be delegated to an office health and safety representative by the CHSM.

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 DESCRIPTION

The site is located in a commercial and residential area of the Lenox Hill neighborhood of the Borough of Manhattan. The site is approximately 1,957 square feet and comprises of a commercial/residential building located on the southwest corner of 1st Avenue and 70th Street. Primary access to the building is on 1st Avenue. The legal description of the site is Block 1444, Lot 30. A site location map is provided as Figure 1. Groundwater at the site was encountered at depths ranging from approximately 15 to 20 ft bgs. The local groundwater flow is assumed to be east/northeast towards the East River. The topography of the site is relatively flat.

The building on the site is a four story tall structure with the first floor occupied by a convenience store. The second, third, and fourth stories are residential. The building also includes a basement which has two separate sections; both sections are used for storage. The basement ceiling height is approximately six feet.

A previous Phase II investigation was conducted by Hydro Tech. on the site in 2007. This report found chlorinated solvents, particularly Tetrachloroethene (PERC), present in the soil beneath the basement. The levels of PERC exceeded regulatory standards in the northeast portion of the basement but were less than standards in the southern portion of the property.

- **Owners/tenants:** *1299 First LLC*
- **Site history:** *Historically utilized for dry cleaning operations*
- **Current site use:** *Currently used as a convenience store (floor one) and residential (floors two through four)*
- **Hazardous waste site:** *No*
- **Industrial waste site:** *No*
- **Topography (if applicable):** *50 feet above sea level, flat*
- **Site access:** *1st Avenue access*
- **Nearest drinking water/sanitary facilities:** *On-site or in vicinity*
- **Nearest telephone:** *Field crew will have a cell phone*
- **Size of site:** *1,957 square feet*

- **Pathways for hazardous substance dispersion:** *Volatilization, dust*

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

An initial groundwater investigation was conducted by Hydro Tech. in 2008. The scope of work called for installing four monitoring wells and seven soil probes. Samples from these wells were sent to a NY state certified laboratory and tested for petroleum range Volatile Organic Compounds (VOCs). The report found migration of PERC to the groundwater beneath the sidewalks at the site. Breakdown products from the PERC were also found in the northeast segment of the basement. Gasoline compounds below regulatory standards were also found beneath the western portion of the East 70th Street sidewalk. The report also found two concrete patches of unknown status within the northwest portion of the basement.

A follow up groundwater study was conducted by Hydro Tech. in May of 2010. Seven groundwater monitoring wells were drilled both on and off of the site. Samples from these wells were sent to a NY state certified laboratory and tested for petroleum range VOCs. The study found total chlorinated solvents exceeding 3,500 ug/L in the central portion of the basement; these levels decreased downgradient to the northeast of the site.

1.5 PROJECT MANAGER AND OTHER KEY CONTACTS

	Name (Affiliation)	Work Telephone	Cell Phone
Project manager	Alana Carroll (Integral)	(212) 962-4301 x306	(646) 895-1430
SSO	James L'Esperance (Integral)	212) 962-4301 x304	(646) 285-4808
CHSM	Eron Dodak (Integral)	(503) 943-3614	(503) 407-2933
Client contact	James Periconi (Periconi, LLC))	212 801-1000	

2 CHEMICAL HAZARD EVALUATION

Potentially hazardous chemicals known to exist at the site are primarily VOCs, SVOCs, heavy metals, PCBs, and pesticides associated with historic site use and fill material. 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-dichloroethane	8.4µg/l to 9.9µg/l	Groundwater	100 ppm (NIOSH REL 100 ppm)	--	3000 ppm	11.06	Flammable Liquid
cis-1,2-dichloroethene (1,2-dichloroethene)	220 µg/l and 260 µg/l	Groundwater and Soil Vapor	200 PPM (NIOSH REL 200 ppm)	--	1000 ppm	9.65	Flammable liquid
Chrysene (under "Coal tar pitch volatiles")	Less than 0.002µg/l	Groundwater and Soil Vapor	0.2 mg/m^3 (NIOSH REL 0.1 mg/m^3)	--	80 mg/m^3	--	Carcinogen
bis(2-ethylhexyl) phthalate	6.10µg/l	Groundwater	5 mg/m^3 NIOSH REL 5 mg/m^3)	(NIOSH ST 10 mg/m^3)	5000 mg/m^3	--	Carcinogen, Combustible Liquid: Fl.P. at or above 200°F
benzo(b) fluoranthene	Less than 1 mg/kg in soil and 0.4 µg/l in groundwater	Soil and Groundwater	--	--	--	--	--
benzo(a)pyrene (under "Coal tar pitch volatiles")	Less than 1 mg/kg in soil	Soil	0.2 mg/m^3 (NIOSH REL 0.1 mg/m^3)	--	80 mg/m^3	--	Carcinogen
indeno(1,2,3-cd)pyrene	Less than 0.5 mg/kg in soil	Soil	--	--	--	--	--
barium	Up to 1000 mg/kg	Soil	--	--	--	--	--
Mercury	Up to 0.74 mg/kg	Soil	0.1 mg/m^3 (NIOSH REL 0.1 mg/m^3) (as Hg)	--	10 mg/m^3 (as Hg)	--	Poison

Chemical of Concern	Concentration (site maximum or range expected)	Medium	OSHA PEL	OSHA STEL	OSHA IDLH	IP(eV)	Carcinogen or Other Hazard
iron	Up to 49,000 µg/l	Groundwater	--	--	--	--	--
lead	Up to 580 mg/kg	Soil	0.050 mg/m^3 (NIOSH REL 0.050 mg/m^3) (as Pb)	--	100 mg/m^3 (as Pb)	NA	--
magnesium	Up to 61,000 µg/l	Groundwater	--	--	--	--	--
manganese	Up to 4,123 µg/l	Groundwater	5 mg/m^3 (NIOSH REL 1 mg/m^3) (as Manganese compunds)	NIOSH ST 3 mg/m^3	500 mg/m^3 (as Mn)	NA	Combustible Solid
nickel	Up to 294.4 µg/l	Groundwater	1 mg/m^3 (NIOSH REL 0.015 mg/m^3)	--	10 mg/m^3 (as Ni)	NA	Carcinogen
zinc	Up to 760 mg/kg	Soil	--	--	--	--	--
4,4'-DDT	Up to 0.0244 mg/kg	Soil	1 mg/m^3 (NIOSH REL 0.5 mg/m^3)	--	500 mg/m^3	--	Carcinogen
4,4' -DDD	Estimated up to 0.0063 mg/kg	Soil	--	--	--	--	--
Dieldrin	Up to .0074 mg/kg	Soil	0.25 mg/m^3 (NIOSH REL 0.25 mg/m^3)	--	50 mg/m^3	--	Carcinogen
Nitric Acid	Concentrated	Preservative	2 ppm (NIOSH REL 2 ppm)	2 ppm (NIOSH)	25 ppm	11.95	Corrosive
Hydrochloric Acid	Concentrated	Preservative	5 ppm (ceiling);	--	50 ppm	12.74	Corrosive

Chemical of Concern	Concentration (site maximum or range expected)	Medium	OSHA PEL	OSHA STEL	OSHA IDLH	IP(eV)	Carcinogen or Other Hazard
			NIOSH REL 5 ppm (ceiling)				

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^3 = 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
Potential Chemical Exposure Routes at the Site:			
Inhalation		X	
Ingestion			X
Skin absorption		X	
Skin contact		X	
Eye contact		X	
Chemical Characteristics:			
Corrosive	X (nitric and hydrochloric acid)		X (site chemicals)
Flammable			X
Ignitable			X
Reactive	X (nitric and hydrochloric acid)		X (site chemicals
Volatile	X (1,1-DCA, cis-1,2-DCE)		X (metals, SVOCs)
Radioactive			X
Explosive			X
Biological agent			X
Particulates or fibers		X (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.

1,1-DCA and cis-1,2-DCE are volatile. Stand upwind of soil if possible. Monitoring breathing zone with a PID in accordance with Section 5.

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). *Note:* 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:

Activity	Potential Hazard
Soil borings, monitoring well installation, soil vapor point installation	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

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.

	Level of Protection	
Site Activity	**Initial**	**Contingency** [a]
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

[a] 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 under work gloves, eye protection, and steel-toed boots, and traffic safety vests are required. Hearing protection is required as needed.

4.2 SAFETY EQUIPMENT

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

Air Monitoring (check the items required for this project)

- [X] PID
- [ ] LEL/O_2 meter
- [ ] Air sampling pumps
- [X] MINIRAM (particle monitors)

- [ ] H_2S meter
- [ ] Detector pump and tubes (e.g., benzene)
- [ ] Radiation meter
- [ ] Other: _____

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)

- [X] Emergency blanket
- [X] Insect repellent
- [X] Sunscreen
- [ ] Other: _____

Other (check the items required for this project)

- [X] Eyewash
- [X] Drinking water
- [ ] Fit test supplies
- [X] Fire extinguisher (drill rigs)
- [ ] Stopwatch for monitoring heart rate for heat stress monitoring[2]
- [ ] Windsock
- [ ] Thermoscan® thermometer for heat stress monitoring
- [X] Cellular phone
- [ ] Radio sets
- [ ] Survival kit[3]
- [X] Global positioning system
- [ ] Personal flotation device
- [ ] Cool vests
- [ ] Other: Hand sanitizer

[2] Heart rate monitoring requires special training.
[3] Consult the CHSM for guidance for site-specific survival kits.

5 AIR MONITORING

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.

Air monitoring may be discontinued at sites where there have been multiple sampling events in the same area/media during similar activities with no action level exceedances. In such instances, the air monitoring results must be well documented and there must be approval from the CHSM prior to discontinuing the air monitoring. Air monitoring must be reinstated for fieldwork in different areas of the site or when sampling new media.

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 5.4, immediate action is required (e.g., don respirators, leave site, etc.) as designated[4].

Real time monitoring for airborne dust should be performed during invasive activities. Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities

[4] 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.

include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

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.

5.3 DUST METERS

It is critical that the dust meter is capable of measuring the concentrations of airborne dust that are at or below the site-specific action levels presented below. 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 its operation prior to use in the field.

The dust meter must be field checked (i.e., zeroed) daily in accordance with the manufacture's specifications, which are provided in the operation manual. A dust meter field check typically involves zeroing the meter with ambient or filtered air. Be sure that all the required zeroing and operational equipment/supplies are provided with the dust meter. Record field check data in the field logbook.

The instrument to be used is the MIE Inc. DataRAM or equivalent with a latching alarm. The instrument will be fitted with an omnidirectional sampling inlet to get representative samples under a variety of wind speeds and directions. A RAM-TCH inlet heater may also be used in humid conditions to remove water vapor from the sampling stream.

The dust monitor should be set up downwind of the excavation activities to verify that dust control methods are adequate. The latching alarm will be set at 1.0 mg/m3 to alert site personnel that the action level has been exceeded. When the alarm is activated, the work area will be wetted to control dust.

5.4 ACTION LEVELS

5.4.1 VOC Monitoring, Response Levels, and Actions

VOCs will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings will be recorded and presented to the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) in daily and weekly reports. Instantaneous readings, if any, used for decision purposes will also be documented and recorded in the daily reports.

5.4.2 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored **continuously** at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations.
The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

All 15-minute readings will be recorded and presented to the NYSDEC and the NYSDOH in daily and weekly reports. Instantaneous readings, if any, used for decision purposes will also be documented and recorded in the daily reports.

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[a]	Supervisor[b]	First Aid/CPR[c]	Medical Monitoring
Integral Field Personnel						
James L'Esperance			X		X	X
Alana Brannon			X		X	

Notes:

[a] Must have current OSHA 8-hour refresher if it has been more than a year since the OSHA 40-hour training.

[b] At least one person onsite must be OSHA HAZWOPER supervisor trained if this is a hazardous waste site.

[c] At least one member of each team of two or more people onsite must be first aid/CPR trained.

[d] 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 1299 1st Avenue 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:

- [X] 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	NYC Presbyterian	(212) 305-2500	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 [a]	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:

[a] 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 lightening, 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 (West 27th Street site entrance). 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:

Contamination reduction zone	Area between the exclusion and support zones that provides a transition between contaminated and clean zones
Exclusion zone	Any area of the site where hazardous substances are present, or are reasonably suspected to be present, and pose an exposure hazard to personnel
Support zone	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 BORINGS AND MONITORING WELL INSTALLATION AND SOIL AND GROUNDWATER SAMPLING

Exclusion zone: An approximate 12-ft radius around the drill rig or sample location will be marked with orange traffic safety cones or caution tape. Only properly equipped and trained (i.e., wearing Level D protective clothing) personnel will be allowed in this area.

Contamination reduction zone: All decontamination activities will occur inside the exclusion 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 SOIL VAPOR POINT INSTALLATION AND SOIL VAPOR SAMPLING

Exclusion zone: An approximate 12-ft radius around the point will be marked with orange traffic safety cones or caution tape. Only properly equipped and trained (i.e., wearing Level D protective clothing) personnel will be allowed in this area.

Contamination reduction zone: All decontamination activities will occur inside the exclusion 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 compositing 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:

Item	Hazardous Constituent	Quantity	Packaging	How Shipped
Samples	None	(various quantities) solid and liquid matrix samples	Coolers	Laboratory courier
Preservatives (groundwater VOCs)	HCL $HN0_3$	2-3 mL per bottle/vial	Pre-packaged laboratory sample jars	Laboratory courier

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 BORINGS AND MONITORING WELL INSTALLATION

Drilling subcontractor to contact New York one-call utility locating service 48 hours prior to initiating field work (1-800-332-2344) and obtain a utility locating ticket. Drilling subcontractor to 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. The utility locating service should have marked all utilities 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.

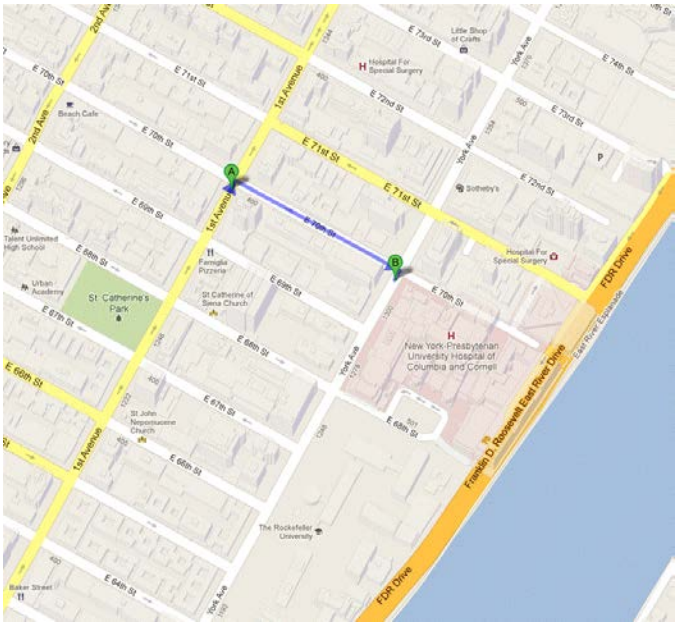
Integral personnel will wear hard hats, safety glasses, traffic safety vests, and steel-toed boots at all times. The exclusion zone around the drill rig will be marked with orange traffic cones or caution tape and personnel will police the area to make sure no unauthorized personnel enter the exclusion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

Conduct air monitoring while in the exclusion zone. Always wear nitrile gloves when touching anything in the exclusion zone. Wash hands or use hand sanitizer when hand washing facilities are not available prior to eating or drinking. Always get help when moving heavy sampling equipment or coolers. Avoid contacting the floor with your knees or any other body part during sampling activities.

ATTACHMENT 1

SITE MAP AND HOSPITAL ROUTE



1299 1st Ave, New York, NY 10021

1. Head northeast on 1st Avenue toward E 70th St go 36 ft

2. Take the 1st right onto E 70th St go 0.1 mi

3. Take the 1st right onto York Ave

4. Destination will be on the left go 43 ft

New York Presbyterian Hospital CRS
1315 York Ave, New York, NY

ATTACHMENT 2

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**. 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

U.S. Department of Labor • Occupational Safety and Health Administration • OSHA 3165

ATTACHMENT 3

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.

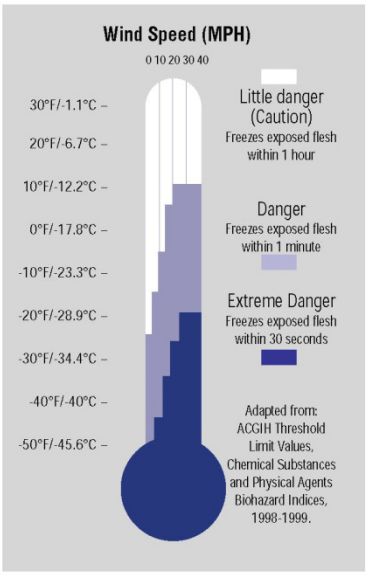
What to do: (water temperatures)

- 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.



Oregon Occupational Safety & Health Division
440-3336E-S (9/03)

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.)

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.

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.)

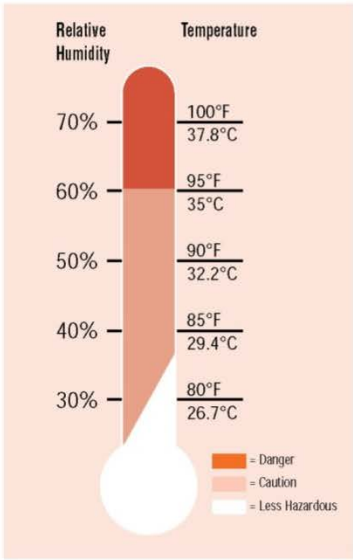
Workers are at increased risk when...

- 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.

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**.



Oregon Occupational Safety & Health Division
440-3333E-S(9/03)

ATTACHMENT 4

MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet

Nitric Acid

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Nitric Acid

Synonyms/Generic Names: Aqua Fortis, Azotic acid, Hydrogen nitrate.

Product Use: Industrial, Manufacturing or Laboratory use

Manufacturer: Columbus Chemical Industries, Inc.
N4335 Temkin Rd. Columbus, WI. 53925

For More Information Call: 920-623-2140
(Monday – Friday 8:00-4:30)

IN CASE OF EMERGENCY CALL: CHEMTREC
(24 Hours/Day, 7 Days/Week) 800-424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

Weight %	Component	CAS #	EINECS# / ELINCS#	Classification*
68 - 70%	Nitric Acid	7697-37-2	231-714-2	O; R8 -C; R35, **

*Symbol and R phrase according to EC Annex1
** Subject to the reporting requirements of SARA Title III Section 313

3. HAZARDS IDENTIFICATION

Clear, colorless to yellow solution with caustic odor.

R35 – Causes severe burns.
R8 – Contact with combustible material may cause fire.

S1/2, S23, S26, S36, S45

Routes of Entry: Skin, eyes, inhalation and ingestion.

Ingredients found on carcinogen lists:

INGREDIENT NAME	NTP STATUS	IARC STATUS	OSHA LIST	ACGIH
Nitric Acid	Not Listed	Not Listed	Not Listed	Not Listed

4. FIRST AID INFORMATION

Inhalation: Inhalation of mists can cause corrosive action on mucous membranes. Symptoms include burning, choking, coughing, wheezing, laryngitis, shortness of breath, headache or nausea. Move casualty to fresh air and keep at rest. May be fatal if inhaled, may cause delayed pulmonary edema. Get medical attention.

Eyes: Contact rapidly causes severe damage. Symptoms include eye burns, watering eyes. Permanent damage to cornea may result. In case of eye contact, rinse with plenty of water and seek medical attention immediately.

Skin: Severe and rapid corrosion from contact. Extent of damage depends on duration of contact. Symptoms include burning, itching, redness, inflammation and/or swelling of exposed tissues. harmful if absorbed through skin. Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and wash using soap. Get medical attention immediately.

Ingestion: **Do Not Induce Vomiting!** Severe and rapid corrosive burns of the mouth, gullet and gastrointestinal tract will result if swallowed. Symptoms include burning, choking, nausea, vomiting and severe pain. Wash out mouth with water and give a glass of water or milk. Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

FLAMMABLE PROPERTIES:

Flash Point:	Not Flammable
Flash Point method:	Not Applicable
Autoignition Temperature:	Not Applicable
Upper Flame Limit (volume % in air):	Not Applicable
Lower Flame Limit (volume % in air):	Not Applicable

Extinguishing Media: Product is not flammable. Use appropriate media for adjacent fire. Use flooding quantities of water to cool containers, keep away from common metals.

Special fire-fighting procedures: Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots. Material can react violently with water (spattering and misting) and react with metals to produce flammable hydrogen gas.

Hazardous combustion products: Emits toxic fumes under fire conditions. (See also Stability and Reactivity section).

Unusual fire and explosion hazards: Strong Oxidizer! Contact with organic material may cause fire. Material will react with metals to produce flammable hydrogen gas.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: See section 8 for recommendations on the use of personal protective equipment.

Environmental precautions: Cleanup personnel need personal protection from inhalation and skin/eye contact. Evacuate and ventilate the area. Prevent spillage from entering drains. Cautiously add water to spill, taking care to avoid splashing and spattering. Neutralize diluted spill with soda ash or lime. Absorb neutralized spill with vermiculite or other inert absorbent material, then place in a suitable container for disposal. Clean surfaces thoroughly with water to remove residual contamination. Any release to the environment may be subject to federal/national or local reporting requirements. Dispose of all waste or cleanup materials in accordance with local regulations. Containers, even when empty, will retain residue and vapors.

7. HANDLING AND STORAGE

Normal handling: See section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation. Wash thoroughly after using. Keep container closed when not in use.

Storage: Store in cool, dry well ventilated area. Keep away from incompatible materials (see section 10 for incompatibilities). Drains for storage or use areas for this material should have retention basins for pH adjustment and dilution of spills.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls: (consult local authorities for acceptable exposure limits)

Chemical name	Regulatory List	Value and type
Nitric Acid	UK OES	5 mg/m^3 TWA
	STEL	10 mg/m^3 (10 minutes)
	USA OSHA PEL	5 mg/m^3 TWA
	STEL	10 mg/m^3 (15 minutes)
	USA ACGIH	5 mg/m^3 TLV
	USA NIOSH	5 mg/m^3 REL
	STEL	10 mg/m^3 (15 minutes)
	USA OSHA - IDLH	25 ppm
	VME France	5 mg/m^3 TWA 8 hr
	VLE France (STEL)	10 mg/m^3 (15 minutes)

TWA: Time Weighted Average over 8 hours of work.
TLV: Threshold Limit Value over 8 hours of work.
REL: Recommended Exposure Limit
STEL: Short Term Exposure Limit during x number of minutes.
IDLH: Immediately Dangerous to Life or Health

Ventilation: Provide local exhaust, preferably mechanical.

Respiratory protection: If necessary use an approved respirator with acid vapor cartridges.

Eye protection: Wear chemical safety glasses with a face shield for splash protection.

Skin and body protection: Wear neoprene or rubber gloves, apron and other protective clothing appropriate to the risk of exposure.

Other Recommendations: Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling. Have supplies and equipment for neutralization and running water available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, colorless to slight brown liquid
Physical state:	Liquid
Odor:	Acrid, suffocating odor
Odor Threshold:	Unknown
Specific Gravity:	1.4200
pH:	1
Melting Point/Freezing Point:	-42°C (-44°F)
Boiling Point/Range:	122°C (252°F)
Flammability:	Not Flammable (See section 5)
Flash point:	Not Flammable (See section 5)
Evaporation Rate (Butyl Acetate =1):	Not Available
Explosive Limits:	Not Explosive (See section 5)
Vapor Pressure (at 25ºC):	10 mmHg
Vapor Density (air =1):	2.5
Solubility:	Completely soluble in water
Partition coefficient/n-octanol/water:	-2.3 @ 25 ºC
% Volatile:	Not Available
Autoignition Temperature:	See section 5

10. STABILITY AND REACTIVITY

Stability: Stable

Conditions to avoid: Uncontrolled addition of water, contact with combustible materials.

Incompatibility: Moisture, bases, organic material, metals, hydrogen sulfide, carbides, alcohols, organic solvents, carbides, cyanides, sulfides.

Hazardous decomposition products: Oxides of nitrogen.

Hazardous polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Effects: See section 4 for symptoms of exposure and effects. Likely routes of exposure are skin, eyes and inhalation.
Target organs: Teeth, eyes, skin, respiratory system.

Acute Toxicity Data:

Nitric acid	LC_{50} (rat): 0.8 mg/L

Chronic Effects: Not Available

Teratogenicity: None found
Mutagenicity: None found
Embryotoxicity: None found
Synergistic Products/Effects: Not Available

12. ECOLOGICAL INFORMATION

Ecotoxicity (aquatic and terrestrial): Aquatic fish; LC50 (96 hrs): 72 mg/l (Gambusia affinis)

Persistence and Degradability: Not Available

Bioaccumulative Potential: Not Available

Mobility in Soil: Not Available

Other Adverse Effects: Not Available

13. DISPOSAL CONSIDERATIONS

RCRA:

Hazardous waste? Yes RCRA ID number: DOO2

Waste Residues: Carefully dilute with water, neutralize per spill procedures in section 6. Neutralized material may be flushed to sewer (REGULATIONS PERMITTING!) or disposed of through a licensed contractor. Users should review their operations in terms of the applicable federal/nation or local regulations and consult with appropriate regulatory agencies before discharging or disposing of waste material.

Product containers: Containers, if thoroughly cleaned, preferably by rinsing three times and handling the rinse water as waste residues, may be disposed of or recycled as non-hazardous waste. Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies before discharging or disposing of waste material.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the material and alter the waste classification and proper disposal methods.

14. TRANSPORTATION INFORMATION

DOT: UN2031, Nitric Acid, 8, pg II

TDG: UN2031, Nitric Acid, 8, pg II

PIN: Not Available

IDMG: UN2031, Nitric Acid, 8, pg II
Marine Pollutant: No

IATA/ICAO: UN2031, Nitric Acid, 8, pg II

RID/ADR: Class 8, Item 2(b), corrosive

15. REGULATORY INFORMATION

TSCA Inventory Status: All ingredients are listed on the TSCA inventory.

Federal and State Regulations:
Pennsylvania RTK: Nitric Acid
Massachusetts RTK: Nitric Acid

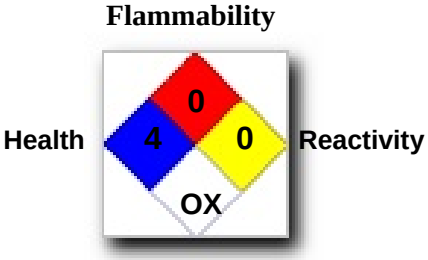
SARA 302/304/311/312 extremely hazardous substances: Nitric Acid
SARA 313 toxic chemical notification and release reporting: Nitric Acid
CERCLA: Hazardous Substances: Nitric Acid 1000 lbs

California Proposition 65: No.
WHMIS Canada: Class E - corrosive liquid.
DSCL (EEC): R35 – Causes severe burns, R8 - Contact with combustible material may cause fire.

HMIS (U.S.A.)

Health Hazard	3
Fire Hazard	0
Reactivity	2

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



Protective Equipment:

ADR (Europe):

TDG (Canada):

DSCL (Europe):

1. OTHER INFORMATION

Current Issue Date: November 30, 2005
Previous Issue Date: N/A
Prepared by: Sherry Brock (920) 623-2140

ALDRICH CHEMICAL CO INC. -- LIQUI-NOX PHOSPHATE-FREE DETERGENT, 24302-7 -- 6810-00N016648

========== Product Identification ==========

Product ID:LIQUI-NOX PHOSPHATE-FREE DETERGENT, 24302-7
MSDS Date:01/09/1990
FSC:6810
NIIN:00N016648
MSDS Number: BQTFQ
=== Responsible Party ===
Company Name:ALDRICH CHEMICAL CO INC.
Address:1001 W. ST. PAUL AVE
Box:355
City:MILWAUKEE
State:WI
ZIP:53201
Country:US
Info Phone Num:414-273-3850/FAX -4979
Emergency Phone Num:414-273-3850
CAGE:60928
=== Contractor Identification ===
Company Name:ALDRICH CHEMICAL CO INC
Address:1001 WEST ST PAUL AVE
Box:355
City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:60928

========== Composition/Information on Ingredients ==========

Ingred Name:LIQUI-NOX, PHOSPHATE-FREE DETERGENT

========== Hazards Identification ==========

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: MAY BE HARMFUL BY INHALATION, INGESTION, OR SKIN ABSORPTION. MAY CAUSE EYE IRRITATION. MAY CAUSE SKIN IRRITATION. TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERT IES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

========== First Aid Measures ==========

First Aid:EYE: IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MIN. SKIN: IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER. INHAL: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ART F RESP. IF BREATHING IS DIFFICULT, GIVEOXYGEN. CALL A PHYSICIAN. WASH CONTAMINATED CLOTHING BEFORE REUSE. INGEST: GET MD IMMEDIATELY .

========== Fire Fighting Measures ==========

Extinguishing Media:WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL POWDER, ALCOHOL OR POLYMER FOAM.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT TO PREVENT CONTACT WITH SKIN AND EYES.
Unusual Fire/Explosion Hazard:NONE SPECIFIED BY MANUFACTURER.

========== Accidental Release Measures ==========

Spill Release Procedures:WEAR NIOSH/MSHA APPROVED RESP, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES. ABSORB ON SAND OR VERMICULITE AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL. VENTILATE AREA AND WASH SPILL S ITE AFTER MATERIAL PICKUP IS COMPLETE.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

========== Handling and Storage ==========

Handling and Storage Precautions:KEEP TIGHTLY CLOSED. STORE IN A COOL DRY PLACE. AVOID INHALATION. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. AVOID PROLONGED OR REPEATED EXPOSURE.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

========== Exposure Controls/Personal Protection ==========

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:MECHANICAL EXHAUST REQUIRED.
Protective Gloves:COMPATIBLE CHEMICAL-RESISTANT GLOVES.
Eye Protection:CHEMICAL SAFETY GOGGLES.
Other Protective Equipment:SAFETY SHOWER AND EYE BATH.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
WASTE DISP: AND NEUTRALIZATION REACTIONS MAY GENRATE HEAT & FUMES WHICH CAN BE CONTROLLED BY THE RATE OF ADDITION. OBSERVE ALL FEDERAL, STATE AND LOCAL LAWS.

========== Physical/Chemical Properties ==========

HCC:N1
Spec Gravity:1.051
Appearance and Odor:NONE SPECIFIED BY MANUFACTURER.

========== Stability and Reactivity Data ==========

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS.
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:NATURE OF DECOMPOSITION PRODUCTS NOT KNOWN.

========== Disposal Considerations ==========

Waste Disposal Methods:SML QTYS: CAUTIOUSLY ADD TO A LRG STIRRED EXCESS OF WATER. ADJUST THE PH TO NEUTRAL, SEPARATE ANY INSOLUBLE SOLIDS OR LIQUIDS & PACKAGE THEM FOR HAZARDOUS-WASTE DISP. FLUSH THE AQUEOUS SOLN DOWN THE D RAIN W/PLENTY OF WATER. THE HYDROLYSIS (SUPP DATA)

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Material Safety Data Sheet

Hydrochloric Acid, 1:1 Aqueous Solution

ACC# 95574

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydrochloric Acid, 1:1 Aqueous Solution
Catalog Numbers: M-043, M043, MCC-030298
Synonyms: Muriatic acid; Chlorohydric acid; Hydrogen chloride; Spirits of salt
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7647-01-0	Hydrochloric acid	< 20	231-595-7
7732-18-5	Water	Balance	231-791-2

Hazard Symbols: T C
Risk Phrases: 23 35

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to slight yellow clear liquid. **Danger!** Corrosive. Causes eye and skin burns. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns. May cause fetal effects based upon animal studies. Possible sensitizer.
Target Organs: Respiratory system, teeth, eyes, skin, circulatory system.

Potential Health Effects

Eye: May cause irreversible eye injury. Vapor or mist may cause irritation and severe burns. Contact with liquid is corrosive to the eyes and causes severe burns. May cause painful sensitization to light.
Skin: May be absorbed through the skin in harmful amounts. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Contact with liquid is corrosive and causes severe burns and ulceration.
Ingestion: May cause circulatory system failure. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract.

Inhalation: May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Causes chemical burns to the respiratory tract. Exposure to the mist and vapor may erode exposed teeth. Causes corrosive action on the mucous membranes.
Chronic: Prolonged or repeated skin contact may cause dermatitis. Repeated exposure may cause erosion of teeth. May cause fetal effects. Laboratory experiments have resulted in mutagenic effects. Prolonged exposure may cause conjunctivitis, photosensitization, and possible blindness.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes). SPEEDY ACTION IS CRITICAL!
Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.
Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately. Give milk of magnesia.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Notes to Physician: Do NOT use sodium bicarbonate in an attempt to neutralize the acid.
Antidote: Do NOT use oils or ointments in eye.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Not flammable, but reacts with most metals to form flammable hydrogen gas. Use water spray to keep fire-exposed containers cool. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Reaction with water may generate much heat which will increase the concentration of fumes in the air. Containers may explode when heated.
Extinguishing Media: For large fires, use water spray, fog, or alcohol-resistant foam. Substance is nonflammable; use agent most appropriate to extinguish surrounding fire. Do NOT get water inside containers. Do NOT use straight streams of water. Most foams will react with the material and release corrosive/toxic gases. Cool containers with flooding quantities of water until well after fire is out. For small fires, use carbon dioxide (except for cyanides), dry chemical, dry sand, and alcohol-resistant foam.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Large spills may be neutralized with dilute alkaline solutions of soda ash (sodium carbonate, Na2CO3), or lime (calcium oxide, CaO). Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Provide ventilation. Do not get water inside containers. A vapor suppressing foam may be used to reduce vapors. Cover with dry earth, dry sand, or other non-combustible material followed with plastic sheet to minimize spreading and contact with water.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Contents may develop pressure upon prolonged storage. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Discard contaminated shoes. Use caution when opening. Keep from contact with moist air and steam.
Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Do not store in metal containers. Do not store near flammable or oxidizing substances (especially nitric acid or chlorates).

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hydrochloric acid	2 ppm Ceiling	50 ppm IDLH	5 ppm Ceiling; 7 mg/m3 Ceiling
Water	none listed	none listed	none listed

OSHA Vacated PELs: Hydrochloric acid: No OSHA Vacated PELs are listed for this chemical.
Water: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear neoprene or polyvinyl chloride gloves to prevent exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Clear liquid

Appearance: colorless to slight yellow
Odor: strong, pungent
pH: 0.01
Vapor Pressure: 5.7 mm Hg @ 0 deg C
Vapor Density: 1.26
Evaporation Rate:> 1.00 (N-butyl acetate)
Viscosity: Not available.
Boiling Point: 81.5-110 deg C @ 760 mmHg
Freezing/Melting Point: -74 deg C
Decomposition Temperature: Not available.
Solubility: Miscible.
Specific Gravity/Density:1.0-1.2
Molecular Formula:HCl.H2O
Molecular Weight:36.46

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Mechanical shock, incompatible materials, metals, excess heat, exposure to moist air or water, bases.
Incompatibilities with Other Materials: Bases, acetic anhydride, alkali metals, aluminum, amines, copper, copper alloys, fluorine, iron, sodium hydroxide, steel, sulfuric acid, vinyl acetate, zinc, potassium permanganate, cesium acetylene carbide, rubidium acetylene carbide, rubidium carbide, sodium, chlorosulfonic acid, oleum, carbonates, perchloric acid, calcium phosphide, metal oxides, acetates, cesium carbide, beta-propiolactone, ethyleneimine, propylene oxide, lithium silicides, alcohols + hydrogen cyanide, 2-aminoethanol, ammonium hydroxide, calcium carbide, 1,1-difluoroethylene, ethylene diamine, magnesium boride, mercuric sulfate, silver perchlorate + carbon tetrachloride, uranium phosphide.
Hazardous Decomposition Products: Hydrogen chloride, chlorine, carbon monoxide, carbon dioxide, hydrogen gas.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7647-01-0: MW4025000; MW4031000
CAS# 7732-18-5: ZC0110000
LD50/LC50:
CAS# 7647-01-0:
Inhalation, mouse: LC50 = 1108 ppm/1H;
Inhalation, mouse: LC50 = 8300 mg/m3/30M;
Inhalation, rat: LC50 = 3124 ppm/1H;
Inhalation, rat: LC50 = 45000 mg/m3/5M;
Inhalation, rat: LC50 = 8300 mg/m3/30M;
Oral, rabbit: LD50 = 900 mg/kg;
CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg;
Carcinogenicity:
CAS# 7647-01-0:
ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: IARC Group 3 - not classifiable CAS# 7732-18-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: Experimental reproductive effects have been reported.
Teratogenicity: Embryo or Fetus: Stunted fetus, Inhalation, rat TCL0=450 mg/m3/1H Specific Developmental Abnormalities: homeostatis, Inhalation, rat TCL0=450 mg/m3/1H (female 1 days pre-mating).
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: Cytogenetic analysis: Hamster, lung = 30 mmol/L.; Cytogenetic analysis: Hamster, ovary = 8 mmol/L.
Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: 3.6 mg/L; 48Hr; Lethal (unspecified) Bluegill/Sunfish: LC50; 96 Hr; pH 3.0-3.5 No data available.
Environmental: Rapidly hydrolyzes when exposed to water. Will exhibit extensive evaporation from soil surfaces. Upon transport through the soil, hydrochloric acid will dissolve some of the soil materials (especially those with carbonate bases) and the acid will neutralize to some degree.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7647-01-0 is listed on the TSCA inventory.
CAS# 7732-18-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 7647-01-0: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 7647-01-0: 500 lb TPQ

SARA Codes

CAS # 7647-01-0: acute.

Section 313

This material contains Hydrochloric acid (CAS# 7647-01-0, 20%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7647-01-0 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7647-01-0 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7647-01-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
California No Significant Risk Level: None of the chemicals in this product are listed.

European / International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T C

Risk Phrases:

R 23 Toxic by inhalation.
R 35 Causes severe burns.

Safety Phrases:

S 1/2 Keep locked up and out of reach of children.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)
CAS# 7647-01-0: 1
CAS# 7732-18-5: No information available.
Canada - DSL/NDSL
CAS# 7647-01-0 is listed on Canada's DSL List.
CAS# 7732-18-5 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of D2A, E.
Canadian Ingredient Disclosure List
CAS# 7647-01-0 is listed on the Canadian Ingredient Disclosure List.
Exposure Limits
CAS# 7647-01-0: OEL-AUSTRALIA:TWA 5 ppm (7 mg/m3) OEL-AUSTRIA:TWA 5 ppm (7 mg/m3) OEL-BELGIUM:STEL 5 ppm (7.7 mg/m3) OEL-DENMARK:STEL 5 ppm (7 mg/m3) OEL-FINLAND:STEL 5 ppm (7 mg/m3);Skin OEL-FRANCE:STEL 5 ppm (7.5 mg/m3) OEL-GERMANY:TWA 5 ppm (7 mg/m3) OEL-HUNGARY:STEL 5 mg/m3 OEL-JAPAN:STEL 5 ppm (7.5 mg/m3) OEL-THE NETHERLANDS:TWA 5 ppm (7 mg/m3) OEL-THE PHILIPPINES:TWA 5 ppm (7 mg/m3) OEL-POLAND:TWA 5 mg/m3 OEL-RUSSIA:STEL 5 ppm (5 mg/m3) OEL-SWEDEN:STEL 5 ppm (8 mg/m3) OEL-SWITZERLAND:TWA 5 ppm (7.5 mg/m3);STEL 10 ppm (15 mg/m3) OEL-THAILAND:TWA 5 ppm (7 mg/m3) OEL-TURKEY:TWA 5 ppm (7 mg/m3) OEL-UNITED KINGDOM:TWA 5 ppm (7 mg/m3);STEL 5 ppm (7 mg/m3) OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 7/06/1999
Revision #3 Date: 3/18/2003

ALCONOX MSDS

Section 1 : MANUFACTURER INFORMATION

Product name: Alconox

Supplier: Same as manufacturer.

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Manufacturer emergency phone number: 800-255-3924.
813-248-0585 (outside of the United States).

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Supplier MSDS date: 2005/03/09

D.O.T. Classification: Not regulated.

Section 2 : HAZARDOUS INGREDIENTS

C.A.S.	CONCENTRATION %	Ingredient Name	T.L.V.	LD/50	LC/50
25155-30-0	10-30	SODIUM DODECYLBENZENESULFONATE	NOT AVAILABLE	438 MG/KG RAT ORAL 1330 MG/KG MOUSE ORAL	NOT AVAILABLE
497-19-8	7-13	SODIUM CARBONATE	NOT AVAILABLE	4090 MG/KG RAT ORAL 6600 MG/KG MOUSE ORAL	2300 MG/M3/2H RAT INHALATION 1200 MG/M3/2H MOUSE INHALATION
7722-88-5	10-30	TETRASODIUM PYROPHOSPHATE	5 MG/M3	4000 MG/KG RAT ORAL 2980 MG/KG MOUSE ORAL	NOT AVAILABLE
7758-29-4	10-30	SODIUM PHOSPHATE	NOT AVAILABLE	3120 MG/KG RAT ORAL 3100 MG/KG MOUSE ORAL >4640 MG/KG RABBIT DERMAL	NOT AVAILABLE

Section 2A : ADDITIONAL INGREDIENT INFORMATION

Note: (supplier).
CAS# 497-19-8: LD50 4020 mg/kg - rat oral.
CAS# 7758-29-4: LD50 3100 mg/kg - rat oral.

Section 3 : PHYSICAL / CHEMICAL CHARACTERISTICS

Physical state: Solid

Appearance & odor: Almost odourless.
White granular powder.

Odor threshold (ppm): Not available.

Vapour pressure (mmHg): Not applicable.

Vapour density (air=1): Not applicable.

By weight: Not available.

Evaporation rate (butyl acetate = 1): Not applicable.

Boiling point (°C): Not applicable.

Freezing point (°C): Not applicable.

pH: (1% aqueous solution).
9.5

Specific gravity @ 20 °C: (water = 1).
0.85 - 1.10

Solubility in water (%): 100 - > 10% w/w

Coefficient of water\oil dist.: Not available.

VOC: None

Section 4 : FIRE AND EXPLOSION HAZARD DATA

Flammability: Not flammable.

Conditions of flammability: Surrounding fire.

Extinguishing media: Carbon dioxide, dry chemical, foam.
Water
Water fog.

Special procedures: Self-contained breathing apparatus required.
Firefighters should wear the usual protective gear.

Auto-ignition temperature: Not available.

Flash point (°C), method: None

Lower flammability limit (% vol): Not applicable.

Upper flammability limit (% vol): Not applicable.

Not available.

Sensitivity to mechanical impact: Not applicable.

Hazardous combustion products: Oxides of carbon (COx).
Hydrocarbons.

Rate of burning: Not available.

Explosive power: None

Section 5 : REACTIVITY DATA

Chemical stability: Stable under normal conditions.

Conditions of instability: None known.

Hazardous polymerization: Will not occur.

Incompatible substances: Strong acids.
Strong oxidizers.

Hazardous decomposition products: See hazardous combustion products.

Section 6 : HEALTH HAZARD DATA

Route of entry: Skin contact, eye contact, inhalation and ingestion.

Effects of Acute Exposure

Eye contact: May cause irritation.

Skin contact: Prolonged contact may cause irritation.

Inhalation: Airborne particles may cause irritation.

Ingestion: May cause vomiting and diarrhea.
May cause abdominal pain.
May cause gastric distress.

Effects of chronic exposure: Contains an ingredient which may be corrosive.

LD50 of product, species & route: > 5000 mg/kg rat oral.

LC50 of product, species & route: Not available for mixture, see the ingredients section.

Exposure limit of material: Not available for mixture, see the ingredients section.

Sensitization to product: Not available.

Carcinogenic effects: Not listed as a carcinogen.

Reproductive effects: Not available.

Teratogenicity: Not available.

Mutagenicity: Not available.

Synergistic materials: Not available.

Medical conditions aggravated by exposure: Not available.

First Aid

Skin contact: Remove contaminated clothing.
Wash thoroughly with soap and water.
Seek medical attention if irritation persists.

Eye contact: Check for and remove contact lenses.
Flush eyes with clear, running water for 15 minutes while holding eyelids open: if irritation persists, consult a physician.

Inhalation: Remove victim to fresh air.
Seek medical attention if symptoms persist.

Ingestion: Dilute with two glasses of water.
Never give anything by mouth to an unconscious person.
Do not induce vomiting, seek immediate medical attention.

Section 7 : PRECAUTIONS FOR SAFE HANDLING AND USE

Leak/Spill: Contain the spill.
Recover uncontaminated material for re-use.
Wear appropriate protective equipment.
Contaminated material should be swept or shoveled into appropriate waste container for disposal.

Waste disposal: In accordance with municipal, provincial and federal regulations.

Handling procedures and equipment: Protect against physical damage.
Avoid breathing dust.
Wash thoroughly after handling.
Keep out of reach of children.
Avoid contact with skin, eyes and clothing.
Launder contaminated clothing prior to reuse.

Storage requirements: Keep containers closed when not in use.
Store away from strong acids or oxidizers.
Store in a cool, dry and well ventilated area.

Section 8 : CONTROL MEASURES

Precautionary Measures

Gloves/Type:

Neoprene or rubber gloves.

Respiratory/Type:

If exposure limit is exceeded, wear a NIOSH approved respirator.

Eye/Type:

Safety glasses with side-shields.

Footwear/Type: Safety shoes per local regulations.

Clothing/Type: As required to prevent skin contact.

Other/Type: Eye wash facility should be in close proximity.
Emergency shower should be in close proximity.

Ventilation requirements: Local exhaust at points of emission.

ATTACHMENT 5

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.:

_____

_____

_____

_____

_____

_____

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

Appendix C
Quality Assurance Project Plan
1299 1st Avenue
Soil Vapor and Indoor Air Investigation Work Plan

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

Prepared for:
3SK Corporation
27-15 27th Street
Astoria, NY 11102

Prepared by:

integral engineering p.c.
267 Broadway
Fifth Floor
New York, NY 10007

FINAL
March 13, 2013

CONTENTS

1 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been developed for the Soil Vapor and Indoor Air Investigation Work Plan (Work Plan) prepared for the property located in at 1299 1st Avenue (Site) (Block 1444, Lot 30) and adjacent properties located at 1297 1st Avenue (Block 1444, Lot 29) and 338 East 70th Street (Block 1444, Lot 130), New York, New York (Figure 1). These properties are immediately adjacent to the south and east if the Site.

The Site (Lot 30) is approximately 1,957 square feet in area and is currently developed with a 4-story commercial/residential building (measuring approximately 25'x 65'). The first floor of the building is utilized as a convenience store and pharmacy. Within the footprint of the Site is a separate one (1) story building (measuring approximately 12' x 25') located east of the main Site building. This building is presently utilized as a drycleaning drop-off and pick up facility and shares a wall with the main building.

Lot 130 measures approximately 28' x 100' and abuts Lot 30 to the east. The lot is improved with a five (5) story residential building which is comprised of 19 units.

1.1 PROJECT SCOPE AND QAPP OBJECTIVE

The proposed scope of work includes the following:

- Installation of temporary soil vapor points within the basements of Lots30, 29, and 130; and,
- Collection of soil vapor from temporary soil vapor points, indoor air and ambient air samples.

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 LLC (Integral) will implement the Work Plan on behalf of 3SK Corp. (Responsible Party) 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.

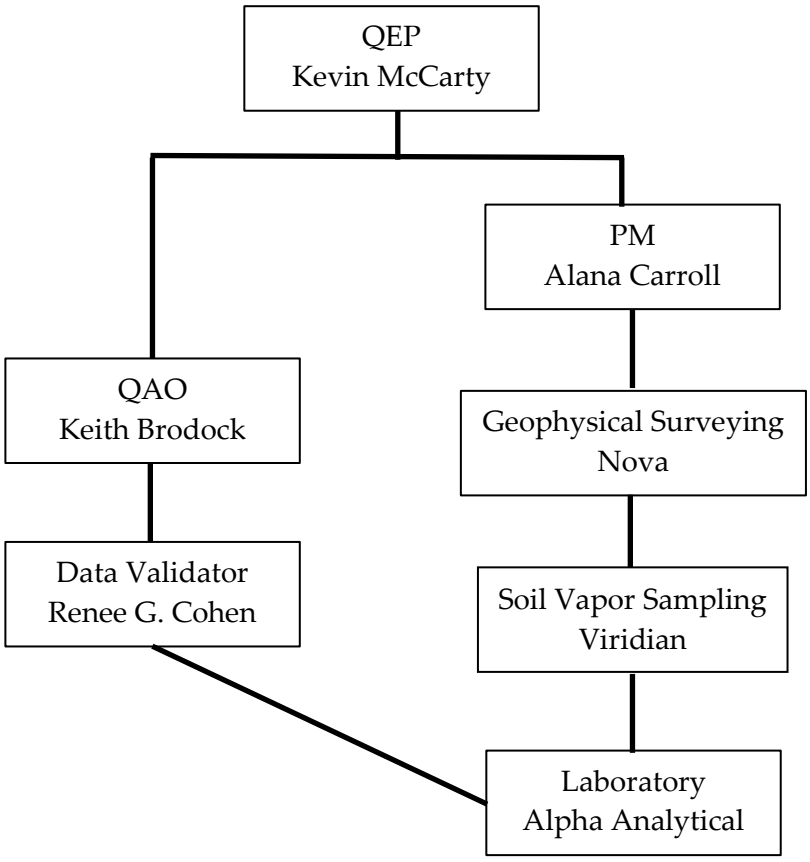
The Quality Assurance Officer will be Mr. Keith Brodock, P.E., managing engineer at Integral. Mr. Brodock is an is a professional engineer with nearly 10 years of experience in environmental risk analysis, real estate portfolio liability estimation, transactional risk evaluation, remediation design, 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 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, senior geologist 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 soil vapor sampling (Viridian Inc. of Upper Montclair, NJ), geophysical survey (Nova Geophysical Services of Douglaston, NY) laboratory services (Alpha Analytical of Mahwah, NJ) and data validation (Premier Environmental Services, Inc. of Merrick, NY).

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 vapor, indoor air and ambient air samples is provided below. Proposed sample locations are shown on Figure 3 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

A field duplicate sample 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.

- Duplicate samples are analyzed to check for sampling and analytical reproducibility.

The general level of QC effort will be one (1) field duplicate for every 20 or fewer investigative samples of a given matrix.

The analytical laboratory will be certified under the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP). 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 current version of the New York State 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. Walk-in 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 VAPOR, INDOOR AND AMBIENT AIR SAMPLING

Soil Vapor Samples

Soil vapor samples will be collected in accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, dated October 2006. Samples will be installed by advancing a 1-inch diameter hole through the floor slab. The holes will be drilled via hammer drill. The core hole will extend through the slab and terminate at the interface with underlying material (i.e. gravel base or soil). At each sampling location, a 0.5-inch diameter and 3.5-inch long decontaminated stainless steel sampling probe will be driven approximately two (2) inches into the underlying soil beneath the basement floor slab. The sampling probe will be retracted approximately one (1) inch to expose a sampling screen. Each sub-slab soil vapor probe 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_2, CO_2, and CH_4 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.

Indoor and Ambient Air Samples

Indoor air samples will be collected in the breathing zone (approximately five feet above the floor). One background ambient air sample will also be collected per day in the rear yard on Lot 29, assuming access is provided. It is anticipated that this investigation will be completed in two to three days. 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.

3.8 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
		FB	TB	DUP						
Soil Vapor	5	0	0	1	6	VOCs	TO-15	None	14 Days	2 L Summa
Ambient Air	2	0	0	0	2					6 L Summa
Indoor Air	4	0	0	0	4					

TB – Trip Blank
FB – Field Blank
DUP – Duplicate
L - liter

FIGURE 1

E 70th Street

1-Story
Dry Cleaner
(Lot 30)

4-Story Commercial/
Residential Building

LOT 30

5-Story
Residental
Building

LOT 130

Rear Yard
(Lot 29)

4-Story Commercial/
Residential Building

LOT 29

1st Avenue

Rear Yard
(Lot 28)

LOT 28

Rear Yard
(Lot 130)

N

P:\Projects\E041_3SK_3SKCorp\CAD\Production Drawings\WorkPlan\Figures_2_3_site_plan.dwg 2/19/2013 11:46:22 AM

integral engineering pc.
267 BROADWAY, FIFTH FLOOR
NEW YORK, NEW YORK
www.integral-corp.com

0 5 10
Feet

Site Boundary

Adjacent Lot Boundary

Notes:
1. Building locations approximate.

Sources:
1. Figure 1 Site Plan, Hydro Tech Environmental Corp., 9/11/08.

Figure 2.
Site Plan
1299 1st Avenue
New York, New York

APPENDIX A

RESUMES

Integral Consulting Inc.
267 Broadway
Fifth Floor
New York, NY 10007

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facsimile: 212.962.4302
kmccarty@integral-corp.com

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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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.

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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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EXPERIENCE **PREMIER ENVIRONMENTAL SERVICES, Merrick, New York**

1993-Present Perform organic and inorganic data validation according to the various protocols from the USEPA EPA CLP, NYS ASP and USEPA Test Methods for the Evaluation of Solid Waste, Methods for the Chemical Analysis of Water and Waste and the Federal Register. Use the USEPA National Functional Guidelines for Organic and Inorganic Data Validation (where applicable) as well as State (NYS DEC ASP/DUSR) and EPA Region requirements to report on laboratory data quality and data usability. Review and write Quality Assurance Project Plans using Regional and State guidelines for Remedial Investigations, Ground Water Monitoring programs and Superfund Programs. Review data and work plans as they relate to project data quality objectives. Conducts seminars on client specific topics. Perform on-site laboratory QA/QC audits as required by the client and site-specific work plans. Has performed ASTM Phase 1 Assessments for engineering firms when requested.

ENVIRONMENTAL QUALITY SERVICES, INC., Farmingdale, New York

1/2011-8/11 QA Manager
(25 hrs/wk) Perform the data review and report compilation of organic and inorganic data for report preparation. Review data for compliance with method as well as data quality objectives for specific client work plans. Perform departmental audits in compliance with NELAC and internal lab mandates. Revise laboratory logbooks for bench chemists. Revised/updated laboratory SOP's for method compliance. Participate in on-site audits by both state representatives and commercial clients. Coordinate PT studies for analyte certification for laboratory certifications. Insure analyte certification for client project requirements. Responsible for the review of new and/or updated method and implementation of these methods within the laboratory.

ENVIRONMENTAL TESTING LABORATORIES, Farmingdale, New York

8/2010-12/2010 QA Manager
(25-30 hrs/wk) Perform the data review and report compilation of organic and inorganic data for report preparation. Perform departmental audits in compliance with NELAC and internal lab mandates. Revise laboratory logbooks for bench chemists. Revised/updated laboratory SOP's for method compliance. Participate in on-site audits by both state representatives and commercial clients. Coordinate PT studies for analyte certification for laboratory certifications. Insure analyte certification for client project requirements.

SOUTH MALL ANALYTICAL LABORATORIES, Plainview, New York

10/2004-12/2009 QA Manager (Part Time)
(10 hrs/wk) Responsible for the overall QA program at the laboratory. Revised, updated and prepared SOP's for method compliance. Wrote and prepared the annual updates to laboratory Quality Assurance Manual. Perform audits of laboratory systems and methods. Prepare corrective action reports and follow-up to audit deficiencies. Oversee client and agency on-site audits. Contact with clients to discuss sampling plans, regulations, and required analyses. Perform the data review and report compilation of organic and inorganic data for reporting. Revised all laboratory logbooks and methods to comply with EPA and method guidelines. Handled document control of logbooks, SOP's, QAPP's. Performed annual data integrity and ethics seminars for all employees. Report directly to senior management.

ENVIRONMENTAL TESTING LABORATORIES, Farmingdale, New York

5/2002-10/2003 (20-24 hrs/wk) QA Specialist

Performed the data review and report compilation of organic and inorganic data for report preparation. Performed departmental audits in compliance with NELAC and internal lab mandates. Helped to revise laboratory logbooks for bench chemists. Revised/updated laboratory SOP's for method compliance. Participated in on-site audits by both state representatives and commercial clients.

KEYSPAN LABORATORY SERVICES, Brooklyn, New York

2/1999-5/2002 Consultant

Developed laboratory QAPP (in accordance with NELAC) and Chemical Hygiene Plan. Modified and updated laboratory SOP's. Perform audits in the different work areas. Maintained the NYS DOH proficiency program for analytes of interest. Review data for completeness and QC criteria. Implemented client inquiry system. Performed QC training and method training for bench and field chemists. Developed protocols and documentation for field PCB wipe sampling. Responsible for update/maintenance of laboratory state certifications and approvals.

NYTEST ENVIRONMENTAL INC., Port Washington, New York

1994-1998 Quality Assurance Officer

Responsible for the overall quality program at the laboratory. This included the auditing test methods, systems and data reporting. Performed the review of 10% of all data reports prior to submission to client. Oversaw the training program of new employees. Maintain the documentation of the training records. Review and maintain state certification paperwork and SOP files. Update and file annual MDL datum. Worked with sales and customer service to insure that client needs are met. Respond to client data inquires. Work with state and federal auditors for review of laboratory to receive certification. Successfully lead the laboratory to an Army Corp of Engineer validation.

1989-1993 **ENSECO EAST, Somerset, New Jersey**

QA/QC Scientist - Performed organic and inorganic audits of the laboratory. Performed and coordinated corrections and revisions to data reports. Wrote and reviewed laboratory Quality Assurance Project plans (QAPjP's) for client specific projects. Developed and led seminars for both client and employees on a number of topics including; data quality objectives, data review vs. data validation and laboratory QC. Interacted with clients, project managers and state personnel for regulatory concerns and data/lab issues. Performed lab audits for method compliance and project specific requirements. Acted as the Technical Representative for Ensecos EPA 3/90 Organic CLP Contract.

1988-1989 **INTECH BIOLABS, East Brunswick, New Jersey**

QA/QC Manager - Responsible for the review of all organic and inorganic data. Performed general laboratory and safety audits. Recorded and charted all QA/QC data. Reviewed and assembled all CLP organic data reports.

1986-1988 **INTERNATIONAL TECHNOLOGIES CORPORATION, Edison, New Jersey**
Central Laboratory Chemist - REAC and EERU Contract for the Emergency Response Branch (ERB) of the USEPA. Responsible for the organic and inorganic extraction of environmental samples according to EPA Methods. This included both metals digestion as well as organic extraction's for semivolatiles, pesticides and PCB's. Performed Volatile Organic analyses using Gas Chromatography, Total Petroleum Hydrocarbon Analysis by IR, Metal Analyses by both Graphite Furnace AA and ICP. Field experience included s on site analyses for both metals and GC volatiles.

1985-1986 **U.S. TESTING COMPANY, Hoboken, New Jersey**
Chemist - Responsible for the digestion and analysis of both soil and aqueous samples for metals according to USEPA CLP and SW 846 protocols. Responsible for the analysis of sample digestates using the Varian Graphite Furnace Atomic Absorption Spectrophotometer and a Jerall Ash ICP-61.

Education

B.S. Environmental Science, December 1984
B.S. Biology, May 1984
Old Dominion University, Norfolk, Virginia

20 hours of Chemistry coursework

Graduate Coursework - Rutgers University, New Brunswick, New Jersey
Long Island University at C.W. Post, Glen Cove, New York

Continuing Education

Good Laboratory Practice (GLP) - June 1992, Center for Professional Development, East Brunswick, New Jersey

40 Hour Course, Region II-Edison, NJ (1987)
24 Hour Refresher Course (1988, 1989, 1991)

References

Available upon request.

3.9 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).

3.10 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 Vapor – Ambient air sample results.

A report documenting the Soil Vapor and Indoor Air 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.