GENESIS ENGINEERING & REDEVELOPMENT

# SITE CHARACTERIZATION WORK PLAN

## Best-DDK Cleaners
## 38-68 13th Street,
## Long Island City, New York

**Site Number 241126**

Prepared For:

Mr. Jae Moon and
Ms. Maryuhn Young Moon
38-68 13th Street
Long Island City, New York

Prepared By:

Genesis Engineering & Redevelopment, Inc.
15-41 125th Street
College Point, New York 11356

October 21, 2011

Thomas L. deArth
Principal

Kenneth P. Wenz, Jr., CPG, PG, LEP
Senior Project Manager

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# TABLE OF CONTENTS



## FIGURES



## TABLES



## APPENDICIES

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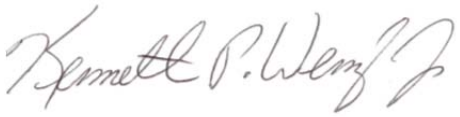
## CERTIFICATION

I, Kenneth P. Wenz, Jr., certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Site Characterization 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).



October 21, 2011.

Kenneth P. Wenz, Jr., CPG, PG, LEP — Date

## 1.0 INTRODUCTION

This Site Characterization Work Plan ("Work Plan") was prepared on behalf of Mr. Jae Moon and Ms. Maryuhn Young Moon ("Owners") to fulfill the requirements of the Order on Consent and Administrative Settlement for Site Number 241126, dated November 22, 2010 ("Order on Consent"). The Order on Consent was executed between the Owners and the New York State Department of Environmental Conservation ("NYSDEC"), regarding the property located at 38-68 13th Street, Queens, New York ("Site"). This Work Plan contains a scope of work for subsurface environmental investigation at the Siteto assess whether historic Site operations have impacted the quality of soil, groundwater, and/or soil vapor beneath the Site. The Site location is shown on Figures 1 and 2.

### 1.1 Work Plan Organization

The Work Plan includes is divided into three sections:

1. Section 1.0 – Introduction;

2. Section 2.0 – Proposed Scope of Work - The sampling program to be implemented at the Site, and descriptions of the sampling and analytical procedures to be used; and

3. Section 3.0 – Project Schedule - The schedule for implementation of the activities described in this Work Plan.

In addition, the following Appendices are included as a part of the Work Plan:

Appendix A – *Quality Assurance Project Plan* – The quality assurance/quality control (QA/QC) procedures for this project and the project team, and

Appendix B – *Health and Safety Plan* – The health and safety plan for the project.

### 1.2 Work Plan Objective

The objective of this Work Plan is to provide data to determine whether the relatively low levels of volatile organic compounds ("VOC") that were previously detected in groundwater immediately adjacent to the Site, are the result of Site operations. The proposed scope includes collection and laboratory analysis of soil, groundwater, and sub-slab soil vapor samples. In addition, the localized groundwater flow direction will be determined.

## 1.3 Background Information

The information in this section is a summary of previous environmental activities at the Site, based on review of documents provided to GE&R, which are assumed to be complete and factual. However, no assessment of the completeness or accuracy of the provided information has been made.

### 1.3.1 Site Description and History

The Site is located at 38-68 13th Street in Long Island City, New York, and includes property identified on the Queens tax map as Block 472, Lot 683. The Site is a 0.12-acre industrial property containing a 5,053 square foot building that has been used as a dry cleaning business since approximately 1996. Prior to this time, the building was reportedly used for sheet metal fabrication (since the 1950s), and prior to that the Site was residential (from the 1890s).

The Site building is currently utilized for operations associated with dry cleaning; which at present uses three dry cleaning machines. No floor drains were observed in the building during the April 20, 2011 Site inspection.

According to the Phase I Environmental Site Assessment ("ESA") Report prepared in December 2004, the one-story building at the Site was built in 1953, and is constructed with brick or concrete block walls, a flat roof and a concrete slab foundation. The building covers the entire property, with the exception of a very small strip along 13th Street. During the Site inspection on April 20, 2011, it was noted that this strip was less than one foot wide, concrete-covered, and adjacent to the sidewalk along 13th Street. This report notes that there is partial basement under the eastern portion of the building, which can only be accessed from the sidewalk, via a near-vertical stairway. The basement area has a concrete floor throughout and contains only a gas-fired boiler and an air compressor. The sanitary sewer discharge pipe also runs through the basement and connects to the municipal sanitary sewer system that runs along 13th Street.

The Site elevation is approximately 15 feet above sea level and is relatively flat, as is the surrounding area. No storm drains were observed at the Site, but storm sewers are present along 13th Street. The Site is served by public utilities and the East River is located approximately 1,800 feet west of the Site. According to a June 2009 subsurface investigation report (see Section 1.3.2), brick fragments and gravel are present below the sidewalk to a depth of two feet. This material is underlain by brown, fine to medium sand to a depth of four feet, then brown to dark brown, fine silty sand to ten feet below grade (the terminal depth of the borings). According to the NYSDEC, bedrock outcrops are present in the Site

vicinity, but bedrock was not observed during the April 20, 2011 Site inspection. However, it is expected that bedrock may be encountered within approximately 20 feet below grade.

In 2009, groundwater at the Site was encountered at seven to eight feet below grade. Based on review of U.S. Geological Survey reports and the topography in the Site vicinity, it is expected that groundwater flow is northwestward, toward the East River.

The area surrounding the Site is occupied by various commercial/industrial establishments, including several automobile repair and auto body shops. The Queensbridge Houses, a public housing complex, is located approximately 700 feet south of the Site (on the south side of 40th Avenue), a public school (PS 111) is located approximately 1,200 feet north of the Site (on 13th Street north of 38th Avenue), and a private school (St. Rita's School) is located approximately 1,800 feet north of the Site (on 36th Avenue).

### 1.3.2 Previous Environmental Investigations

According to a December 2010 Site characterization work plan (that was rejected by the NYSDEC), three soil vapor samples were collected from beneath the building foundation in July 2008. These samples reportedly contained tetrachloroethene ("PCE") at concentrations ranging from 3,750 micrograms per cubic meter ("µg/$m^3$") to 8,270 µg/$m^3$ and trichloroethene ("TCE") at concentrations ranging from 11 µg/$m^3$ to 70.4 µg/$m^3$. Since the locations of these samples were not provided and no reference to these samples was found in any other document provided to GE&R, the validity and usefulness of these data is uncertain.

In June 2009, two soil probes were advanced through the sidewalk along 13th Street, in front of the Site (these locations, SB-1 and SB-2, are shown on Figure 3), and one groundwater sample was collected for laboratory analysis at each location. As shown in Table 1 and on Figure 3, PCE and cis-1,2-dichloroethene ("cis-1,2-DCE") were detected in both samples, and the sample from SB-2 also contained TCE. PCE has historically been used as a dry cleaning solvent, and TCE and cis-1,2-DCE are breakdown products of PCE. However, all three VOCs are used as degreasing agents in industries other than dry cleaning. Both PCE concentrations and the cis-1,2-DCE concentration in the sample from SB-2 exceeded the New York State Class GA standards for these constituents.

According to correspondence to the Owners from the NYSDEC dated March 29, 2010, the NYSDEC documented a hazardous material release at the Site on March 18, 2010, and as a result, Spill Case Number 09-13336 was opened. This letter required that the Owners submit a work plan to determine the groundwater flow direction and delineate soil and groundwater impacts, as well as submit a Phase I ESA Report for the Site.

In November 2010, the Order on Consent was executed, and a draft site characterization work plan was submitted to the NYSDEC on behalf of the Owners in December 2010. In correspondence dated January 18, 2011, the NYSDEC rejected that work plan and required submittal of a revised work plan within 60 days. This Work Plan has been prepared to fulfill that requirement.

In January 2011, three groundwater samples were collected at the property immediately northwest of the Site, as part of a property transaction investigation. As shown in Table 1and on Figure 3, chloroform was detected in each of the samples, and cis-1,2-DCE and vinyl chloride were detected in one sample.

**Table 1. Summary of Historic Groundwater Data**

| Sample | Sample Date | Location | PCE *(µg/l)* | TCE *(µg/l)* | Cis-1,2-DCE *(µg/l)* | Chloroform *(µg/l)* | Vinyl Chloride *(µg/l)* |
|---|---|---|---|---|---|---|---|
| SB-1 | 6/2/09 | Site | 9.8 | < 1.0 | 4.4 | < 1.0 | < 1.0 |
| SB-2 | 6/2/09 | Site | 25.6 | 3.1 | 62.7 | < 1.0 | < 1.0 |
| GW-1 | 1/3/11 | NW property | < 1.0 | < 1.0 | < 1.0 | 2.6 | < 1.0 |
| GW-2 | 1/3/11 | NW property | < 1.0 | < 1.0 | 5.3 | 2.6 | 1.7 |
| GW-3 | 1/3/11 | NW property | < 1.0 | < 1.0 | < 1.0 | 5.5 | < 1.0 |

Note: Only detected compounds reported in Table

## 2.0 PROPOSED SCOPE OF WORK

In accordance with discussions with NYSDEC personnel, the proposed scope of work for the Site includes soil characterization and determination of the depth to bedrock at one exterior location, installation of temporary monitoring wells at three exterior locations, assessment of Site-specific groundwater flow direction, collection and laboratory analysis of groundwater samples at three exterior locations, collection and laboratory analysis of sub-slab soil vapor samples at five interior locations, and collection and laboratory analysis of one exterior ambient air sample. Proposed sample locations are shown on Figure 4. The specific procedures associated with each of these activities are described below.

### 2.1 Pre-sampling Activities

Upon receipt of written notification that the Work Plan has been approved by the NYSDEC, GE&R will direct the drilling subcontractor to contact the One Call Center and request that subsurface utilities in the Site vicinity be marked. Based on the estimated completion date

for the One Call mark-out, the sampling work will be scheduled with the Owners and subcontractors (geophysical, drilling, surveying, laboratory, and data validation), and the NYSDEC will be notified of the planned sampling date. Written (e-mail) notice of seven days (minimum five business days) will be provided to the NYSDEC prior to implementation of any field activities associated with this Work Plan.

The proposed sampling program includes installation, development, and surveying of three temporary monitoring wells, and groundwater sampling at three exterior locations. As shown on Figure 4, one temporary well will be located in the sidewalk on the east side of 13th Street, across and presumably upgradient from the Site, and two temporary wells will be located in the sidewalk on the eastern side of 12th Street, presumably downgradient from the Site.

Five sub-slab soil vapor samples will be collected at the locations shown on Figure 4. Prior to initiation of intrusive activities, each location will be screened using a geophysical survey (magnetics and/or ground-penetrating radar) to identify any subsurface utilities or other obstructions that may impact the successful completion of the sampling program as proposed. These activities will be conducted by NAEVA Geophysics of Congers, New York. Based on the results of the geophysical survey or other access considerations, actual sample locations may differ slightly from those shown on Figure 4.

Equipment decontamination procedures are specified in Section 3.0 of the Quality Assurance Project Plan (Appendix A to this Work Plan).

## 2.2 Soil Sampling

At the drilling location on 13th Street (GER-1), soil samples will be collected using the direct push method. The direct push rig will be used to cut through the sidewalk, and soil samples will then be collected continuously from immediately below the sidewalk to bedrock (or refusal, whichever comes first), using new, dedicated disposable acetate sleeves. Upon retrieval, each sleeve will be opened and the soil within scanned for total volatile VOCs using a photoionization detector ("PID") and geologically described using the Unified Soil Classification System, including documentation of observations regarding potential contamination such as odors, staining, etc. All descriptions and observations will be documented in a field notebook. Drilling services will be provided by Eastern Environmental Solutions, Inc. ("Eastern") of Manorville, New York.

The boring locations were selected primarily to determine groundwater flow direction at the Site and evaluate groundwater quality in the Site vicinity, and are not close enough to the Site to evaluate Site-related soil impacts. As a result, no soil samples are proposed to be collected for laboratory analysis. However, if elevated PID readings (relative to background)

are detected in any of the soil characterization samples, one soil sample from the zone of elevated PID readings and the deepest sample within GER-1 will be collected for laboratory analysis. Any soil samples to be analyzed will be collected directly from the acetate sleeve using an EnCore® sampler, and submitted for laboratory analysis of VOCs, using Methods 5035A (sample preparation) and 8260B (sample analysis), with a Category B data package. If soil samples are collected for analysis, blind duplicate and matrix spike/matrix spike duplicate ("MS/MSD") samples will also be collected at a frequency of 5% (i.e., one set of QA/QC samples per twenty environmental samples (or portion thereof)). Since dedicated equipment will be utilized for sample collection, field blanks will not be collected during this program.

## 2.3 Groundwater Sampling

As shown on Figure 4, one temporary well will be located in the sidewalk on the east side of 13th Street, presumably upgradient of the Site, and two temporary wells will be located in the sidewalk on the eastern side of 12th Street, presumably downgradient of the Site. The temporary wells will be installed using the direct push method, and will be constructed using 0.75-inch diameter PVC, with ten feet of screen installed to a depth approximately eight feet below the water table (total depth of approximately 16 feet below grade). Each temporary well will be developed using a vacuum truck, to establish a good connection between the well and the surrounding formation.

Following completion of development at each temporary well, a New York State-licensed surveyor will measure the top of casing and ground surface elevations at each well location, and the depth to groundwater in each well will be measured using an electronic water level indicator. These measurements will be used in conjunction with the top of casing elevations to calculate the groundwater elevation at each well location, which will allow determination of the groundwater flow direction at the Site.

One groundwater sample will be collected from each temporary well. Purging and sampling will be conducted in accordance with the U.S. Environmental Protection Agency ("USEPA") guidance document entitled, "Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures", dated April 1996. Because of the small diameter of the temporary wells, purging and sampling will be conducted using a peristaltic pump and new dedicated Teflon or Teflon-lined tubing. Samples will be collected into laboratory-supplied sample containers, and will immediately be placed into an iced cooler for transport to the laboratory under Chain of Custody procedures. Purge water will be collected by the vacuum truck for disposal with the development water.

Each groundwater sample will be submitted for laboratory analysis of VOCs, using Method 8260B with a Category B data package. It is expected that reporting limits of 1.0 micrograms per liter will be provided by the laboratory for most constituents in these samples. QA/AC samples will include one blind duplicate sample, one MS/MSD sample set, and one trip blank. Blind duplicate and MS/MSD samples will be collected at a frequency of 5% (i.e., one QA/QC sample per twenty environmental samples (or portion thereof)). Since dedicated equipment will be utilized for sample collection, field blanks will not be collected during this program.

Following completion of sampling at each location, the temporary wells will be removed and each probehole will be backfilled with excess cuttings, clean sand, and/or cement/bentonite grout, and the sidewalk will be restored with concrete.

### 2.4 Sub-slab Soil Vapor Sampling

The five interior soil vapor samples will be collected from temporary, sub-slab sample points in accordance with the New York State Department of Health ("NYSDOH") document entitled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York", dated October 2006. As shown on Figure 4, sample GER-SV5 will be collected below the basement floor. At each location, a portable corer will be used to penetrate the concrete foundation for manual installation of the soil vapor sampling probe, which will be conducted using a stainless steel hand auger. Each probe will be comprised of Teflon tubing installed immediately below the building foundation. The tubing will be surrounded by sand or glass beads and the tubing will be sealed to the foundation with bentonite. The probes will be installed by Eastern.

An overturned bucket will be sealed to the floor over the sample location, with the Teflon tubing penetrating the bucket wall. A tracer gas (helium) will be introduced into the bucket, the helium concentration within the bucket will be measured using a helium detector and recorded, and the sample tubing will be purged using a helium detector (the measured helium concentration in the sample tubing will also be recorded). After purging, the sample tubing will be connected to a pre-evacuated, laboratory-supplied Summa canister equipped with a regulator calibrated to provide a 2-hour to 4-hour sample period with a maximum sample rate of 0.2 liter per minute (all regulators will be provided by the laboratory with the canisters, and will all be calibrated for the same sample time). The canister valve will then be opened for sample collection.

The ambient air sample will be collected from an outdoor location in the Site vicinity, over the same time period as the sub-slab soil vapor samples. The results from the ambient air

sample will provide comparison criteria for the sub-slab soil vapor samples. Since the Site is currently used as an active dry cleaner, indoor air sampling is not proposed for this program.

The canister vacuum will be recorded prior to sampling and upon completion of sampling. Upon completion of sampling, the canister valve will be closed and the sampling apparatus disassembled. The tubing will be removed and the concrete foundation will be patched. The canisters will be packaged for delivery to the laboratory for analysis of VOCs, using Method TO-15, plus helium. It is expected that a reporting limit of 1.0 micrograms per cubic meter or less will be provided by the laboratory for most constituents.

## 2.5 Community Air Monitoring Plan

During outdoor intrusive activities associated with the field investigation (i.e., direct push soil sampling and temporary well installation), continuous monitoring for VOCs will be conducted at the work zone, using a PID. If a total VOC concentration greater than five parts per million ("ppm") above background is measured at the work location, an additional PID reading will be collected at the downwind perimeter of the work area. In accordance with NYSDOH air monitoring guidance, a PID reading of between five ppm and 25 ppm (above background) at the work zone perimeter will cause work to cease until continued monitoring indicates total VOC levels have decreased to less than five ppm above background. If total VOC levels at the downwind perimeter of the work area persist at levels above five 5 ppm but less than 25 ppm over background, work activities will be halted, the source of VOCs identified, corrective actions taken to abate emissions, and monitoring continued. Any reading greater than 25 ppm above background at the work zone perimeter will cause cessation of work.

Particulate monitoring will not be conducted during this investigation because of the low potential for dust generation by the direct push sampling equipment.

## 2.6 Sample Handling and Laboratory Analysis

Immediately after collection, each soil (if collected) and groundwater sample will be placed into an iced cooler for subsequent delivery to the laboratory under chain-of-custody procedures. Soil vapor and ambient air samples will be packaged in accordance with laboratory and shipping requirements for delivery to the laboratory under chain-of-custody procedures. Samples will either be picked up by the laboratory, delivered to the laboratory in person by the sampler, or will be 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 Analytical Services Protocol ("ASP").

As described above and summarized in Tables 2 and 3, the sampling program includes collection of three groundwater samples (plus QA/QC samples), five soil vapor samples, and one ambient air sample for laboratory analysis of VOCs. All samples collected during this program will be analyzed by Alpha Analytical of Wyckoff, New Jersey, which is approved under the NYSDOH Environmental Laboratory Approval Program ("ELAP") for the analyses to be performed. The analyses will be conducted using the latest version of ASP and the analytical results will be provided with a Category B data package and a 28-day turnaround time.

**Table 2. Sample Summary**

| Medium | Number of Samples | Analysis | Analytical Method | Container |
|---|---|---|---|---|
| Soil | 0 | VOC | 5035A/8260B | EnCore® sampler |
| Groundwater | 7 * | VOC | 8260B | 40-milliliter glass |
| Ambient Air | 1 | VOC | TO-15 | 6-liter Summa canister |
| Soil Vapor | 5 | VOC | TO-15 | 6-liter Summa canister |

* Includes three groundwater samples, one blind duplicate sample, one MS/MSD sample set, and one trip blank.

**Table 3. Sampling Rationale**

| Sample | Medium/Sample Depth *(feet)* | Analysis/Method | Rationale |
|---|---|---|---|
| GER-1 | Groundwater/16 | VOC/8260B | Upgradient of Site |
| GER-2 | Groundwater/16 | VOC/8260B | Downgradient of Site |
| GER-3 | Groundwater/16 | VOC/8260B | Downgradient of Site |
| GER-SV1 | Soil Vapor/0* | VOC/TO-15 | Below building foundation |
| GER-SV2 | Soil Vapor/0* | VOC/TO-15 | Below building foundation |
| GER-SV3 | Soil Vapor/0* | VOC/TO-15 | Below building foundation |
| GER-SV4 | Soil Vapor/0* | VOC/TO-15 | Below building foundation |
| GER-SV5 | Soil Vapor/0* | VOC/TO-15 | Below building foundation |
| GER-Ambient | Ambient Air/NA | VOC/TO-15 | Comparison to soil vapor sample results |

* Sample collected immediately beneath foundation

## 2.7 Investigation-Derived Waste

As described above, excess soil sample material will be returned to the boring from which it was removed (i.e., GER-1). Temporary well development water and purge water generated during groundwater sampling will be contained in a vacuum truck for subsequent proper disposal.

## 2.8 Data Review and Reporting

The Category B data package will be validated by an independent data validation subconsultant (Data Validation Services of North Creek, New York, who have been approved by the NYSDEC for data validation), and a Data Usability Summary Report ("DUSR") summarizing the results of the data validation process will be prepared. The analytical results, qualified as necessary by the data validation and DUSR, will be reviewed and compared against background concentrations and/or applicable New York State criteria:

1. *Soil (if collected)* – Unrestricted or Commercial Soil Cleanup Objectives (as listed in 6NYCRR Part 375);

2. *Groundwater* – Class GA groundwater standards and guidance values for groundwater (as listed in TOGs 1.1.1); and

3. *Soil Vapor* – Ambient air sample results.

A report documenting the Site Characterization will be prepared to document Site conditions and all applicable observations made during the sample collection program. In addition, the report will include details of the sampling procedures, tabulated sample results, an assessment of the data and conclusions, and recommendations for follow-up activities, as warranted. The laboratory data packages, DUSR, geologic logs, well construction diagrams, and field notes will be included in the report as appendices. The data will also be submitted to NYSDEC's Environmental Information Management System ("EIMS") in the standardized electronic data deliverable format.

## 3.0 PROJECT SCHEDULE

It is estimated that the sampling scope of work presented in this work plan can be completed within one calendar day, and that all project activities will be completed within approximately twelve weeks after Work Plan approval by the NYSDEC. As a result, the following project schedule has been developed:

| Task | Estimated Duration (business days) | Total Duration (business days) |
|---|---|---|
| Work plan approval by NYSDEC | 0 | 0 |
| Pre-sampling activities* | 10 | 10 |
| Groundwater and soil vapor sampling | 1 | 11 |
| Laboratory analysis | 20 | 31 |
| Data validation and reporting | 20 | 61 |

* Includes scheduling with Owner and subcontractors, notification to NYSDEC, and completion of utility mark-out through One Call Center

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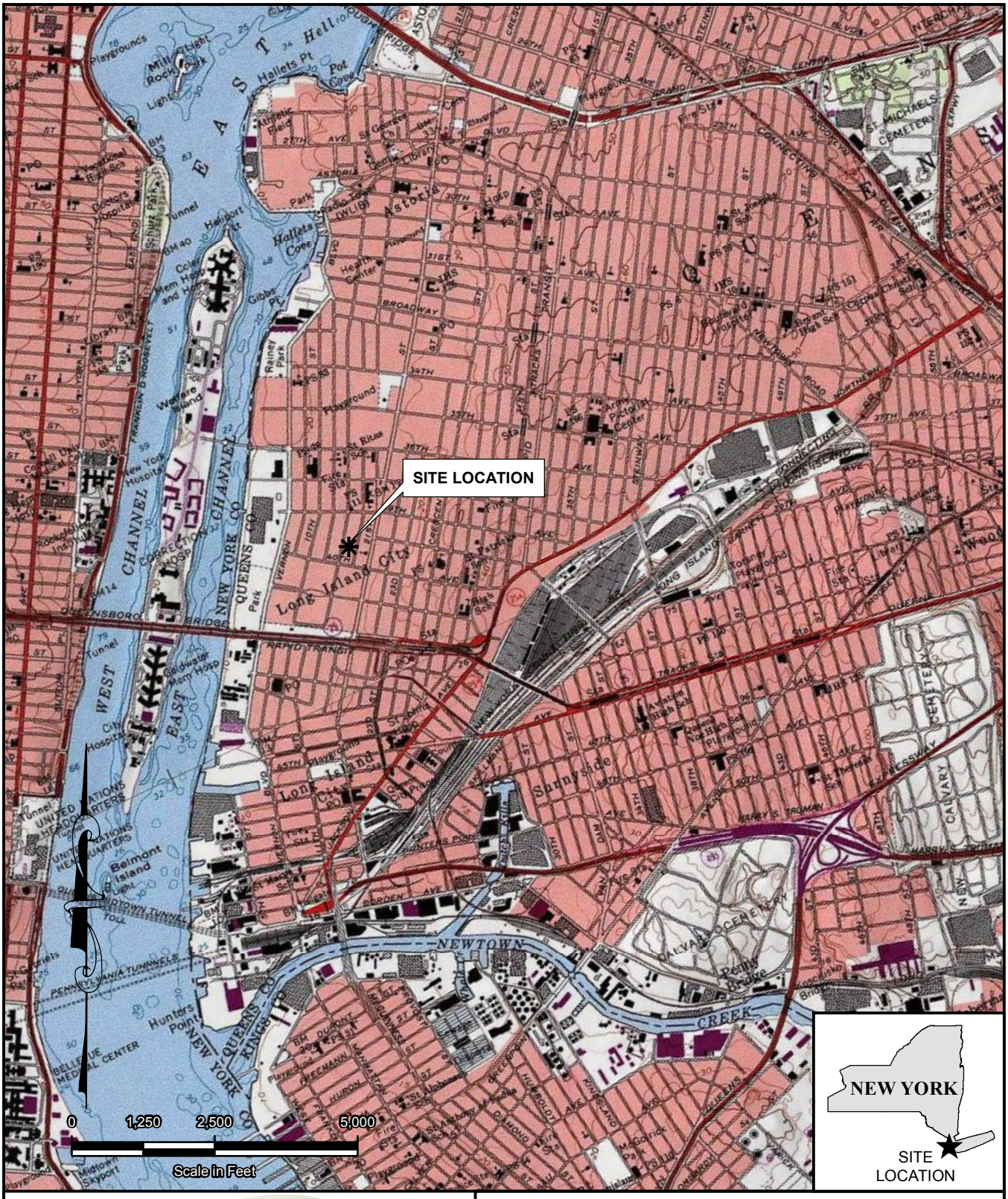
# FIGURES




GENESIS ENGINEERING & REDEVELOPMENT
351 Ruess Road · Ripon, CA 95366
Tel: 209.599.2004 · Fax: 209.433.3990
www.gercorp.com

# SITE LOCATION MAP

Site Characterization Work Plan
Best Cleaners
38-68 13th Street, Long Island City, New York

| | | | | |
|---|---|---|---|---|
| Designed: | DH | Project Number: | 155-C-3 | Figure 1 |
| Drawn: | DH | File: | 155C3_1 | |
| Checked: | KW | Revision: | xxxxx | Date: 04/18/11 |


0 150 300 600

Scale in Feet

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351 Ruess Road · Ripon, CA 95366
Tel: 209.599.2004 · Fax: 209.433.3990
www.gercorp.com

# SITE VICINITY MAP

Site Characterization Work Plan
Best Cleaners
38-68 13th Street, Long Island City, New York

| | | | | |
|---|---|---|---|---|
| Designed: | KW | Project Number : | 153-C-3 | Figure 2 |
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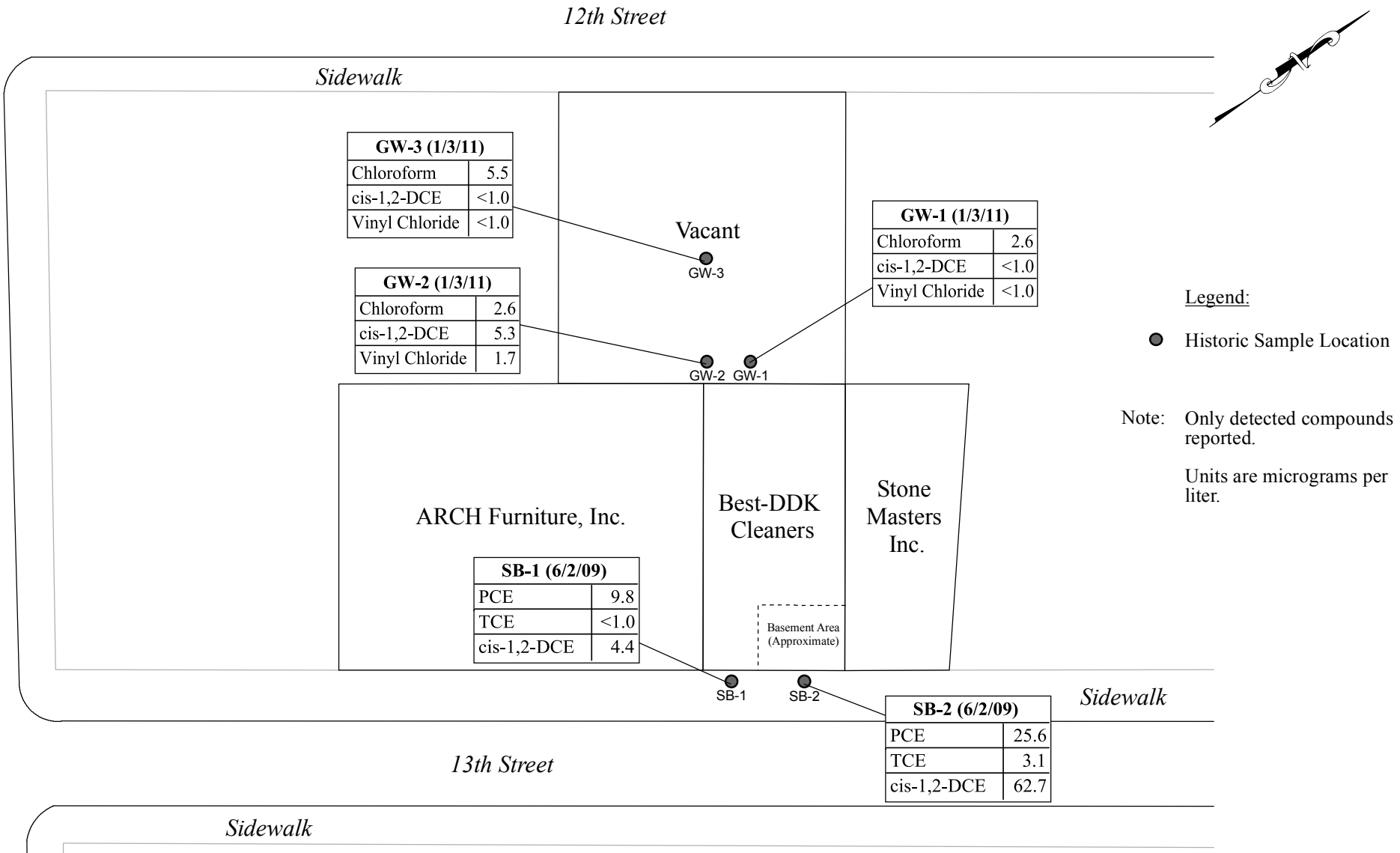


GENESIS ENGINEERING & REDEVELOPMENT
15 - 41 125th Street · College Point, NY 11356
Tel: 718.888.0802 · Fax: 718.888.1402
www.gercorp.com

HISTORIC SAMPLE LOCATIONS AND GROUNDWATER SAMPLE RESULTS
Site Characterization Work Plan
38-68 13th Street, Long Island City, New York

| | | | | |
|---|---|---|---|---|
| Designed: | KW | Project Number : | 153-C-3 | Figure 3 |
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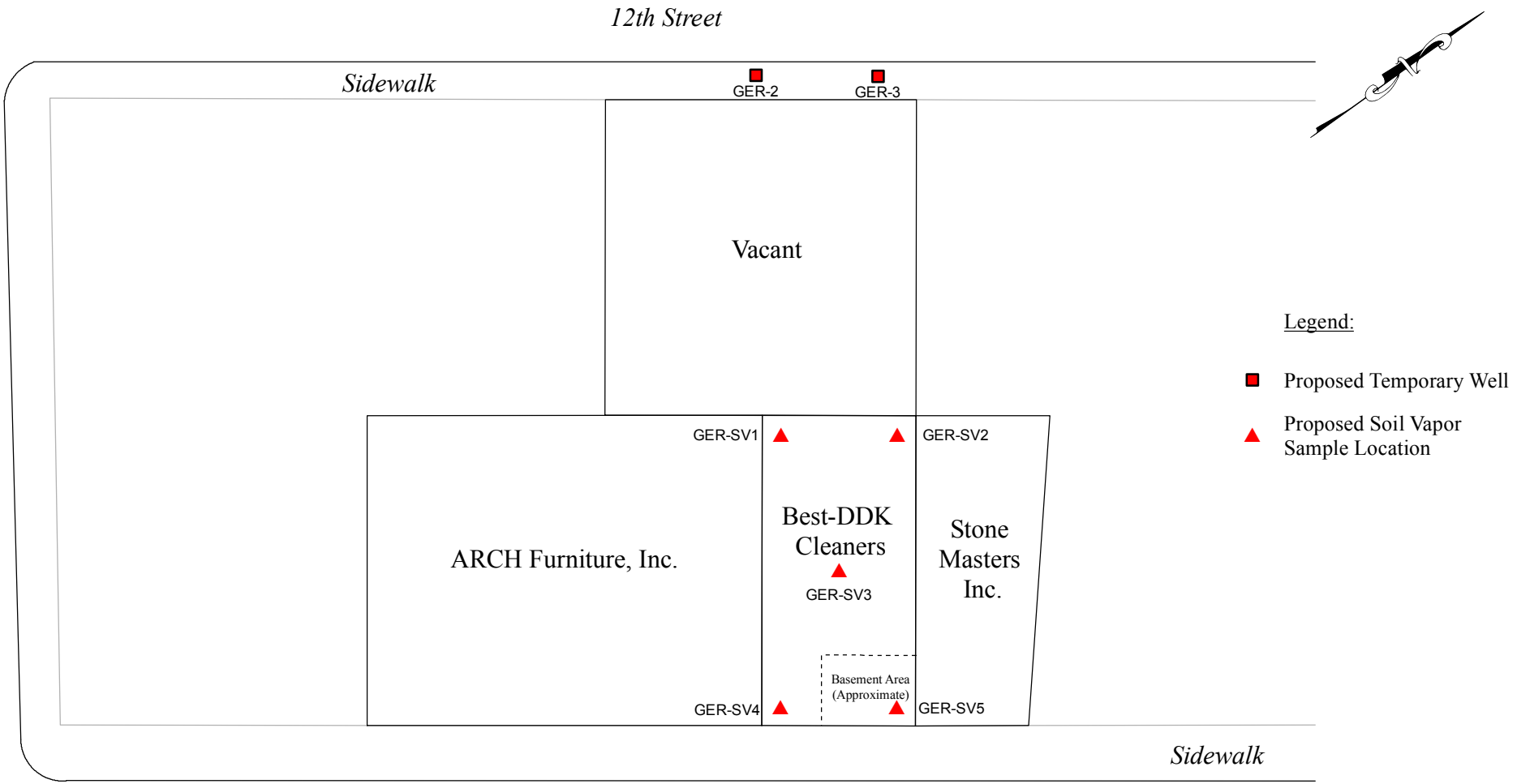
| Checked: | KW | Revision : | xxxxx | Date: 10/19/11 |

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15 - 41 125th Street · College Point, NY 11356
Tel: 718.888.0802 · Fax: 718.888.1402
www.gercorp.com

PROPOSED SAMPLE LOCATIONS
Site Characterization Work Plan
38-68 13th Street, Long Island City, New York

| | | | | |
|---|---|---|---|---|
| Designed: | KW | Project Number : | 153-C-3 | Figure 4 |
| Drawn: | DH | File : | 155C3_5 | |
| Checked: | KW | Revision : | xxxxx | Date: 10/19/11 |

GENESIS ENGINEERING & REDEVELOPMENT

# APPENDIX A

## Quality Assurance Project Plan

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# APPENDIX A

# QUALITY ASSURANCE PROJECT PLAN

**for**

## Best-DDK Cleaners
## Site Characterization Work Plan

## 38-68 13th Street,
## Long Island City, New York

**Site Number 241126**

Prepared For:

Mr. Jae Moon and
Ms. Maryuhn Young Moon
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October 21, 2011

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# TABLE OF CONTENTS

## 1.0 INTRODUCTION

This section presents the Quality Assurance Project Plan for the site characterization activities for the property located at 38-68 13th Street, Queens, New York ("Site"), which has been designated by the NYSDEC as Site Number 241126.

### 1.1 Project Scope and Objective

As described in Section 1.0 of the Work Plan, the Site is currently occupied by a commercial dry cleaner (DDK Pro Cleaner), and has been occupied by dry cleaning facilities since approximately 1996. Previous reported site uses included sheet metal fabrication (1950s through approximately 1996) and residential (1890s through 1950s). The purpose of the site characterization is to assess whether historic Site operations have impacted the quality of groundwater and soil vapor beneath the Site. The proposed scope of work for the site characterization program is described in detail in Section 2.0 of the Work Plan, and will include collection and laboratory analysis of three groundwater samples, five sub-slab soil vapor samples, and one ambient air sample. Proposed sample locations are shown on Figure 4 of the Work Plan.

## 2.0 PROJECT ORGANIZATION

On behalf of the Owners, Genesis Engineering and Redevelopment, Inc. ("GE&R") will be responsible for implementation of the Work Plan, once it has been approved by the NYSDEC. The Principal-in-Charge, Project Director, and Quality Assurance Officer will be **Mr. Thomas deArth**. As President of GE&R, Mr. deArth brings over 24 years of consulting and professional experience in the United States and abroad and serves as client manager and technical manager on numerous high profile and complex projects involving soil and groundwater quality impacts and hazardous waste handling and management practices. He provides technical direction and supervises a staff of geologists, engineers, hydrogeologists and scientists on projects associated with site characterization, remedial design, remedial implementation, system operation, facility management, document management, and litigation support.

Mr. deArth possesses a vast amount of experience in managing large-scale multimillion dollar RI/FS projects involving potential responsible parties (PRPs) under adverse litigious conditions. He has also worked with numerous law firms as a technical expert and strategic advocate to help minimize the environmental liabilities for their national and international clients. In addition, Mr. deArth has significant experience working on as well as providing technical oversight as a consultant on various types of projects including environmental assessments (many of which were conducted at industrial and dry cleaner sites), remedial

investigations (RI), due diligence/ environmental site assessments (ESA), feasibility/treatability studies (FS/TS), remedial design (RD), remediation/closure, environmental/ISO 14001/OSHA compliance/safety audits, job safety analysis, hazmat emergency response, spill prevention and management, waste management (hazardous, solid and wastewater), hazardous materials transportation, hydrologic/hydrogeologic characterizations and analysis, RCRA, CERCLA, HMTA, EPCRA, $P^2$, CAA and ISO 14000. In addition, throughout Mr. deArth's career he has conducted hundreds of Phase I ESAs for financial institutions, fortune large multi-national companies as well as individual real estate investors. For this project, he will be responsible for overall project administration, coordination with client and regulatory representatives, quality assurance review, and review of project deliverables.

The Project Manager for this project will be **Kenneth P. Wenz, Jr.** Mr. Wenz is a Senior Geologist/Senior Project Manager with more than 24 years of experience in the environmental field, comprising both consulting and regulatory positions. He is a Certified Professional Geologist, a Registered Professional Geologist (Pennsylvania), Licensed Environmental Professional (Connecticut) and a licensed subsurface evaluator (New Jersey). He has performed and managed projects in New York, New Jersey, Connecticut, Pennsylvania and Vermont. These projects have included federal and state Superfund investigation and remediation programs, Brownfield projects, various New Jersey ISRA investigations and property transfer investigations in several states, as well as soil, soil vapor, sediment and water assessment and remediation activities for numerous commercial, industrial and government clients. A substantial portion of his experience has involved New York State Superfund and Brownfield projects, including designing, conducting and managing site characterization, RI/FS and remediation activities at numerous sites, many of which were focused on chlorinated solvents or involved current or former dry cleaners. In addition, he has more than two years of experience in evaluation of environmental and remedial assessments, plans and activities, preparation of technical documentation, and grants management with the USEPA. Mr. Wenz will be responsible for preparing and implementing the site characterization work plan, data assessment, report preparation and project management. For this project, he will also serve as health and safety officer, responsible for implementation of the health and safety plan. Resumes for Mr. deArth and Mr. Wenz are provided as part of this Work Plan.

In addition, GE&R will utilize subcontractors for geophysical survey (NAEVA Geophysics), drilling (Eastern Environmental Solutions), surveying (Precision Survey), laboratory services (Alpha Analytical) and data validation (Data Validation Services), as described in Section 2.0 of this Work Plan.

## 3.0 SAMPLING AND DECONTAMINATION PROCEDURES

A detailed description of the procedures to be used during this program for collection of the groundwater, soil vapor, and ambient air samples is provided below. Proposed sample locations are shown on Figure 4 of the Work Plan. As noted, all samples will be collected using new, dedicated sampling equipment. As a result, field decontamination of equipment will not be conducted as part of this site characterization.

### 3.1 Soil Sampling

At the drilling location on 13th Street (GER-1), soil samples will be collected using the direct push method. The direct push rig will be used to cut through the sidewalk, and soil samples will then be collected continuously from immediately below the sidewalk to bedrock (or refusal, whichever comes first), using new, dedicated disposable acetate sleeves. Upon retrieval, each sleeve will be opened and the soil within scanned for total volatile VOCs using a photoionization detector ("PID") and geologically described using the Unified Soil Classification System, including documentation of observations regarding potential contamination such as odors, staining, etc. All descriptions and observations will be documented in a field notebook.

The boring locations were selected primarily to determine groundwater flow direction at the Site and evaluate groundwater quality in the Site vicinity, and are not close enough to the Site to evaluate Site-related soil impacts. As a result, no soil samples are proposed to be collected for laboratory analysis. However, if elevated PID readings (relative to background) are detected in any of the soil characterization samples, one soil sample from the zone of elevated PID readings and the deepest sample within GER-1 will be collected for laboratory analysis. Any soil samples to be analyzed will be collected directly from the acetate sleeve using an EnCore® sampler, and submitted for laboratory analysis of VOCs, using Methods 5035A (sample preparation) and 8260B (sample analysis), with a Category B data package. If soil samples are collected for analysis, blind duplicate and MS/MSD samples will also be collected at a frequency of 5%.

### 3.2 Groundwater Sampling

As shown on Figure 4 of the Work Plan, one temporary well will be located in the sidewalk on the east side of 13th Street, presumably upgradient of the Site, and two temporary wells will be located in the sidewalk on the eastern side of 12th Street, presumably downgradient of the Site. The temporary wells will be installed using the direct push method, and will be constructed using 0.75-inch diameter PVC, with ten feet of screen installed to a depth approximately eight feet below the water table (total depth of approximately 16 feet below

grade). Each temporary well will be developed using a vacuum truck, to establish a good connection between the well and the surrounding formation.

Following completion of development at each probehole, a New York State-licensed surveyor will measure the top of casing and ground surface elevations at each well location, and the depth to groundwater in each well will be measured using an electronic water level indicator. These measurements will be used in conjunction with the top of casing elevations to calculate the groundwater elevation at each well location, which will allow determination of the groundwater flow direction at the Site.

One groundwater sample will be collected from each temporary well. Purging and sampling will be conducted in accordance with the USEPA guidance document entitled, "Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures", dated April 1996. Due to the small diameter of the temporary wells, purging and sampling will be conducted using a peristaltic pump and new dedicated Teflon or Teflon-lined tubing. Samples will be collected into laboratory-supplied sample containers, and will immediately be placed into an iced cooler for transport to the laboratory under Chain of Custody procedures. Purge water will be collected by the vacuum truck for disposal with the development water.

Each groundwater sample will be submitted for laboratory analysis of VOCs, using Method 8260B with a Category B data package. It is expected that reporting limits of 1.0 micrograms per liter will be provided by the laboratory for most parameters in these samples. QA/AC samples will include one blind duplicate sample, one MS sample, one MSD sample, and one trip blank. Blind duplicate and MS/MSD samples will be collected at a frequency of 5% (i.e., one QA/QC sample per twenty environmental samples (or portion thereof)). Since dedicated equipment will be utilized for sample collection, field blanks will not be collected during this program.

Following completion of sampling at each location, the temporary wells will be removed and each probehole will be backfilled with excess cuttings, clean sand and/or cement/bentonite grout, and the sidewalk will be restored with concrete.

### 3.3 Sub-slab Soil Vapor Sampling

The five interior soil vapor samples will be collected from temporary, sub-slab sample points in accordance with the NYSDOH document entitled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York", dated October 2006. As shown on Figure 4, sample GER-SV5 will be collected below the basement floor. At each location, a portable corer will be used to penetrate the concrete foundation for manual installation of the soil vapor sampling probe, which will be conducted using a stainless steel hand auger. Each probe will

be comprised of Teflon tubing installed immediately below the building foundation. The tubing will be surrounded by sand or glass beads and the tubing will be sealed to the foundation with bentonite.

An overturned bucket will be sealed to the floor over the sample location, with the Teflon tubing penetrating the bucket wall. A tracer gas (helium) will be introduced into the bucket, the helium concentration within the bucket will be measured using a helium detector and recorded, and the sample tubing will be purged using a helium detector (the measured helium concentration in the sample tubing will also be recorded). After purging, the sample tubing will be connected to a pre-evacuated, laboratory-supplied Summa canister equipped with a regulator calibrated to provide a 2-hour to 4-hour sample period with a maximum sample rate of 0.2 liter per minute (all regulators will be provided by the laboratory with the canisters, and will all be calibrated for the same sample time). The canister valve will then be opened for sample collection.

The ambient air sample will be collected from an outdoor location in the Site vicinity, over the same time period as the sub-slab soil vapor samples. The results from the ambient air sample will provide comparison criteria for the sub-slab soil vapor samples. Since the Site is currently used as an active dry cleaner, indoor air sampling is not proposed for this program.

The canister vacuum will be recorded prior to sampling and upon completion of sampling. Upon completion of sampling, the canister valve will be closed and the sampling apparatus disassembled. The tubing will be removed and the concrete foundation will be patched. The canisters will be packaged for delivery to the laboratory for analysis of VOCs, using Method TO-15, plus helium. It is expected that a reporting limit of 1.0 micrograms per cubic meter or less will be provided by the laboratory for most compounds.

### 3.4 Sample Handling and Laboratory Analysis

Immediately after collection, each soil (if collected) and groundwater sample will be placed into an iced cooler for subsequent delivery to the laboratory under chain-of-custody procedures. Soil vapor and ambient air samples will be packaged in accordance with laboratory and shipping requirements for delivery to the laboratory under chain-of-custody procedures. Samples will either be picked up by the laboratory, delivered to the laboratory in person by the sampler, or will be 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 ASP.

As described above and summarized in the table below, the sampling program includes collection of three groundwater samples (plus QA/QC samples), five soil vapor samples, and one ambient air sample for laboratory analysis of VOCs. All samples collected during this program will be analyzed by Alpha Analytical of Wyckoff, New Jersey, which is approved under the NYSDOH ELAP for the analyses to be performed. The analyses will be conducted using the latest version of the New York State ASP and the analytical results will be provided with a Category B data package and a 28-day turnaround time.

**Sample Summary**

| Medium | Number of Samples | Analysis | Analytical Method | Container |
|---|---|---|---|---|
| Soil | 0 | VOC | 5035/8260B | EnCore® sampler |
| Groundwater | 7 * | VOC | 8260B | 40-milliliter glass |
| Ambient Air | 1 | VOC | TO-15 | 6-liter Summa canister |
| Soil Vapor | 5 | VOC | TO-15 | 6-liter Summa canister |

* Includes three groundwater samples, one blind duplicate sample (5%), one MS/MSD sample set (5%), and one trip blank.

## 3.5 Investigation-Derived Waste

As described above, excess soil sample material will be returned to the boring from which it was removed (i.e., GER-1). Temporary well development water and purge water generated during groundwater sampling will be contained in a vacuum truck for subsequent proper disposal.

## 3.6 Data Review and Reporting

The Category B data package will be validated by an independent data validation subconsultant (Data Validation Services, who have been approved by the NYSDEC for data validation), and a DUSR summarizing the results of the data validation process will be prepared. The analytical results, qualified as necessary by the data validation and DUSR, will be reviewed and compared against background concentrations and/or applicable New York State criteria:

1. *Soil (if collected)* – Unrestricted or Commercial Soil Cleanup Objectives (as listed in 6NYCRR Part 375);
2. *Groundwater* – Class GA groundwater standards and guidance values for groundwater (as listed in TOGs 1.1.1); and
3. *Soil Vapor* – Ambient air sample results.

A report documenting the Site Characterization will be prepared, and will describe Site conditions and document all applicable observations made during the sample collection program. In addition, the report will include a description of the sampling procedures, tabulated sample results, an assessment of the data and conclusions, and recommendations for follow-up activities, as warranted. The laboratory data packages, DUSR, geologic logs, well construction diagrams, and field notes will be included in the report as appendices. The data will also be submitted to the NYSDEC's Environmental Information Management System ("EIMS") in the standardized electronic data deliverable format.

GENESIS ENGINEERING & REDEVELOPMENT

# RESUMES

GENESIS ENGINEERING & REDEVELOPMENT

**Thomas L. deArth, M.S., R.E.A.**
**President**

As President of Genesis Engineering & redevelopment, Mr. deArth brings over 22 years of consulting and professional experience in the United States and abroad and serves as client manager and technical manager on numerous high profile and complex projects involving soil and groundwater quality impacts and hazardous waste handling and management practices. He provides technical direction and supervises a staff of geologists, engineers, hydrogeologists, and scientists on projects associated with site characterization, remedial design, remedial implementation, system operation, facility management, document management, and litigation support.

Mr. deArth possesses a vast amount of experience in managing large-scale multimillion dollar RI/FS projects involving potential responsible parties (PRPs) under adverse litigious conditions. He has also worked with numerous law firms as a technical expert and strategic advocate to help minimize the environmental liabilities for their national and international clients. In addition, Mr. deArth has significant experience working on as well as providing technical oversight as a consultant on various types of projects including environmental assessments, Remedial Investigations (RI), Due Diligence/Environmental Site Assessments (ESA), Feasibility/Treatability Studies (FS/TS), Remedial Design (RD), and Remediation/ Closure, environmental/ISO 14001/OSHA compliance/ safety audits, job safety analysis, hazmat emergency response, spill prevention/ management, waste management (hazardous, solid and wastewater), hazardous materials transportation, hydrologic/ hydrogeologic characterizations and analysis, RCRA, CERCLA, HMTA, EPCRA, $P^2$, CAA, & ISO 14000.

**EDUCATION:**
M.S. in Hydrology/Hydrogeology, California State University, Chico
B.S. in Environmental Science, California State University, Chico

**EXPERIENCE:**
President – Genesis Engineering & Redevelopment, present
Vice President/Midwest Reg. Mgr. – EnviroForensics, 2000-2005
Senior Project Manager - Dames & Moore, 1997-2000
Technical Advisor/Consultant - Cambodia Ministry Environment/International Development Research Center, 1996-1997
Senior Project Manager - A/C Industrial Services Corp., 1993-1996
Operations Mgr/Project Mgr - North State Env. Dynamics, 1988-1993
EH&S Manager - California State University, Chico, 1984-1988

**Thomas L. deArth, M.S., R.E.A.**
**(Continued)**

## REPRESENTATIVE PROJECTS

Site Characterization / Soil and Groundwater Remediation

***Southwest & Central PCE Plumes, California.***
*Senior Project Manager* for the Chico Southwest and Chico Central PCE Plumes' Intermediate and Deep Aquifer Water Quality Monitoring program. With annual total combined budget of nearly $600,000, this program consisted of the investigation, monitoring, and associated data analysis and reporting for a solvent plume that extended down through numerous aquifers to a total depth of over 450 feet below ground surface (bgs).

***Southeast TCE Plume, California.***
*Client and Program Manager* for the Chico Southeast Plume Deep Aquifer Investigation and Intermediate and Deep-Aquifer Quality of Water Monitoring program. This program has resulted in field investigations of a large chlorinated solvent contaminant plume that approached $800 in the final year of investigation activities. Project activities included the installation of 22 Intermediate and Deep Aquifer monitoring wells and the designed and development of a remediation action plan.

***Former McNamara and Peepe Sawmill, California.***
*Client/Program and Senior Project Manager* responsible for client management activities as well as the overall design, budget development, implementation and oversight of an $2 + million d RI/FS based site characterization and remedial program for a 10 acre site contaminated with PCBs, dioxins, petroleum hydrocarbons, PCP/TCP, and heavy metals. The RI/FS involved the collection of hundreds of soil, sediment, surface and groundwater samples that will be used in the development of a baseline human health risk assessment, ecological risk assessment, which was used in the designed and implementation of an approved Remedial Action Plan (RAP).

***Merck & Co. Inc., Banyu Pharmaceutical Kugosaki Manufacturing Facility, Aichi, Japan.***
*Senior Project Manager* responsible for overall design, budget development, implementation and technical oversight of RI/FS, Remedial Design, and Remedial Action Plan (RAP) for a pharmaceutical manufacturing site contaminated with significant amounts of mercury and organoarsenic compounds. Mr. deArth managed a team of project managers over a two year period as the $6.7 million project moved from its preliminary investigation phases through the design and implementation of a complex set of soil and groundwater remedial alternatives that included the design and construction of a 2,500 meter cut-off trench designed to impede further contaminant migration offsite to adjacent sensitive areas. As the client manager, Mr. deArth liaised with regulators to negotiate remedial goals and prepared and presented periodic updates

presentations to Merck executives. As the project included an added element of public sensitivity, working with public relations experts, he developed and oversaw in the implementation of a broad based 5 year public relations program.

***DuPont Chemical, Ibaraki Works Facility, Ibaraki, Japan.***
*Senior Project Manager* responsible for the client management and overall design and implementation of an extensive hydrogeologic and geophysical investigation and subsequent remedial measures of PCB and solvent contamination associated with a large chemical manufacturing facility. This $3.9 million project involved the installation of a large groundwater monitoring network that extended into underlying intermediate and deep aquifers. In addition, Under Mr. deArth direction remedial measures that included the in-situ and ex-situ remediation of approximately 15,000 cubic yards of contaminated soil were. Through Mr. deArth's negotiation and managerial strategy, the client was able to meet stringent project standards and tight regulatory deadlines. Mr. deArth was ultimately successful in obtaining site closure for his client.

***Federated Insurance Company, California***
*Senior Project and Client Manager*-managed and directed all aspects of this $2.5 million project from project inception through the design of final remedial stages. With over 4,000 gallons of chlorinated solvents released into soils adjacent to the upper reaches of the Sacramento River, the project involved the design and implementation of a RI/FS, baseline human health risk assessment, ecologic risk assessment, remedial design and action plan as the released material migrated into underlying soil, groundwater, and the nearby surface waters and sediments of the Sacramento River. As the client manager Mr. deArth provided final project oversight, including reporting requirements and agency negotiations. Mr. deArth was successful in obtaining site closure for his client.

***Chico Unified School District Senior High School, California.***
*Client and Senior Project* for the design and implementation of a focused FI/FS, Remedial Design, and subsequent Remedial Action Plan for soil and groundwater contamination underlying Chico Senior High School in Chico, California. In addition, Mr. deArth directed field staff in an extensive around the clock site remediation program that involved the excavation of approximately 12,000 cubic yards of contaminated soil and follow-up site restoration and well as subsequent soil and groundwater remediation. Throughout this $1.6 Million dollar project, Mr. deArth provided final project oversight and served as a liaison between his client and the Lead Regulatory Agencies during project negotiations, reporting and final site closure.

**Thomas L. deArth, M.S., R.E.A.**
**(Continued)**

Landfill Mitigation

***U.S. Department of Interior, Bureau of Land Management, Fitzgerald Ranch, California.***
*Client and Senior Project Manager*- conducted an extensive RI/FS of a former landfill containing pesticides owned by BLM and located in West Sacramento County, California. Under Mr. deArth's direction, proposed cost, a Remedial Design, its Feasibility Study and Remedial Action Plan were generated for the client and subsequent remedial actions were carried out for successful site closure. As the client manager, Mr. deArth served a liaison in project negotiations with the Lead regulatory Agencies (California Regional Water Quality Board and Cal EPA DTSC). Remedial efforts associated with this 2.45 million dollar project involved the excavation of and ex-situ remediation of 15,000 cubic yards of toxephene contaminated soil, the installation of an extensive groundwater monitoring network and extraction and treatment of pesticide contaminated groundwater.

***Barceloux Trust, California.***
*Client and Senior Project Manager* responsible for the overall costing, design and implementation of a soil and groundwater investigation of pesticide and heavy metal contaminated site that was formally utilized as a country landfill in Glenn County, California. Under Mr. deArth oversight, onsite and adjacent site investigations included soil gas surveys, hydrogeologic and geophysical investigations. Mr. deArth led an engineering team in the design of remedial alternatives designed to impede contaminated groundwater migration from reaching adjacent sensitive areas. Mr. deArth was ultimately successful in obtaining site closure for his client.

Environmental Audits

***Louisiana-Pacific Corporation, California.***
*Senior Project and Client Manager*- conducted comprehensive environmental audits of Louisiana-Pacific's California lumber, plywood, and composite board manufacturing and processing facilities. Audits included an assessment for compliance of all relevant local, state and federal environmental and OSHA health & safety regulations as they pertained to each facility, their operations and personnel tasks procedures. In addition to an overall program evaluation, the audit included the development of a comprehensive report that described the findings associated with Mr. deArth's thorough investigation of facility operations, various environmental health & safety programs, facility procedures and program documentation.

***Bowater-Hall Paper Corporation, Mokpo, Korea***
*Client and Senior Project Manager*- conducted an environmental audit of Bowater Mokpo paper manufacturing facility located in Mokpo, Korea. The audit was designed to cover both corporate environmental standards (as per US regulations) and Korean environmental

regulations as well as ISO 14001 standards as they pertained to site operations. In addition to an overall program evaluation, the audit included a thorough investigation of facility operations, various environmental health & safety programs, facility procedures and program documentation. Mr. deArth concluded the audit with a comprehensive report and presented results to Bowater executives.

Regulatory Compliance

***Aero Union International Corporation, California.***
*Senior Project and Client Manager*- conducted a comprehensive ISO 140001 based environmental and OSHA based health & safety audit of Aero Union's (AU) manufacturing and maintenance facilities in Chico, California in effort to evaluate AU's compliance with local, state and federal standards. In an effort to alleviate regulatory deficiencies, Mr. deArth developed various required programs such as a corporate/facility, Hazard Communication, Hazardous Materials Management and Hazardous Waste Management, Respirator Protection and Spill Prevention Control and Countermeasure and Facility Contingency plans and programs. Mr. deArth also developed a comprehensive training manual and subsequently provided training to all facility personnel. Upon completion, Mr. deArth generated an all-inclusive report and presented findings to corporate executives in a project closure meeting.

***County of Butte, Oroville, California.***
*Senior Project and Client Manager*- managed/conducted thorough assessments of all county departments in an effort to determined the level of County environmental/health and safety regulatory compliance. Once the audits were completed, Mr. deArth managed and provided final oversight in the development of a county-wide and departmental Hazard Communication, Hazardous Materials Management and Hazardous Waste Management, Respirator Protection and Spill Prevention Control and Countermeasure and Facility Contingency plans and programs. The project was finalized in with the development and implementation of comprehensive as well as site-specific training programs for all county employees.

Emergency Response

***Union Pacific Railroad Company (UPRR), Feather River Canyon, California.***
*Client and Senior Project Manager* for an emergency response (and subsequent environmental investigations/remedial activities) involving a train derailment and release of 14,000 gallons of diesel into a hillside adjacent to the Feather River in the Feather River Canyon. Due to heavy rains, and associated high velocity of the Feather River, the diesel quickly migrated into Lake Oroville, located approximately 30 miles downstream. Under Mr. deArth's direction, a field staff provided emergency response measures, which included the development of a an extensive contaminant containment system whereby thousands of feet a absorbent booms were deployed, subsequent remedial investigations, remedial designs, implementation and associated

reporting. On behalf of his client, Mr. deArth's successfully negotiated regulatory closure for the initial spill site (Feather River and Lake Oroville) within one year of the derailment.

***California Department of Transportation (CalTrans), Northern California.***
*Senior Project Manager*- provided first responder management and final project oversight of numerous hazardous material related emergency response associated with a three year, multi-million dollar regional contract that covered Northern California. Most of the responses and subsequent site remediation involved the release of transported hazardous substances or illegally releases along CalTrans maintained roads and highways. On behalf of his client, Mr. deArth negotiated remedial levels and obtained site closure through efficient remedial strategies and associated reporting.

Litigation Support and Asset Management

***Contaminated Property Transactions, Locations throughout the United States.***
*Client and Project Manager*- Represented several hundred buyers and sellers with property transactions involving the purchase and sale of contaminated properties. Responsibilities have included developing cleanup costs and negotiating site remediation objectives with regulatory agencies, providing guaranteed cleanup financing, and maximizing the assets of environmentally impaired property. Many of the projects involved identifying historical owners and operators, and their insurers, working with legal counsel to conduct due diligence activities, conducting site investigation and cleanup activities, and conducting technical and fact finding research to develop project upside.

***General Waste Products, Evansville, Indiana***

*Senior Project Manager* for the site investigation and cleanup of a former metal salvage yard contaminated with PCBs. The project involved the prospective purchase of the property by the City of Evansville for use as a park following site cleanup Mr. deArth directed a team of professionals through exhaustive search of the company records to locate historical insurance policies and identify parties responsible for the contamination as part of a extensive contributing source investigation that identified over 700 PRPs and led to an extensive RCRA based PCB site investigation and remediation program valued at over $ 9 million. To date the historical insurance carriers have funded investigation and remedial activities with no out-of-pocket expenses to our client.

***Jacksonville Ash Sites, Jacksonville, Florida***

*Senior Project Manager* on a class action lawsuit for medical monitoring. Case involved the exposure of residences, workers, and students to concentrations of hazardous substances well above established background levels. The exposures were the result of contaminants

generated during the incineration of waste and were in the form of ash and partially incinerated constituents from the stacks of the incinerators. Mr. deArth was responsible for providing litigation support that included collecting soil and ash samples from residential neighborhoods, evaluating available technical reports, discovering an analysis of the historical operations of the incinerators, and developing trial exhibits.

***Stringfellow Superfund Site, California.***
*Client and Senior Project Manager*- Assisted the legal team with litigation associated with the defining the allocation of investigation and remediation costs spent by the State of California and their insurance carriers. Mr. deArth led a team of technical experts in a review of over $88 million of invoices associated with all the environmental work that had been conducted on the project to determine if the associated costs were reasonable and necessary and to appropriately categorize the cost for litigation.

***Victor Industries, California.***
*Client and Senior Project Manager*- provided the legal team with the technical support associated with a large solvent plume that affected downgradient water potable water usage. Mr. deArth was a key member of the mediation team in a large global settlement between the State of California and several insurance carriers.

***Solvent and Petroleum Plumes, California, Illinois, and Indiana.***
Client and Senior Project Manager- provided technical support for legal teams associated with numerous solvent and petroleum plumes. Designed and conducting a contributing source investigation that identified as many and included over 450 potential responsible parties. Mr. deArth continues to assist with legal support and forensics associated with an ongoing CERCLA investigation of the responsible parties for many of these cases.

GENESIS ENGINEERING & REDEVELOPMENT

**Kenneth P. Wenz, Jr., C.P.G., P.G., L.E.P.**
**Senior Geologist/Senior Project Manager**

Kenneth P. Wenz, Jr. is a geologist with more than 24 years of professional experience in the environmental field, comprising both consulting and regulatory positions. He has performed and managed projects in New York, New Jersey, Connecticut, Pennsylvania and Vermont. These projects have included Brownfield projects, federal and state Superfund investigation and remediation programs, various New Jersey ISRA investigations, property transfer investigations in several states, and soil, soil vapor, sediment and water assessment and remediation activities for numerous commercial, industrial and government clients. In addition, he has more than two years of experience in evaluation of environmental and remedial assessments, plans and activities, preparation of technical documentation, and grants management with the USEPA. His diverse experience includes roles as director/manager, project manager, field supervisor and team member, and he has managed a wide variety of projects, ranging from long-term multi-million dollar projects to smaller, finite projects with rapid turnaround requirements.

**EDUCATION:**
M.S. in Geology, 1988, University of Massachusetts
B.A. in Geology, 1983, Colgate University

**CERTIFICATIONS:**
Certified Professional Geologist (AIPG), CPG-8934
Registered Professional Geologist in Pennsylvania, PG001273G
Licensed Environmental Professional in Connecticut, LEP-408
Certified Subsurface Evaluator in New Jersey, No. 0017133
Transportation Worker Identification Credential (TWIC)
Health and Safety Operations at Hazardous Waste Sites (OSHA)

**EXPERIENCE:**
Senior Geologist/Senior Project Manager, GE&R, 2011-Present
Adjunct Professor, SUNY Stony Brook, 2011-Present
Senior Geologist/Senior Project Manager, Holzmacher, McLendon and Murrell, PC, 2007-2010
Senior Geologist/Senior Associate, Dvirka and Bartilucci Consulting Engineers, 1997-2007
Senior Project Hydrogeologist, ERM-Northeast, 1989-1997
Geologist, U.S. Environmental Protection Agency, 1987-1989

**REPRESENTATIVE PROJECTS:**

*Town of Oyster Bay, NY:* Project Manager for large-scale soil quality investigation at the Liberty Industrial Finishing Site (federal Superfund site) in Farmingdale, New York, to evaluate whether additional soil remediation is warranted at the site as a result of modification of the planned reuse scenario from industrial/commercial to recreational, and in support of potential acquisition of a portion of the property. Responsibilities included project scoping and work plan development (site-specific health and safety plan and site-specific quality assurance project plan),

oversight of field personnel and subcontractors, data review and interpretation, site characterization, development of remediation plans for various redevelopment scenarios, report preparation, budget management and negotiations with town and USEPA personnel.

*New York State Department of Environmental Conservation:* Project Manager for numerous RI/FS, Preliminary Site Assessment (PSA) and Brownfield site assessment projects, responsible for project design and scoping, work plan development and implementation, management of field personnel and subcontractors, data evaluation, budget development and management, report preparation, assessment of the need for remediation and development of remediation alternatives, if warranted, and public presentations regarding projects. Projects ranged from single-property PSAs to multi-site, regional groundwater investigations covering hundreds of acres, with varied contaminants of concern, including petroleum products, chlorinated solvents, pesticides, PCBs and heavy metals, and media of concern, including soil, sediment, soil vapor, groundwater and surface water.

*Town of Oyster Bay, NY:* Project Manager for technical assistance project regarding the Liberty Industrial Finishing Site (federal Superfund site) in Farmingdale, New York. Responsibilities include review of technical documents, management and coordination of staff for remedial construction observation and split sampling activities, data assessment, identification of areas where additional remediation is required, budget management, preparation of progress reports, coordination with regulatory personnel and other consultants, and presentations at project meetings.

*New York State Department of Environmental Conservation:* Assistant Contract Manager for Superfund Standby Contract. Responsibilities included tracking of projects' status, budget evaluation, preparation and review of work plans and reports, public presentations, and regular contact with NYSDEC technical and administrative personnel regarding contract issues.

*SUNY Stony Brook:* Project Manager for a petroleum investigation and remediation program at the Southampton, NY campus. Responsibilities included review of background information and development of a soil sampling program to investigate the horizontal and vertical extent of soil impacts from the spill, oversight of field personnel and subcontractors, data evaluation and preparation of a soil sampling report, development of a remediation approach for impacted soil, development of a groundwater monitoring plan, budget management and negotiations with regulatory personnel.

*New York City Economic Development Corporation:* Project Manager for waste disposal project in Brooklyn, New York, involving hazardous (lead-containing) and TSCA (PCB-impacted) sediments dredged from the East River. Responsibilities included review of chemical data, identification and assessment of disposal alternatives, management and coordination of staff

providing continuous on-site client representation during loading and transportation, review of returned manifests, coordination with federal and New York State regulators regarding waste disposal reporting, budget management, and presentations at project meetings.

*SUNY Stony Brook:* Project Manager for soil and sediment investigation and remediation program at the Southampton, NY campus. Responsibilities included project scoping and preparation of budget estimates, oversight of field personnel and subcontractors, data review and assessment, development and implementation of remediation plans, report preparation, budget management and negotiations with client and regulatory agency personnel.

*Private Developer, Suffolk County, NY:* Project Manager for environmental due diligence program related to redevelopment of a 53-acre portion of a former military airbase and current airport. Responsibilities include project scoping, review of historic documents, oversight of investigation and remediation activities conducted by the current property owner, management of field personnel and subcontractors, data evaluation, budget development and management, report preparation, and negotiations and coordination with regulatory personnel, the current property owner and its consultant.

*City of Glen Cove, New York:* Project Manager for Phase I, Phase II and Phase III environmental site assessments at various Brownfield sites, responsible for project scoping, work plan development and implementation, management of field personnel and subcontractors, data collection and evaluation, budget development and management, report preparation, evaluation of remediation alternatives, preparation of remediation plans, negotiations with regulatory personnel and developers, and litigation support.

*Private Developer, Nassau County, NY:* Project Manager for RCRA closure/remediation and sanitary system remediation program at a former industrial printing facility. Responsibilities include preparation of closure plan (including site-specific health and safety and quality assurance plans), review of historic sample data to support closure of open spill case, management of field personnel and subcontractors, data evaluation, compliance inspection, budget development and management, report preparation, and coordination with State and County regulators and the current property owner.

*City of Stamford, Connecticut:* Project Manager for Phase I, Phase II and Phase III environmental site assessments at various Brownfield sites, responsible for project scoping, work plan development and implementation, management of field personnel and subcontractors, data collection and evaluation, budget development and management, report preparation, evaluation of remediation alternatives, preparation of remediation plans, negotiations with regulatory personnel, and development, design and implementation of the remediation programs.

**Kenneth P. Wenz, Jr., C.P.G., P.G., L.E.P.**
**Senior Geologist/Senior Project Manager**

*New York State Department of Environmental Conservation:* Project Manager for Brownfield site investigation programs in New York City and Yonkers, which were funded by the NYSDEC using a Targeted Site Assessment grant from the USEPA. Responsibilities included project scoping, work plan and budget development, oversight of field personnel and subcontractors, data review and evaluation, preparation of a human health exposure assessments, report preparation, budget management, and negotiations with representatives of regulatory and local agencies.

*City of Stamford, Connecticut:* Project Manager for Phase II Environmental Site Assessment at a former landfill that was redeveloped as a park in Stamford, CT. Responsibilities included negotiations with regulatory personnel and local government officials, project scoping, work plan and budget development, oversight of field personnel and subcontractors, data review and evaluation, preparation of human health exposure assessment, report preparation, development of proposed remediation plan, and budget management.

*New York City Economic Development Corporation:* Project Manager for Brownfield site investigation for the City of New York. Responsibilities included review of historic site information, oversight of field personnel and subcontractors, geologic characterization, data review and interpretation, preparation of a human health exposure assessment, report preparation, budget management, and client and regulatory negotiations.

*Town of North Hempstead, NY:* Project Manager for regional groundwater investigation in the vicinity of a closed landfill in Port Washington, New York. Responsibilities included project scoping and selection of groundwater profiling locations, work plan development, oversight of field personnel and subcontractors, data assessment, report preparation, negotiations with USEPA personnel and budget management.

*Con Edison and Private Developer:* Project Manager and field inspector for engineering oversight project in New York City. Responsibilities included providing independent oversight of investigation and remediation activities at a former manufactured gas plant and active Consolidated Edison generating plant, evaluation of compliance with approved work plans and remediation plans, management of other field inspectors, data review, review of project-related reports and correspondence, preparation of documents provides technical opinions on whether investigation and remediation activities were conducted in conformance with approved work plans and remediation plans, as warranted, and budget management.

*Islip Resource Recovery Agency, Islip, NY:* Project Manager for multiple post-remediation groundwater monitoring programs for closed landfill sites, including federal and state Superfund sites. Responsibilities include project scoping, preparation of site-specific health and safety plan

and quality assurance plan), management of field personnel, data evaluation, budget development and management, report preparation and coordination with regulatory personnel.

*Purex Industries:* Assistant project manager for long-term investigation and remediation at an industrial facility in Millville, NJ. Responsibilities included supervision of field personnel and subcontractors; negotiations with State and local regulators, client, and site occupants; participation in regulatory meetings; delineation of soil and ground water contamination; preparation of permit documents and reports.

*Northrop Grumman Corporation:* Field team leader for Phase II investigations and remediation activities at various sites in Nassau and Suffolk Counties, NY. Responsibilities included supervision of field personnel and subcontractors; delineation of contamination; client and regulatory negotiations; remediation analysis; report preparation; budget management.

*Metro-North Railroad:* Assistant project manager and field team leader for petroleum delineation at several rail yards in New York and Connecticut. Responsibilities included supervision of field personnel and contractors, delineation of free-phase and dissolved contamination, client and regulatory negotiations, remediation analysis and report preparation.

*Private Developer, Nassau County, NY:* Project Manager for a site remediation program at a former commercial property in Lake Grove, NY, conducted to address environmental impacts identified as part of due diligence activities, including petroleum storage tanks, pesticide-impacted soils and abandoned sanitary structures. Responsibilities included review of background information, preparation of a remediation plan for the identified environmental conditions, oversight of field personnel and subcontractors, data evaluation and reporting, budget management and negotiations with local regulatory personnel.

GENESIS ENGINEERING & REDEVELOPMENT

# APPENDIX B

## Health and Safety Plan

GENESIS ENGINEERING & REDEVELOPMENT

# APPENDIX B

# PROJECT HEALTH AND SAFETY PLAN

**for**

## Site Characterization Work Plan

## Best-DDK Cleaners
## 38-68 13th Street,
## Long Island City, New York

**Site Number 241126**

Prepared For:

Mr. Jae Moon and
Ms. Maryuhn Young Moon
38-68 13th Street
Long Island City, New York

Prepared By:

Genesis Engineering & Redevelopment, Inc.
15-41 125th Street
College Point, New York 11356

October 21, 2011

GENESIS ENGINEERING & REDEVELOPMENT

# TABLE OF CONTENTS

GENESIS ENGINEERING & REDEVELOPMENT

## TABLE OF CONTENTS
## (Continued)



### TABLE



### FIGURE



### ATTACHMENTS

## 1.0 INTRODUCTION

This Health and Safety Plan (HASP) was developed for site characterization activities at the property located at 38-68 13th Street, Queens, New York (Site). The Site location is shown on Figure 1. The HASP provides information on the potential hazards and general health and safety guidance for personnel conducting the field activities at the Site, as described in Section 2.0 of the Work Plan. Site characterization data presented in previous investigation reports for the Site were used to prepare this HASP.

The following regulatory, guidance, and background documents were used in developing the HASP:

- *Standard Operating Safety Guides* (USEPA, 1988)
- *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (National Institute for Occupational Safety and Health [NIOSH], Occupational Safety and Health Administration [OSHA], United States Coast Guard [USCG], U.S. Environmental Protection Agency [USEPA], 1985)
- Title 29, Code of Federal Regulations (29 CFR)
- 6NYCRR Part 375
- NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10)

As authorized by the Owners, Genesis Engineering & Redevelopment, Inc. ("GE&R") will conduct a site characterization investigation to assess whether historic Site operations have impacted the quality of soil, groundwater or soil vapor beneath the Site.

### 1.1 Scope of HASP

This HASP provides the standard operating safety procedures to be used by GE&R personnel conducting the following activities:

- Advancement of exploratory borings for subsurface soil and groundwater sampling at three exterior locations.
- Installation and sampling of temporary soil vapor points at five interior locations.

GE&R personnel will observe field activities. All subcontractors shall be required to develop and follow their own project-specific HASP. Each subcontractor is individually responsible for following all federal, state, and local regulations and requirements applicable to their

operations. Upon request, subcontractors shall provide GE&R with a copy of their HASP, documentation of training, medical surveillance program participation, respirator fit-test records, and workers compensation insurance for all personnel conducting field activities.

## 2.0 PROJECT SAFETY AUTHORITY

The following personnel are responsible for project health and safety, for GE&R personnel only, under this HASP:

- Project Manager
- Field Team Leader
- Corporate Health and Safety Officer (CHSO)

In addition, each individual working at the Site will be responsible for compliance with the health and safety procedures established herein as well as conformance with general safe work practices, and each member of the GE&R field team shall have the authority to stop work if a potentially hazardous situation or event is observed.

### 2.1 Project Manager

The Project Manager is responsible for the overall operation of the project. For this project, the Project Manager will also act as the Health and Safety Manager. In addition, the Project Manager is responsible to assure compliance with the health and safety procedures established herein, as well as conformance with general safe work practices.

### 2.2 Field Team Leader

The Field Team Leader is responsible for disseminating the information contained in the HASP to GE&R staff assigned to this project. The Field Team Leader may also act as the health and safety manager. At the time of the job assignment, the Field Team Leader will have a minimum of forty hours of initial training, three days of supervised field experience and at least eight hours of specialized hazardous waste operations management training on topics regarding the employer's safety and health program and the associated employee training, personal protective equipment (PPE), spill containment and health hazard monitoring procedures and techniques. The Field Team Leader is also responsible for coordination of daily Site work including required safety preparations (such as utility mark-outs, and availability and calibration of test equipment). The Field Team Leader will conduct Site safety meetings in the absence of the Corporate Health and Safety Officer (CHSO).

## 2.3 Corporate Health & Safety Officer

The CHSO is also responsible for disseminating the information contained in this HASP to all personnel assigned to the project. The CHSO has the authority to suspend work any time that it is determined the provisions of this HASP are not being met.

The CHSO is responsible for:

- Overall Site safety
- Enforcing safe work practices
- Ensuring that Site safety meetings are conducted
- Inventorying equipment and supplies
- Accident investigation and reporting
- Workers Compensation reporting
- Reviewing the HASP for accuracy on a regular basis
- Assessment of Site hazards

The CHSO shall review the requirements of this HASP during a health and safety (H&S) meeting with all project personnel before each phase of the field activities begins. The Field Health and Safety Form (included as Attachment 1) will be completed for each H&S meeting. Safe work practices, control of potentially impacted materials, and protection of personnel and property as described in this HASP shall be emphasized during each safety meeting. GE&R field personnel will be required to sign a certificate confirming that they have read the HASP and that they will comply with the plan provisions.

Each field subcontractor shall identify its H&S Officer for this project by name before the field activities begin. Telephone numbers of these individuals (as emergency contacts) shall also be provided.

## 2.4 Project Personnel

Consultants and subcontractors are responsible for ensuring that they completely understand how to safely perform all aspects of their job at the Site. The project personnel and subcontractor(s) will not compromise safe operating procedures at any time. If they are unclear about any aspect of their job, they should immediately ask the supervisor of the field activities. The project personnel and subcontractors are responsible for reporting any unsafe condition, accident, or near miss to the supervisor of the field activities.

# 3.0 HAZARD ASSESSMENT AND CONTROL MEASURES

## 3.1 Human Exposure Pathways

Potentially-impacted soil, groundwater and soil vapor at the Site is the primary media of concern for personnel exposure during implementation of field activities. The potential exposure pathways for constituents of concern ("COC") include dermal contact, incidental ingestion and inhalation of vapors during the field activities. The overall potential for inhalation of dust or vapors is expected to be relatively low, because the entire Site area is covered by sidewalk or building, and because direct push methods will be used for soil and groundwater sampling activities. Dermal contact and incidental ingestion pathways will be minimized through a vigilant personal hygiene program and the use of respiratory and PPE when thresholds are exceeded. Air monitoring in the breathing zone will be performed to confirm that ambient VOC concentrations are below prescribed action levels (Section 4.0 below and Section 2.5 of the Work Plan). For this project, potential exposures will be controlled primarily through the use of safe work practices and PPE.

## 3.2 Chemical Hazards

Based on historic data and the current use of the Site for dry cleaning, the primary COCs anticipated to be encountered at the Site include:

- Tetrachloroethene ("PCE")
- Trichloroethene ("TCE")

Attachment 2 includes the Material Safety Data Sheets ("MSDS") for PCE, TCE and cis-1,2-DCE. All personnel are required to review the MSDSs and ensure that all information presented in them is completely understood. Since the MSDSs provide information based on essentially 100% pure chemical, adherence to the MSDS information will provide project personnel with the highest level of protection from adverse health effects.

The permissible exposure limits ("PEL") are defined as the time-weighted average concentrations for a nominal eight-hour work day and a 40-hour work week, to which nearly all workers may be repeatedly exposed without adverse effect. The immediately dangerous to life and health ("IDLH") criteria are defined as the maximum level from which a person could escape within 30 minutes without loss of life or irreversible health effects (*NIOSH Pocket Guide to Chemical Hazards,* U.S. Department of Health and Human Services).

It should be noted that the concentrations of the COCs in groundwater are reported on a weight-to-volume in water ratio (grams per liter). As a result, they are not directly comparable to the inhalation exposure route criteria for PELs and IDLHs which are reported on a weight-to-volume or volume-to-volume ratio in air.

### 3.3 Physical Hazards

The physical hazards associated with the field activities likely present a greater risk of injury than the chemical constituents at the Site. Activities within the scope of this project shall comply with New York State and Federal OSHA construction safety standards.

#### 3.3.1 Head Trauma

To minimize the potential for head injuries, field personnel will be required to wear NIOSH-approved hard hats during all field activities. Hats must be worn properly and not altered in any way that would decrease the degree of protection provided.

#### 3.3.2 Foot Trauma

To avoid foot injuries, field personnel will be required to wear steel-toed safety shoes while field activities are being performed. To afford maximum protection, all safety shoes must meet American National Standards Institute (ANSI) standards.

#### 3.3.3 Eye Trauma

Field personnel will be required to wear eye protection (safety glasses with side shields) while field activities are being performed to prevent eye injuries caused by contact with chemical or physical agents.

#### 3.3.4 Noise Exposure

Field personnel will be required to wear hearing protection (ear plugs or muffs) in high noise areas (noise from heavy equipment) while field activities are being performed. Local noise ordinances will be observed during execution of the field activities. Any elevated noise levels from field activities will be minimized, and limited to normal working hours.

#### 3.3.5 Heavy Equipment Limitations

Vehicles and heavy equipment shall not exceed a speed limit of ten miles-per-hour in the project area. Drivers and equipment operators will wear seat belts at all times. No riders will be allowed on heavy equipment or in vehicles unless seats and seat belts are available for their use.

### 3.3.6 Buried Utilities and Overhead Power Lines

Boring locations will be examined by project personnel, facility representatives, and an underground utility locator service, so that utilities will be protected during drilling activities. In addition, prior to intrusive activities, the drilling subcontractor will contact the One Call Center to arrange for a utility mark-out, in accordance with New York State requirements. Protection from overhead power lines will be accomplished by maintaining safe distances of at least 15 feet at all times.

### 3.3.7 Thermal Stress

Adverse climate conditions are an important consideration in planning and conducting Site operations. The effects of ambient temperature can cause physical discomfort, personal injury, and increase the probability of accidents. In addition, heat stress due to lack of body ventilation caused by protective clothing is an important consideration. Heat-related illnesses commonly consist of heat stroke and heat exhaustion.

The symptoms of heat stroke include:

- Sudden onset
- Change in behavior
- Confusion
- Dry, hot, and flushed skin
- Dilated pupils
- Fast pulse rate
- Body temperature reaching 105° or more
- Deep breathing later followed by shallow breathing

The symptoms of heat exhaustion include:

- Weak pulse
- General weakness and fatigue
- Rapid shallow breathing
- Cold, pale, clammy skin

- Nausea or headache
- Profuse perspiration
- Unconsciousness
- Appearance of having fainted

Heat-stress monitoring will be conducted if air temperatures exceed 70 degrees Fahrenheit. The initial work period will be set at 2 hours. Each worker will check his/her pulse at the wrist for 30 seconds early in each rest period. If the pulse rate exceeds 110 beats per minute, the next work period will be shortened by one-third.

One or more of the following precautions will reduce the risk of heat stress on the Site:

- Provide plenty of liquids to replace lost body fluids; water, electrolytic drinks, or both will be made available to minimize the risk of dehydration and heat stress
- Establish a work schedule that will provide appropriate rest periods
- Establish work regimens consistent with the American Conference of Governmental Industrial Hygienists (ACGIH) guidelines
- Provide adequate employee training on the causes of heat stress and preventive measures

In the highly unlikely event of extreme low temperatures, reasonable precautions will be made to avoid risks associated with low temperature exposure.

### 3.3.8 Traffic

Field activities will occur near public roadways. As a result, vehicular traffic will be a potential hazard during these activities and control of these areas will be established using barricades or traffic cones. Additional staff will be assigned as warranted for the sole purpose of coordinating traffic. Personnel will also be required to wear high-visibility traffic vests while working in the vicinity of the public roadways and local requirements for lane closure will be observed as needed. All work in public rights-of-way will be coordinated with the local authority and will adhere to their requirements for working in traffic zones.

### 3.3.9 Electric Shock

All electrical equipment to be used during field activities will be suitably grounded and insulated. Ground fault circuit interrupters (GFCI) will be utilized with all heavy electrical equipment to reduce the potential for electrical shock.

### 3.3.10 Hazardous Weather Conditions

All Site workers will be made aware of hazardous weather conditions, specifically including extreme heat, and will be requested to take the precautions described herein to avoid adverse health risks. All workers are encouraged to take reasonable, common sense precautions to avoid potential injury associated with possible rain or high wind. Conditions of sleet, snow or freezing are extremely unlikely.

### 3.3.11 Slip, Trip and Fall

Areas at the Site may be slippery from mud or water. Great care should be taken by all Site workers to avoid slip, trip and fall hazards. Workers shall not enter areas that not have adequate lighting. Additional portable lighting will be provided at the discretion of the CHSO or the Field Team Leader, if necessary.

### 3.3.12 Biological Hazards

Drugs and alcohol are prohibited from the Site. Any worker or oversight personnel suspected of being in an impaired condition, as a result of drugs or alcohol, will be immediately expelled from the Site.

Any worker or oversight personnel with a relevant medical condition that may require attention should inform the Field Team Leader or CHSO of such condition. The CHSO will describe appropriate measures to be taken if the individual should become symptomatic.

Due to the Site location in an urban area, it is highly unlikely that poisonous snakes, spiders, plants, and insects will be encountered. However, other animals (dogs, cats, etc.) may be encountered, and care should be taken to avoid contact.

### 3.3.13 Excavations

The scope of work for this project does not include excavation of test pits or trenches. As a result, excavations are not a concern for this project.

### 3.3.14 Confined Space Entry

Confined spaces may be described as having, but not being limited to, the following characteristics:

- Large enough to permit an employee to enter and perform work
- Limited or restricted means of entry and exit
- Not equipped, designed, or intended for continuous human occupancy

In addition, one or more of the following conditions may be present in a permit-required confined space:

- Contains or has the potential to contain a hazardous atmosphere
- Contains or has the potential to contain a material with the potential to engulf or entrap an employee
- Configured that an employee may become trapped, disoriented, or asphyxiated by wall configurations or smaller cross sections
- Contains any other established safety or health hazards, such as energized equipment or moving parts

The scope of work for this project does not include planned entry into confined spaces. However, if site conditions require such entry to complete the scope of work, a confined space entry plan will be prepared prior to any entry.

## 4.0 AIR MONITORING

Air monitoring will be conducted in accordance with the Community Air Monitoring Plan (CAMP) presented in Section 2.5 of the Work Plan. If work is stopped per the CAMP due to elevated total VOC readings, the Project Manager, Field Team Leader and CHSO will evaluate whether the respiratory protection level currently in place (Level D) remains appropriate, and upgrade as required.

## 5.0 PERSONAL PROTECTIVE EQUIPMENT

Using the appropriate PPE will minimize the potential hazards from exposure to COCs. The minimum level of protection selected for the project is Level D, as defined by the USEPA (July 1988). Level D protective equipment is used on sites that have been investigated and

characterized as posing occupationally insignificant skin or respiratory hazards, and for which all criteria for the use of air-purifying respirators have been met. Dermal protection will be required when direct contact with impacted materials is possible to prevent unnecessary exposure.

The respiratory protection level at the Site may be upgraded to Level C, as specified by the Field Team Leader or CHSO, based on air monitoring results as outlined in Section 4.0.

The appropriate PPE must be worn during all field activities associated with this project. It is anticipated that drilling activities will require Level D PPE, which consists of the following:

*Level D*

- Safety glasses or goggles
- Hard hat
- Steel-toed boots
- Long pants
- High-visibility traffic vests
- No supplemental respiratory protection

In addition, chemical resistant (nitrile) gloves are recommended when handling soil or groundwater samples.

The following PPE will be readily available for use as necessary based on monitoring results outlined in Section 4.0:

*Level C*

- Half- or full-face respirators with organic vapor cartridges and high efficiency particulate filters
- Chemical-resistant (nitrile) gloves
- Chemical-resistant boots
- Tyvek® or Saranex® outer garment

All field personnel assigned to work in the project area in which respiratory protection may be necessary, will be required to have been fit-tested for and trained in the use, limitations, care, and maintenance of air-purifying respirators.

## 6.0 EXPOSURE MONITORING

The selective monitoring of high-risk workers (i.e., those who are closest to the source of COCs) may be conducted as determined by the CHSO. Workers are not expected to be exposed to sources of COCs during site work but exposure monitoring may be initiated if sources of hazardous materials are identified. This approach is based on the rationale that the probability of significant exposure varies directly with the distance from the source. If workers closest to the source are not significantly exposed then all other workers are, presumably, also not significantly exposed and probably do not need to be monitored. Personal monitoring samples may be collected at the discretion of the Field Team Leader or H&S Officer in the breathing zone and, if workers are wearing respiratory protective equipment, outside the face-piece. These samples would represent the actual inhalation exposure of workers who are not wearing respiratory protection and the potential exposure of workers who are wearing respirators. Personnel monitoring may be executed via a passive 3M® 500 Organic Vapor Monitor (OVM), which contains a single sorbent wafer for collection and analysis of organic vapors by gas chromatography.

## 7.0 SITE ACCESS

Access to the investigation locations during field activities will be controlled and unauthorized personnel and visitors shall not be allowed access to the project work area. Only personnel with specific operational duties should be present in the work area when field operations are being conducted. Site control at work locations shall be established using barricades, cones, and flagging tape, as needed to prevent unauthorized access to the work area during work.

## 8.0 WORK AREAS

This section provides a brief description of the work areas that will be established for the activities described in this HASP. In addition to the areas described below, an evacuation meeting place will be designated before operation begins, based on the field activity planned. Work zone boundaries will be delineated in the field, as necessary, using safety cones, barricades and/or flagging tape.

## 8.1 Exclusion Area

An Exclusion Area will be established to control access to the work areas and will ideally extend from a distance of at least ten feet from the area where potentially-impacted media is being sampled or tested, and at least 25 feet in areas where drill rigs or heavy equipment is in use in the event significant concentration of hazardous material are encountered. However, it is recognized that exterior sampling will be conducted through a sidewalk near an active street and interior activities will be conducted within an active dry cleaning facility. As a result, every effort will be made to keep the exclusion zone around each work area as small as possible. The size and shape of the Exclusion Area will be determined based on wind direction, effective Site security, surrounding operations and surrounding public areas. Level D protection will be required at a minimum for all personnel within the Exclusion Area.

## 8.2 Contamination Reduction Area

A Contamination Reduction Area may be placed in an area adjacent to and upwind from the Exclusion Area. In this area, personnel and equipment will be decontaminated, as appropriate, after work has been completed. Potentially contaminated trash will be accumulated in this area.

## 8.3 Support Area

The Support Area covers all areas outside the Exclusion and Contamination Reduction Areas. The Support Area provides for all administrative and support functions (command post, first-aid station, rest area, etc.) necessary to keep the field activities running smoothly. Potable water, portable hand washing area, and restroom facilities for field personnel shall be provided at this location.

# 9.0 DECONTAMINATION PROCEDURES

As noted in Section 4.3 of the Work Plan, all samples will be collected using new, dedicated sampling equipment. As a result, field decontamination of equipment will not be conducted as part of this site characterization.

Decontamination procedures for personnel will be performed as required before leaving the work areas as part of the system for preventing or reducing the physical transfer of impacted materials from the project area. Physical (removal of contamination by removing PPE, gloves, boots, brushing, vacuuming, etc) and chemical (washing with detergent, solvents, neutralizing agents, etc) decontamination procedures will be used. As warranted, primary decontamination will take place in the Contamination Reduction Area. If necessary, the

Contamination Reduction Area will include wash tubs with soap and water and rinse tubs for cleaning of personnel and reusable equipment, and drums will be provided for contaminated PPE. Secondary decontamination will take place at portable hand washing facilities in the Support Area. All personnel will be required to wash their hands before eating and after work.

Solid waste (disposable sampling equipment and used PPE) and liquid waste (decontamination wastewater and purged groundwater) will be placed in properly labeled containers as these wastes are generated. The wastes will be managed based on the analytical results or generator knowledge.

As warranted, personnel decontamination procedures should be performed in the following sequence:

- If gross contamination is obvious, physically remove contamination by brushing, scraping, etc., prior to leaving the Exclusion Area;
- Transfer the equipment to the Contamination Reduction Area for subsequent chemical decontamination or disposal;
- In the Contamination Reduction Area, remove any outer disposable PPE and discard into the appropriate disposal drum;
- In the Contamination Reduction Area, scrub chemical-resistant boots and gloves with detergent and water followed by water rinse;
- In the Contamination Reduction Area, remove respirator and avoid touching face;
- In the Support Area, thoroughly wash hands and face.

## 10.0 GENERAL SAFE WORK PRACTICES

Field activities will be conducted following the minimum safety practices described below.

### 10.1 Safe Work Practices

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in any area where the potential for contamination exists.
- Hands must be thoroughly washed when leaving a contaminated or suspected contaminated area before eating, drinking or any other activities.

- Potentially contaminated PPE and equipment will not be removed from the Contaminant Reduction Area until it has been properly decontaminated or containerized.
- Removal of potential contamination from PPE and equipment by blowing, shaking, or any means that may disperse materials into the air is prohibited.
- Personnel on-Site must use the "buddy" system when wearing respiratory protective devices or working in an Exclusion Area. Emergency communications will be prearranged in the case there are unexpected situation arises. Visual contact must be maintained between "pairs" on-Site and each individual should remain close enough to assist the other in an emergency.
- Personnel will be cautioned to inform each other of subjective symptoms of chemical exposure such as headache, dizziness, nausea, and irritation of the respiratory tract and heat stress.
- No excessive facial hair that interferes with a satisfactory fit of the face-piece of the respirator to the face will be allowed on personnel required to wear respiratory protective equipment.
- On-Site personnel will be thoroughly briefed about the anticipated hazards, equipment requirements, safety practices, emergency procedures, and communications methods.
- All field personnel will, whenever possible, locate themselves so that they work upwind from any excavation area.
- Field personnel are prohibited from entering confined spaces, trenches, or excavations deeper than four feet unless the entry provisions are made as described in Section 3.3.14.

## 10.2 Safe Workplace Conditions

The following safe working conditions will be maintained at all times:

- A multipurpose (A, B, C) portable fire extinguisher and other emergency response equipment shall be located in the immediate vicinity of the work area;
- Field equipment shall be kept in good condition;
- First-aid supplies shall be available in the Support Area
- Appropriate work areas designated for support, contamination reduction, and exclusion will be maintained.

## 11.0 EMERGENCY PROCEDURES

All illnesses, injuries, or accidents occurring during the field activities shall be reported to the Field Team Leader or CHSO and attended to immediately.

A first-aid kit will be available in both the work area and project Support Area for treatment of minor injuries, such as cuts or bruises that may result from an accident. In an emergency or hazardous situation involving explosions, fires or major physical injuries, the individual who observes this condition will immediately give a verbal alarm. Upon hearing the alarm, field personnel will safely de-energize nonessential equipment and evacuate to a suitable upwind location. Emergency contact telephone numbers are shown in Table 1. If there is a chemical release to the environment in excess of the reportable quantities, then it will be reported to the NYSDEC and National Response Center, within 24 hours.

The location of the nearest hospital is shown on Figure 1. Seriously injured personnel must be attended to immediately and medical attention must be obtained. If required, the injured personnel will be transported to the hospital. Field activities will be suspended until the cause of the injury has been investigated and the work procedures have been modified accordingly.

The "Injury Reporting Form" in Attachment 3 will be completed for any illness, injury, or accident that occurs during the field activities. The Field Team Leader shall report to the CHSO or Project Manager for instructions.

## 12.0 TRAINING

All personnel performing the field activities described in this HASP will have received the initial safety training required by 29 CFR, 1910.120. Current refresher training status also will be required for all personnel engaged in field activities. Documentation that this training has been completed will be provided to the CHSO upon request.

During field activities, daily safety meetings will be held by the CHSO or designee to review specific health and safety aspects of the scheduled work.

Field personnel responsible for air monitoring will be adequately trained in the use, calibration, and limitations of the field monitoring equipment.

## 13.0 MEDICAL MONITORING

All personnel scheduled for field activities will have completed medical examinations, meeting the minimum medical surveillance requirements described in 29 CFR, 1910.120.

## 14.0 REFERENCES


1. 1988 *Standard Operating Safety Guides* (USEPA, 1988)
2. *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (National Institute for Occupational Safety and Health [NIOSH], Occupational Safety and Health Administration [OSHA], United States Coast Guard [USCG], U.S. Environmental Protection Agency [USEPA], 1985)
3. Title 29, Code of Federal Regulations (29 CFR)
4. 6NYCRR Part 375
5. NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10)

GENESIS ENGINEERING & REDEVELOPMENT

**TABLE 1**

GENESIS ENGINEERING & REDEVELOPMENT

# Table 1

## Emergency Contact Information
## 38-68 13th Street
## Long Island City, New York

| Emergency Contact | Address | Phone Number |
|---|---|---|
| **Fire Department/ Ambulance** | New York City Fire Department | 911 |
| **Hospital** | Mount Sinai Hospital Queens<br>2510 30th Avenue<br>Queens, NY 11102-2418 | (718) 267-4285<br>(Emergency Dept.) |
| **Police** | New York City Police Department | 911 |
| **NYSDEC Region 2** | 47-40 21st Street<br>Long Island City, NY 11101-5407 | 800-457-7362<br>(Spill Hotline within NYS) |
| **National Control Center** | | 800-424-8802 |
| **Poison Control Center** | | 800-962-1253 |
| **Genesis Engineering & Redevelopment, Inc.** | 15-41 125th Street<br>College Park, NY 11356 | (718) 888-0802 |

GENESIS ENGINEERING & REDEVELOPMENT

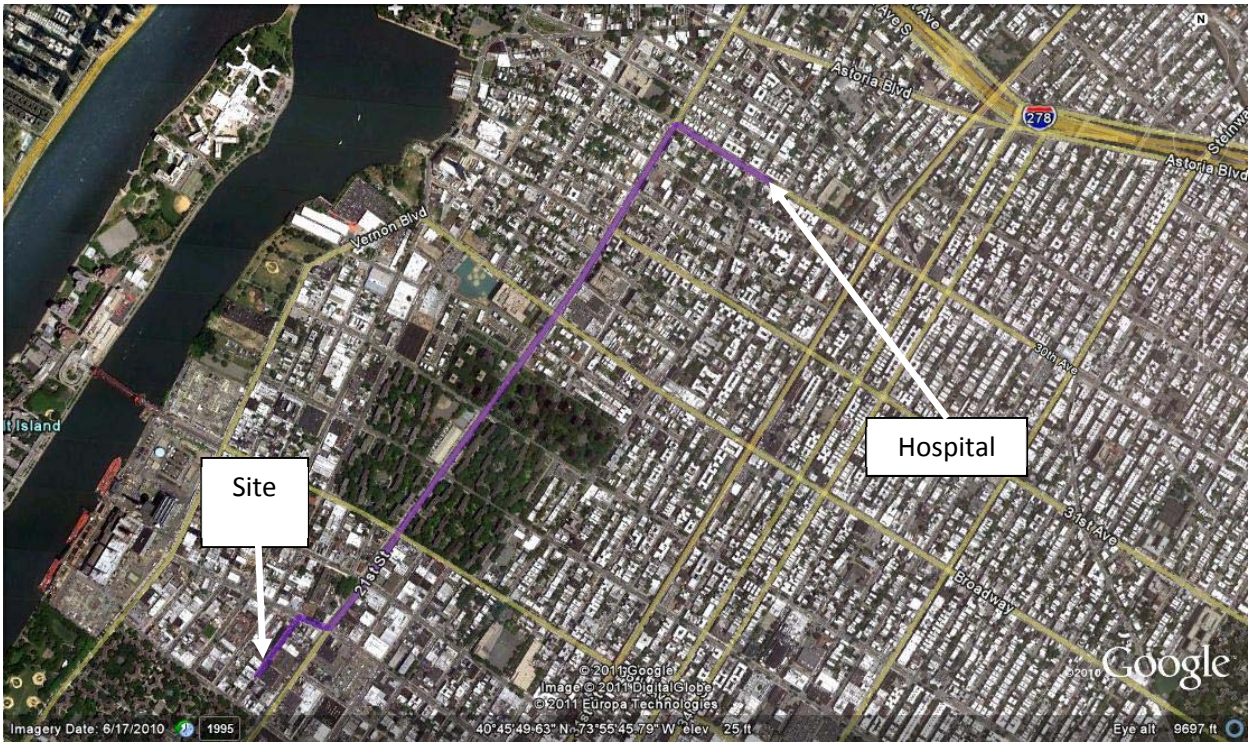
**FIGURE 1**

GENESIS ENGINEERING & REDEVELOPMENT

**FIGURE 1**
**HOSPITAL DIRECTIONS AND MAP**

**Mount Sinai Hospital Queens**
2510 30th Avenue
Queens, NY 11102-2418
(718) 267-4285 (Emergency Department)

**From the Site, head northeast on 13th Street and turn right at first intersection onto 38th Avenue. Proceed to 21st Street and turn left, proceed approximately one mile and turn right onto 30th Avenue. Proceed approximately 0.2 mile to the hospital.**



GENESIS ENGINEERING & REDEVELOPMENT

**Attachment 1**

**Field Health and Safety Form**

GENESIS ENGINEERING & REDEVELOPMENT

**Field Health and Safety Plan**
**Sign-in Form**

GE&R Employees: I have reviewed GE&R's HASP for investigation activities to be conducted at the subject Site. I understand its purpose and consent to adhere to its policies, procedures, and guidelines for this project while an employee of GE&R.

Subcontractors: I have participated in a Site Health and Safety Meeting prior to performing Site activities.

| Name (please print) | Date | Signature |
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GENESIS ENGINEERING & REDEVELOPMENT

# Attachment 2

# Material Safety Data Sheets

GENESIS ENGINEERING & REDEVELOPMENT

# TETRACHLOROETHYLENE (PCE)

## Section 1 - Product and Company Identification

**Product Identification:** TETRACHLOROETHYLENE
**Date of MSDS:** 04/06/1989 **Technical Review Date:** 06/12/1992
**FSC:** 6810 **NIIN:** 00-819-1128
**Submitter:** D DG
**Status Code:** C
**MFN:** 01
**Article:** N
**Kit Part:** N

**Manufacturer's Information**

**Manufacturer's Name:** MALLINCKRODT INC SCIENCE PRODUCTS DIVISION
**Post Office Box:** M
**Manufacturer's Address1:** PARIS BYPASS
**Manufacturer's Address2:** PARIS, KY 40361
**Manufacturer's Country:** US
**General Information Telephone:** 314-982-5000
**Emergency Telephone:** 314-982-5000
**Emergency Telephone:** 314-982-5000
**MSDS Preparer's Name:** N/P
**Proprietary:** N
**Reviewed:** Y
**Published:** Y
**CAGE:** 62910
**Special Project Code:** N

**Item Description**

**Item Name:** TETRACHLOROETHYLENE, TECHNICAL
**Item Manager:** S9G
**Specification Number:** O-T-236
**Type/Grade/Class:** GRADE A
**Unit of Issue:** CN **Quantitative Expression:** 00000000005GL
**Unit of Issue Quantity:** 1
**Type of Container:** CAN

**Contractor Information**

**Contractor's Name:** MALLINCKRODT SPECIALTY CHEMICALS CO
**Contractor's Address1:** 222 RED SCHOOL LANE
**Contractor's Address2:** PHILLIPSBURG, NJ 08865
**Contractor's Telephone:** 908-859-2151
**Contractor's CAGE:** 62910

## Section 2 - Composition/Information on Ingredients
**TETRACHLOROETHYLENE**

**Ingredient Name:** PERCHLOROETHYLENE (TETRACHLOROETHYLENE) (SARA III)
**Ingredient CAS Number:** 127-18-4 **Ingredient CAS Code:** M
**RTECS Number:** KX3850000 **RTECS Code:** M
**=WT: =WT Code:**
**=Volume: =Volume Code:**
**>WT: >WT Code:**
**>Volume: >Volume Code:**
**<WT: <WT Code:**
**<Volume: <Volume Code:**
**% Low WT: % Low WT Code:**
**% High WT: % High WT Code:**
**% Low Volume: % Low Volume Code:**
**% High Volume: % High Volume Code:**
**% Text:** 100
**% Environmental Weight:**

**Other REC Limits:** NONE SPECIFIED
**OSHA PEL:** 100 PPM **OSHA PEL Code:** M
**OSHA STEL:** **OSHA STEL Code:**
**ACGIH TLV:** 25PPM/100,A3 STEL;94 **ACGIH TLV Code:** M
**ACGIH STEL:** N/P **ACGIH STEL Code:**
**EPA Reporting Quantity:** 100 LBS
**DOT Reporting Quantity:** 100 LBS
**Ozone Depleting Chemical:** N

## Section 3 - Hazards Identification, Including Emergency Overview
**TETRACHLOROETHYLENE**

**Health Hazards Acute & Chronic:** ACUTE: MAY CAUSE EYE & SKIN IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION. CENTRAL NERVOUS SYSTEM DEPRESSANT. LOSS OF CONSCIOUSNESS AND EVEN DEATH CAN OCCUR AT HIGH LEVELS OF EXPOSURE. CHRONIC: LIVER AND KIDNEY DAMAGE. ASPIRATION HAZARD DO NOT INDUCE VOMITING. PROBABLE CANCER HAZARD.

**Signs & Symptoms of Overexposure:**
INCOORDINATION AND IMPAIRED JUDGMENT MAY OCCUR AT VAPOR EXPOSURES FROM 500-1000 PPM. DIZZINESS, DROWSINESS, AND GENERAL ANESTETHIC EFFECTS MAY OCCUR IN RANGES OF 1000 PPM AND HIGHER.

**Medical Conditions Aggravated by Exposure:**
EYE/SKIN/RESPIRATORY CONDITIONS MAY BE AGGRAVATED BY EXPOSURE. MAY CAUSE CANCER.

**LD50 LC50 Mixture:** ORAL LD50 (RAT) = 5000 MG/KG
**Route of Entry Indicators:**
- **Inhalation:** YES
- **Skin:** YES
- **Ingestion:** YES

**Carcinogenicity Indicators**
- **NTP:** YES
- **IARC:** YES
- **OSHA:** NO

**Carcinogenicity Explanation:** LISTED AS A CARCINOGEN BY NTP AND IARC.

## Section 4 - First Aid Measures
**TETRACHLOROETHYLENE**

**First Aid:**
INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE CPR. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN. EYE: FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR 15 MINUTES. GET MEDICAL AT TENTION. SKIN: REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER PROMPTLY. INGESTION: DO NOT INDUCE VOMITING. GIVE MILK OR USP MINERAL OIL. GET IMMEDIATE MEDICAL ATTENTION.

## Section 5 - Fire Fighting Measures
**TETRACHLOROETHYLENE**

**Fire Fighting Procedures:**
FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
**Unusual Fire or Explosion Hazard:**
FIRE OR EXCESSIVE HEAT MAY CAUSE PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS INCLUDING PHOSGENE AND HYDROGEN CHLORIDE.
**Extinguishing Media:**
ANY MEDIA SUITABLE FOR SURROUNDING FIRES.
**Flash Point: Flash Point Text:** N/R
**Autoignition Temperature:**
- **Autoignition Temperature Text:** N/R
- **Lower Limit(s):** N/R
- **Upper Limit(s):** N/R

## Section 6 - Accidental Release Measures
**TETRACHLOROETHYLENE**

**Spill Release Procedures:**
SMALL SPILL: WIPE UP WITH RAGS OR TOWELS. LARGE SPILLS: WEAR NIOSH APPROVED RESPIRATOR. VENTILATE AREA. DIKE TO RETAIN FLUID. PUMP UP FREE LIQUID. RESIDUE WILL EVAPORATE QUICKLY. DO NOT FLUSH TO SEWER OR WATERWAY.

## Section 7 - Handling and Storage
**TETRACHLOROETHYLENE**

**Handling and Storage Precautions:**

**Other Precautions:**

## Section 8 - Exposure Controls & Personal Protection
**TETRACHLOROETHYLENE**

**Respiratory Protection:**
IN HIGH VAPOR AREA, USE NIOSH APPROVED RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE. USE SELF-CONTAINED BREATHING APPARATUS IF ALLOWABLE VAPOR LEVELS ARE EXCEEDED OR WORKING IN A CONFINED AREA.
**Ventilation:**
LOCAL EXHAUST RECOMMENDED TO CONTROL VAPORS BELOW 50% OF TLV.
**Protective Gloves:**
NEOPRENE, PVA GLOVES RECOMMENDED.
**Eye Protection:** USE CHEMICAL SAFETY GOGGLES.
**Other Protective Equipment:** APRON AND WORK CLOTHING TO MINIMIZE EXPOSURE. EYE WASH STATION & SAFETY SHOWER RECOMMENDED.
**Work Hygienic Practices:** WASH THOROUGHLY AFTER USE AND BEFORE EATING, SMOKING OR USING TOILET FACILITIES. DO NOT BREATH VAPORS OR MIST.
**Supplemental Health & Safety Information:** TARGET ORGANS ARE SKIN, CNS, CVS, AND EYES.

## Section 9 - Physical & Chemical Properties
**TETRACHLOROETHYLENE**

**HCC:** T4
**NRC/State License Number:**
**Net Property Weight for Ammo:**
**Boiling Point: Boiling Point Text:** 119F,48C
**Melting/Freezing Point: Melting/Freezing Text:** N/R
**Decomposition Point: Decomposition Text:** UNKNOWN
**Vapor Pressure:** 16 **Vapor Density:** 5.83
**Percent Volatile Organic Content:**
**Specific Gravity:** 1.63
**Volatile Organic Content Pounds per Gallon:**
**pH:** N/R
**Volatile Organic Content Grams per Liter:**
**Viscosity:** N/P
**Evaporation Weight and Reference:** 0.27 (CCL4=1)
**Solubility in Water:** 0.015% BY WT
**Appearance and Odor:** CLEAR, COLORLESS LIQUID, EHTEREAL ODOR
**Percent Volatiles by Volume:** 100
**Corrosion Rate:** UNKNOWN

## Section 10 - Stability & Reactivity Data
**TETRACHLOROETHYLENE**

**Stability Indicator:** YES
**Materials to Avoid:**
STRONG OXIDIZERS AND ALKALIS, ACTIVE METALS (SODIUM, POTASSIUM, LITHIUM, ZINC, ALUMINUM, BARIUM ETC.)

**Stability Condition to Avoid:**
HIGH TEMPERATURES, SPARKS, AND OPEN FLAMES. HIGH PRESSURE ALUMINUM SYSTEMS.
**Hazardous Decomposition Products:**
DECOMPOSES INTO HIGHLY TOXIC AND IRRITATING HYDROGEN CHLORIDE AND PHOSGENE.
**Hazardous Polymerization Indicator:** NO
**Conditions to Avoid Polymerization:**
NOT APPLICABLE

## Section 11 - Toxicological Information
**TETRACHLOROETHYLENE**

**Toxicological Information:**
N/P

## Section 12 - Ecological Information
**TETRACHLOROETHYLENE**

**Ecological Information:**
N/P

## Section 13 - Disposal Considerations
**TETRACHLOROETHYLENE**

**Waste Disposal Methods:**
CLEAN-UP DEBRIS WILL LIKELY BE A LAND-BANNED HAZARDOUS WASTE. DISPOSAL MUST BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.

## Section 14 - MSDS Transport Information
**TETRACHLOROETHYLENE**

**Transport Information:**
N/P

## Section 15 - Regulatory Information
**TETRACHLOROETHYLENE**

**SARA Title III Information:**
N/P
**Federal Regulatory Information:**
N/P
**State Regulatory Information:**
N/P

## Section 16 - Other Information
**TETRACHLOROETHYLENE**

**Other Information:**
N/P

**HMIS Transportation Information**

**Product Identification:** TETRACHLOROETHYLENE
**Transportation ID Number:** 86825
**Responsible Party CAGE:** 62910
**Date MSDS Prepared:** 04/06/1989
**Date MSDS Reviewed:** 06/12/1992
**MFN:** 06/12/1992
**Submitter:** D DG
**Status Code:** C
**Container Information**
- **Unit of Issue:** CN
- **Container Quantity:** 1
- **Type of Container:** CAN
- **Net Unit Weight:** 68.0 LBS

**Article without MSDS:** N
**Technical Entry NOS Shipping Number:**
**Radioactivity:**
**Form:**
**Net Explosive Weight:**
**Coast Guard Ammunition Code:**
**Magnetism:** N/P
**AF MMAC Code:**
**DOD Exemption Number:**
**Limited Quantity Indicator:**
**Multiple Kit Number:** 0
**Kit Indicator:** N
**Kit Part Indicator:** N
**Review Indicator:** Y
**Additional Data:**

**Department of Transportation Information**

**DOT Proper Shipping Name:** TETRACHLOROETHYLENE
**DOT PSN Code:** NYB
**Symbols:**
**DOT PSN Modifier:**
**Hazard Class:** 6.1
**UN ID Number:** UN1897
**DOT Packaging Group:** III
**Label:** KEEP AWAY FROM FOOD
**Special Provision(s):** N36,T1
**Packaging Exception:** 153
**Non Bulk Packaging:** 203
**Bulk Packaging:** 241
**Maximum Quantity in Passenger Area:** 60 L
**Maximum Quantity in Cargo Area:** 220 L
**Stow in Vessel Requirements:** A
**Requirements Water/Sp/Other:** 40

**IMO Detail Information**

**IMO Proper Shipping Name:** TETRACHLOROETHYLENE
**IMO PSN Code:** OJV
**IMO PSN Modifier:** P
**IMDG Page Number:** 6264
**UN Number:** 1897
**UN Hazard Class:** 6.1
**IMO Packaging Group:** III
**Subsidiary Risk Label:** -
**EMS Number:** 6.1-02
**Medical First Aid Guide Number:** 340

**IATA Detail Information**

**IATA Proper Shipping Name:** TETRACHLOROETHYLENE
**IATA PSN Code:** XOW
**IATA PSN Modifier:**
**IATA UN Id Number:** 1897
**IATA UN Class:** 6.1
**Subsidiary Risk Class:**
**UN Packaging Group:** III
**IATA Label:** TOXIC
**Packaging Note for Passengers:** 605
**Maximum Quantity for Passengers:** 60L
**Packaging Note for Cargo:** 612
**Maximum Quantity for Cargo:** 220L
**Exceptions:**

**AFI Detail Information**

**AFI Proper Shipping Name:** TETRACHLOROETHYLENE
**AFI Symbols:**
**AFI PSN Code:** XOW
**AFI PSN Modifier:**

**AFI UN Id Number:** UN1897
**AFI Hazard Class:** 6.1
**AFI Packing Group:** III
**AFI Label:**
**Special Provisions:** P5, N36
**Back Pack Reference:** A10.5

**HAZCOM Label Information**

**Product Identification:** TETRACHLOROETHYLENE
**CAGE:** 62910
**Assigned Individual:** N
**Company Name:** MALLINCKRODT SPECIALTY CHEMICALS CO
**Company PO Box:**
**Company Street Address1:** 222 RED SCHOOL LANE
**Company Street Address2:** PHILLIPSBURG, NJ 08865 US
**Health Emergency Telephone:** 314-982-5000
**Label Required Indicator:** Y
**Date Label Reviewed:** 06/12/1992
**Status Code:** C
**Manufacturer's Label Number:** UNKNOWN
**Date of Label:** 06/12/1992
**Year Procured:** N/K
**Organization Code:** F
**Chronic Hazard Indicator:** Y
**Eye Protection Indicator:** YES
**Skin Protection Indicator:** YES
**Respiratory Protection Indicator:** YES
**Signal Word:** WARNING
**Health Hazard:** Moderate
**Contact Hazard:** Slight
**Fire Hazard:** Slight
**Reactivity Hazard:** None

# TRICHLOROETHYLENE (TCE)

## Section 1 - Product and Company Identification

**Product Identification:** TRICHLOROETHYLENE
**Date of MSDS:** 01/01/1987 **Technical Review Date:** 03/22/1993
**FSC:** 6810 **NIIN:** 00-924-7107
**Submitter:** D DG
**Status Code:** C
**MFN:** 01
**Article:** N
**Kit Part:** N

### Manufacturer's Information

**Manufacturer's Name:** PHIPPS PRODUCTS CORP (COMPANY OUT OF BUSINESS)
**Manufacturer's Address1:** 186 LINCOLN ST SUITE 502
**Manufacturer's Address2:** BOSTON, MA 02111-2403
**Manufacturer's Country:** US
**General Information Telephone:** COMPANY OUT OF BUSINESS
**Emergency Telephone:** COMPANY OUT OF BUSINESS
**Emergency Telephone:** COMPANY OUT OF BUSINESS
**MSDS Preparer's Name:** DEFENSE GEN SUPPLY CTR
**Proprietary:** N
**Reviewed:** Y
**Published:** Y
**CAGE:** 86511
**Special Project Code:** N

### Item Description

**Item Name:** TRICHLOROETHYLENE,TECHNICAL
**Item Manager:** S9G
**Specification Number:** O-T-634
**Type/Grade/Class:** TYPE I
**Unit of Issue:** GL
**Unit of Issue Quantity:** 6
**Type of Container:** CAN,METAL

### Preparer Information

**Preparer's Name:** PHIPPS PRODUCTS CORP
**Preparer's Address1:** 186 LINCOLN ST SUITE 502
**Preparer's Address2:** BOSTON, MA 02111-2403
**Preparer's CAGE:** 86511
**Assigned Individual:** N

### Contractor Information

**Contractor's Name:** PHIPPS PRODUCTS CORP
**Contractor's Address1:** 186 LINCOLN ST SUITE 502
**Contractor's Address2:** BOSTON, MA 02111-2403
**Contractor's Telephone:** OUT OF BUSINESS
**Contractor's CAGE:** 86511

## Section 2 - Composition/Information on Ingredients
### TRICHLOROETHYLENE

**Ingredient Name:** TRICHLOROETHYLENE (SARA III)
**Ingredient CAS Number:** 79-01-6 **Ingredient CAS Code:** M
**RTECS Number:** KX4550000 **RTECS Code:** M
**=WT: =WT Code:**
**=Volume: =Volume Code:**
**>WT: >WT Code:**
**>Volume: >Volume Code:**
**<WT: <WT Code:**
**<Volume: <Volume Code:**
**% Low WT: % Low WT Code:**

**% High WT:** **% High WT Code:**
**% Low Volume:** **% Low Volume Code:**
**% High Volume:** **% High Volume Code:**
**% Text:** 100.0
**% Environmental Weight:**
**Other REC Limits:** NOT ESTABLISHED
**OSHA PEL:** 100 PPM/100 STEL **OSHA PEL Code:** M
**OSHA STEL:** **OSHA STEL Code:**
**ACGIH TLV:** 50 PPM/100,A5STEL;93 **ACGIH TLV Code:** M
**ACGIH STEL:** N/P **ACGIH STEL Code:**
**EPA Reporting Quantity:** 100 LBS
**DOT Reporting Quantity:** 100 LBS
**Ozone Depleting Chemical:** N

## Section 3 - Hazards Identification, Including Emergency Overview
**TRICHLOROETHYLENE**

**Health Hazards Acute & Chronic:** ACUTE: IRRITATION OF EYES, SKIN, RESPIRATORY OR G.I. TRACT. SEVERE PAIN, REDNESS OF EYES; DRYNESS OF SKIN; CNS EFFECTS LIKE, VISUAL DISTURBANCES AND MENTAL CONFUSION, HEADACHE, NAUSEA, DIZZINESS, VOMI TING, DIZZINESS. CHRONIC: LIVER AND KIDNEY DAMAGE, CNS EFFECTS.

**Signs & Symptoms of Overexposure:**
EYES/SKIN: IRRITATION, PAIN, REDNESS, DRYNESS. INHALATION: RESPIRATORY TRACT IRRITATION, HEADACHE, NAUSEA, VOMITING, DIZZINESS, VISUAL DISTURBANCES, MENTAL CONUFUSION. INGESTION: SAME SYMPTOMS AS INHA LATION.

**Medical Conditions Aggravated by Exposure:**
PRE-EXISTING EYE, SKIN, RESPIRATORY, KIDNEY OR LIVER CONDITIONS MAY BE AGGRAVATED BY EXPOSURE.

**LD50 LC50 Mixture:** ORAL RAT LD50: 4920 MG/KG
**Route of Entry Indicators:**
- **Inhalation:** YES
- **Skin:** YES
- **Ingestion:** NO

**Carcinogenicity Indicators**
- **NTP:** NO
- **IARC:** YES
- **OSHA:** NO

**Carcinogenicity Explanation:** SUSPECTED ANIMALS CARCINOGEN.

## Section 4 - First Aid Measures
**TRICHLOROETHYLENE**

**First Aid:**
INHALATION: REMOVE TO FRESH AIR. USE CPR/OXYGEN IF NECESSARY. CONSULT A PHYSICIAN. INGESTION: IF CONSCIOUS, GIVE TWO GLASSES OF WATER. CONSULT A PHYSICIAN IMMEDIATELY. SKIN AND EYES: FLUSH WITH PLENTY OF WATER FOR ABOUT 15-20 MINUTES, CALLA PHYSICIAN IMMEDIATELY.

## Section 5 - Fire Fighting Measures
**TRICHLOROETHYLENE**

**Fire Fighting Procedures:**
FULL PROTECTIVE CLOTHING AND NIOSH/MSHA APPROVED SCBA IN AN ENCLOSED AREA.
**Unusual Fire or Explosion Hazard:**
A STRONG IGNITION SOURCE CAN PRODUCE IGNITION.
**Extinguishing Media:**
WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL, FOAM.
**Flash Point:** **Flash Point Text:** NONE
**Autoignition Temperature:**
- **Autoignition Temperature Text:** N/A
- **Lower Limit(s):** 12.5
- **Upper Limit(s):** 90

## Section 6 - Accidental Release Measures
**TRICHLOROETHYLENE**

**Spill Release Procedures:**
USE PROPER PERSONAL PROTECTION. CONTAIN FREE LIQUID IF POSSIBLE. REMOVE ALL IGNITION SOURCES. USE SUITABLE INERT ABSORBENT MATERIAL AND RECOVER FOR PROPER DISPOSAL.

## Section 7 - Handling and Storage
**TRICHLOROETHYLENE**

**Handling and Storage Precautions:**

**Other Precautions:**

## Section 8 - Exposure Controls & Personal Protection
**TRICHLOROETHYLENE**

**Respiratory Protection:**
USE NIOSH/MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS/MIST IF ABOVE PEL/TLV OR SCBA IN AN ENCLOSED AREA.
**Ventilation:**
LOCAL EXHAUSTED/GENERAL TO MAINTAIN PEL/TLV.
**Protective Gloves:**
IMPERVIOUS
**Eye Protection:** CHEMICAL SAFETY GOGGLES.
**Other Protective Equipment:** IMPERVIOUS APRON. EYE-WASH FACILITIES.
**Work Hygienic Practices:** AVOID CONTACT WITH EYES AND SKIN;DO NOT BREATHE VAPORS/MIST;WASH THOROUGHLY AFTER EACH USE.
**Supplemental Health & Safety Information:** MSDS PREPARED BY DGSC-SSH/HMIS FOR COMPANY OUT-OF-BUSINESS.

## Section 9 - Physical & Chemical Properties
**TRICHLOROETHYLENE**

**HCC:** T4
**NRC/State License Number:** N/R
**Net Property Weight for Ammo:** N/R
**Boiling Point: Boiling Point Text:** 188.F/87C
**Melting/Freezing Point: Melting/Freezing Text:** -99.4F/-73C
**Decomposition Point: Decomposition Text:** N/K
**Vapor Pressure:** 57.8 **Vapor Density:** 4.5;AIR=1
**Percent Volatile Organic Content:**
**Specific Gravity:** 1.45
**Volatile Organic Content Pounds per Gallon:**
**pH:** N/K
**Volatile Organic Content Grams per Liter:**
**Viscosity:** N/P
**Evaporation Weight and Reference:** N/K
**Solubility in Water:** NEGLIIBLE
**Appearance and Odor:** CLEAR,COLORLESS LIQUID,CHLOROFORM-LIKE.
**Percent Volatiles by Volume:** N/K
**Corrosion Rate:** UNKNOWN

## Section 10 - Stability & Reactivity Data
**TRICHLOROETHYLENE**

**Stability Indicator:** YES
**Materials to Avoid:**
ALKALI HYDROXIDES, POWDERED METALS, LIQUID OXYGEN.
**Stability Condition to Avoid:**

EXTREME HEAT, FLAMES, LIGHT, UV LIGHT.
**Hazardous Decomposition Products:**
CARBON MONOXIDE, PHOSGENE AND HYDROCHLORIC ACIDS VAPORS.
**Hazardous Polymerization Indicator:** NO
**Conditions to Avoid Polymerization:**
NOT APPLICABLE

**Section 11 - Toxicological Information**
**TRICHLOROETHYLENE**

**Toxicological Information:**
N/P

**Section 12 - Ecological Information**
**TRICHLOROETHYLENE**

**Ecological Information:**
N/P

**Section 13 - Disposal Considerations**
**TRICHLOROETHYLENE**

**Waste Disposal Methods:**
CONSULT LOCAL AUTHORITIES. DISPOSAL MUST BE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. WASTE MATERIAL WILL BE A LAND-BANNED HAZARDOUS WASTE.

**Section 14 - MSDS Transport Information**
**TRICHLOROETHYLENE**

**Transport Information:**
N/P

**Section 15 - Regulatory Information**
**TRICHLOROETHYLENE**

**SARA Title III Information:**
N/P
**Federal Regulatory Information:**
N/P
**State Regulatory Information:**
N/P

**Section 16 - Other Information**
**TRICHLOROETHYLENE**

**Other Information:**
N/P

**HMIS Transportation Information**
**Product Identification:** TRICHLOROETHYLENE
**Transportation ID Number:** 92066
**Responsible Party CAGE:** 86511
**Date MSDS Prepared:** 01/01/1987
**Date MSDS Reviewed:** 03/22/1993
**MFN:** 03/22/1993
**Submitter:** D DG
**Status Code:** C
**Container Information**
**Unit of Issue:** GL
**Container Quantity:** 6
**Type of Container:** CAN,METAL
**Net Unit Weight:** 73 POUNDS
**Article without MSDS:** N
**Technical Entry NOS Shipping Number:** TRICHLOROETHYLENE
**Radioactivity:**

**Form:**
**Net Explosive Weight:**
**Coast Guard Ammunition Code:**
**Magnetism:** N/P
**AF MMAC Code:**
**DOD Exemption Number:**
**Limited Quantity Indicator:**
**Multiple Kit Number:** 0
**Kit Indicator:** N
**Kit Part Indicator:** N
**Review Indicator:** Y
**Additional Data:**

**Department of Transportation Information**

**DOT Proper Shipping Name:** TRICHLOROETHYLENE
**DOT PSN Code:** OQK
**Symbols:**
**DOT PSN Modifier:**
**Hazard Class:** 6.1
**UN ID Number:** UN1710
**DOT Packaging Group:** III
**Label:** KEEP AWAY FROM FOOD
**Special Provision(s):** N36,T1
**Packaging Exception:** 153
**Non Bulk Packaging:** 203
**Bulk Packaging:** 241
**Maximum Quantity in Passenger Area:** 60 L
**Maximum Quantity in Cargo Area:** 220 L
**Stow in Vessel Requirements:** A
**Requirements Water/Sp/Other:** 40

**IMO Detail Information**

**IMO Proper Shipping Name:** TRICHLOROETHYLENE
**IMO PSN Code:** OVL
**IMO PSN Modifier:** P
**IMDG Page Number:** 6273
**UN Number:** 1710
**UN Hazard Class:** 6.1
**IMO Packaging Group:** III
**Subsidiary Risk Label:** -
**EMS Number:** 6.1-02
**Medical First Aid Guide Number:** 340

**IATA Detail Information**

**IATA Proper Shipping Name:** TRICHLOROETHYLENE
**IATA PSN Code:** YMD
**IATA PSN Modifier:**
**IATA UN Id Number:** 1710
**IATA UN Class:** 6.1
**Subsidiary Risk Class:**
**UN Packaging Group:** III
**IATA Label:** TOXIC
**Packaging Note for Passengers:** 605
**Maximum Quantity for Passengers:** 60L
**Packaging Note for Cargo:** 612
**Maximum Quantity for Cargo:** 220L
**Exceptions:**

**AFI Detail Information**

**AFI Proper Shipping Name:** TRICHLOROETHYLENE
**AFI Symbols:**
**AFI PSN Code:** YMD
**AFI PSN Modifier:**
**AFI UN Id Number:** UN1710
**AFI Hazard Class:** 6.1
**AFI Packing Group:** III

**AFI Label:**
**Special Provisions:** P5, N36
**Back Pack Reference:** A10.5

**HAZCOM Label Information**

**Product Identification:** TRICHLOROETHYLENE
**CAGE:** 86511
**Assigned Individual:** N
**Company Name:** PHIPPS PRODUCTS CORP
**Company PO Box:**
**Company Street Address1:** 186 LINCOLN ST SUITE 502
**Company Street Address2:** BOSTON, MA 02111-2403 US
**Health Emergency Telephone:** COMPANY OUT OF BUSINESS
**Label Required Indicator:** Y
**Date Label Reviewed:** 03/22/1993
**Status Code:** C
**Manufacturer's Label Number:** N/K
**Date of Label:** 03/22/1993
**Year Procured:** 1983
**Organization Code:** G
**Chronic Hazard Indicator:** Y
**Eye Protection Indicator:** YES
**Skin Protection Indicator:** YES
**Respiratory Protection Indicator:** YES
**Signal Word:** WARNING
**Health Hazard:** Moderate
**Contact Hazard:** Slight
**Fire Hazard:** None
**Reactivity Hazard:** None

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**Attachment 3**

**Injury Reporting Form**

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# INJURY REPORTING FORM

Name of injured person: _____
Company Name and Address: _____
Age: _____ Sex: □ M □ F SSN: _____ - ____ - _____

Summary of incident: (provide detail and parts of body affected.)

_____
_____
_____
_____

Type of incident: Possible Chemical Exposure ☐ Physical Incident ☐ Other ☐
Chemical name and form (liquid, solid, gas, fume, mist) _____
Date of Incident: _____ Time of incident: _____
Weather conditions at time of incident: (temperature, precipitation, wind speed, and direction)

_____
_____

Was medical care provided on-site? Yes ☐ No ☐
If yes, when and where care was provided

_____
_____
By whom: _____
If "off-site" care was provided, provided name and location of health-care facility:

_____
_____

Nature of care at the health-care facility: _____
Was the Site Health and Safety Coordinator contacted? Yes ☐ No ☐
If no, who was contacted? _____
Has the employee returned to work? Yes ☐ No ☐
If yes, on what date? _____
Provide names of persons who witnessed the exposure/injury incident.

_____
Was the activity being performed under a Health and Safety Plan?
Yes ☐ No ☐ If yes, attach a copy of the plan.

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**INJURY REPORTING FORM**

(Continued)

Provide a list of any personal protective clothing and equipment used by the employee at the time of the exposure/injury incident.

_____

Did any aspect of personal protective clothing and equipment contribute to the exposure/injury incident?

Yes ☐ No ☐ If yes, please explain. _____

_____

_____

Are measures available that may help prevent a repeat of a similar exposure/injury incident?

Yes ☐ No ☐ If yes, please explain. _____

_____

Describe property damage, if applicable. _____

_____

Name, job position, office location of individual(s) completing this exposure/injury incident report.

_____

_____ Date: _____

Project Manager

_____ Date: _____

Employee

_____ Date: _____

Site Safety Coordinator

_____ Date: _____

Site Technical Coordinator