# REMEMDIATION WORK PLAN

## POPULAR HAND LAUNDRY
## 88 INGRAHAM STREET
## BROOKLYN, NEW YORK

Prepared For

88 INGRAHAM REALTY CORPORATION


By

Dvirka and Bartilucci Consulting Engineers
Woodbury, New York

August 1998

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**POPULAR HAND LAUNDRY**

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# REMEDIATION WORK PLAN

# POPULAR HAND LAUNDRY
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# BROOKLYN, NEW YORK

## 1.0 INTRODUCTION

Based on the results of the Supplemental Site Assessment and Exposure Assessment conducted for the Popular Hand Laundry property under the New York State Voluntary Cleanup Program (VCP), and letters from the New York State Department of Environmental Conservation (NYSDEC), dated May 15 and August 4, 1997, which provided comments on the Supplemental Site Assessment Report and recommendations for remediation, the following is the remediation plan for the 88 Ingraham Street property, hereinafter referred to as the site. This remediation plan incorporates comments provided by NYSDEC on the draft remediation plan in a letter dated August 29 and September 25, 1997. The Supplemental Site Assessment Report and Exposure Assessment are contained in Appendices A and B, respectively, and the NYSDEC letters of May 15, August 4, August 29 and September 25, 1997, are contained in Appendix C.

## 2.0 REMEDIATION AND MONITORING SYSTEMS

An air sparging groundwater remediation system and groundwater monitoring system will be installed at the site. The purpose of the air sparging system will be to mitigate the release of chlorinated volatile organic compounds from the site, and the purpose of the monitoring system will be to determine groundwater quality upgradient and downgradient of the site, which will be used to evaluate the effectiveness of the remediation system and to provide data to determine termination of the remediation system.

Based on information provided by a remediation contractor (Miller Environmental Group [MEG]), the anticipated effective radius of an air sparging well at the site, considering geologic information available for the site, is approximately 30 feet. Based on this radius of influence, one air sparging well will be installed at the location illustrated in Figure 1. Figure 1 also shows the anticipated radius of influence for the sparging well.

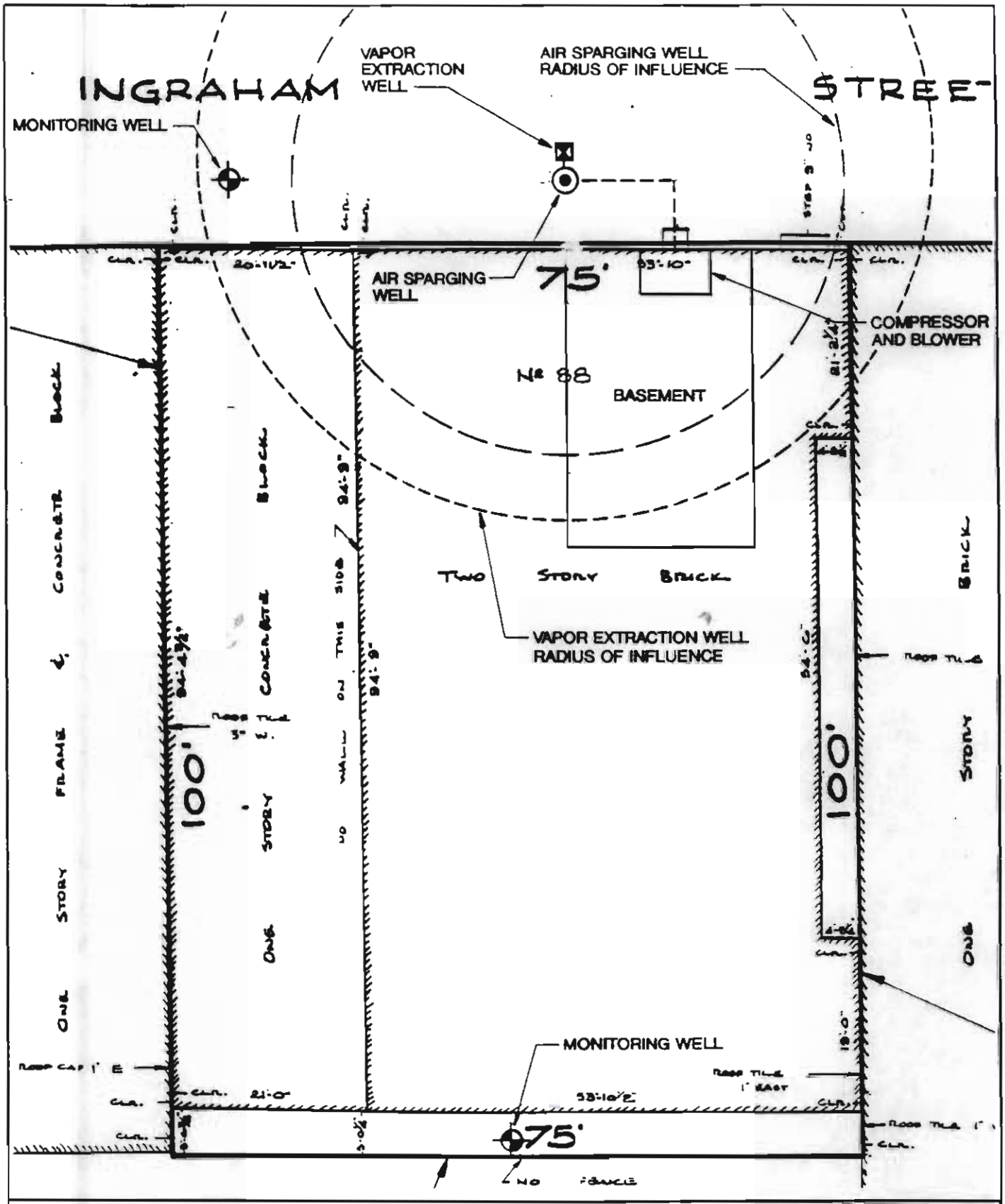
To capture the vapors released by the sparging well, one vapor extraction well will be installed which, based upon information from MEG, will have an anticipated radius of influence of approximately 40 feet based on the geologic information available for the site. The proposed location of this vapor extraction well and the anticipated radius of influence of this well is provided in Figure 1.

The compressor for the air sparging well and the blower for the vapor extraction well will be located in the basement of the site building. The sparging and extraction wells will be placed below the sidewalk/concrete pavement in front of the building and will be accessible via subsurface vaults and flush mounted locking steel covers. All piping will be in trenches located below the pavement. The vapors will be vented 5 feet above the roof of the two-story building.

The sparging well will be constructed of 2-inch PVC casing and 2-foot screen. The top of the sparging screen will be located approximately 10 feet below the water table.

The vapor extraction well also will be constructed of 2-inch PVC casing and screen. The extraction screen will be approximately 12 feet in length extending from approximately 3 feet above the water table to approximately 8 feet below ground surface just above the wastewater discharge line from the building.

The groundwater monitoring system will comprise the sparging well and two monitoring wells; one located upgradient (south of the site building) and the second in the front of the site building to the west of the sparging well. The locations of the monitoring wells are shown in Figure 1. Installation of the upgradient monitoring well (on the Popular Hand Laundry property)




## LOCATION OF REMEDIATION AND MONITORING SYSTEMS

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FIGURE 1

is contingent upon NYSDEC being able to provide access through the private property which borders the site to the south. The owner of this property previously has denied access through the property.

The monitoring wells will be installed utilizing 2-inch PVC casing and screen. The wells will be installed with 10-foot screens, with approximately 5 feet of screen below the water table. The wells will be placed in subsurface vaults with flush mounted locking steel covers. A babcock valve will be installed in the top portion of the PVC riser pipe of each well to facilitate collection of pressure measurements and soil vapor samples.

## 3.0 MONITORING PROGRAM

The monitoring program for system start-up and the operating period is provided in Table 1.

Routine groundwater samples collected quarterly from the two monitoring wells and the sparging well during start-up and routine operation will be analyzed for tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE) and vinyl chloride. Trip blanks will not be analyzed and no other quality assurance samples will be provided when collecting routine samples. The routine groundwater samples will be analyzed by Method 601 with Category A deliverables. For analysis, the gas chromatograph will be calibrated specifically for cis-1,2-DCE. Detailed procedures for sample collection are provided in Attachment No. 1.

The sparging well will be shut off three days prior to water level measurement and sample collection.

Termination of the remediation system will be based on either of the following:

1. The upgradient monitoring well indicates the same contaminants and similar levels of contamination as the sparging well and downgradient monitoring well; or

## TABLE 1

## POPULAR HAND LAUNDRY
## MONITORING PROGRAM

| Parameter | Frequency of Monitoring | | | |
|---|---|---|---|---|
| | Start-up | Operational Period | | |
| | Once | Weekly[3] | Monthly | Quarterly |
| Pressure/Vacuum: | | | | |
| MW-1 | X[1] | X[1] | | |
| MW-2 | X[1] | X[1] | | |
| Air Sparging Well | X[1] | X[1] | | |
| SVE Well | X[1] | X[1] | | |
| Flow Rate: | | | | |
| Air Sparging Well | X[1] | X[1] | | |
| SVE Well | X[1] | X[1] | | |
| VOC Concentration: | | | | |
| SVE Well | X[1] | | X[1] | X[3] (After Re-Start) |
| Groundwater Elevation: | | | | |
| MW-1 | X[1] | | X[1] | |
| MW-2 | X[1] | | X[1] | |
| Air Sparging Well | X[1] | | | |
| D.O. Concentrations: | | | | |
| MW-1 | X[1] | | X[1] | |
| MW-2 | X[1] | | X[1] | |
| Air Sparging Well | | | | |
| Temperature (SVE Well) | X[1] | X[1] | | |
| GW VOC Concentration: | | | | |
| MW-1 | X (Prior to Start-up) | | | X[2] |
| MW-2 | X (Prior to Start-up) | | | X[2] |
| Air Sparging Well | | | | X[2] |

[1] This parameter to be monitored while system is operating.
[2] This parameter to be monitored after minimum 7-day air sparging system shutdown and 24-hour SVE system shutdown.
[3] For first quarter only, then monthly thereafter.
D.O. - Dissolved Oxygen

2. There is no substantial change in contaminant concentrations in the sparging well and downgradient monitoring well for three consecutive quarters. This includes the initial two quarters, followed by remediation system shutdown for three weeks and reactivation of the system for one week and sampling. Substantial change could be defined as described in Attachment No. 2.

The confirmatory sample collected after the shutdown period will be analyzed for PCE, TCE, DCE and vinyl chloride utilizing Analytical Services Protocol (ASP) Method 95-1 with Category B deliverables to validate the results. Quality Assurance (QA) samples will include a trip blank and all other QA samples will be provided and analyzed by the laboratory (e.g., method blank, MS/MSD, etc.).

Monitoring reports will be submitted to NYSDEC at the completion of the start-up period and after each quarterly monitoring. The reports will include monitoring and laboratory results, a discussion of activities, system adjustments or modifications, and down time (length and reason), and recommendations for reducing monitoring frequency.

## 4.0 EMISSIONS ANALYSIS

The proposed air sparging/soil vapor extraction system has been designed to remove vinyl chloride, PCE, TCE and primarily 1,2 dichloroethene (DCE) from the vadose and saturated zones.

The area of contamination to be treated is estimated to extend below the building floor area to a depth of 20 feet, and within the soil vapor extraction system horizontal area of influence north of the building to a depth of 30 feet at a radius of 40 feet. The total volume of soil to be treated within this area is estimated to be approximately 8,000 cubic yards. Therefore, volatile compounds within the vadose layer will be removed from a depth of 2 feet to 20 feet below grade. The proposed air sparging system will be designed to effect removal of volatile compounds in the saturated zone down to a depth of 30 feet

The proposed extraction system blower has a maximum design flow rate of 110 cfm. The blower capacity was determined based on the desired area of influence and experience with similar projects. A PVC stack will discharge the blower exhaust 5 feet above the building roof.

To ensure compliance with NYSDEC guideline concentrations documented in Air Guide-1, the maximum annual impacts were evaluated. Impacts from the treatment system were calculated and evaluated using the AG-1 model developed by NYSDEC.

It was assumed for the purpose of this analysis that the treatment system will have an extraction efficiency of 80%, which is considered conservative, and that the system will operate for a period of 2 years. Table 2 summarizes the estimated emission rate for each compound, as well as the calculated annual impact and corresponding NYSDEC annual guideline concentration (AGC). The emission rates were estimated using the maximum measured concentrations in the soil and groundwater.

Based on the results of the air quality analysis, vapor phase control is not required for any of the volatile compounds analyzed. If much higher emission rates are anticipated (i.e., the volatile compounds are extracted at a faster rate) the stack height could be increased to increase dispersion or the blower flow rate could be reduced to decrease the rate of extraction.

## 5.0 IMPLEMENTATION SCHEDULE

Upon execution of the Voluntary Cleanup Agreement between Popular Hand Laundry and NYSDEC, construction of the remediation system as described in this Remediation Work Plan (Section 2.0) will commence within 90 days. It is anticipated that the construction period will be 30 days, including installation of the monitoring wells and start-up of the system. Following completion of construction, the monitoring program as described in this Work Plan (Section 3.0) will commence and will continue until the system termination conditions are attained as also described in this Work Plan (Section 3.0).

## TABLE 2

## POPULAR HAND LAUNDRY

## EMISSIONS ANALYSIS

| Compound | Concentration (ppmw) Maximum Vadose | Concentration (ppmw) Saturated | Total Mass (lb) | Emission Rate (lb/yr) | Ag-1 Impact ($ug/m^3$) | AGC ($ug/m^3$) |
|---|---|---|---|---|---|---|
| Vinyl Chloride | 0.14 | 0.44 | 5.15 | 2.06 | 0.0041 | 0.02 |
| Tetrachloroethene | 11 | 0.067 | 138 | 55.2 | 0.11 | 1.2 |
| Trichloroethene | 0.02 | 0.3 | 2.57 | 1.03 | 0.0021 | 0.45 |
| 1,2 Dichloroethene | 9.5 | 5.5 | 161 | 64.5 | 0.13 | 1900 |

Upon completion of construction of the remediation and monitoring systems, an Engineering Report will be prepared which will contain as-built/record drawing of the installed systems. Also at the completion of construction, an Operations and Maintenance (O&M) Plan will be prepared which will contain the monitoring program described in this Work Plan, together with a description of a maintenance program. The Engineering Report and O&M Plan will be submitted to NYSDEC 60 days following completion of construction and start-up of the system.

## ATTACHMENT NO. 1

## GROUNDWATER SAMPLING PROCEDURES

1. Measure the depth of water using a decontaminated water level indicator and compute the volume of standing water in the well.

2. Remove three to five times the volume of standing water from the well until field measurements (pH, conductivity, temperature, and turbidity) stabilize, or until the well is dry, whichever occurs first, with a submersible pump or bladder pump using dedicated polyethylene tubing, or dedicated or decontaminated bailer. Purge water will be discharged to the sanitary sewer system.

3. Remove the laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.

4. Obtain a sample by using the disposable polyethylene bailer or decontaminated Teflon or stainless steel bailer.

5. Gently pour the sample into the sample container taking care not to spill on outside of bottle or overfill container and replace cover on the sample container. Samples for volatile organic analyses will have no air space in the sample vial prior to sealing. This is done by filling the vial such that there is a meniscus on top. Carefully slide the septum, teflon side down, onto the top of the vial and cap the vail. Check for bubbles by turning the vial upside down and tapping it lightly. If the bubbles appear, reopen the vial, remove septum and add more sample (or resample). Replace septum, recap and check for bubbles. Continue until vial is bubble-free.

6. Return sample container to sample cooler.

7. Dispose of or decontaminate bailer. Decontamination will comprise the following:

    - Wash thoroughly with nonresidual detergent (alconox) and clean potable tap water using a brush to remove particulate matter or surface film.
    - Rinse thoroughly with tap water.
    - Rinse thoroughly with distilled water.
    - Rinse in a well ventilated area with methanol (pesticide grade) and air dry.
    - Rinse thoroughly with distilled water and air dry.
    - Wrap completely in clean aluminum foil with dull side against the equipment.

## ATTACHMENT NO. 2

## SUBSTANTIAL CHANGE DETERMINATION

Termination of operation of the remediation system will be based on a "Zero Slope Condition," the definition of which is provided below.

The Zero Slope Condition is met as follows: when the slope of the curve of the concentrations of 1,2 dichloroethene (DCE) is deemed zero. The determination of whether there is a zero slope shall be made as follows:

1. Samples will be taken at the locations and frequencies stated in the Monitoring Program.

2. The data collected over the preceding twelve (12) month period will be examined and the concentration values for 1,2 DCE and the associated confidence limits will be computed and plotted.

3. If the curve suggested by these data points is linear, then a straight line using least squares regression model will be fitted to the data and the slope of the fitted line will be considered as the estimated slope for purposes of this paragraph.

4. If the data points suggest a nonlinear form, then an exponential curve using a least squares regression model will be fitted to the data. The estimated slope for purposes of this paragraph will be the first derivative of the curve at a value of time halfway between the dates of the last two sample points.

5. The estimated slope will be deemed to be zero if that slope is less than or equal to zero and greater than or equal to negative 100 ppb/year.

6. If the mean concentration in a well is less than or equal to 1,000 ppb, and the procedure defined above results in a positive slope, then the 95 percent confidence interval will be calculated for the slope of the regression line. If a zero slope is within this confidence interval, then the estimated slope will be deemed to be zero.

7. The concentration at a well will be deemed to meet the Zero Slope Condition if the estimated slope is deemed to be zero.

# Appendix A

# VOLUNTARY CLEANUP SUPPLEMENTAL SITE ASSESSMENT REPORT

## POPULAR HAND LAUNDRY SITE
## BROOKLYN, NEW YORK

PREPARED FOR

88 INGRAHAM REALTY CORPORATION
88 INGRAHAM STREET
BROOKLYN, NEW YORK

MARCH 1997

# VOLUNTARY CLEANUP
# SUPPLEMENTAL SITE ASSESSMENT REPORT

## POPULAR HAND LAUNDRY SITE
## BROOKLYN, NEW YORK

**Prepared for**

**88 INGRAHAM STREET**
**BROOKLYN, NEW YORK 11237**

**By**

**DVIRKA AND BARTILUCCI CONSULTING ENGINEERS**
**WOODBURY, NEW YORK**

**MARCH 1997**

**VOLUNTARY CLEANUP**
**SUPPLEMENTAL SITE ASSESSMENT REPORT**

**POPULAR HAND LAUNDRY SITE**
**BROOKLYN, NEW YORK**

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## 1.0 PURPOSE AND BACKGROUND

The purpose of this Supplemental Site Assessment is to satisfy the requirements of the New York State Department of Environmental Conservation (NYSDEC) for additional environmental data under the Voluntary Cleanup Program for the Popular Hand Laundry property located at 88 Ingraham Street, Brooklyn, New York.

This document is a supplement to the Voluntary Cleanup Site Assessment Report that was submitted to NYSDEC in December 1996, as part of the Voluntary Cleanup Program Application for this site. Based on review of the site assessment data that was contained in the application report, NYSDEC requested that additional soil and groundwater samples be collected at the site to confirm the results of the initial assessment, and to collect an ambient air sample to determine if the levels of contamination detected at the site pose a threat.

As a result of this request by NYSDEC, a letter work plan and addendum for a Supplemental Site Assessment was prepared and submitted to the Department on February 24, 1997 and February 26, 1997, respectively (see Appendix A). Based on a verbal approval of the NYSDEC Project Manager (Mr. Joseph O'Connell, Region 2 Office, Division of Environmental remediation), the supplemental investigation was conducted on March 3 and 4, 1997.

This document presents a description of the field program performed as part of the Supplemental Site Assessment (Section 2), the analytical results of the investigation (Section 3), validation of the data (Section 4), and conclusions and recommendations (Sections 5 and 6).

## 2.0 FIELD PROGRAM

### 2.1 Ambient Air Sampling

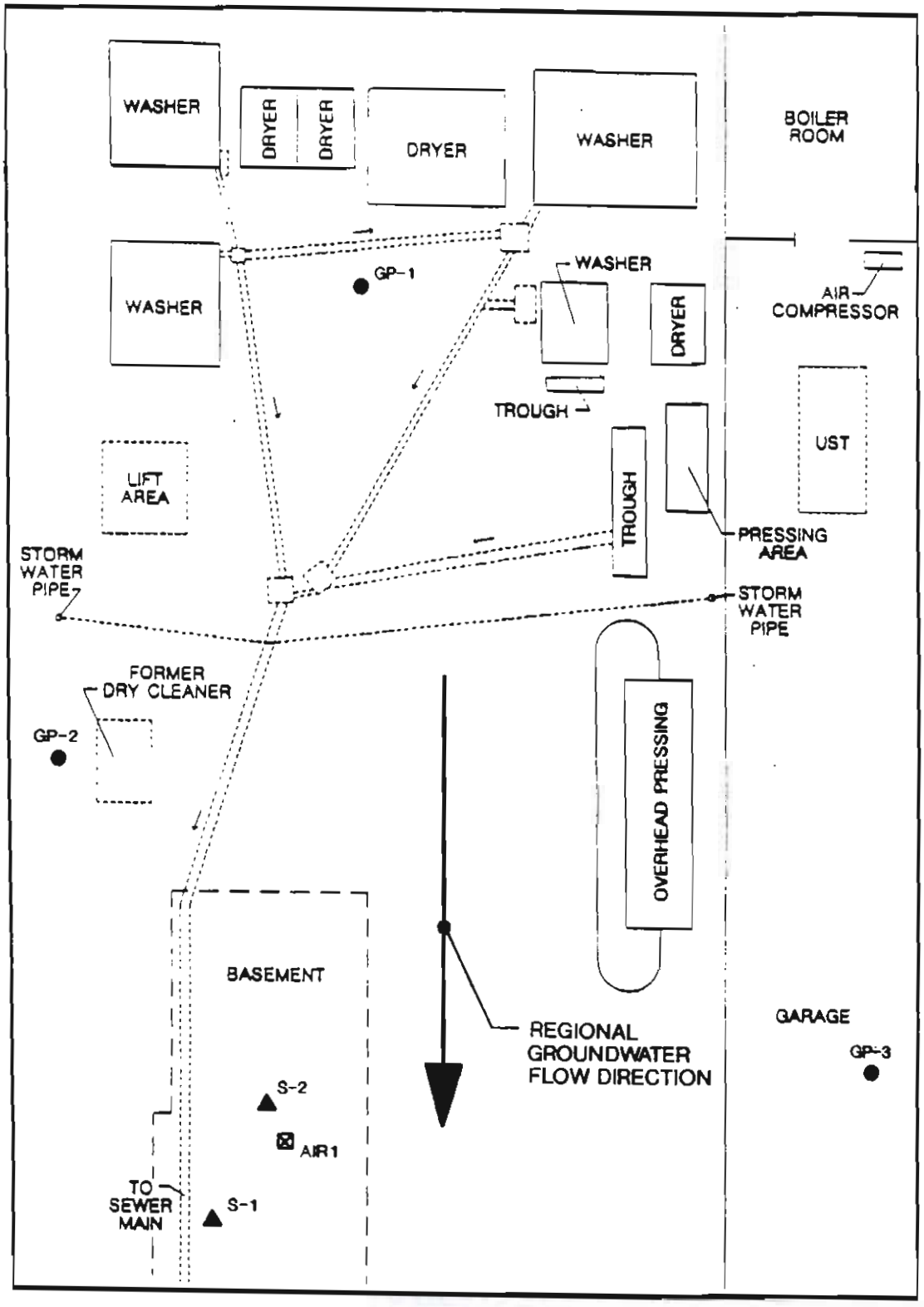
One ambient air sample (Air 1) was collected in the basement of the building (see Figure 1). The air sample was analyzed for volatile organic compounds (VOCs) (Method T01/T02). The ambient air sample was collected by pumping air at a flow rate of 10 ml/min through a tenax tube with a Gillian air pump. The total volume of air sampled was 1.5 liters. The air sample was analyzed by IEA, which is a New York State Department of Health Environmental Laboratory Approval Program (ELAP) laboratory.

### 2.2 Soil/Groundwater Probe Program

Four soil/groundwater probes were installed by Zebra Environmental, Inc. using the Geoprobe sampling system. In addition, two soil samples were collected manually in the basement. The locations of the sampling points are shown on Figure 1.

#### 2.2.1 Probe Installation

The Geoprobe sampling system involved a soil/groundwater sampling device mounted to the back of an All Terrain Vehicle (ATV) which was connected to a remote drive unit. The sampler was hydraulically driven into the ground to the desired depth. The sample was then collected and the drill rods and soil sampling device were removed. Soil samples were collected upon removal of the drill rods and soil sampling device from the borehole. Due to limited access in the basement, the remote unit could not be utilized. As a result, these soil samples were collected by manually driving the Geoprobe soil sampler to the desired depth with a slidehammer and retrieving it with a jack. Upon removal of the rods and sampler, the boreholes were backfilled with cement-bentonite grout and patched with concrete at the surface.




LEGEND:

- ● GEOPROBE SOIL AND GROUNDWATER SAMPLING LOCATION AND NUMBER
- ○ GEOPROBE GROUNDWATER SAMPLING LOCATION AND NUMBER
- ▲ SOIL SAMPLING LOCATION AND NUMBER
- ⊠ AMBIENT AIR SAMPLING LOCATION AND NUMBER

NOTE: Not to Scale

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SITE LAYOUT AND SAMPLING LOCATIONS
POPULAR HAND LAUNDRY
BROOKLYN, NEW YORK

Figure 1

### 2.2.2 Subsurface Soil Sampling

Five subsurface soil samples were collected from locations GP-1, GP-2, GP-3, S-1 and S-2. All the soil samples were collected from the 0 to 2 foot depth interval with the exception of S-1. Soil samples at S-1 were collected at 2-foot intervals from grade to groundwater, approximately 13 feet below the basement floor. Each of the samples collected from the S-1 location was screened with a photoionization detector (PID) and observed for odor and discoloration. Based on the results of organic vapor screening and visual identification, a laboratory sample was selected from 6-7 feet below grade (refer to boring logs in Appendix B for PID readings). The soil samples were analyzed for VOCs utilizing Method 91-1, semivolatile organic compounds (SVOCs) utilizing Method 91-2 and Target Analyte List (TAL) metals. Soil samples, as well as the groundwater samples, were analyzed by Nytest Environmental which is an ELAP laboratory.

To penetrate the building concrete floor, a rotary carbide drill bit was utilized with the probe unit. For collection of the soil sample, a Geoprobe large bore sampler was driven to the top of the desired sample interval. The sampler was closed while it was being driven. At the top of the desired depth interval, the sampler was opened. The sampler was then driven through the sample interval and the sample collected. A soil sample, approximately 24 inches long and 1 inch in diameter, was obtained. Each of the samplers used was fitted with a new disposable acetate liner prior to use. The acetate liner assists in the removal of the soil sample from the tube and prevents sample cross contamination.

All samples were logged on-site by a geologist and immediately transferred to the sample containers. All sample containers were placed on ice in a cooler, sealed and transferred to the laboratory. The sampler and probe rods were decontaminated between each location with an alconox water wash followed by a distilled water rinse. During probe installation, ambient air was monitored for the presence of VOC vapors using a PID.

Generally, the subsurface soils encountered consisted of a fill material in the samples collected from a depth of 0 to 2 feet. Glacial moraine (till) consisting of clay, sand, gravel and boulders were encountered beneath the basement floor at the S-1 location from 2 to 13 feet (water table).

### 2.2.3 Groundwater Sampling

A total of four groundwater samples were collected from probe locations GP-1, GP-2, GP-3 and GP-4. The samples were collected at the water table at depth of approximately 21 feet below grade. Each sample was analyzed for VOCs Method 91-1, SVOCs Method 91-2 and TAL metals. Groundwater samples were collected after purging three to five well volumes of water and upon stabilization of pH, temperature and conductivity. Due to high turbidity in all the samples (> 999 NTUs) the laboratory filtered the samples for metals analysis.

To collect the groundwater samples, a screen point sampler was driven to the desired depth, opened and then retracted approximately 2 feet to expose a stainless steel screen. The stainless steel screen was then pushed into the resulting void by using chase rods from the surface. Hydrostatic pressure in the formation causes water to rise within the screen. Once the screen was exposed, a clean section of 3/8-inch diameter polyethylene tubing fitted with a clean stainless steel bottom check valve was inserted into the probe rods and slowly oscillated up and down to draw a column of water to the surface for collection. Groundwater samples were transferred directly into the laboratory bottles. The bottles were placed on ice in a cooler and delivered to the laboratory.

Prior to filling with the sample, the bottles were labeled with the project name, sample number, date and analysis to be performed. New latex gloves were worn during the sampling and handling of each sample. Chain of custody forms were completed for each sample delivery and the location of each probe was measured and recorded in a field notebook. The chain of custody forms are provided in Appendix C.

Prior to collecting the groundwater samples, the sampler and probe rods were decontaminated with an alconox and water wash followed by a distilled water rinse. Dedicated polyethylene tubing was used to collect each sample.

## 3.0 ANALYTICAL RESULTS

The analytical results for the ambient air, soil and groundwater samples collected as part of the Supplemental Site Assessment are presented in Tables 1, 2, 3, respectively. The laboratory data is presented in Appendix D. Below is a discussion of each of the samples matrices.

### 3.1 Ambient Air Sampling

The ambient air sample collected in the building basement was analyzed for volatile organic compounds (VOCs). The results indicate low levels of a few VOCs, well below the Occupational Safety and Health Administrations' Permissible Exposure Limits (PEL) as shown in Table 1. The PELs are time-weighted average concentration limits for an eight-hour work shift of a 40-hour work week.

### 3.2 Subsurface Soil Sampling

The subsurface soil samples were collected 0 to 2 feet immediately below the concrete floor (three on the street/main level and one in the basement) and one sample was collected 6 to 7 feet below the basement floor which exhibited the highest screening levels of VOC vapors between the basement floor and groundwater (approximately 13 feet).

In general, the results show low levels of VOCs. The locations which exceeded the NYSDEC recommended soil cleanup objective for an individual compound was the sample (S-1) collected at a depth of 6-7 feet beneath the basement floor (1,2 dichloroethene [DCE] at 9.5 mg/kg versus a cleanup objective of 0.55 mg/kg) and GP2 collected at a depth of 0-2 feet beneath the main floor in the vicinity of the former dry cleaning machine (tetrachloroethene [PCE] at 11 mg/kg versus a cleanup objective of 1.4 mg/kg). The total VOCs of 11 mg/kg for sample GP2 is slightly above the cleanup objective of 10 mg/kg. These levels for PCE and DCE are below or just at the United States Environmental Protection Agency (USEPA) Soil Screening Level (SSL)

# TABLE 1
## VOLUNTARY CLEANUP
## SUPPLEMENTAL SITE ASSESSMENT REPORT
## POPULAR HAND LAUNDRY SITE
## WORKPLACE AIR SAMPLING
## VOLATILE ORGANIC COMPOUNDS
## ANALYTICAL LABORATORY: NYTEST ENVIRONMENTAL, INC.

| SAMPLE IDENTIFICATION | AIR#1 | OSHA Permissible Exposure Limits (PELs) * |
|---|---|---|
| DATE OF COLLECTION | 03/04/97 | |
| QUANT. FACTOR | 1.00 | |
| VOLATILE ORGANICS | (ni/l) | (ni/l) |
| Chloromethane | U | |
| Bromomethane | U | |
| Vinyl Chloride | U | |
| Chloroethane | U | |
| Methylene Chloride | 880 E | 500000 |
| Carbon Disulfide | U | |
| 1,1-Dichloroethene | U | |
| 1,1-Dichloroethane | U | |
| 1,2-Dichloroethene (trans) | U | |
| 1,2-Dichloroethene (cis) | U | |
| Chloroform | U | |
| 1,2-Dichloroethane | U | |
| 1,1,1-Trichloroethane | 0.7 J | 350000 |
| Carbon Tetrachloride | U | |
| Bromodichloromethane | U | |
| 1,2-Dichloropropane | U | |
| cis-1,3-Dichloropropene | U | |
| Trichloroethene | U | |
| Dibromochloromethane | U | |
| 1,1,2-Trichloroethane | U | |
| Benzene | U | |
| Trans-1,3-Dichloropropene | U | |
| Bromoform | U | |
| Tetrachloroethene | 0.9 | 100000 |
| 1,1,2,2-Tetrachloroethane | U | |
| Toluene | 0.6 J | 200000 |
| Chlorobenzene | U | |
| Ethylbenzene | U | |
| Styrene | U | |
| m&p-Xylene | U | |
| o-Xylene | U | |

QUALIFIERS/ABBREVIATIONS:

U: Compound analyzed for but not detected

J: Compound found at level below CRDL, value estimated

E: Concentration exceeds instrument calibration limits. Value estimated

* OSHA PELs obtained from NIOSH Pocket Guide to Chemical Hazards; June 1994

**TABLE 2**
**VOLUNTARY CLEANUP**
**SUPPLEMENTAL SITE ASSESSMENT REPORT**
**POPULAR HAND LAUNDRY SITE**
**VOLATILE ORGANICS IN SOILS**
**ANALYTICAL LABORATORY: NYTEST ENVIRONMENTAL, INC.**

| SAMPLE IDENTIFICATION | GP1 | GP2 | GP3 | S-1 | S-2 | CONTRACT REQUIRED DETECTION LIMIT | NYSDEC RECOMMENDED SOIL CLEANUP OBJECTIVES | USEPA SOIL SCREENING LEVELS (GENERIC SSLS) | |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLE DEPTH | 0-2 FEET | 0-2 FEET | 0-2 FEET | 6-7 FEET | 0-2 FEET | | | Ingestion | Inhalation Volatiles |
| DATE OF COLLECTION | 03/03/97 | 03/04/97 | 03/03/97 | 03/04/97 | 03/04/97 | | | | |
| DILUTION FACTOR | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | | | |
| PERCENT SOLIDS | 90 | 87 | 90 | 75 | 85 | | | | |
| VOLATILE ORGANICS | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Chloromethane | U | U | U | U | U | 10 | --- | --- | --- |
| Bromomethane | U | U | U | U | U | 10 | --- | --- | --- |
| Vinyl Chloride | U | U | U | 140 | U | 10 | 200 | 300 | 30 |
| Chloroethane | U | U | U | U | U | 10 | 1900 | --- | --- |
| Methylene Chloride | 3 JB | 5 JB | 3 JB | 4 JB | 4 JB | 10 | 100 | 85000 | 13000 |
| Acetone | 2 J | 2 J | 2 J | 20 | 3 J | 10 | 200 | 7.8E+06 | 1.0E+08 |
| Carbon Disulfide | U | U | U | U | U | 10 | 2700 | 7.8E+06 | 720000 |
| 1,1-Dichloroethene | U | U | U | U | U | 10 | 400 | 1000 | 70 |
| 1,1-Dichloroethane | U | U | U | U | U | 10 | 200 | 7.8E+06 | 1.3E+06 |
| 1,2-Dichloroethene (total) | U | 2 J | U | [redacted] | 35 | 10 | 550* | 1.6E+06** | 3.1E+06** |
| Chloroform | U | U | U | U | U | 10 | 300 | 100000 | 300 |
| 1,2-Dichloroethane | U | U | U | U | U | 10 | 100 | 7000 | 400 |
| 2-Butanone | U | U | U | 9 J | U | 10 | 300 | --- | --- |
| 1,1,1-Trichloroethane | U | U | U | U | U | 10 | 600 | --- | 1.2E+06 |
| Carbon Tetrachloride | U | U | U | U | U | 10 | 600 | 5000 | 300 |
| Bromodichloromethane | U | U | U | U | U | 10 | --- | 10000 | 3E+06 |
| 1,2-Dichloropropane | U | U | U | U | U | 10 | --- | 9000 | 15000 |
| cis-1,3-Dichloropropene | U | U | U | U | U | 10 | --- | 4000*** | 100*** |
| Trichloroethene | U | 2 J | 2 J | U | 20 | 10 | 700 | 58000 | 5000 |
| Dibromochloromethane | U | U | U | U | U | 10 | --- | --- | --- |
| 1,1,2-Trichloroethane | U | U | U | U | U | 10 | --- | 11000 | 1000 |
| Benzene | U | U | U | U | U | 10 | 60 | 22000 | 800 |
| Trans-1,3-Dichloropropene | U | U | U | U | U | 10 | --- | 4000*** | 100*** |
| Bromoform | U | U | U | U | U | 10 | --- | 81000 | 53000 |
| 4-Methyl-2-Pentanone | U | U | U | U | U | 10 | 1000 | --- | --- |
| 2-Hexanone | U | U | U | U | U | 10 | --- | --- | --- |
| Tetrachloroethene | 10 J | [redacted] | 33 | U | 140 | 10 | 1400 | 12000 | 11000 |
| 1,1,2,2-Tetrachloroethane | U | U | U | U | U | 10 | 600 | 3000 | 600 |
| Toluene | U | U | U | U | U | 10 | 1500 | 1.6E+07 | 650000 |
| Chlorobenzene | U | U | U | U | U | 10 | 1700 | 1.6E+06 | 130000 |
| Ethylbenzene | U | U | U | U | U | 10 | 5500 | 7.8E+06 | 400000 |
| Styrene | U | U | U | U | U | 10 | --- | 1.6E+07 | 1.5E+06 |
| Total Xylenes | U | U | U | U | U | 10 | 1200 | 1.6E+08**** | 460000**** |
| Vinyl Acetate | U | U | U | U | U | 10 | --- | 7.8E+07 | 1E+06 |
| TOTAL VOCs | 15 | 11011 | 40 | 9673 | 202 | | 10000 | --- | --- |

QUALIFIERS/ABBREVIATIONS:
J: Compound found at a concentration below the detection limit
U: Compound analyzed for but not detected
B: Compound found in the blank as well as the sample
D* Result taken from reanalysis at a 1:125 dilution
* Proposed - based on the sum of trans-1,2-dichloroethene (.300 ppm) and cis-1,2-dichloroethene (.250 ppm)
**These levels are for trans-1,2-dichloroethene
***These levels are for 1-3-dichloropropene
****These levels are for p-xlyene

NOTES:
1. [redacted]: Value exceeds recommended cleanup objective
2. Detection Limit = CRDL*DF*(100/%S)

**TABLE 2**
**VOLUNTARY CLEANUP**
**SUPPLEMENTAL SITE ASSESSMENT REPORT**
**POPULAR HAND LAUNDRY SITE**
**SEMIVOLATILE ORGANICS IN SOILS**
**ANALYTICAL LABORATORY: NYTEST ENVIRONMENTAL, INC.**

| SAMPLE IDENTIFICATION | GP1 | GP2 | GP3 | S-1 | S-2 | CONTRACT REQUIRED DETECTION LIMIT | NYSDEC RECOMMENDED SOIL CLEANUP OBJECTIVES | USEPA SOIL SCREENING LEVELS (GENERIC SSLS) | |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLE DEPTH | 0-2 FEET | 0-2 FEET | 0-2 FEET | 6-7 FEET | 0-2 FEET | | | Ingestion | Inhalation Volatiles |
| DATE OF COLLECTION | 03/03/97 | 03/04/97 | 03/03/97 | 03/04/97 | 03/04/97 | | | | |
| DILUTION FACTOR | 1.0 | 5.0 | 2.0 | 1.0 | 2.0 | | | | |
| PERCENT SOLIDS | 90 | 87 | 90 | 75 | 85 | | | | |
| COMPOUNDS | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Phenol | U | U | U | U | U | 330 | 30 OR MDL | 4.7E+07 | — |
| bis(2-Chloroethyl)ether | U | U | U | U | U | 330 | --- | 600 | 200 |
| 2-Chlorophenol | U | U | U | U | U | 330 | 800 | 390000 | 5.3E+07 |
| 1,3-Dichlorobenzene | U | U | U | U | U | 330 | 1600 | — | — |
| 1,4-Dichlorobenzene | U | U | U | U | U | 330 | 8500 | 27000 | — |
| 1,2-Dichlorobenzene | U | U | U | U | U | 330 | 7900 | 7E+06 | 560000 |
| 2-Methylphenol | U | U | U | U | U | 330 | 100 OR MDL | 3.9E+06 | — |
| 2,2'-oxybis(1-chloropropane) | U | U | U | U | U | 330 | --- | --- | --- |
| 4-Methylphenol | U | U | U | U | U | 330 | 900 | --- | --- |
| N-Nitroso-di-n-propylamine | U | U | U | U | U | 330 | --- | 90 | --- |
| Hexachloroethane | U | U | U | U | U | 330 | --- | 46000 | 55000 |
| Nitrobenzene | U | U | U | U | U | 330 | 200 OR MDL | 39000 | 92000 |
| Isophorone | U | U | U | U | U | 330 | 4400 | 670000 | 4.6E+06 |
| 2-Nitrophenol | U | U | U | U | U | 330 | 330 OR MDL | --- | — |
| 2,4-Dimethylphenol | U | U | U | U | U | 330 | --- | 1.6E+06 | — |
| bis(2-Chloroethoxy)methane | U | U | U | U | U | 330 | --- | --- | --- |
| 2,4-Dichlorophenol | U | U | U | U | U | 330 | 400 | 230000 | --- |
| 1,2,4-Trichlorobenzene | U | U | U | U | U | 330 | 3400 | 780000 | 3.2E+06 |
| Naphthalene | U | U | 100 J | U | 100 J | 330 | 13000 | 3.1E+06 | — |
| 4-Chloroaniline | U | U | U | U | U | 330 | 220 OR MDL | 310000* | ----* |
| Hexachlorobutadiene | U | U | U | U | U | 330 | --- | --- | --- |
| 4-Chloro-3-methylphenol | U | U | U | U | U | 330 | 240 OR MDL | --- | — |
| 2-Methylnaphthalene | U | U | 170 J | U | 79 J | 330 | 36400 | — | — |
| Hexachlorocyclopentadiene | U | U | U | U | U | 330 | --- | 550000 | 10000 |
| 2,4,6-Trichlorophenol | U | U | U | U | U | 330 | — | 58000 | 200000 |
| 2,4,5-Trichlorophenol | U | U | U | U | U | 800 | 100 | 7.8E+06 | — |
| 2-Chloronaphthalene | U | U | U | U | U | 330 | --- | — | --- |
| 2-Nitroaniline | U | U | U | U | U | 800 | 430 OR MDL | — | — |
| Dimethylphthalate | U | U | U | U | U | 330 | 2000 | — | — |
| Acenaphthylene | U | 240 J | U | U | U | 330 | 41000 | — | — |
| 2,6-Dinitrotoluene | U | U | U | U | U | 330 | 1000 | 900 | — |
| 3-Nitroaniline | U | U | U | U | U | 800 | 500 OR MDL | — | — |
| Acenaphthene | U | 340 J | 130 J | U | 280 J | 330 | 50000 | 4.7E+06 | — |
| 2,4-Dinitrophenol | U | U | U | U | U | 800 | 200 OR MDL | 160000 | — |
| 4-Nitrophenol | U | U | U | U | U | 800 | 100 OR MDL | --- | --- |

**TABLE 2**
**VOLUNTARY CLEANUP**
**SUPPLEMENTAL SITE ASSESSMENT REPORT**
**POPULAR HAND LAUNDRY SITE**
**SEMIVOLATILE ORGANICS IN SOILS**
**ANALYTICAL LABORATORY: NYTEST ENVIRONMENTAL, INC.**

| SAMPLE IDENTIFICATION | GP1 | GP2 | GP3 | S-1 | S-2 | CONTRACT REQUIRED DETECTION LIMIT | NYSDEC RECOMMENDED SOIL CLEANUP OBJECTIVES | USEPA SOIL SCREENING LEVELS (GENERIC SSLS) | |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLE DEPTH | 0-2 FEET | 0-2 FEET | 0-2 FEET | 6-7 FEET | 0-2 FEET | | | Ingestion | Inhalation Volatiles |
| DATE OF COLLECTION | 03/03/97 | 03/04/97 | 03/03/97 | 03/04/97 | 03/04/97 | | | | |
| DILUTION FACTOR | 1.0 | 5.0 | 2.0 | 1.0 | 2.0 | | | | |
| PERCENT SOLIDS | 90 | 87 | 90 | 75 | 85 | | | | |
| COMPOUNDS | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Dibenzofuran | U | 210 J | U | U | 200 J | 330 | 6200 | — | — |
| 2,4-Dinitrotoluene | U | U | U | U | U | 330 | — | 900 | — |
| Diethylphthalate | U | U | U | 790 | 130 J | 330 | 7100 | 6.3E+07 | 2E+06 |
| 4-Chlorophenyl-phenylether | U | U | U | U | U | 330 | — | — | — |
| Fluorene | U | 320 J | U | U | 310 J | 330 | 50000 | 3.1E+06 | — |
| 4-Nitroaniline | U | U | U | U | U | 800 | — | — | — |
| 4,6-Dinitro-2-methylphenol | U | U | U | U | U | 800 | — | — | — |
| N-Nitrosodiphenylamine | U | U | 260 J | U | U | 330 | — | 130000 | — |
| 4-Bromophenyl-phenylether | U | U | U | U | U | 330 | — | — | — |
| Hexachlorobenzene | U | U | U | U | U | 330 | 410 | 400 | 1000 |
| Pentachlorophenol | U | U | U | U | U | 800 | 1000 OR MDL | 3000 | — |
| Phenanthrene | 200 J | 5100 | 680 J | U | 2400 | 330 | 50000 | — | — |
| Anthracene | U | 1000 J | U | U | 610 J | 330 | 50000 | 2.3E+07 | — |
| Carbazole | U | U | U | U | U | 330 | — | 32000 | — |
| Di-n-butylphthalate | U | U | U | U | U | 330 | 8100 | 7.8E+06 | 2.3E+06 |
| Fluoranthene | 440 | 8200 | 310 J | 60 J | 2200 | 330 | 50000 | 3.1E+06 | — |
| Pyrene | 410 | 7000 | 380 J | U | 1400 | 330 | 50000 | 2.3E+06 | — |
| Butylbenzylphthalate | 41 J | U | U | U | U | 330 | 50000 | 1.6E+07 | 930000 |
| 3,3'-Dichlorobenzidine | U | U | U | U | U | 330 | — | 1000 | — |
| Benzo(a)anthracene | 230 J | 3600 | 170 J | U | 790 J | 330 | 224 OR MDL | 900 | — |
| Chrysene | 260 J | 3800 | 230 J | U | 770 J | 330 | 400 | 88000 | — |
| bis(2-Ethylhexyl)phthalate | 200 J | 200 J | 200 J | 68 J | 670 J | 330 | 50000 | 46000 | 3.1E+07 |
| Di-n-octylphthalate | U | U | U | U | U | 330 | 50000 | 1.6E+06 | 1E+07 |
| Benzo(b)fluoranthene | 200 J | 2500 | 150 J | U | 560 J | 330 | 224 OR MDL** | 900 | — |
| Benzo(k)fluoranthene | 230 J | 3600 | 170 J | U | 470 J | 330 | 224 OR MDL** | 9000 | — |
| Benzo(a)pyrene | 240 J | 3900 | 170 J | U | 820 J | 330 | 61 OR MDL | 90 | — |
| Indeno(1,2,3-cd)pyrene | 160 J | 2400 | 120 J | U | 310 J | 330 | 3200 | 900 | — |
| Dibenz(a,h)anthracene | U | 200 J | U | U | U | 330 | 14 OR MDL | 90 | — |
| Benzo(g,h,i)perylene | 180 J | 2700 | 150 J | U | 330 J | 330 | 50000 | — | — |
| Benzyl Alcohol | U | U | U | U | U | 330 | — | — | — |
| Benzoic Acid | U | U | U | 50 J | U | 330 | 2700 | 3.1E+08 | — |
| TOTAL PAHs | 2550 | 44600 | 2760 | 60 | 11120 | | — | — | — |
| TOTAL CARCINOGEN PAHs | 1320 | 19750 | 1010 | 0 | 3490 | | 10000** | — | — |
| TOTAL SVOCs | 2791 | 45010 | 3390 | 968 | 12199 | | 500000 | — | — |

QUALIFIERS/ABBREVIATIONS:
J: Compound found at a concentration below the detection limit, value estimated
U: Compound analyzed for but not detected
*Reported as p-Chloroaniline
**Proposed

NOTES:
1. ▒▒: Value exceeds recommended cleanup objective
2. —: Not established
3. Detection Limit = CRDL*DF*(100/%S)

**TABLE 2**
**VOLUNTARY CLEANUP**
**SUPPLEMENTAL SITE ASSESSMENT REPORT**
**POPULAR HAND LAUNDRY SITE**
**INORGANIC CONSTITUENTS IN SOILS**
**ANALYTICAL LABORATORY: NYTEST ENVIRONMENTAL, INC.**

| SAMPLE IDENTIFICATION | GP1 | GP2 | GP3 | S-1 | S-2 | INSTRUMENT DETECTION LIMITS | NYSDEC RECOMMENDED SOIL CLEANUP OBJECTIVES | USEPA SOIL SCREENING LEVELS (GENERIC SSLS) | |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLE DEPTH | 0-2 FEET | 0-2 FEET | 0-2 FEET | 6-7 FEET | 0-2 FEET | | | Ingestion | Inhalation Particulates |
| DATE OF COLLECTION | 03/03/97 | 03/04/97 | 03/03/97 | 03/04/97 | 03/04/97 | | | | |
| DILUTION FACTOR | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | | | |
| PERCENT SOLIDS | 90.1 | 86.7 | 90.3 | 74.9 | 84.8 | | | | |
| INORGANIC CONSTITUENTS | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (ug/l) | (mg/kg) | (mg/kg) | (mg/kg) |
| Aluminum | 7440 | 5490 | 6680 | | 9180 | 19.7 | SB | --- | --- |
| Antimony | 1.4 B | 2.3 B | 2.4 B | 2.5 B | 1.1 B | 4.9 | SB | 31 | --- |
| Arsenic | 33.8 | 7 | 4.6 | 7.5 | 2.9 | 4.1 | 7 5 or SB | 0.4 | 750 |
| Barium | 175 | 168 | 404 | 80.5 | 38.2 | 5.7 | 300 or SB | 5500 | 6.9E+05 |
| Beryllium | 0.51 B | 0.34 B | 0.42 B | 0.68 | 0.38 B | 0 1 | 0.16 or SB | 0 1 | 1300 |
| Cadmium | 1.1 | 0.67 | 0.51 B | 0.31 B | U | 0 4 | 10* | 78 | 1800 |
| Calcium | 5800 | 6920 | 2920 | 11400 | 1470 | 97.4 | SB | --- | --- |
| Chromium | 24.1 | 13.9 | 16.8 | 24.1 | 14.9 | 1.3 | 50* | 390 | 270 |
| Cobalt | 7.4 | 6.3 | 7.6 | 9.8 | 7.1 | 1.2 | 30 or SB | --- | --- |
| Copper | 99.0 | 329 | 52.0 | 34.8 | 13.4 | 1.8 | 25 or SB | --- | --- |
| Iron | 29400 | 19800 | 23900 | 22900 | 15100 | 16.5 | 2000 or SB | --- | --- |
| Lead | 358 | 524 | 787 | 69.4 | 36.7 | 1.8 | ** | 400 | --- |
| Magnesium | 2310 | 1430 | 2200 | 2630 | 1560 | 95.9 | SB | --- | --- |
| Manganese | 326 | 381 | 410 | 384 | 188 | 0.4 | SB | --- | --- |
| Mercury | 1.7 | 1.7 | 0.33 | 0.73 | 0.89 | 0.1 | 0.1 | --- | --- |
| Nickel | 19.0 | 13.1 | 19.2 | 18.5 | 10.0 | 2.1 | 13 or SB | 1600 | 13000 |
| Potassium | 1160 | 1010 | 930 | 1740 | 634 | 271 | SB | --- | --- |
| Selenium | U | 1.3 | 0.49 B | U | 0.72 | 4.1 | 2 or SB | 390 | --- |
| Silver | 0.36 B | 0.28 B | 0.22 B | U | U | 2 | SB | 390 | --- |
| Sodium | 578 | 485 B | 472 B | 612 B | 235 B | 633 | SB | --- | --- |
| Thallium | U | U | U | U | U | 5.2 | SB | --- | --- |
| Vanadium | 26.5 | 21.5 | 24.0 | 35.8 | 20.4 | 1.8 | 150 or SB | 550 | --- |
| Zinc | 337 | 384 | 226 | 73.4 | 32.4 | 3.4 | 20 or SB | 23000 | --- |

QUALIFIERS/ABBREVIATIONS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL
* Proposed
** Backgroound levels for lead vary widely. Average background levels in metropolitan or surburban areas near highways are much higher and typically range from 200-500 ppm. The USEPA's Interim Lead Hazard Guidance (July 14, 1994) establishes a residential screening level of 400 ppm.

NOTES:
1. [redacted]: Value exceeds recommended cleanup objective
2. —: Not established
3. Detection Limit = IDL*DF*(100/%S)*(Final Vol/Initial Wt)
(Final Vol/Initial Wt) is typically 0.2-This converts ug/l to mg/kg

TABLE 3
VOLUNTARY CLEANUP
SUPPLEMENTAL SITE ASSESSMENT REPORT
POPULAR HAND LAUNDRY SITE
VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER
ANALYTICAL LABORATORY: NYTEST ENVIRONMENTAL, INC.

| SAMPLE IDENTIFICATION | GP1GW | GP2GW | GP3GW | GP4GW | TRIP | CONTRACT REQUIRED DETECTION LIMIT | NYSDEC CLASS GA GROUNDWATER STANDARDS/GUIDELINES | NYSDOH DRINKING WATER MAXIMUM CONTAMINANT LEVELS (MCLs) |
|---|---|---|---|---|---|---|---|---|
| DATE OF COLLECTION | 03/04/97 | 03/04/97 | 03/03/97 | 03/04/97 | NA | | | |
| DILUTION FACTOR | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | | |
| VOLATILE ORGANICS | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) |
| Chloromethane | U | U | U | U | U | 10 | 5 ST | — |
| Bromomethane | U | U | U | U | U | 10 | 5 ST | — |
| Vinyl Chloride | 10 | 14 | 72 | 440 JD**** | U | 10 | 2 ST | 2 |
| Chloroethane | U | U | U | U | U | 10 | 5 ST | — |
| Methylene Chloride | 7 J | U | U | U | 2 J | 10 | 5 ST | 5 |
| Acetone | 16 B | U | 15 B | 12 B | 23 | 10 | 50 GV | — |
| Carbon Disulfide | U | U | U | U | U | 10 | — | — |
| 1,1-Dichloroethene | U | U | U | 4 J | U | 10 | 5 ST | 5 |
| 1,1-Dichloroethane | U | 3 J | 2 J | 4 J | U | 10 | 5 ST | 5 |
| 1,2-Dichloroethene (total) | 1700 D* | 680 D** | 500 D*** | 5500 D***** | U | 10 | 5 ST* | 5 |
| Chloroform | U | U | U | U | U | 10 | 7 ST | 100** |
| 1,2-Dichloroethane | U | U | U | U | U | 10 | 5 ST | 5 |
| 2-Butanone | 25 | U | U | U | U | 10 | 50 GV | — |
| 1,1,1-Trichloroethane | U | U | U | U | U | 10 | 5 ST | 5 |
| Carbon Tetrachloride | U | U | U | U | U | 10 | 5 ST | 5 |
| Bromodichloromethane | U | U | U | U | U | 10 | 50 GV | 100** |
| 1,2-Dichloropropane | U | U | U | U | U | 10 | 5 ST | 5 |
| cis-1,3-Dichloropropene | U | U | U | U | U | 10 | 5 ST | 5 |
| Trichloroethene | 36 | 2 J | 38 | 300 D**** | U | 10 | 5 ST | 5 |
| Dibromochloromethane | U | U | U | U | U | 10 | 50 GV | 100** |
| 1,1,2-Trichloroethane | U | U | U | U | U | 10 | 5 ST | 5 |
| Benzene | U | U | 1 J | U | U | 10 | 0.7 ST | 5 |
| Trans-1,3-Dichloropropene | U | U | U | U | U | 10 | 5 ST | 5 |
| Bromoform | U | U | U | U | U | 10 | 50 GV | 100** |
| 4-Methyl-2-Pentanone | 7 J | U | U | U | U | 10 | ---- | — |
| 2-Hexanone | U | U | U | U | U | 10 | 50 GV | 5 |
| Tetrachloroethene | 4 J | U | 28 | 87 | U | 10 | 5 ST | 5 |
| 1,1,2,2-Tetrachloroethane | U | U | U | U | U | 10 | 5 ST | ---- |
| Toluene | 3 J | 1 J | 1 J | U | U | 10 | 5 ST | 5 |
| Chlorobenzene | U | U | U | U | U | 10 | 5 ST | 5 |
| Ethylbenzene | U | U | 11 | U | U | 10 | 5 ST | 5 |
| Styrene | U | U | U | U | U | 10 | 5 ST | 5 |
| Total Xylenes | U | U | 30 | U | U | 10 | 5 ST* | 15 |
| Vinyl Acetate | U | U | U | U | U | 10 | ---- | — |
| TOTAL VOCs | 1801 | 680 | 694 | 6327 | 25 | | | |

QUALIFIERS/ABBREVIATIONS:
U: Compound analyzed for but not detected
B: Compound found in the method blank as well as the sample
J: Compound found at level below CRDL, value estimated
CRDL: Contract Required Detection Limit
D* Result obtained from reanalysis of the sample at a 1:20 Dilution
D** Result obtained from reanalysis of the sample at a 1:5 Dilution
D*** Result obtained from reanalysis of the sample at a 1:10 Dilution
D**** Result obtained from reanalysis of the sample at a 1:50 Dilution
GV: Guidance Value
ST: Standard

NOTES:
1. [redacted]: Value exceeds Class GA Standards/Guidelines
2. *: Applies to each isomer individually
3. **: Total trihalomethanes not to exceed 100 ug/l
4. —: Not established
5. Detection Limit = DF*CRDL

**TABLE 3**
**VOLUNTARY CLEANUP**
**SUPPLEMENTAL SITE ASSESSMENT REPORT**
**POPULAR HAND LAUNDRY SITE**
**SEMIVOLATILE ORGANIC COMPOUNDS IN GROUNDWATER**
**ANALYTICAL LABORATORY: NYTEST ENVIRONMENTAL, INC.**

| SAMPLE IDENTIFICATION | GP1GW | GP2GW | GP3GW | GP4GW | CONTRACT REQUIRED DETECTION LIMIT | NYSDEC CLASS GA GROUNDWATER STANDARDS/ GUIDELINES | NYSDOH DRINKING WATER MAXIMUM CONTAMINANT LEVELS (MCLs) |
|---|---|---|---|---|---|---|---|
| DATE OF COLLECTION | 03/04/97 | 03/04/97 | 03/03/97 | 03/04/97 | | | |
| DILUTION FACTOR | 1.0 | 1.0 | 1.0 | 1.0 | | | |
| SEMIVOLATILE ORGANIC COMPOUND | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) |
| Phenol | U | U | U | U | 10 | 1 ST ** | — |
| bis(2-Chloroethyl)ether | U | U | U | U | 10 | 1 0 ST | — |
| 2-Chlorophenol | U | U | U | U | 10 | 1 ST ** | — |
| 1,3-Dichlorobenzene | U | U | U | U | 10 | 5 ST | — |
| 1,4-Dichlorobenzene | U | U | U | U | 10 | 4.7 ST * | — |
| 1,2-Dichlorobenzene | U | U | U | U | 10 | 4.7 ST * | — |
| 2-Methylphenol | U | U | U | U | 10 | 1 ST ** | — |
| 2,2'-oxybis(1-chloropropane) | U | U | U | U | 10 | 5 ST | — |
| 4-Methylphenol | U | U | U | U | 10 | 1 ST ** | — |
| N-Nitroso-di-n-propylamine | U | U | U | U | 10 | — | — |
| Hexachloroethane | U | U | U | U | 10 | 5 ST | — |
| Nitrobenzene | U | U | U | U | 10 | 5 ST | — |
| Isophorone | U | U | U | U | 10 | 50 GV | — |
| 2-Nitrophenol | U | U | U | U | 10 | 1 ST ** | — |
| 2,4-Dimethylphenol | U | U | U | U | 10 | 1 ST ** | — |
| bis(2-Chloroethoxy)methane | U | U | U | U | 10 | 5 ST | — |
| 2,4-Dichlorophenol | U | U | U | U | 10 | 1 ST ** | — |
| 1,2,4-Trichlorobenzene | U | U | U | U | 10 | 5 ST | 5 |
| Naphthalene | U | 1 J | [redacted] | U | 10 | 10 GV | — |
| 4-Chloroaniline | U | U | U | U | 10 | 5 ST | — |
| Hexachlorobutadiene | U | U | U | U | 10 | 5 ST | 5 |
| 4-Chloro-3-methylphenol | U | U | U | U | 10 | 1 ST ** | — |
| 2-Methylnaphthalene | U | U | 28 | U | 10 | — | — |
| Hexachlorocyclopentadiene | U | U | U | U | 10 | 5 ST | — |
| 2,4,6-Trichlorophenol | U | U | U | U | 10 | 1 ST ** | — |
| 2,4,5-Trichlorophenol | U | U | U | U | 50 | 1 ST ** | — |
| 2-Chloronaphthalene | U | U | U | U | 10 | 10 GV | — |
| 2-Nitroaniline | U | U | U | U | 50 | 5 ST | — |
| Dimethylphthalate | U | U | U | U | 10 | 50 GV | — |
| Acenaphthylene | U | U | U | U | 10 | — | — |
| 2,6-Dinitrotoluene | U | U | U | U | 10 | 5 ST | — |
| 3-Nitroaniline | U | U | U | U | 50 | 5 ST | — |
| Acenaphthene | U | U | 2 J | U | 10 | 20 GV | — |
| 2,4-Dinitrophenol | U | U | U | U | 50 | 1 ST ** | — |
| 4-Nitrophenol | U | U | U | U | 50 | 1 ST ** | — |

**TABLE 3**
**VOLUNTARY CLEANUP**
**SUPPLEMENTAL SITE ASSESSMENT REPORT**
**POPULAR HAND LAUNDRY SITE**
**SEMIVOLATILE ORGANIC COMPOUNDS IN GROUNDWATER**
**ANALYTICAL LABORATORY: NYTEST ENVIRONMENTAL, INC.**

| SAMPLE IDENTIFICATION | GP1GW | GP2GW | GP3GW | GP4GW | CONTRACT REQUIRED DETECTION LIMIT | NYSDEC CLASS GA GROUNDWATER STANDARDS/ GUIDELINES | NYSDOH DRINKING WATER MAXIMUM CONTAMINANT LEVELS (MCLs) |
|---|---|---|---|---|---|---|---|
| DATE OF COLLECTION | 03/04/97 | 03/04/97 | 03/03/97 | 03/04/97 | | | |
| DILUTION FACTOR | 1.0 | 1.0 | 1.0 | 1.0 | | | |
| SEMIVOLATILE ORGANIC COMPOUND | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) |
| Dibenzofuran | U | U | 1 J | U | 10 | --- | --- |
| 2,4-Dinitrotoluene | U | U | U | U | 10 | 5 ST | --- |
| Diethylphthalate | U | U | U | U | 10 | 50 GV | --- |
| 4-Chlorophenyl-phenylether | U | U | U | U | 10 | --- | --- |
| Fluorene | U | U | 3 J | U | 10 | 50 GV | --- |
| 4-Nitroaniline | U | U | U | U | 50 | 5 ST | --- |
| 4,6-Dinitro-2-methylphenol | U | U | U | U | 50 | 1 ST ** | --- |
| N-Nitrosodiphenylamine | U | U | U | U | 10 | 50 GV | --- |
| 4-Bromophenyl-phenylether | U | U | U | U | 10 | --- | --- |
| Hexachlorobenzene | U | U | U | U | 10 | 0.35 ST | --- |
| Pentachlorophenol | U | U | U | U | 50 | 1 ST ** | --- |
| Phenanthrene | U | U | 4 J | U | 10 | 50 GV | --- |
| Anthracene | U | U | U | U | 10 | 50 GV | --- |
| Carbazole | U | U | U | U | 10 | --- | --- |
| Di-n-butylphthalate | 1 J | U | U | U | 10 | 50 ST | --- |
| Fluoranthene | U | U | U | U | 10 | 50 GV | --- |
| Pyrene | U | U | U | U | 10 | 50 GV | --- |
| Butylbenzylphthalate | U | U | U | U | 10 | 50 GV | --- |
| 3,3'-Dichlorobenzidine | U | U | U | U | 10 | 5 ST | --- |
| Benzo(a)anthracene | U | U | U | U | 10 | 0.002 GV | --- |
| Chrysene | U | U | U | U | 10 | 0.002 GV | --- |
| bis(2-Ethylhexyl)phthalate | 2 J | U | 1 J | U | 10 | 50 ST | --- |
| Di-n-octylphthalate | U | U | U | U | 10 | 50 GV | --- |
| Benzo(b)fluoranthene | U | U | U | U | 10 | 0.002 GV | --- |
| Benzo(k)fluoranthene | U | U | U | U | 10 | 0.002 GV | --- |
| Benzo(a)pyrene | U | U | U | U | 10 | ND ST | --- |
| Indeno(1,2,3-cd)pyrene | U | U | U | U | 10 | 0.002 GV | --- |
| Dibenz(a,h)anthracene | U | U | U | U | 10 | --- | --- |
| Benzo(g,h,i)perylene | U | U | U | U | 10 | --- | --- |
| Benzyl Alcohol | U | U | U | U | 10 | --- | --- |
| Benzoic Acid | U | U | U | U | 50 | --- | --- |
| TOTAL PAHs | 0 | 1 | 21 | 0 | | | |
| TOTAL CARCINOGEN PAHs | 0 | 0 | 0 | 0 | | | |
| TOTAL SVOCs | 3 | 1 | 51 | 0 | | | |

QUALIFIERS/ABBREVIATIONS:
J: Compound found at a concentration below the detection limit
U: Compound analyzed for but not detected
ST: Standard
GV: Guidance Value

NOTES:
1. [redacted]: Value exceeds Class GA Guideline
2. *: Value pertains to the sum of the isomers
3. **: Value pertains to total phenols
4. ---: Not established
5. Detection Limit = DF*CRDL

**TABLE 3**
**VOLUNTARY CLEANUP**
**SUPPLEMENTAL SITE ASSESSMENT REPORT**
**POPULAR HAND LAUNDRY SITE**
**INORGANIC CONSTITUENTS IN GROUNDWATER**
**ANALYTICAL LABORATORY: NYTEST ENVIRONMENTAL, INC.**

| SAMPLE IDENTIFICATION | GP1GW | GP1GW-F | GP2GW | GP2GW-F | GP3GW | GP3GW-F | GP4GW | GP4GW-F | INSTRUMENT DETECTION LIMITS | NYSDEC CLASS GA GROUNDWATER STANDARDS/GUIDELINES | NYSDOH DRINKING WATER MAXIMUM CONTAMINANT LEVELS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE OF COLLECTION | 03/04/97 | 03/04/97 | 03/04/97 | 03/04/97 | 03/03/97 | 03/03/97 | 03/04/97 | 03/04/97 | | | |
| DILUTION FACTOR | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | | |
| INORGANIC CONSTITUENTS | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) | (ug/l) |
| Aluminum | 381000 | 268 | 385000 | 431 | 209000 | 280 | 203000 | 125 B | 19.7 | ---- | ---- |
| Antimony | 46.4 B | U | 37 B | U | 52 B | U | 40.2 B | U | 4.9 | 3 GV | ---- |
| Arsenic | 104 | U | 113 | U | 99.3 | U | 99.0 | U | 4.1 | 25 ST | 50 |
| Barium | 2460 | 209 | 3620 | 263 | 1550 | 677 | 2590 | 243 | 5.7 | 1000 ST | 1000 |
| Beryllium | 18.3 | U | 21.2 | U | 18.3 | U | 21.2 | U | 0.10 | 3 GV | ---- |
| Cadmium | 12.3 | 0.91 B | 6.2 | 0.46 B | U | U | 5.4 | 0.48 B | 0.40 | 10 ST | 5 |
| Calcium | 162000 | 136000 | 212000 | 195000 | 154000 | 144000 | 181000 | 183000 | 97.4 | ---- | ---- |
| Chromium | 1780 | U | 667 | U | 1020 | U | 647 | U | 1.3 | 50 ST | 100 |
| Cobalt | 392 | 11.8 B | 558 | 20.1 B | 320 | 18.1 B | 363 | 4.1 B | 1.2 | ---- | ---- |
| Copper | 1340 | 4.0 B | 1080 | 2.9 B | 896 | 8.8 B | 741 | 4.6 B | 1.8 | 200 ST | 1000 |
| Iron | 1490000 | [redacted] | 1260000 | [redacted] | 165000 | [redacted] | 1190000 | [redacted] | 16.5 | 300 ST * | 300* |
| Lead | 366 | U | 298 | U | 475 | U | 250 | U | 1.8 | 25 ST | 15** |
| Magnesium | 135000 | 24400 | 158000 | [redacted] | 96700 | [redacted] | 128000 | [redacted] | 95.9 | 35000 GV | ---- |
| Manganese | 26000 | [redacted] | 47300 | [redacted] | 19600 | [redacted] | 24600 | [redacted] | 0.4 | 300 ST * | 300* |
| Mercury | 2.1 | U | 0.67 | U | 1.4 | U | 0.53 | U | 0.10 | 2 ST | 2 |
| Nickel | 1160 | 43.5 | 862 | 24.2 B | 643 | 24.7 B | 547 | 14.2 B | 2.1 | ---- | ---- |
| Potassium | 97200 | 21200 | 92500 | 22800 | 57200 | 12000 | 66300 | 9440 | 271 | ---- | ---- |
| Selenium | U | U | U | U | U | U | U | U | 4.1 | 10 ST | 10 |
| Silver | U | U | U | U | U | U | U | U | 2.0 | 50 ST | 50 |
| Sodium | 99100 | [redacted] | 95000 | [redacted] | 140000 | [redacted] | 88000 | [redacted] | 633 | 20000 ST | ---- |
| Thallium | U | [redacted] | 42.3 | [redacted] | U | U | U | U | 5.2 | 4 GV | ---- |
| Vanadium | 1070 | U | 916 | U | 993 | U | 1000 | U | 1.8 | ---- | ---- |
| Zinc | 4300 | 45.1 | 1130 | 68.4 | 1210 | 157 | 1240 | 37.9 | 3.4 | 300 ST | 5000 |

QUALIFIERS/ABBREVIATIONS

U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.
GV: Guidance Value
ST: Standard

NOTES

1. [redacted] Value exceeds Class GA Standards/Guidelines (filtered samples only)
2. * Standard for the sum of iron and manganese is 500 ug/l
3. ** Action level for lead is 15 ug/l effective 12/7/92
4. ----: Not established
5. Detection Limit = DF*IDL

of 1,600 mg/kg for DCE and 11 mg/kg for PCE Note, however, these SSLs are for residential land use and the Popular Hand Laundry site is used for industrial purposes and is located in a predominantly industrial area.

With regard to SVOCs, all samples, except for the sample 6-7 feet below the basement floor, showed some exceedances of the NYSDEC soil cleanup objectives for individual compounds. However, except for the sample (GP2) collected below the main floor near the former location of the dry cleaning machine, both the levels of total SVOCs and total carcinogen SVOCs are less than the NYSDEC cleanup objectives of 500 mg/kg and 10 mg/kg, respectively. The levels of total carcinogenic SVOCs (polycyclic aromatic hydrocarbons [PAHs]) in sample GP2 was 19.7 mg/kg.

With regard to metals, although there are a number of exceedances of the NYSDEC soil cleanup objectives, most exceedances are minor, except for iron and zinc. The levels for zinc however, were well below the USEPA SSL (Table 2). It should be noted, that while there are some exceedances of the NYSDEC soil cleanup objective for SVOCs and metals, the source of these contaminants is not likely a result of discharges at the site, but rather, characteristic of the fill material which was used to construct the building. In addition, the soil cleanup objectives for iron and zinc are based on an average of USA Eastern background levels and are not health risk related as are USEPA's SSLs.

### 3.3 Groundwater Sampling

The groundwater samples were collected at the water table. The results indicate some exceedances of Class GA standards for VOCs, in particular for 1,2 dichloroethene. The results for SVOCs, except for a single slight exceedance of napthalene (GP3GW) (12 ug/l versus a guidance value of 10 ug/l) and a few filtered metals (iron, magnesium, manganese, sodium and slight exceedances for thallium [9.3 and 14.8 ug/l versus a guidance value of 4 ug/l]) did not indicate exceedances of standards or guidelines.

## 4.0 DATA VALIDATION RESULTS

Five soil, four groundwater, one trip blank and one air sample were collected during the supplemental investigation at the Popular Hand Laundry site. The soil and groundwater samples were analyzed for Target Compound List (TCL) volatiles (VOCs), TCL semivolatiles (SVOCs) and Target Analyte List (TAL) metals. The analysis was performed in accordance with NYSDEC 12/91 Analytical Services Protocol (ASP) requirements by Nytest Environmental, Inc. The air sample was analyzed for TCL VOCs by Method T01/T02. The air analysis was performed by IEA, a subcontractor to D&B.

All data packages have been validated (reviewed) as per NYSDEC Quality Assurance/Quality Control (QA/QC) requirements for completeness, accuracy and adherence to the specified methods. The findings of the validation process are summarized below.

All analyses were performed in accordance with the specified methods and within the required holding times.

The semivolatile fraction of GP3GW and GP202 required reanalysis due to surrogate recoveries and/or internal standard area counts being outside QC limits. The reanalysis of each sample yielded results similar to the initial run; therefore, the results from the initial run are to be utilized for environmental assessment.

Several of the volatile samples required reanalysis at secondary dilutions due to compound concentrations exceeding the instrument calibration range. The results for the compounds impacted were taken from the diluted run and are flagged with a D on the data summary tables. All other results for those samples are from the initial undiluted analysis.

The methylene chloride results for all the soil samples and the acetone results for the water samples have been qualified as non-detect due to laboratory contamination.

The analysis of the air sample was performed in accordance with Method T01/T02.

No other problems were found with the data and all results are deemed valid and usable as qualified above.

## 5.0 CONCLUSIONS

Based on the results of the ambient air sample, the contaminants detected in soil and groundwater beneath the site do not pose a threat.

While the soils beneath the main floor of the building indicate somewhat elevated levels of VOCs, SVOCs and metals, the SVOCs and metals are likely attributable to the fill material on which the building was constructed and not to discharges at the site. PAHs and metals are commonly associated with fill in New York City, much of it being the result of the disposal of coal ash. As mentioned in Section 3, this is evidenced by the results of the soil samples collected below the basement floor in the native soil, which showed low levels of SVOCs and metals.

The groundwater beneath the site indicates elevated levels of VOCs which may be attributable to the former dry cleaning operation in the building. However, while in general the results of the supplemental investigation are fairly similar to the initial investigation for groundwater for tetrachloroethene (PCE), trichloroethene (TCE) and vinyl chloride (VC), the results for 1,2 dichloroethene are higher. While it would be expected that PCE and its breakdown products (TCE, DCE and VC) would be present, the very low levels of PCE and TCE combined with the higher levels of DCE (two to three orders of magnitude) is not common.

Assuming, based on regional flow information, that groundwater flows in a northerly direction, it is possible that there is an upgradient source of DCE. The assumed upgradient groundwater data point showed 1.7 mg/l of DCE, while the downgradient results showed 0.5, 0.6 and 5.5 mg/l or an average downgradient level of 2.2 mg/l, which is similar to the upgradient value. DCE, besides being a breakdown product of PCE and TCE, is also used as a solvent.

If the DCE is attributable to the site, it is likely the result of leaky sewers beneath the building into which separated wash water from the dry cleaning operation was reportedly disposed. The results of the initial site assessment, which sampled the soil in the vicinity of the sewer lines below the building floor and detected low levels of PCE and its breakdown products,

as well as DCE detected below the sewer line in the supplemental investigation, appear to substantiate this hypothesis.

Concerned about off site contamination

88 Ingraham St

— Cornell Beverages

— Allan
718-381-3000

130

## 6.0 RECOMMENDATIONS

Since the contaminants detected in the soil below the building are not significantly elevated, are not attributable to waste disposal at the site (but rather due to fill material), except perhaps due to leaky sewers, do not impair ambient air inside the building and are isolated from any contact by workers that occupy the building, remediation of soil at the Popular Hand Laundry property is not necessary and, therefore, not recommended.

With regard to groundwater, although there are elevated levels of contaminants that could be attributable to former dry cleaning operations at the property, they may also be the result of other sources of contamination in the highly industrial area that surrounds the site. Since the groundwater beneath and downgradient of the site is not currently used for potable supply, and based on the results for sodium, which range between 92.5 and 150 mg/l (groundwater standard of 20 mg/l), chloride, which ranges between 74.5 and 237 mg/l (groundwater standard of 250 mg/l), and total dissolved solids, which range between 861 and 1,020 mg/l, the groundwater appears to be saline as a result of the nearby English Kill (which is a salt water body), the groundwater in the area of the Popular Hand Laundry property is likely not suitable as a future source of potable water. (Saline/Class GSA groundwater is defined as having a chloride concentration of greater than 250 mg/l or a total dissolved solids concentration of greater than 1,000 mg/l.) As a result, remediation of the groundwater will not be beneficial. Therefore, remediation of groundwater is also not recommended.

# APPENDIX A

# SUPPLEMENTAL SITE ASSESSMENT WORK PLAN AND AMENDMENT

**Dvirka and Bartilucci**
CONSULTING ENGINEERS

330 Crossways Park Drive, Woodbury, New York, 11797-2015
516-364-9890 • 718-460-3634 • Fax: 516-364-9045

February 24, 1997

Joseph M. O'Connell
Division of Environmental Remediation
Region 2
New York State Department of
Environmental Conservation
47-40 21st Street
Long Island City, NY 11101

Re: Popular Hand Laundry
D&B No. 1447

Dear Mr. O'Connell:

As a result of our telephone conversation on February 21, 1997, please find below a revised work plan for the requested additional investigation.

1. Three Geoprobe soil and groundwater samples will be collected from the following locations. The soil samples will be collected at the 0-2' depth interval and the groundwater sample will be collected at the water table.

   a. At the rear of the building. If this location outside of the building cannot be accessed, an alternate location inside the building will be utilized (see attached figure);

   b. In the area of the former dry cleaning machine; and

   c. In the northwestern area of the garage.

2. One Geoprobe groundwater (water table) sample will be collected at the front of the building.

3. Two soil samples will be collected in the basement. One sample will be collected from the 0-2' depth interval in the center of where the boxes are stored, and one sample with the highest PID reading will be collected from a boring (to groundwater if possible) along the sewer line by the entrance to the basement.

4. The four groundwater samples and five soil samples will be analyzed for volatile organic compounds (VOCs)/ASP Method 91-1, semivolatile organic compounds (SVOCs)/ASP Method 91-2 and metals/ASP TAL metals. Groundwater samples will be collected after purging three to five well volumes (stabilization of temperature, conductivity and pH), and will be filtered for metals analysis if greater than 50 NTUs

5. One ambient air sample will be obtained in the basement of the building and analyzed for VOCs (Method T01/T02).

6. Groundwater samples will be collected with a bailer.

7. The ambient air samples for VOCs will be collected with a tenex tube.

8. QA/QC samples will comprise one trip blank (VOCs). No field blanks will be collected since dedicated bailers, tubing and soil samplers will be used. Laboratory method blanks and MS/MSDs will be utilized for data validation. NYTest Laboratory, which is ELAP certified, will perform the sample analysis; and

9. After sample collection, the Geoprobe and boring locations will be backfilled and grouted, if necessary.

Following receipt of the analytical results, a supplemental report to the Voluntary Cleanup Program Application will be prepared, which will provide the following:

1. Figure illustrating the locations of the Geoprobe points, soil borings and ambient air sample

2. Description of Geoprobe and boring construction and sample collection procedures

3. Tabulated analytical results and comparison to standards/guidelines

4. Data validation results

5. Conclusions

Joseph M. O'Connell
Division of Environmental Remediation
Region 2
New York State Department of
Environmental Conservation
February 24, 1997



6. Recommendations

7. Appendix with complete laboratory data reports.

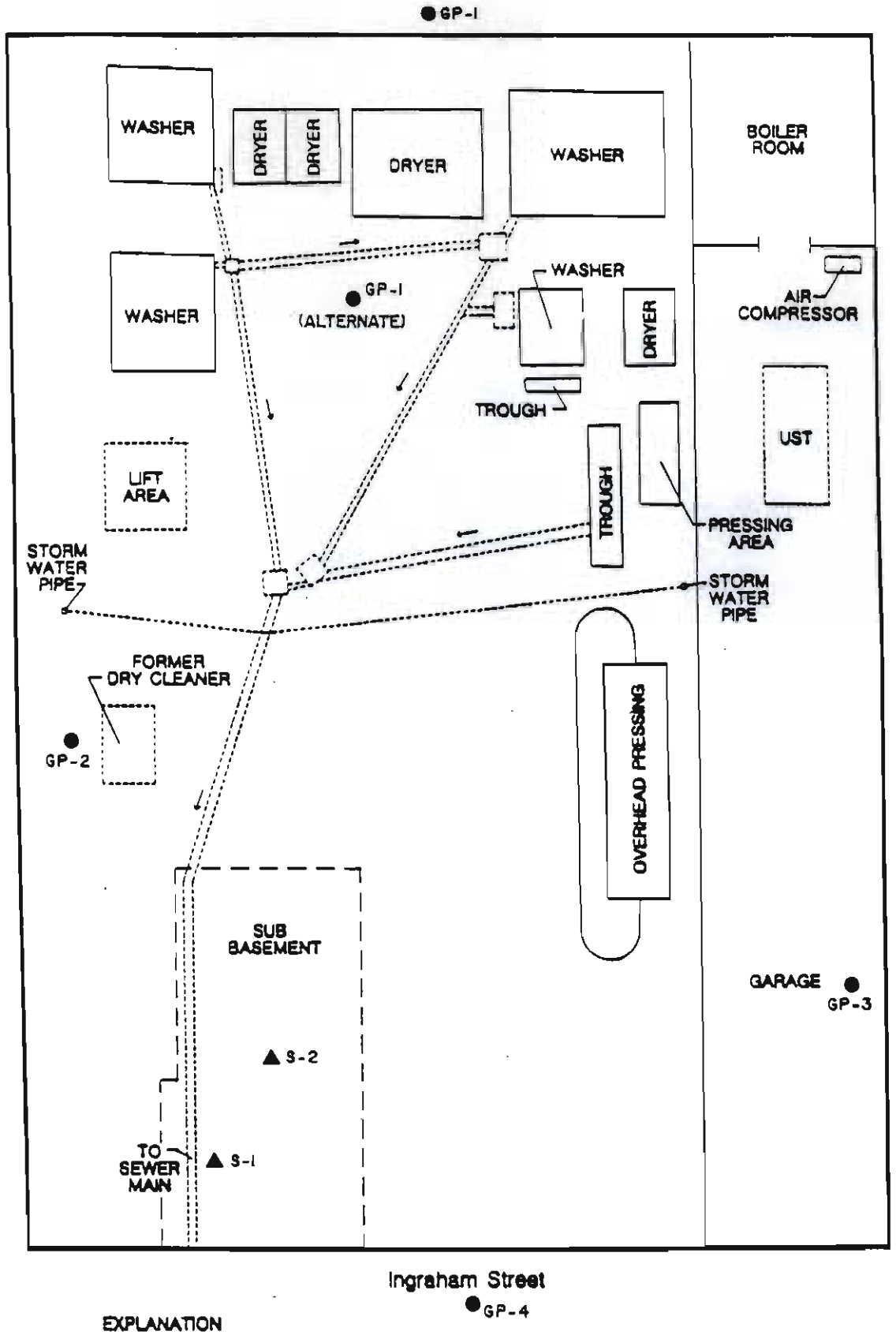
If you have any questions with regard to this revised work plan, or require additional information, please do not hesitate to call me. Since we would like to plan the field work for March 1 and 2, 1997, your expeditious review and aproval would be greatly appreciated.

Very truly yours,

Thomas F. Maher, P.E.
Vice President

TFM/tam
Enclosure
cc: Igor Bilewich, Esq., Farrell, Fritz
John Soderberg, Esq., Farrell, Fritz

o1447/TFM97-11.LTR




EXPLANATION

▲ SOIL BORING LOCATION

● GEOPROBE LOCATION

NOTE: Not to Scale

C:\acad\014933A\14933A01

ENVIRON

A Division of APTI
Environmental Sciences Group, Inc.

SITE LAYOUT AND SAMPLING LOCATIONS
POPULAR HAND LAUNDRY
BROOKLYN, NEW YORK

Figure

Dvirka
and
Bartilucci
CONSULTING ENGINEERS

330 Crossways Park Drive, Woodbury, New York, 11797-2015
516-364-9890 • 718-460-3634 • Fax: 516-364-9045

February 26, 1997

Joseph M. O'Connell
Division of Environmental Remediation
Region 2
New York State Department of
Environmental Conservation
47-40 21st Street
Long Island City, NY 11101

Re: Popular Hand Laundry
D&B No. 1447

Dear Mr. O'Connell:

As requested, please find enclosed our Standard Operating Procedure for the collection of ambient air samples using a tenex tube.

If this is acceptable, as discussed, could you please send me a letter approving the supplemental field investigation to be conducted at the above referenced site.

If you have any questions, or require additional information, please do not hesitate to call me.

Very truly yours,

Thomas F. Maher, P.E.
Vice President

TFM/tam
Enclosure
cc: Igor Bilewich, Esq., Farrell, Fritz
John Soderberg, Esq., Farrell, Fritz

O1447/TFM97-14.LTR

## Standard Operating Procedures Collection of Ambient Air

1. Be certain that the sample location is noted on Location Sketch.

2. Label tube, fill out Sample Information Record and Chain of Custody Form.

3. Connect tube to pump with a flow meter in series using polyethylene tubing and set tube 5 feet above ground surface. Turn on pump and record the flow rate of the flow meter.

4. Turn on pump and monitor the pump flow rate at half hour intervals during the duration of sampling. Collect 1.5 liters of air through the tube.*

5. Turn off pump and disconnect tube and check the pump flow rate.

6. Place tube in container and place in cooler.

*To determine the duration of same collection a calculation is performed using the conversion chart for the flow meter utilized. The conversion chart assigns a flow rate to the readings on the flow meter. The calculation is as follows:

$$\text{Sample Time} = \frac{1.5 \text{ Liters}}{\text{Flow Rate (ml / min)}}$$

# APPENDIX B

# BORING LOGS

DVIRKA AND BARTILUCCI

**DRILLING CONTRACTOR**
Driller: Zebra
Inspector: Keith Robins
Rig Type: Manual/Remote
Drilling Method: Manual soil probe
Drive Hammer Weight: —

**DRILLING LOG**
PROJECT NAME: Popular Uniform
PROJECT #: 1447
Location/Address: 88 In Graham Street Brooklyn, NY

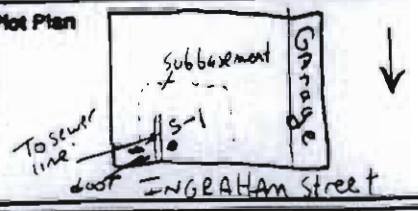
**BORING NUMBER** S-1
Sheet 1 of 1
Boring Location:

**GROUNDWATER OBSERVATIONS**

| | | | |
|---|---|---|---|
| Water Level | | | |
| Time | | | |
| Date | | | |
| Casing Depth | | - | |

Weather: Light drizzle / Snow
Date/Time Start: 3/4/97
Date/Time Finish: 3/4/97

Plot Plan




| Sample Depth | Sample Number | SPT | PID/FID Reading | FIELD IDENTIFICATION OF MATERIAL | WELL SCHEMATIC | COMMENTS |
|---|---|---|---|---|---|---|
| 0-2 | SS-1 | — | 2 ppm | (0-2) Brown sand coarse-medium, silt, cobbles, gravel, concrete. | | Fill material |
| rec: | 24" | | | | | |
| 2-4 | SS-2 | — | 2 ppm | (2-4) Brown cobbles, sand, gravel little silt | | Fill material |
| rec: | 24" | | | | | Glacial (Till) |
| 4-6 | SS-3 | — | 3-5 ppm | (4-6) Brown silt, little gray brown clay - moist | | ↓ (Lab sample) |
| rec: | 24" | | | | | possible organics |
| 6-8 | SS-4 | — | 15-20 ppm | (6-8) Dark Brown-Gray silt some clay, black staining at (6-7) | | wet at 10' |
| rec: | 24" | | | | | |
| 8-10 | SS-5 | — | 1.5 ppm | (8-10) Gray-Green silt, clay | | Glacial (Till) |
| rec | 24" | | | | | |
| 10-12 | SS-6 | — | 2.0 ppm | (10-12) Orange Brown dense clay, some silt, interbedded with small subrounded gravel, medium size cobbles. - damp-moist | | |
| rec: | 24" | | | | | |
| | | | | END OF BORING AT 12' | | |

SPT = STANDARD PENETRATION TEST

Soil Stratigraphy Summary:

DVIRKA AND BARTILUCCI

**DRILLING CONTRACTOR**
Driller: Zebra
Inspector: Keith Robins
Rig Type: Geoprobe Soil Sampler
Drilling Method: Manual Geoprobe
Drive Hammer Weight:

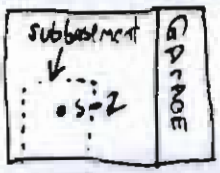
**DRILLING LOG**
PROJECT NAME: Popular Uniform
PROJECT #: 1447
Location/Address: 88 Ingraham Street Brooklyn New York

**BORING NUMBER** S-2
Sheet 1 of 1
Boring Location: AREA OF Storage boxes in middle of basement Floor.

**GROUNDWATER OBSERVATIONS**

| | | | |
|---|---|---|---|
| Water Level | | | |
| Time | | | |
| Date | | | |
| Casing Depth | | - | |

Weather: light drizzle / snow 30°F
Date/Time Start: 3/4/97
Date/Time Finish: 3/4/97

Plot Plan: 


| Sample Depth | Sample Number | SPT | PID/FID Reading | FIELD IDENTIFICATION OF MATERIAL | WELL SCHEMATIC | COMMENTS |
|---|---|---|---|---|---|---|
| 0-2 | SS-1 | - | 0-1 ppm | (0-2') Brown-DK Brown sand course - medium qtz, silts, gravel, some large cobbles. Trace amounts of Brown-Orange Sand. dry-damp moisture. / poorly sorted. | | Fill material Concrete (0-2") |
| rec= | 24" | | | | | |
| | | | | END OF BORING AT 2.0 Feet | | |

SPT = STANDARD PENETRATION TEST

Soil Stratigraphy Summary:

DVIRKA AND BARTILUCCI

**DRILLING LOG**

| | |
|---|---|
| DRILLING CONTRACTOR | |
| Driller | Chris / Zebra |
| Inspector | Keith Robins |
| Rig Type | Geoprobe |
| Drilling Method | Remote Unit |
| Drive Hammer Weight | |
| PROJECT NAME | Popular Uniform |
| PROJECT # | 1447 |
| Location/Address | Brooklyn, New York 88 Ingraham Street |
| BORING NUMBER | GP-1 (soil) |
| Sheet | 1 of 1 |
| Boring Location | |

| GROUNDWATER OBSERVATIONS | | | |
|---|---|---|---|
| Water Level | | | |
| Time | | | |
| Date | | | |
| Casing Depth | | - | |

Weather: Cloudy, cold 30°F

Date/Time Start: 3/3/97

Date/Time Finish: 3/3/97

Plot Plan


| Sample Depth | Sample Number | SPT | PID/FID Reading | FIELD IDENTIFICATION OF MATERIAL | WELL SCHEMATIC | COMMENTS |
|---|---|---|---|---|---|---|
| 0-2 | SS-1 | - | 2-3 ppm | (0-2') concrete 0-3" Brown - Dark Brown fine - medium Sand, little silt, trace black color, some fine to medium gravel, dry - damp. | | Fill material |
| rec: | 2-4" | | | | | |
| | | | | END OF Boring at 2 FT | | |

SPT = STANDARD PENETRATION TEST

Soil Stratigraphy Summary

DVIRKA AND BARTILUCCI

**DRILLING CONTRACTOR**
Driller: Zebra
Inspector: Keith Robins
Rig Type: Remote Unit
Drilling Method: Geoprobe
Drive Hammer Weight: —

**DRILLING LOG**
PROJECT NAME: Popular Uniform
PROJECT #: 1447
Location/Address: 88 Ingraham Street Brooklyn, New York

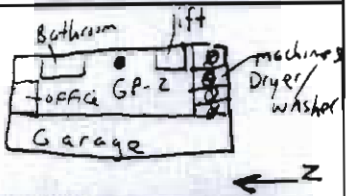
**BORING NUMBER** GP-2 (Soil)
Sheet 1 of 1
Boring Location:

**GROUNDWATER OBSERVATIONS**

| | | | |
|---|---|---|---|
| Water Level | | | |
| Time | | | |
| Date | | | |
| Casing Depth | | - | |

Weather: Light drizzle / snow 30°F
Date/Time Start: 3/4/97
Date/Time Finish: 3/4/97

Plot Plan




| Sample Depth | Sample Number | SPT | PID/FID Reading | FIELD IDENTIFICATION OF MATERIAL | WELL SCHEMATIC | COMMENTS |
|---|---|---|---|---|---|---|
| 0-2 | SS-1 | - | 2 ppm | (0-2') 0-2" concrete (2"-24") Dark Brown sand, some gravel subangular, red brick fragments, little silt, concrete pieces, poorly sorted | | Fill material |
| rec= | 24" | | | | | |
| | | | | END OF Boring AT 2 Feet | | |

SPT = STANDARD PENETRATION TEST

Soil Stratigraphy Summary:

DVIRKA AND BARTILUCCI

**DRILLING CONTRACTOR**
Driller: Zebra
Inspector: Keith Robins
Rig Type: Remote Unit
Drilling Method: Geoprobe
Drive Hammer Weight: —

**DRILLING LOG**
PROJECT NAME: Popular Uniform
PROJECT #: 1447
Location/Address: 88 INGRAHAM ST. Brooklyn, NY

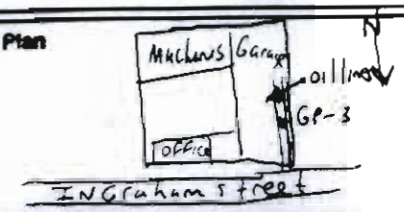
**BORING NUMBER** GP-3 (Soil)
Sheet 1 of 1
Boring Location

**GROUNDWATER OBSERVATIONS**

| | | | |
|---|---|---|---|
| Water Level | | | |
| Time | | | |
| Date | | | |
| Casing Depth | | - | |

Weather: Cold, cloudy 35°F
Date/Time Start: 3/3/97
Date/Time Finish: 3/3/97

Plot Plan




| Sample Depth | Sample Number | SPT | PID/FID Reading | FIELD IDENTIFICATION OF MATERIAL | WELL SCHEMATIC | COMMENTS |
|---|---|---|---|---|---|---|
| 0-2 | SS-1 | — | 2-5 | (0-2') Dark Brown medium to coarse sands, trace amounts of fine gravel, very slight petroleum odor. Soil has been backfilled around pipes. Due to replacing new pipes. | | Collected between 2 underground oil pipes connected to boiler |
| rec= | 24" | | | | | |
| | | | | END OF Boring AT 2FT | | |

SPT = STANDARD PENETRATION TEST

Soil Stratigraphy Summary

# APPENDIX C

# CHAIN OF CUSTODY FORMS

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

# nytest environmental inc.

(516) 625-5500 FAX: (516) 625-1274

# Chain of Custody Record

page #: 1 of 1

Client Name: Divirka and Bartilucci Engineers
Address: 330 Crossways Park Drive, Woodbury New York 11791
Project Manager: Tom Maher
Phone: 516 364-9810 FAX: 516 364-9805
Project Name: Popular Van Form
Project Number: 1447
P.O. #:
Analytical Protocol: Deliverables:
Sampled By: Keith Robins

| Sample ID (Maximum of 6 Characters) | Date Sampled | Time Sampled | Sample Description | No. of Containers | Volatile organics VOCs/ASP 91-1 | Semi-volat. organic compound, SVOCs ASP91 | Metals ASP TAL (not F.) | Metals ASP TAL Metals Filtered | Comments |
|---|---|---|---|---|---|---|---|---|---|
| GP1GW | 3/4/97 | 930 | Groundwater GP-1 (21) | 7 | ✓ | ✓ | ✓ | ✓ | Filter metals in Lab "F" |
| GP4GW | 3/4/97 | 1100 | Groundwater GP-4 (22) | 7 | ✓ | ✓ | ✓ | ✓ | Filter metals in Lab "F" |
| S-1-6 7 | 3/4/97 | 1130am | soil in basement (6-7) | 2 | ✓ | ✓ | ✓ | | |
| S-2 0-2 | 3/4/97 | 1230 | Soil in basement (0-2) | 2 | ✓ | ✓ | ✓ | | |
| GP2 0-2 | 3/4/97 | 230pm | GP-2 soil (0-2) | 2 | ✓ | ✓ | ✓ | | |
| GP2GW | 3/4/97 | 300pm | GP-2 Groundwater (21) | 7 | ✓ | ✓ | ✓ | ✓ | Filter metals in Lab F |

Bin #'s In/Out (For Lab Use Only)

Login #:
Ship to: Nytest Environmental Inc. 60 Seaview Blvd Port Washington N.Y. 11050 Attn.: Sample Control
Date Shipped: Pick up
Carrier:
Air Bill #:
Cooler #:
C of C #:
SDG #:
NEI QT #:

| Relinquished by: | Date / Time | Received by: | Date / Time |
|---|---|---|---|
| Print Name: Keith Robins | 3/4/97 5:00pm | Print Name: | |
| Relinquished by: | Date / Time | Received by: | Date / Time |
| Print Name: | | Print Name: | |
| Relinquished by: | Date / Time | Received by Laboratory: | Date / Time |
| Print Name: | | Print Name: | |

Lab Use Only
Sample Temperature
Preservation
COMMENTS

Special Instructions: ONE WEEK Turnaround on Laboratory data.

CLIENT RETAINS YELLOW COPY ONLY

Nytest Environmental
(516) 625-5500 FAX: (516) 625-1274

# Chain of Custody Record



Client Name: Dvicka and Bartilucci
Address: 330 Crossways Park Drive
Woodbury, New York 11797
Project Manager: JDM Maher
Phone: 516 364-9890 FAX: 516 364-9045
Project Name: Popular Variety
Project Number: 1417
P.O. #:
Analytical Protocol: Deliverables:
Sampled By: Keith Robins

**Analysis Requested**

| Sample ID (Maximum of 6 Characters) | Date Sampled | Time Sampled | Sample Description | No. of Containers | Volatile Organic Compounds, Vols Asp 91-1 | Semi-Vols, Ltr Digest Compounds Asp-91-2 | Metals ASP TAL | Metals Asp TAL Filter in Laboratory | | | | | Bin #'s In/Out (For Lab Use Only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GP30-2 | 3/3/97 | 1000am | Soil (0-2) | 2 | ✓ | ✓ | ✓ | | | | | | |
| GP1 0-2 | 3/3/97 | 12 noon | Soil (0-2) | 2 | ✓ | ✓ | ✓ | | | | | | |
| GP3GW | 3/3/97 | 1030pm | Groundwater at 21 | 7 | ✓ | ✓ | ✓ | ✓ | | | | 1 | |

Login #:
Ship to: Nytest Environmental Inc.
60 Seaview Blvd
Port Washington N.Y. 11050
Attn.: Sample Control
Date Shipped: pick up 3/4/97
Carrier:
Air Bill #:
Cooler #:
C of C #:
SDG #:
NEI QT #:

**Comments**

| Relinquished by: | Date / Time | Received by: | Date / Time |
|---|---|---|---|
| Print Name: Keith Robins | 3/3/97 5:00P | Print Name: | |
| Relinquished by: | Date / Time | Received by: | Date / Time |
| Print Name: | | Print Name: | |
| Relinquished by: | Date / Time | Received by Laboratory: | Date / Time |
| Print Name: | | Print Name: | |

**Lab Use Only**
Sample Rec'd in Good Condition
Sample Temperature: Degrees
INSPECTED BY:
COMMENTS:

Special Instructions: ONE WEEK Turnaround on Results.

CLIENT RETAINS YELLOW COPY ONLY

IEA
An Aquarion Company

200 Monroe Turnpike
Monroe, CT 06468
203-261-4458

# CHAIN OF CUSTODY RECORD

PAGE 1 OF 1 | NO.

EA JOB #:

CLIENT: Divirka and Bartolucci

PROJECT ID: 1447

EA PROJECT MGR: Tom Maher

RUSH ☒ YES ☐ NO | DUE DATE 1 week

| | TESTS | | | | | | | | GENERAL REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| BOTTLE TYPE AND PRESERVATIVE | VOCs (Method TO/502) | | | | | | | | |
| | 1 Glass Tenax Tube | | | | | | | | |
| SAMPLE # | CLIENT SAMPLE ID | DATE / TIME SAMPLED | MATRIX | # OF CONTAINERS | QC Y / N | FIELD FILTERED, CIRCLE Y OR N | | | SAMPLE REMARKS |
| | Air #1 | 3/3/97 1.15 | A | | | Y / N | Y / N | Y / N | |

**MATRIX CODES**

A - AIR
AQ - AQUEOUS
C - COMPLEX
D - DRUM WASTE
O - OIL
S - SOIL
SL - SLUDGE
W - WIPE
O - OTHER
FB - FIELD BLANK
TB - TRIP BLANK

| | |
|---|---|
| BOTTLES PREPPED BY / DATE / TIME | BOTTLES RECD BY / DATE / TIME |
| SIGNATURE | SIGNATURE |
| SAMPLES COLLECTED BY / DATE / TIME: Keith Robins 3/3/97 | RECEIVED IN LAB BY / DATE / TIME |
| SIGNATURE | SIGNATURE |

**CONDITIONS FOR SAMPLE RECEIPT**

☐ BOTTLES INTACT ☐ CUSTODY SEALS
☐ PRESERVED ☐ SEALS INTACT
☐ CHILLED ☐ SEE REMARKS

# APPENDIX D

# LABORATORY DATA

# Appendix B

# VOLUNTARY CLEANUP PROGRAM
# SUPPLEMENTAL SITE ASSESSMENT REPORT

## POPULAR HAND LAUNDRY SITE
## BROOKLYN, NEW YORK

## EXPOSURE ASSESSMENT

## 1.0 INTRODUCTION

In discussion with the New York State Department of Health (NYSDOH) regarding review of Voluntary Cleanup Program (VCP) Application and Supplemental Site Assessment Report for the Popular Hand Laundry Site, Brooklyn, New York, the NYSDOH requested that an Exposure Assessment be prepared for the site to address potential exposure to contamination resulting from ingestion, inhalation and dermal contact. Provided below is the requested Exposure Assessment which is an Addendum to the Supplemental Site Assessment Report.

## 2.0 INGESTION

### 2.1 Soil

The soils beneath the floor of the building indicate somewhat elevated levels of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs)/polycyclic aromatic hydrocarbons (PAHs) and metals as compared to New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives as contained in Technical and Administration Guidance Memorandum 4046. However, for the most part, the concentrations detected are below the United States Environmental Protection Agency (USEPA) Residential Soil Screening Levels for ingestion (see Table 1 of the Voluntary Cleanup Site Assessment Report, December 1996, and Table 2 of Voluntary Cleanup Supplemental Site Assessment Report, March 1997.

Based on chemical usage at the site, the SVOCs and metals are likely attributable to the fill material on which the building was constructed and not to discharges at the site. PAHs and metals are commonly associated with fill in New York City, much of it resulting from the disposal of coal ash. This is evidenced by the results of the soil samples collected below the basement floor in the native soil which show low levels of SVOCs and metals.

The VOCs in the soil beneath the building floor may be attributable to the former dry cleaning operation in the building which likely leaked wash water from the sewer lines beneath the building. No evidence of existing or former floor drains/dry wells were observed at the site.

Although somewhat elevated levels of VOCs, SVOCs and metals exist in the soil beneath the building, since the soils are below a concrete floor, the contaminants do not pose a threat to human health or the environment. The main portion of the building is constructed as slab on grade except for a partial basement, which also has a concrete floor. Therefore, there is little chance for contact with and ingestion of contaminated soil.

## 2.2 Groundwater

The groundwater beneath the site indicates elevated levels of VOCs which may be attributable to the former dry cleaning operation in the building. However, while in general the groundwater results of the supplemental investigation are fairly similar to the initial investigation for tetrachloroethene (PCE), trichloroethene (TCE) and vinyl chloride (VC), the results for 1,2 dichloroethene (DCE) are higher. While it would be expected that PCE and its breakdown products (TCE, DCE and VC) would be present, the very low levels of PCE and TCE combined with the higher levels of DCE (two to three orders of magnitude) is not common.

Based on regional flow information (source: U.S. Geological Survey) that groundwater flows in a northerly direction toward the English Kill, it is possible that there is an upgradient source of DCE. The area surrounding the site is highly industrialized. The assumed upgradient groundwater data point showed 1.7 mg/l of DCE, while the downgradient results showed 0.5, 0.6

and 5.5 mg/l or an average downgradient level of 2.2 mg/l which is similar to the upgradient value. DCE, besides being a breakdown product of PCE and TCE, is also used as a degreaser.

If the DCE, as well as the other VOCs are attributable to the site, similar to the soils as discussed above, it is likely the result of leaky sewers beneath the building into which separated wash water from the dry cleaning operation was reportedly disposed. The results of the initial site assessment, which sampled the soil in the vicinity of the sewer lines below the building floor and detected low levels of PCE and its breakdown products, as well as DCE detected below the sewer line in the supplemental investigation, appear to substantiate this hypothesis. Although there are elevated levels of contaminants that could be attributable to former dry cleaning operations at the property, as described above, contamination may also be the result of other sources.

The groundwater beneath and downgradient of the site is not currently used for potable supply. In addition, based on the results for sodium which range between 92.5 and 150 mg/l (groundwater standard of 20 mg/l), chloride which ranges between 74.5 and 237 mg/l (groundwater standard of 250 mg/l), and total dissolved solids which range between 861 and 1,020 mg/l, the groundwater appears to be saline as a result of the nearby English Kill which is a salt water body. (Saline/Class GSA groundwater is defined as having a chloride concentration of greater than 250 mg/l or a total dissolved solids concentration of greater than 1,000 mg/l.) As a result, the groundwater in the area of the Popular Hand Laundry property is likely not suitable as a future source of potable water. As a result of the saline conditions and the highly industrialized nature of the area in which the site is located, current or future potable use of groundwater beneath and surrounding/downgradient of the site is highly unlikely and, therefore, ingestion of groundwater at the site does not pose a threat to human health or the environment.

## 3.0 INHALATION

To address possible volatilization of chemicals from soil and groundwater beneath the site, an air sample collected in the basement of the building, indicated low levels of VOCs. These

levels are well below limits established by the U.S. Occupational, Safety and Health Administration for occupational exposure. In addition, the basement is used only for storage; therefore, any exposure would be limited and infrequent. As a result, the contaminated soil and groundwater beneath the building does not pose a threat to worker health.

With regard to potential impacts to residents who may live in basement apartments in the immediate vicinity and downgradient of the site, a survey was conducted to determine if this potential exposure is a concern. The results of this survey are provided in Figure 1. Based on this survey, the closest residential building is located about 150 feet south-southwest of the site, which, based on a regional groundwater flow direction, is upgradient of the site. There were no residential buildings noted between the site and the English Kill. In addition, the closest subway is also located about 150 feet south/upgradient of the site along Harrison Place. As a result of the location of the nearest residence and subway, it appears that the site does not pose a threat to human health and the environment as a result of inhalation.

## 4.0 DERMAL CONTACT

As described above in Section 2.0, since the soil is isolated beneath the building and basement floor, and since groundwater is approximately 20 feet below the main building floor and 13 feet below the basement floor and is not used as a potable source of water, and the nearest subway is upgradient of the site, dermal contact with contaminated soil or groundwater does not pose a threat to human health or the environment.

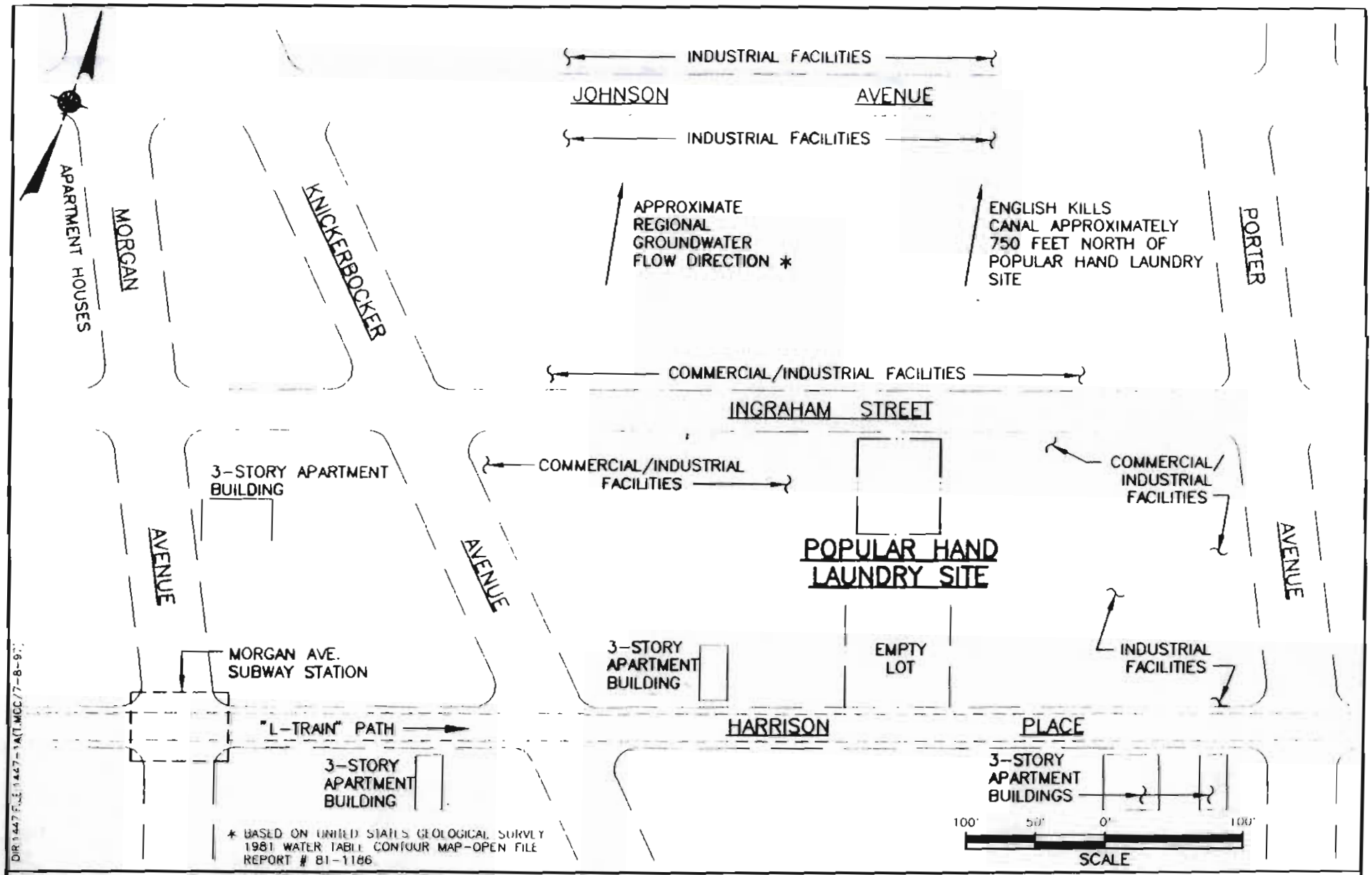
With regard to potential contact with (or inhalation of) contaminated groundwater as a result of subway dewatering, it has been reported by the New York Transit Authority, through the New York State Department of Environmental Conservation, that the pumping rates and closest dewatering activities relative to the site are at the following locations:

| Location | Pumpage | Approximate Distance from the Popular Hand Laundry Site |
|---|---|---|
| McKibbon St. & White St. | 32,000 gal/wk (~ 3 gal/min) | 2,000 ft. |
| Harrison Pl. & Vandervoort St. | 900 gal/wk (~ 0.1 gal/min) | 500 ft. |
| Wyckoff Ave. & Flushing Ave. | 182,000 gal/wk (~ 18 gal/min) | 7,000 ft. |

Based on potential drawdown and radius of influence in the area of the dewatering, it is extremely unlikely that groundwater flow direction at the Popular Hand Laundry site would be impacted. The closest dewatering location (500 feet from the site) pumps at only an average of 0.1 gallons per minute, and the location of greatest pumpage (average of 18 gallons per minute) is located over one mile from the site. The finding of the highest levels of contamination north of the building appears to confirm that groundwater flow is to the north and away from the subway, as well as any residences.

## 5.0 CONCLUSION AND RECOMMENDATION

Since the contaminants in soil are for the most part below USEPA Residential Soil Screening Levels and groundwater is not currently nor will it likely be used as a source of potable water, and since there is no current or potential route of exposure to soil or groundwater at the site, as a result there is no potential threat to human health or the environment. Therefore, based on exposure assessment, remediation of soil or groundwater at the Popular Hand Laundry site is not necessary.




POPULAR HAND LAUNORY SITE
BROOKLYN, NEW YORK

## POTENTIAL RECEPTORS LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C

FIGURE 1

# Appendix C

**New York State Department of Environmental Conservation**
**Division of Environmental Remediation, Region 2**
**Hazardous Waste Remediation**
**47-40 21st Street**
**Long Island City, New York 11101**
**(718) 482-4995 Fax: (718) 482-4954**

John P. Cahill
Acting
Commissioner

May 15, 1997


Mr. Thomas F. Maher, P.E.
Vice President
Dvirka & Bartilucci Consulting Engineers
330 Crossways Park Drive
Woodbury, NY 11797-2015

Re: Popular Hand Laundry; 88 Ingraham Street, Brooklyn

Dear Mr. Maher,

The Department has received and reviewed the "Voluntary Cleanup Site Assessment Report", dated December 1996 and the "Voluntary Cleanup Supplemental Site Assessment Report", dated March 1997, both prepared by Dvirka and Bartilucci Consulting Engineers for the above named property. The purpose of this letter is to convey the Department's position on the remedial needs at the property.

At the conclusion of the review of the "Voluntary Cleanup Site Assessment Report" the Department recommended that groundwater monitoring wells be installed in order to identify the direction of groundwater flow, to ensure that downgradient groundwater was being properly monitored. It was subsequently agreed that because of the relatively low levels of contamination identified in the initial investigation that additional push probe groundwater samples could be taken to confirm the levels of contamination in groundwater instead of installing conventional groundwater monitoring wells. The idea was to sample the groundwater on all sides of the property, and if no significantly higher contamination was observed, then the direction of groundwater flow would not be significant. Unfortunately, the data presented in the latest report has indicated a much higher level of contamination in the groundwater. Of greatest significance was the finding of the relatively high concentrations of 1,2-dichloroethene in the groundwater samples obtained from Geoprobe points GP-1 and GP-4.

My understanding is that there is currently no knowledge of any areas that were used for on-site storage of dry cleaning chemicals, filters, or other related material, and the building was always connected to the municipal sewer system, so no other potential source areas have been identified based on site history. The one potential area which you have described where a release may have occurred is in the basement, through releases to the municipal sewer system which were discharged into the basement when the main trap on the wastewater line was periodically

accidentally left open. The contamination levels in the basement's subsurface soils do not indicate a grossly contaminated area, but since the contaminated soil is very close to the water table, it is likely that it is contributing to the groundwater contamination, and, therefore, must be addressed.

Based on my understanding of the site contamination and the intended use of the property (continued operation as a commercial laundry), the best course of action would be to address the contaminated soils beneath the building with a soil vapor extraction system, coupled with an air sparging system to address the groundwater contamination. The air sparging system must be designed to address the groundwater contamination in the area of Geoprobe location GP-4 on the north side of the building. The soil vapor extraction system must be designed to have sufficient reach to address the contamination indicated in subsurface soils in the vicinity of the former dry cleaning apparatus, the subsurface soils in the basement, and vapors produced by the air sparging system.

At this point, a work plan must be developed which incorporates the above remedial system. The objective of the system is to reduce the concentrations of volatile organic compounds in the groundwater to a level consistent with the contamination observed upgradient of the site and to reduce contaminant levels in subsurface soils so that those contaminated soils will not have a continued impact upon the groundwater. In this regard, the Department does not agree with your current assumption that the groundwater sample from Geoprobe location GP-1 is representative of upgradient conditions. Therefore, as part of the work plan, the method of determination of the groundwater flow direction and upgradient conditions must be identified.

Please contact me at your earliest convenience so that we may discuss the above.

Respectfully,

Joseph M. O'Connell

cc: R. Gardineer
E. Devine

**New York State Department of Environmental Conservation**
**Division of Environmental Remediation, Region 2**
**Hazardous Waste Remediation**
**47-40 21st Street**
**Long Island City, New York 11101**
**(718) 482-4995 Fax: (718) 482-6358**

**John P. Cahill**
**Commissioner**

August 4, 1997


Mr. Thomas F. Maher, P.E.
Vice President
Dvirka & Bartilucci Consulting Engineers
330 Crossways Park Drive
Woodbury, NY 11797-2015

Re: Popular Hand Laundry; 88 Ingraham Street, Brooklyn

Dear Mr. Maher,

This letter is to clarify the Department's position on Popular Hand Laundry's application to the Voluntary Cleanup Program. This clarification comes after considering the information submitted along with consultation of the Department's Central Office to ensure consistency in the program statewide. The Voluntary Cleanup Program can be thought of as addressing two separate issues: on-site contamination (sources areas potentially consisting of contaminated soils, sediment and groundwater) and off-site contamination (contaminated non-source areas). The objective of the Voluntary Cleanup Program is primarily to remediate source areas, and then, depending on site specific circumstances, address non-source areas. The Department expects that some remedial effort will occur at sites where there is evidence that there has been a release of hazardous waste and where there is an unacceptable impact to a natural resource.

Specific to the source areas at this site, there has been a release of a listed hazardous waste which has resulted in an unacceptable impact to groundwater. Because of the concentrations observed in groundwater, at over 1000 times the groundwater standard, the contaminated groundwater itself is considered to be a source. Therefore, the on-site source, consisting of the high concentration of contaminated groundwater and any soils contributing to those high concentrations, must be remediated. While achieving groundwater standards at the property boundary is the Department's goal, we recognize the technology limitations faced at these sites (as we have at Superfund sites) and are willing to discuss a suitable approach to determining when remediation would be considered complete.

The non-source areas at this site would consist of the low concentration dissolved phase plume of contaminants in groundwater leaving the source areas. An exposure assessment would be used to show that this plume is not causing an increased risk to human health or any other sensitive off-site receptors. The exposure assessment presented to date is based on the presumption that the

groundwater flow is to the north, discharging into the English Kills. Based on the information received from New York City Transit on subway dewatering operations, the presumed direction of groundwater flow may be incorrect, and therefore, the exposure assessment may not accurately present the receptors which may be affected by downgradient groundwater contamination. As such, the exposure assessment must be modified to include the identification of any permitted groundwater wells in the impacted area and their use, and to identify any receptors that may be affected due to a change from the presumed direction of groundwater flow. A finding that there would still be no receptors, along with source remediation, would allow that the off-site plume would not have to be characterized any further.

Hopefully, the above clarifies the Department's position, and we can work toward resolving the specifics of the required work plan and a Voluntary Cleanup Agreement in the very near future. Should you have any questions, please contact me at 718 482-4892.

Respectfully,

Joseph M. O'Connell

cc: R. Gardineer
E. Devine
G. Lacetti

**New York State Department of Environmental Conservation**
**Division of Environmental Remediation, Region 2**
**Hazardous Waste Remediation**
**47-40 21st Street**
**Long Island City, New York 11101**
**(718) 482-4995 Fax: (718) 482-6358**

**John P. Cahill**
**Commissioner**

August 29, 1997


Mr. Thomas F. Maher, P.E.
Vice President
Dvirka & Bartilucci Consulting Engineers
330 Crossways Park Drive
Woodbury, NY 11797-2015

Re: Popular Hand Laundry; 88 IN GRAHAM Street, Brooklyn

Dear Mr. Maher,

The Department has received and reviewed your draft remediation work plan sent to this office via facsimile on August 19. The purpose of this letter is to describe what information is necessary to produce an acceptable work plan for the design, startup, and operation of an air sparge/soil vapor extraction (SVE) remedial system for the above named property. It is noted that the work plan provided describes the proposed design layout for this system and anticipated performance, but there is no description of the how the operating parameters will be determined or demonstration that the system will operate with the anticipated radii of influence.

As we have agreed in the past, it is appropriate that the system be placed in front of the building. What had not been discussed in detail was the area which needs to be remediated. You have proposed one sparge point with an anticipated radius of influence of 30 feet. Based on the observed concentrations from the three groundwater samples taken in front of the building, the minimum area that must be influenced by air sparging would be contained within a radius of 20 feet from the point previously proposed as the location for the air sparging well. There must be some demonstration of the determination of the pressure and flow rate to be used that will cause the desired remedial effect, while at the same demonstrating that it does not significantly alter the groundwater gradient so as to cause the contaminants to be driven away from the source area.

The second concern on the sparge point is the selection of the depth and size of the screened interval. It is indicated in the work plan that the top of the screened interval will be located immediately below the water table and will extend 10 feet below the water table. Current literature on air sparging discusses both of these issues: first, it would seem that screen lengths longer than three feet do not increase the performance of the system, and second, the top of the screened interval is placed below the zone of contamination. A recommended depth for this system is at least five feet below the surface of the water table. However, site specific conditions

should be evaluated to determine the appropriate depth of the screened interval. It is the Department's opinion that installing the sparge point as described will not achieve the objectives of the remedial system.

Similarly for the SVE system, there must be some demonstration that the proposed system has a radius of influence that covers at a minimum the same area as the sparge system, and as you have proposed, the SVE radius of influence should be larger than that of the air sparge system. The screened interval on the SVE well should extend from just above the level of the building's wastewater discharge line to the just above the water table, keeping in mind that there may be seasonal fluctuations and changes due to the operation of the air sparging system.

Regarding the emissions analysis, we have different values for the dichloroethylene annual guideline concentration (AGC). Air Guide 1 has the value 360 ug/m3 for trans-1,2-dichloroethylene and 1900 ug/m3 for cis-1,2-dichloroethylene. The work plan gives a value of 0.02 ug/m3 for non-isomer specific dichloroethylene. This is the correct value for vinylidene chloride, or 1,1-dichloroethylene, but this compound was not observed in site groundwater. If this is the cause for our difference, you should revise your analysis accordingly. Also, as a rough guideline, we consider for systems of this nature with the identified chemicals of concern that emit less than 0.5 lb/hr are not likely to need emission controls.

For the monitoring program, you have proposed two monitoring wells in addition to the air sparge point itself. The monitoring wells must be conventional wells with screen lengths which cover no greater than five feet of groundwater. The screened interval should begin, at the lowest, at the water table surface. It may better suit your needs to partially place the screen above the water table so that the soil pressure can be monitored in this well also. Once the wells are installed and developed, the elevation of the water table and gradient must be determined. If it is possible to measure the effects of the sparge point and the SVE well using the one adjacent well, then the proposed system of monitoring points will be accepted. If during testing it is determined that the sparge point or SVE radius of influence cannot be estimated using the proposed system, then a sufficient number of additional monitoring points must be installed to evaluate the system's effective radius of influence. The nature of the additional monitoring points is at your discretion.

Once the system is operating at the determined flow rates and pressures, there must be an initial startup period to observe site conditions and assess if any modifications are needed. It is recommended that this startup period last for at least one week and the following parameters should be measured daily: injection well pressure and flow rate, SVE well pressure and discharge flow rate, SVE discharge VOC concentration, groundwater elevations in monitoring wells, and dissolved oxygen content in wells within the radius of influence of the sparge point. If significant changes are made to the operating conditions, the startup period of monitoring should be extended.

For the continued operation of the system, an operation and maintenance plan should be prepared for facility personnel to use. The plan should describe the details of the upper and lower limits of the system operating conditions such as pressure and flow rate as well as the routine maintenance

that is necessary for the system to continue operating efficiently. The plan should also include the details of the monitoring program as described in the work plan, with the following modifications. The monitoring program should be broken into three parts: monitoring of the system's operation, groundwater quality, and SVE discharge quality. On at least a weekly basis, the system's operation should be monitored with observations of air sparge pressure and flow rate and SVE pressure and flow rate. On at least a monthly basis, check the pressure at monitoring wells screened above the water table to document that the point is under influence by the extraction system, check discharge flow rate, check discharge temperature, take an air sample of the SVE system discharge via tedlar bag with analysis for tetrachloroethlyene and its breakdown components, and check the water level in monitoring wells. On at least a quarterly basis, perform the regular monthly monitoring, and then shut down the air sparge system for a period of one week. On the sixth day of the air sparge shutdown, shutdown the SVE system. On the seventh day perform water level measurement and groundwater sample collection activities as described in Attachment 1 to the work plan.

Monthly reports are to be submitted which include all of the previous month's monitoring and laboratory reports. Include a discussion of work activities and any adjustments or modifications made to the system, and a description of all system downtime (how long and why). After the variability of the system performance has been demonstrated, a request may be submitted for reducing the frequency of the monitoring parameters.

Termination of the remediation system should rely on two criteria: the groundwater quality and the VOC mass removal rate. For the groundwater evaluation, if there is no substantial change in contaminant concentrations for two consecutive quarters, cyclic operation of the system should commence for the next quarter. If there is no substantial change in contaminant concentrations in groundwater after cyclic operation for one quarter, the air sparge system may be shutdown for final sampling, which is to occur no sooner than 3 months after the air sparge system has been shutdown. If there is no substantial change in contaminant concentrations in groundwater at this point, the air sparge system may be permanently shutdown. During the cyclic operation of the air sparge system, sampling of the SVE system discharge should continue. The SVE system may be shutdown after the VOC removal rate reaches the same type of asymptotic low.

If you have any questions, please contact me at 718 482-4892.

Respectfully,

Joseph M. O'Connell

Joseph M. O'Connell

cc: R. Gardineer
E. Devine

**New York State Department of Environmental Conservation**
**Division of Environmental Remediation, Region 2**
**Hazardous Waste Remediation**
**47-40 21st Street**
**Long Island City, New York 11101**
**(718) 482-4995 Fax: (718) 482-6358**

**John P. Cahill**
**Commissioner**

September 25, 1997

Mr. Thomas F. Maher, P.E.
Vice President
Dvirka & Bartilucci Consulting Engineers
330 Crossways Park Drive
Woodbury, NY 11797-2015

Re: Popular Hand Laundry; 88 Ingraham Street, Brooklyn

Dear Mr. Maher,

The Department has received and reviewed your draft remediation work plan received by this office via facsimile on September 10. The purpose of this letter is provide comments on the September 10 work plan for the above named property.

In my August 29, 1997 letter to you it is indicated that some type of demonstration of the determination of the system's operating parameters is necessary. The Department's preference is for pilot testing of the system's components to determine the optimal configuration, which should minimize the length of time of continued operation. You have indicated that such a pilot test of the system is not necessary for the conditions encountered at this property, and any necessary modifications could be made after the system has been installed and has begun operation. The Department will, in this case, yield to your preference for installing the system without pilot testing. However, keep in mind that any modifications which are needed to enable the system to achieve the remedial goals are the responsibility of the property owner.

On page 2 of the work plan, the construction and placement of the vapor extraction well is discussed. It is stated that the screened interval will extend to just below the wastewater discharge line from the building. As was indicated in my August 29 letter to you, the Department's preference is that the screened interval extend from above the elevation of the building's wastewater discharge line, not below it. Please modify the language in the work plan accordingly.

On page 4 of the work plan, it is stated that routine groundwater samples will be analyzed by Method 601 for tetrachloroethene, trichloroethene, 1,2-dichloroethene and vinyl chloride. Cis-1,2-dichloroethene, which appears to be the main contaminant of concern at the site, is not included in the target compound list of Method 601. The Department will agree to the use of this method for the analysis of routine samples only if the laboratory calibrates the instrument for cis-

1,2-dichloroethene, along with the other contaminants of concern, before sample analysis.

Please provide a schedule which identifies when the work will commence on the installation of the system and when the work is anticipated to be completed. The schedule may be made relative to the date of the Department's notification to the volunteer to proceed with the agreed upon work plan. The final engineering report shall consist, at a minimum, of the following items:

- an operation and maintenance plan describing the procedures to be used to:
  - minimize system downtime,
  - perform the sampling and monitoring specified in Table 1 of the work plan,
  - ensure that discharge from the vapor extraction system is at levels that do not need controls
- "as-built" drawings of the remedial system components and equipment layout, and
- certification that all activities were completed in full accordance with the Work Plan or agreed upon modifications.

The remedial work plan and the final engineering report must be prepared, signed and sealed by a professional engineer. If you have any questions, please contact me at 718 482-4892.

Respectfully,

Joseph M. O'Connell

Joseph M. O'Connell

cc: R. Gardineer
E. Devine