Environment

Prepared for:
NYSDEC
Albany, NY

Prepared by:
AECOM
Chestnut Ridge, NY
60237880
June 2013

Remedial Investigation Report Jung Sun Laundry Plume Site (No. 241102)

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ENGINEERING CERTIFICATION

I, Scott Underhill, certify that I am currently a NYS registered professional engineer and that this Remedial Investigation Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Respectfully submitted,
AECOM Technical Services Northeast, Inc.

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Registered Professional Engineer
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Date

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List of Acronyms

AECOM	AECOM Technical Services Northeast, Inc.
AGS	Advanced Geological Services, Inc.
ASTM	American Standard Test Method
bgs	below ground surface
DCE	dichloroethene
DHC	dehalococcoides
DER	Division of Environmental Remediation
DO	dissolved oxygen
DUSR	data usability summary report
ELAP	Environmental Laboratory Accreditation Program
EPA	United States Environmental Protection Agency
f_{oc}	fraction of organic carbon
ft	feet
ft/day	feet per day
ft/yr	feet per year
HREC	historic recognized environmental conditions
IDW	investigation derived wastes
in Hg	inches of mercury
K_d	soil/water distribution coefficient
K_{ow}	octanol/water coefficient
K_{oc}	octanol/carbon partition coefficient
µg/L	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter
µV	microvolt

mg/Kg	milligrams per kilogram
mL/min	milliliters per minute
MIP	membrane interface probe
msl	mean sea level
mV	millivolt
n_e	effective porosity
NTU	nephelometric turbidity units
NYCRR	New York Codes, Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORP	oxidation-reduction potential
p_b	dry bulk density of aquifer matrix
PCE	tetrachloroethene
PE	professional engineer
PID	photoionization detector
ppm	parts per million
R_d	retardation factor
REC	recognized environmental conditions
RI	remedial investigation
SCGs	standards, criteria and guidance
SCO	soil cleanup objective
SVOC	semivolatile organic compound
t	time
TCLP	toxicity characteristic leaching procedure

TCE	trichloroethene
TOC	total organic carbon
UGA	Upper Glacial Aquifer
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VC	vinyl chloride
VOC	volatile organic compound
V_{pt}	contaminant transport rate
V_s	groundwater seepage velocity
YEC	YEC, Inc.
Zebra	Zebra Environment Corp.

1.0 INTRODUCTION

AECOM Technical Services Northeast, Inc. (AECOM) was issued Work Assignment # D007626-02 under the New York State Department of Environmental Conservation (NYSDEC) State Superfund Standby Contract for Investigation and Design Services (D007626). The scope of work is to conduct a remedial investigation (RI) and feasibility study at the Jung Sun Laundry Plume Site, Long Island City, New York, located in Queens County (NYSDEC registry number 241102). The site location is shown on Figure 1.

AECOM was issued approval of the Schedule 2.11s on January 18, 2012. The RI scope of work consisted of a membrane interface probe (MIP) investigation, soil boring and temporary well sampling, overburden well installation and sampling, soil gas sampling, and soil vapor intrusion sampling were planned. An amendment was issued on December 13, 2012 for additional soil vapor intrusion sampling. The MIP investigation, soil boring and temporary well sampling, and overburden well installation were completed between February 2012 and March 2012; two rounds of groundwater samples were collected in April 2012 and June 2012; soil gas sampling was completed in March 2012; and soil vapor intrusion sampling was completed in March 2012, November 2012, and March 2013. This RI report presents the findings of the field investigation.

1.1 Site Background Information

Information on the location and previous investigations are provided in the subsections below.

1.1.1 General/Location

The Jung Sun Laundry Plume site (herein identified as the “site”) is located at 37-10 24th Street in Long Island City, Queens County, New York 11101 (Figure 1). Jung Sun has been in operation since the 1930s. From the late 1980s to the mid 1990s, the site was operated as a commercial dry cleaner. The site then transitioned from dry cleaning back to laundry service. The site operated as a laundry until it was closed by the previous owner, Mr. Tony Yang. The former Scalamandre Silks was located adjacent to the site. Textile fabric manufacturing was performed on this adjacent property starting in 1936. The Scalamandre Silks manufacturing facility operated starting in the 1950s. Based on previous site use, it is likely that chemical dyes, paints, solvents and softening agents were used historically as part of day-to-day operations. This adjacent is currently rented to various tenants by 37-24 24th Street Equities. For the remainder of this report, the adjacent property is referred to as the 37-24 24th Street Equities property.

1.1.2 Land Use

The surrounding area is urban with commercial and industrial establishments as well as residences nearby. The site is surrounded by industrial buildings along the east and south, while the northern properties are a mix of commercial and residential properties. The western side of the property abuts several automotive repair and storage operations and included a yard for shipping and receiving laundry and supplies. This yard extended from the rear of the building to 23rd Street. Figure 2 provides a site plan depicting the location of key features on the site along with the physical layout of the property. This figure shows the condition of the site on March 20, 2012. AECOM observed that the site debris had been removed from the backyard prior to a sampling event in November 2012.

According to historical resources including Sanborn fire insurance maps, city directories, and interviews with the previous owner/occupant, the facility operated as a commercial dry cleaner or laundry facility since its initial construction.

Land uses in the immediate vicinity of the site are as follows:

- North: The site is bordered by 37th Avenue, across which lies vacant buildings and residential properties.
- East: The site is bordered by Hephaistos Building Supplies and the Victoria Laundromat Corporation.
- South: The site is bordered by a mixed use commercial building.
- West: The site is bordered by Shah Jee Motors which is an automotive repair facility and KSW, Inc. which installs HVAC equipment.

1.1.3 Surface Water Hydrology

The East River is located approximately 0.6 miles to the west of the site. According to the Environmental Data Resources, Inc., (EDR) report (EDR, 2012), the site is located in Queens County, New York and is not listed under FEMA (100 year or 500 year) Flood Zone or the National Wetland Inventory. There are areas located within a 0.5-mile radius located within the 500-year flood zone. There are federally designated wetland areas located within 1 mile of the site, but not on the site. The East River is designated as a Class I surface water. The best usages of Class I waters are for fish, shellfish, and wildlife propagation and survival. The site is relatively flat. The area is paved with few bare locations. Most runoff is captured in drains.

1.1.4 Groundwater Hydrology

The depth to groundwater is approximately 15 ft below ground surface (bgs). The groundwater flow appears to be to the south-southeast across the site, although the extremely minimal gradient makes determination of the groundwater flow direction difficult.

1.1.5 Local and Site Geology

According to soils information provided in the EDR report, the site is underlain by soils classified as "*Urban Land*" with "variable" soil surface texture. The stratigraphic rock formation in the area is defined by "Mesozoic" era and "Cretaceous" system. The EDR report also includes soils information for other locations in the vicinity of the site; surface soils are identified as underlain primarily by silt loam, loamy sand, sandy loam, and fine sandy loam. Shallow soil is identified as sandy loam and deeper soils as un-weathered bedrock, very gravelly-loamy sand, stratified, and sandy loam. Previous reports (Aaron & Wright [2003a] and AECOM [2010]) indicate that soils at the site consist of sand with some silt and gravel.

1.1.6 Topography

The 1979 United States Geologic Survey (USGS) topographic map for the Central Park, New York Quadrangle was reviewed to obtain information about the topography of the site (Figure 1). The map shows that the land surface slopes upward east of the site and is relatively flat westward toward the East River. The study area is flat at an elevation of 20 ft.

1.1.7 Prior Investigations Conducted at the Site

1.1.7.1 Scalamandre Silks Investigations

Aarron & Wright completed a Phase 1 Environmental Site Assessment in September 2003, a Phase 2 Limited Subsurface Investigation in October 2003, and a Phase 2 Limited Groundwater Investigation in December 2003 on the adjacent 37-24 24th Street Equities property. During the Phase 2 Limited Subsurface Investigations, five borings were advanced to a depth of 10 feet, but no samples were collected because the photoionization detector (PID) readings were 0 parts per million (ppm) and there was no visible indication of contamination. A groundwater sample was collected from a temporary well. The trichloroethene (TCE) and tetrachloroethene (PCE) concentration exceeded the NYSDEC Class GA groundwater quality criterion of 5 µg/L with detections of 7.17 µg/L and 37.7 µg/L, respectively. During the Phase 2 Limited Groundwater Investigation, five permanent monitoring wells were installed. Samples from these wells exceeded the NYSDEC Class GA groundwater quality criteria for TCE, PCE or vinyl chloride (VC). The highest levels were detected in the monitoring well adjacent to the Jung Sun Laundry on 37-24 24th Street Equities property.

1.1.7.2 Jung Sun Laundry

Jung Sun conducted a limited environmental investigation of the property for business purposes. This report was not provided to NYSDEC.

1.1.7.3 NYSDEC Site Characterization 2008 (Phase I)

NYSDEC conducted a two phase site characterization of the Jung Sun Laundry in 2008 and 2009 (EarthTech, 2009 and AECOM, 2010). The field investigations were conducted to determine the existence of contamination at the site and to identify the nature of the contamination. The Phase I field investigation consisted of a MIP investigation, soil sampling, well installation and groundwater sampling.

Four shallow soil samples (plus a field duplicate) were collected from above the water table and submitted for laboratory analysis of VOCs utilizing United States Environmental Protection Agency (USEPA) SW-846 Method 8260. The soil analytical results were compared to the NYSDEC unrestricted use soil cleanup objectives (SCOs) (6 New York Codes, Rules and Regulations [NYCRR] Part 375-6.8(a)) (Figure 3). PCE was detected at a concentration of 7 mg/Kg at 10-12 ft bgs adjacent to the site on 37-24 24th Street Equities property. All other VOCs were either not detected or were present at concentrations below the unrestricted use SCOs. However, based on review of the MIP results collected in 2008, and the groundwater elevation data, it appears that the soil samples were collected above the depth of the highest levels of contamination.

A total of eight groundwater samples were collected and submitted for analysis of VOCs utilizing USEPA SW-846 Method 8260. The groundwater results were compared to the New York State (NYS) Class GA groundwater criteria. NYS Class GA criteria were exceeded for a number of chlorinated solvents and other VOCs as summarized below:

- PCE concentrations exceeded criteria in seven of the eight samples, with detections ranging from 6.1 µg/l (MW-2) to 37,000 µg/l (MW-4).
- TCE concentrations exceeded criteria in four of the samples, with detections ranging from 60 µg/l (MW-8) to 6,500 µg/l (MW-4).

- VC concentrations exceeded criteria in two of the samples, with detections of 21 µg/l (MW-8) and 3,300 µg/l (MW-4).

- The concentration of cis-1,2-dichlorethene (DCE) exceeded criteria in three of the samples with detections ranging from 480 µg/l (MW-8) to 15,000 µg/l (MW-4).

- The concentration of chloroform exceeded criteria in two samples with detections ranging from 22 µg/l (MW-2) to 48 µg/l (MW-8).

- Chlorobenzene (24 µg/l) exceeded the criteria in MW-1, while acetone exceeded the criteria in MW-2 (110 µg/l) and MW-6 (400 µg/l).

The chemical concentrations for PCE, TCE, DCE, and VC are presented in Figures 4. The distribution of contamination in the five existing wells is generally consistent with the 2003 site investigation for the Scalamandre Silks (37-24 24th Street Equities property), with more elevated concentrations in MW-5 observed in February 2008.

Based on the results of the field investigation and review of the site information, NYSDEC concluded that:

- The presence of PCE and TCE was confirmed in the groundwater under the Jung Sun and the 37-24 24th Street Equities property. The presence of PCE was confirmed in the subsurface soil on the 37-24 24th Street Equities property adjacent to the Jung Sun property.

- The concentration of PCE and other chlorinated solvents observed in the groundwater is greatest in MW-4, located immediately to the west of the Jung Sun facility and near the location of the dry cleaning operation.

- Groundwater flow in the shallow zone appears to be to the south-southeast across the site (A&W, 2003), although the extremely minimal gradient makes determination of the groundwater flow direction difficult. The data indicate that the dissolved plume observed on the south side of the site is not present north of the Site. This suggests that the site is a probable source of the observed contamination.

- There is some upgradient or cross-gradient contamination in the shallow groundwater; suggesting a possible additional upgradient source if the presumed flow direction is correct. Alternatively, this relatively low level of contamination may result from dispersion of the contaminant plume identified on the Jung Sun property.

- Based on the distribution and concentration of contaminants observed in the soil and groundwater, it is considered possible that there may be an additional source area near a area of the tank-like geophysical anomaly on the 37-24 24th Street Equities property adjacent to the Jung Sun property, identified during the utility survey.

- Ecological impacts from the elevated groundwater concentrations is not considered significant because of the urban setting and lack of a direct pathway.

- Impacts to human health from airborne contamination should be evaluated since receptors are present at the operating facilities on the block. No public water wells were identified within a mile of the site indicating there is no significant threat to human health from ingestion of the groundwater.

- Off –site migration of the groundwater contamination is possible because PCE contamination in the downgradient MW-1 was observed in the 2003 and January 2008 sampling events at levels exceeding the Class GA criteria.

- Jung Sun is a probable source of the PCE in groundwater because:

  - The laundry used solvents during 1980s and 1990s as part of their dry cleaning business as stated by the owner, Mr. Moy, during the site visit on September 19, 2007. Further, Jung Sun is listed in the EDR report as a generator of F002 wastes (solvents).

  - The adjacent facility, 37-24 24th Street Equities, is listed in the EDR Report as a generator of F003 ignitable wastes, but not solvents. However, investigation of the tank-like structure for the presence of solvents should be considered.

  - Although the water table is generally flat, it appears there is a slight gradient to the southeast from a high on the Jung Sun property which may result in solvents historically discharged from the Jung Sun property pooling in the groundwater on the adjacent 37-24 24th Street Equities property next to the building formerly owned by Scalamandre Silks.

  - A solvent-like odor was observed near the surface a boring location which is adjacent to the Jung Sun property on 37-24 24th Street Equities property, possibly indicating historical discharge of solvents. No odor was observed during precleaning of a boring adjacent to the building on 37-24 24th Street Equities property near a tank-like structure.

1.1.7.4 NYSDEC Site Characterization 2009 (Phase II)

A second phase of the investigation was completed to confirm the source area of the PCE contamination. The field investigation conducted in February 2009 consisted of groundwater sampling along with the collection of groundwater elevation measurements, test pit excavation, soil sampling, and installation of temporary soil gas sampling points on the Jung Sun and the 37-24 24th Street Equities properties. Three temporary soil gas sampling points on 24th Street were installed in May 2009. All soil gas points were sampled in May 2009.

Ten soil samples (plus a field duplicate) were collected from above the water table and submitted for laboratory analysis of VOCs utilizing USEPA SW-846 Method 8260. The soil analytical results were compared to the NYSDEC unrestricted use SCOs. The concentrations in soil for PCE and breakdown products are shown on Figure 3.

- PCE concentrations exceeded the SCO in SB-1B (13 mg/Kg) near the test pit on the 37-24 24th Street Equities property at depth 12-12.5 ft bgs. During boring, soils were screened continuously with a PID and at this location the PID response was recorded as 0.0 ppm throughout the depth of 0-11 ft bgs.

- PCE (22 mg/Kg), TCE (2.6 mg/Kg) and cis-1,2-DCE (0.55 mg/Kg) were detected above criteria in SB-3 collected at a depth of 12-12.5 ft bgs on the Jung Sun property. At this location, the PID responses recorded increased from 20 to 250 ppm at depths 3-13 ft bgs.

- Acetone (0.28 mg/Kg) exceeded the criteria in SB-4A on the Jung Sun property at a depth of 2.5-3 ft bgs.

- m&p-Xylenes (0.51 mg/Kg), total xylenes (0.605 mg/Kg) and acetone (0.4 mg/Kg) exceeded criteria in SB-5A on the Jung Sun property at a depth of 0.5-1 ft bgs.

One sample was collected from a test pit excavation on the 37-24 24th Street Equities property. Concentrations in the soil sample from the test pit (TP-2) were not elevated above NYSDEC unrestricted use SCOs.

A total of eight groundwater samples were collected and submitted for VOC analysis utilizing USEPA SW-846 Method 8260. The groundwater results were compared to the NY Class GA groundwater criteria (Figure 4). NYS Class GA criteria were exceeded for a number of chlorinated solvents and other VOCs as summarized below.

- PCE concentrations exceeded the threshold in six of the eight samples, with detections ranging from 98 µg/l (MW-7) to 13,000 µg/l (MW-5).

- TCE concentrations exceeded the threshold in five of the eight samples, with detections ranging from 5.7 µg/l (MW-6) to 1,800 µg/l (MW-1).

- VC concentrations exceeded the threshold in three of the eight samples, with detections ranging from 5.9 µg/l (MW-2) to 260 µg/l (MW-5).

- cis-1,2-DCE concentrations exceeded the threshold in six of the eight samples with detections ranging from 6 µg/l (MW-6) to 3,100 µg/l (MW-1).

- The concentration of chloroform exceeded the threshold in one sample with a detection of 33 µg/l (MW-8).

- The concentration of 1,2,4-trimethylbenzene exceeded the threshold in one sample with a detection of 6 µg/l (MW-6).

- The concentration of acetone exceeded the threshold in one sample with a detection of 140 µg/l (MW-7).

- The concentration of sec-butylbenzene exceeded the threshold in one sample with a detection of 6.1 µg/l (MW-6).

Eight soil gas samples including one field duplicate sample were collected at the locations shown on Figure 5. The samples were analyzed for VOCs by USEPA method TO-15. The PCE concentration in the ambient air sample (3.1 µg/m^3) was lower than all soil gas samples (32-560,000 µg/m^3). The TCE concentration in the ambient air sample (1.7 µg/m^3) was lower than all soil gas samples except SG-4 (1.6 µg/m^3).

Based on the results of the field investigations, NYSDEC concluded that:

- The groundwater, soil, and soil gas results confirm the presence of chlorinated VOCs (TCE, PCE, VC and cis-1,2-DCE) in all matrices at the site and in the vicinity of the site.

- The groundwater flow in the shallow zone appears to be relatively flat across the site and the extremely minimal gradient makes determination of the groundwater flow direction difficult. The data from the previous site investigation (February 2008) and this round (February 2009) of site investigation indicate that the dissolved plume has migrated towards south-southeast to the site at MW-1 and MW-5.

- In Phase 2, a decrease in groundwater contamination concentrations was observed for MW-4 and an increase in groundwater contamination was observed in the downgradient wells MW-1 and MW-5 compared to Phase 1. This indicates the migration of the plume from the site towards south-southeast, and a potential vertical migration of the plume.

- There is some upgradient or cross-gradient contamination in the shallow groundwater; suggesting a possible additional upgradient source, if the presumed flow direction is correct. Alternatively, this relatively low level of contamination may result from dispersion of the contaminant plume identified on the Jung Sun property.

- PCE was detected in groundwater above the NYSDEC Class GA criteria in six of the eight monitoring wells.

- PCE was detected in soil above NYSDEC unrestricted use SCOs on the Jung Sun property and the 37-24 24th Street Equities property adjacent to Jung Sun. At location SB-1B within the 37-24 24th Street Equities property PCE was detected at 12.0 ft bgs, which is believed to have migrated from contaminated groundwater during seasonal fluctuation.

- PCE and TCE were detected at elevated concentrations in soil gas samples; future soil vapor investigation is warranted.

- Ecological impacts from the elevated groundwater concentrations are not considered significant because of the urban setting and a lack of a direct pathway.

- Test pit excavation at the suspected tank-like anomalies presented at the 37-24 24th Street Equities property adjacent to Jung Sun property identified a reinforced concrete pad.

Based on the two phases of site investigation data (2008 and 2009), NYSDEC classified the site as class 2. Contamination present at the site is a significant threat to the public health and the environment based on significant exceedence of NYS Class GA groundwater criteria on and off-site; exceedance of the NYSDEC unrestricted use SCO from a soil boring on the Jung Sun property; and concentrations of contaminants in soil vapor have the potential to impact occupants in nearby structures through soil vapor intrusion.

Jung Sun Laundry is a probable source of the PCE in groundwater because:

- The laundry used solvents during 1980s and 1990s as part of their commercial dry cleaning business as stated by the former owner, Mr. Moy, during the site visit September 19, 2007.

- Jung Sun is listed in the EDR report as a generator of F002 wastes (solvents).

- The adjacent former Scalamandre Silks facility (37-24 24th Street Equities property), is listed in the EDR Report as a generator of F003 ignitable wastes, but not solvents. No tanks were identified on the 37-24 24th Street Equities property.

- Although the water table is generally flat, it appears there is a slight gradient to the southeast from a high on the Jung Sun property which may result in solvents historically discharged from the Jung Sun property pooling in the groundwater adjacent to a building on the 37-24 24th Street Equities property.

- Groundwater and soil samples from the Jung Sun property exceed the applicable NYSDEC criteria for PCE and TCE.

1.2 Phase I ESA

A Phase I Environmental Site Assessment (ESA) was prepared for the Jung Sung Laundry facility. The full text of the Phase I ESA is provided in Appendix A. The Phase I ESA was conducted in accordance with the Standard for Environmental Site Assessments: Phase I Environmental Site Assessment Process (American Standard Test Method [ASTM] Standard) established by the ASTM (ASTM Designation E 1527-05), which meets the requirements of 40 CFR Part 312 and is intended to constitute *"all appropriate inquiry"* for purposes of the landowner liability protection. In addition to the ASTM and USEPA standards, the intent of this assessment is to comply with the records search requirements outlined under NYSDEC DER-10 Appendix 3A.

In accordance with the ASTM Standard, potential findings can include recognized environmental conditions (RECs), historic recognized environmental conditions (HRECs), and de minimis conditions. RECs are conditions where the data collected indicates that there is or has been a release or that there is a potential for a release of hazardous substances or petroleum products into the structures at the subject site, or into the ground, groundwater or surface water of the subject site. HRECs are generally conditions that in the past have been remediated to the satisfaction of the responsible regulatory agency. De minimis conditions are those situations that do not present a material risk of harm to public health or the environment and generally would not be subject to enforcement action if brought to the attention of the appropriate governmental agencies.

Conditions at the time of the site visit on March 20, 2012 are described. This assessment revealed no evidence of RECs in connection with the property except for the following:

- <u>Subject Property</u>
  - A review of the Sanborn Maps indicates that the site has historically been used as a laundry facility including dry cleaning operations since at least 1934. The potential for impacts from historic operations and residual contamination constitutes a REC. The historic use of laundry and dry cleaning chemicals could result in residual contamination and vapor intrusion concerns within the building.
  - This property is currently the subject of a RI by the NYSDEC to assess the soil and groundwater contamination underneath the building. Investigative activities to date indicate that the Jung Sun facility is the source of local groundwater contamination.
  - Numerous drums of laundry cleaning fluids were found scattered about the property inside and outside of the building. Some of the drums are open, some are unlabeled.

- o Trenches and sumps are present within the building and the discharge points are not known.
- o Stained concrete and asphalt was observed on the property. The staining was extensive and is not easily correlated to any given materials. Staining was observed in the previously mentioned sumps and trenches.
- o A hydraulic trash compactor is located in the center of the yard area and appears to have leaked onto the site.
- o An unexplained pile of crushed concrete is located adjacent to the trash compactor and may be the result of dumping on the property.
- o A sump is located in one of the basements of the building and appears to be unlined with unidentified drainage pipes leading to it.
- o An aboveground oil storage tank is located in the basement of the building and the contents of the tank could not be determined. The tank is encased in a masonry and concrete vault and could not be assessed for structural integrity or leak potential.
- o Two sets of fill ports were observed in the sidewalk in front of the building indicating the presence of two additional tanks which were not observed. AECOM believes that the piping may have led to additional vaulted tanks in the basements.
- o Wastewater at the property allegedly discharges to the city sewer system; however, a large sump was partially visible under a steel road plate in the southern end of the building. The sump was observed to contain several feet of water and AECOM suspects some of the buildings wastewater may have been discharged to the sumps.
- o The presence of broken fluorescent light bulbs and suspected PCB containing light ballasts in the basement is a REC.

- <u>Surrounding Property Use</u>:
  - o The properties to the south, east, and west of the site have historically and continue to be used for a variety of industrial applications including automotive repair. The industrial use of the surrounding properties is a REC.
  - o The properties to the east of the site have been identified in multiple regulatory databases and are documented to have spills or other contamination present. The industrial use of the surrounding properties is a REC.

The following HRECs were identified with respect to the site:

- A review of the Sanborn Maps indicates that the site has historically been used as a laundry facility. The potential for impacts from historic operations and residual contamination constitutes an HREC.

No de minimis conditions were identified with respect to the site.

Per the ASTM Standard, historical research is complete when either: 1) the objectives in Sections 8.3.1 through 8.3.2.2 of the Standard are achieved; or 2) data failure is encountered. The following data failures/gaps were encountered or identified with respect to the site:

- AECOM could not speak with the current owners of the building.

- At the time of the site inspection, much of the ground surface was obscured by garbage, piles of concrete, rolling carts, and steel road plates, and as such, the ground surface could not be thoroughly reviewed.

2.0 REMEDIAL INVESTIGATION

A RI was conducted to determine the sources and location of contamination within the site and its threat to human health or the environment. The scope and execution of the RI is discussed below. The work to date consisted of the following:

- MIP investigation (February 2012 and March 2012);
- Soil borings, soil sample collection, temporary well sample collection (March 2012);
- Well installation and development (March 2012);
- Groundwater sampling (April 2012 and June 2012);
- Permanent soil gas point installation and sampling (March 2012); and,
- Soil vapor intrusion sampling (March 2012, November 2012, and March 2013).

Field forms for the sampling events are provided in Appendix B. The results of the MIP investigation are provided in Appendix C. A photo log is provided in Appendix D.

A subconsultant to AECOM, YEC, Inc. (YEC), assisted with field activities during the RI.

2.1 Utility Mark Out and Hand Clearing

Prior to beginning the RI, a geophysical survey was conducted at the location of all sample points by Advanced Geological Services, Inc. (AGS), a subcontractor to AECOM. The survey was conducted at all boring locations for the MIP investigation, soil borings, monitoring wells, and soil gas points on February 20 to 21, 2012 for off-site locations and March 1, 2012 for on-site locations. AGS utilized a combination of ground-penetrating radar to locate buried utility lines and structures at the proposed boring locations. Several underground utility markings (possibly gas or sewer lines) were identified at some of the proposed boring locations and the borings were relocated to maintain a minimum of 3-ft clearance from the utilities. The final locations of these boring were marked out with spray paint and photographed. Zebra Environmental, Inc. (Zebra), the drilling standby subcontractor to AECOM, hand cleared each point to 5 ft bgs. The driller contacted Dig|Safely prior to the field effort.

2.2 Facility Sample

Water was observed in trenches located in the Jung Sun facility. A water sample was collected from a trench at the location shown in Figure 6 on March 15, 2012. A dry pit was also observed. AECOM attempted to collect a soil sample from the dry pit, but there was no soil present. The location may have been used to access an above ground storage tank located in the basement.

2.3 Membrane Interface Probe

A MIP investigation was conducted from February 27, 2012 to March 6, 2012 as a screening effort to optimize the locations and extent of subsequent investigative phases (e.g., soil borings and monitoring well installation). The MIP boring locations and electron capture detector (ECD) results are shown on Figure 7.

AECOM and Zebra personnel mobilized to the site on February 27, 2012. A total of 20 MIP soil probes were advanced between February 27, 2012 and March 6, 2012 to depths ranging from approximately 34 ft bgs to 62 ft bgs, varying the depth of the probe to track the plume. The MIP was advanced to collect remote sensing data indicating the possible presence of chlorinated solvents in the soils or groundwater based on the response of the ECD. The boring was continued until either the response returned to baseline conditions or to refusal of the probe. A summary log and graphs of individual probe point data are included in the summary report provided by Zebra (Appendix C).

The MIP borings locations and maximum ECD results are shown in plan view on Figure 7. A cross-section showing ECD readings is provided on Figure 8. Elevated MIP readings were found on the Jung Sun property (MIP-33 and MIP-34) and on the 37-24 24th Street Equities property (MIP-23). These figures indicate that there are groundwater plumes with elevated chlorinated solvents concentrations located approximately 10 ft bgs underneath the Jung Sun facility and approximately 20 ft bgs at the 37-24 24th Street Equities property. Elevated MIP ECD results were also observed at MIP-19, on the west side of 23rd Street (Appendix C).

Soil boring and monitoring well locations were selected following review of the MIP results. Soil borings SB-10, SB-11, and SB-14 were located at MIP-33, MIP-34, and MIP-14, respectively. Monitoring well locations and screening depths were adjusted to target the elevated MIP ECD levels as follows:

- MW-9 (15-30 ft bgs): MIP-13, MIP-28
- MW-10 (30-40 ft bgs): MIP-18
- MW-11 (40-50 ft bgs): MIP-12, MIP-14, MIP-15
- MW-12 (30-40 ft bgs): MIP-14, MIP-17, MIP-28
- MW-13 (35-45 ft bgs): MIP-17, MIP-26
- MW-14 (30-40 ft bgs): MIP23
- MW-15 (35-45 ft bgs): MIP-21, MIP-24, MIP-26
- MW-16 (45-55 ft bgs): MIP-22, MIP-23
- MW-17 (23-38 ft bgs): MIP-19, MIP-20
- MW-18 (24-34 ft bgs): MIP-18, MIP-20
- MW-19 (29.5-44.5 ft bgs): MIP-14, MIP-17, MIP-18
- MW-20 (15-25 ft bgs): MIP-28
- MW-21 (17-27 ft bgs): MIP-13, MIP-28

Elevated conductivity results were observed at locations in the study area. A cross-section of the MIP conductivity readings is shown in Figure 9. Changes in conductivity indicate changes in lithology, and may indicate the presence of elevated salts, metals, or organics.

2.4 Direct Push Soil Sampling and Temporary Well Sampling

Direct push soil borings were advanced at seven locations. Three of these borings are located within the Jung Sun facility (SB-11, SB-12, and SB-13). One boring was located on the Jung Sun property (SB-10). One boring was located on the 37-24 24th Street Equities property (SB-14). An upgradient (SB-9) and downgradient (SB-15) locations were also selected. The soil boring locations are shown on Figure 10.

Drilling was conducted by Zebra on March 15-16, 2012 and March 20, 2012 by direct push. Soil boring logs are provided in Appendix B. Soil samples were collected in five foot intervals by macrocores to collect readings with a PID and soil characterization. Soil samples were collected from stained soil or soil with PID readings above background. If there was no staining or PID detections, a sample was collected at the deepest interval above the water table.

The soil samples were collected in unpreserved jars provided by the laboratory. The samples were kept cooled to 4ºC and sent to AECOM's subcontract laboratory. Samples were analyzed for VOCs (USEPA Method SW846 8260). Three samples SB-10 (7-7.5 ft bgs), SB-11 (8.5-9 ft bgs), and SB-13 (12.5-13 ft bgs) were also analyzed for semivolatile organic compounds (SVOCs), pesticides/PCBs, and metals analyses.

Temporary well samples were collected at SB-10 (16-20 ft bgs), SB-11 (16-20 ft bgs), and SB-14 (18-23 ft bgs) to coincide with elevated MIP ECD readings. The groundwater samples were collected with a hydropunch device. The hydropunch device was advanced to the targeted depth and retracted to expose the stainless steel screened interval. Groundwater was purged from the hydropunch device with the goal of obtaining clear water prior to sampling. Groundwater samples from the hydropunch locations were collected using a foot valve with Teflon-lined poly tubing.

Groundwater samples were collected in pre-preserved bottles provided by the laboratory, cooled to 4ºC after collection, and sent to the laboratory VOC analysis (USEPA Method SW846 8260).

2.5 Monitoring Well Sampling

Monitoring wells were installed to determine the extent of the groundwater contamination in the overburden. The well locations were adjusted based on review of the MIP ECD results (Section 2.3). Existing wells MW-6 and MW-7 are considered upgradient wells because of the southward direction of groundwater within the study area. Wells located south of 38th Avenue are located at the southern extent of the groundwater plume. Well construction data are provided in Table 1. Groundwater Elevation data is provided in Table 2. The monitoring well locations are shown on Figure 11.

2.5.1 Monitoring Well Installation

The monitoring wells were installed by Zebra with a direct push rig with 3.25 inch OD geoprobe rods. All wells except MW-16 were constructed using 2-inch PVC threaded pipes with 10-foot slotted PVC screen. The rig could not advance the 3.25-inch OD rods to the targeted depth at MW-16. Following three attempts, NYSDEC permitted a 1-inch PVC well to be installed using 2-inch OD rods. The wells were prepacked. All monitoring wells were completed with flush mount well covers. Well installation occurred from March 8-19, 2012.

Each new monitoring well was developed to achieve a hydraulic connection between the formation and the well screen on March 21, 2012. The wells were developed using a surge and pump method. A Waterra pump with poly tubing was used for development at MW-16 because of the narrow diameter of the well. The remaining wells were developed using a Hurricane pump. The well was purged until the water ran clear, had turbidity readings less than 50 nephelometric turbidity units (NTU) or two hours of development transpired. The purge water did not have any visible contamination and was collected in 55-gallon drums.

Monitoring well construction forms and well development forms are provided in Appendix B.

YEC conducted a land survey of the permanent monitoring wells on April 10, 2012. A figure from YEC showing the well coordinates is provided in Appendix E.

2.5.2 Groundwater Sampling

Two rounds of monitoring well samples were collected from the 13 new and eight existing wells. The initial sampling round was conducted April 9-11, 2012. The second sampling round was conducted June 11-13, 2012. Prior to sample collection, AECOM measured the groundwater elevation in the wells. The groundwater samples were collected using low flow sampling. Water quality parameters (pH, oxidation reduction potential [ORP], dissolved oxygen [DO], specific conductivity, temperature, and turbidity) were measured using a flow through cell. A water level indicator was used to measure depth during sampling. The wells were purged at a rate of approximately 300 mL/min. A QED MP10 controller was used with the QED Sample Pro (2-inch) or Geotech (1-inch) bladder pump. Water samples were collected after stabilization of the water quality parameters. Purging was considered complete when the indicator parameters stabilized over three consecutive readings. Stabilization parameters are:

- pH: ± 0.1;
- Conductivity: ± 3 percent;
- DO: ± 10 mV;
- ORP: ±10 percent; and,
- Turbidity: less than 50 NTU.

During sample collection, the flow through cell was disconnected and the sample tubing discharge was transferred directly into the laboratory-supplied sample containers. The dedicated tubing was placed back into the well after sampling for future use. The non-dedicated sampling equipment was decontaminated prior to collecting each sample. Groundwater sampling logs are provided in Appendix B.

2.5.3 Analysis of Groundwater Samples

Water samples were collected in pre-preserved bottles provided by the laboratory, cooled to 4ºC after collection, and shipped to the subcontract laboratory for analysis. Groundwater samples from the monitoring wells were analyzed for VOCs (USEPA SW846 Method 8260) and monitored natural attenuation parameters (MNA). The MNA parameters consist of iron and manganese (total and field filtered; USEPA Method 6010B), biochemical oxygen demand (BOD; Standard Methods [SM] 5210B), chemical oxygen demand (COD; USEPA 410.4), alkalinity (SM 2320B), ammonia (SM4500-NH3 H), nitrate and nitrite (USEPA 353.2), chloride and sulfate (USEPA 300.0), phosphorous (SM4500-P E), sulfide (SM4500-S E), total organic carbon (SM 5310B), and methane, ethane, and ethene (RSK-175).

2.6 Decontamination

Drilling equipment was decontaminated before the first use, between boreholes, and prior to demobilization using high-pressure steam. The bladder pumps were disassembled and cleaned after each use. A new bladder was used for each well. Stainless steel parts were decontaminated with laboratory grade detergent (e.g. Alconox) and rinsed with deionized water. Other parts, such as gaskets were replaced after each use. Acetate liners and tubing used for development were discarded after use. The groundwater sampling tubing was left in the wells for future use. Decontamination water was drummed for disposal.

2.7 Investigation-Derived Waste (IDW) Disposal

Investigation derived wastes generated from installation and sampling of the soil borings and monitoring wells were temporarily stored on the Jung Sun site in nine 55-gallon drums. AECOM collected composite water samples from the drums on April 11, 2012 and June 13, 2012, and a soil waste characterization sample on June 13, 2012. The groundwater waste samples were analyzed for VOCs. The soil waste sample was analyzed for VOCs, SVOCs, PCBs, toxicity characteristic leaching procedure (TCLP) metals, reactive cyanide, ignitability, corrosivity pH, percent moisture, and reactive sulfide.

2.8 Probe Hole Closure

All probe holes were backfilled with bentonite, indigenous soil, and/or clean sand.

2.9 Soil Gas Sampling

Permanent soil gas points were installed and sampled to determine the extent of the soil gas contamination and determine if additional soil vapor intrusion sampling was needed in nearby structures. Soil gas points SG-08 through SG-20 were installed between March 7, 2012 and March 20, 2012 by a direct push rig. The points were installed according to the requirements in New York State Department of Health (NYSDOH) (2006) for permanent points. The soil gas sample points are shown on Figure 12. The permanent sampling point construction logs are provided in Appendix B.

Soil vapor sampling was conducted on March 23, 2012. One outdoor air sample and field duplicate were collected. The air sampling equipment (Summa canisters and regulators) was provided by the analytical laboratory.

Soil gas probes were installed to a depth of approximately 8 ft bgs. The boreholes were backfilled with glass beads and bentonite slurry was placed above the glass beads to the ground surface. A leak test was performed on each of the sampling trains and fittings to confirm that air leakage was not occurring.

The tubing was purged of approximately two to three probe volumes at a flow rate less than 0.2 liters per minute. PID readings were recorded during pumping. The air sampling pump was disconnected and the end of the tubing was connected directly to the Summa canister intake valve. Each Summa canister was checked to verify that the initial vacuum is 28 inches of mercury (in Hg), ±2 in Hg, before sampling. Samples were collected in laboratory-provided batch-certified 1.4-liter Summa canisters with regulators calibrated to collect a sample for a 2-hour period. Soil gas samples were analyzed for VOCs by USEPA method TO-15.

2.10 Soil Vapor Intrusion Sampling

Soil vapor intrusion sampling was conducted in structures near the site to determine whether actions were needed to address exposures to site-related contaminants. Soil vapor intrusion sampling was conducted in three structures. The structures were selected by NYSDEC and NYSDOH. Sampling dates are as follows:

- Structures B02 and B03 - March 19-20, 2012
- Structure B04 – March 20-21, 2012 and November 15-16, 2012
- Structures B12 and B15 – March 27-28, 2013

Indoor air and sub-slab samples were collected from each structure. An outdoor air sample was collected during each sampling event.

2.10.1 Pre-Sampling Building Survey

Building surveys were performed prior to sampling. The focus of the pre-sampling building survey is to select sampling locations, identify chemical usage, and to identify and minimize conditions that may interfere with the proposed testing. The survey evaluated the type of structure, floor layout, air flows, and physical conditions. Based on the findings of the survey, AECOM selected the sampling locations.

A product inventory was also conducted during the pre-sampling building survey to identify chemicals and products that may bias sampling results. In addition, the presence and description of odors and PID readings were recorded. In addition to readings within the buildings, PID readings were taken outdoors to establish typical ambient values.

Information obtained during the pre-sampling building survey, including sources of potential indoor air contamination, was documented on the NYSDOH Indoor Air Quality Questionnaire and Building Inventory Form for each structure. The NYSDOH Indoor Air Quality Questionnaire and Building Inventory Forms were provided to NYSDEC separately to protect the confidentiality of the structure tenants and owners.

Residents were provided with a list of activities to avoid 24 hours during sampling. The list is provided in Appendix B.

2.10.2 Sampling Locations

Based on the observations made during the pre-sampling building survey, AECOM identified locations for the collection of the sub-slab vapor, indoor air, and outdoor air samples. Indoor air sampling locations were selected primarily in areas routinely occupied by the residents and/or employees, while sub-slab vapor sampling locations were selected to provide coverage of the presumed lateral extent of the soil vapor plume. Sub-slab vapor sampling locations were also selected based on the condition of the basement floor and presence of crawl spaces. For structure B04, NYSDEC and NYSDOH preselected locations to sample. Adjustments were made in the field if these locations were inaccessible or the owner or tenant stated that the location was unacceptable.

2.10.3 Sub-Slab Vapor Sample Collection

AECOM personnel installed the temporary probes. A powered drill was utilized to make a 1-inch diameter hole through the concrete slab. The drill bit was advanced approximately 6 inches into the sub-slab material at each location to create an open cavity. A Teflon-lined polyethylene tube was then inserted into the hole. The annulus around the tube was sealed with bees wax to the top of the cement slab.

After installation of the probe, the tubing was connected to a SKC pump, and up to one liter (approximately three times the volume of air in the tubing and probe) of sub-slab vapor was purged at a rate less than 200 mL/min]). Once purging was completed, the sampling tube was connected to the Summa canister. After setup was complete, samples were drawn concurrently with indoor and outdoor air samples at each property. At the completion of the sampling, all holes were patched to restore the pre-sampling condition.

2.10.4 Indoor Air Sample Collection

Indoor air samples were collected by placing the Summa canister in the breathing zone (4 to 6 ft above the ground).

2.10.5 Outdoor Air Sample Collection

Outdoor air samples were located away from outdoor operations that are known to generate VOCs (e.g., automobile exhaust). Outdoor air samples were collected by placing the Summa canister in the breathing zone (4 to 6 ft above ground).

2.10.6 Analytical Methodology

The samples were collected in 6-liter, stainless steel, batch-certified Summa canisters equipped with pre-set regulators designed to sample for a 24-hour period. The Summa canisters were retrieved at the completion of the 24-hour sample time. The samples were analyzed for VOCs using USEPA Method TO-15. The quantitation limit was less than 1 $\mu g/m^3$ for all compounds in all media (sub-slab vapor, indoor air and outdoor air samples) in undiluted samples (i.e., samples with a dilution factor of 1.0); the quantitation limit for TCE was less than 0.25 $\mu g/m^3$ (typically 0.12 $\mu g/m^3$) to meet the evaluation criteria in the Soil Vapor/Indoor Air Matrix 1 (NYSDOH, 2006). A log was completed for each sampling location (Appendix B).

3.0 LABORATORY ANALYTICAL RESULTS

This section summarizes the laboratory analytical results and provides a comparison to the applicable standards, criteria or guidance (SCG) values. The laboratory data packages are provided in Appendix F.

3.1 Facility (Wet Pit)

A grab sample was collected from a wet pit in the Jung Sun Laundry facility. The wet pit sample VOC results are provided in Table 3. VOC detections are listed in Figure 13. The data were compared to the NYS Class GA groundwater criteria.

- PCE exceeds the 5 µg/L criterion at 150,000 µg/L;
- TCE exceeds the 5 µg/L criterion at 2,300J µg/L;
- cis-1,2-DCE exceeds the 5 µg/L criterion at 8,300J;
- trans-1,2-DCE exceeds the 5 µg/L criterion at 12 µg/L; and,
- 1,1-DCE exceeds the 5 µg/L criterion at 6J µg/L.

PCE was detected at the reported solubility level of the compound. The wet pit may have been a disposal area for spent PCE.

3.2 Direct Push Soil Sampling

Thirteen soil samples (plus a field duplicate) were collected from seven direct push soil boring locations. The samples were submitted for laboratory analysis of VOCs. Three samples from the Jung Sun property and facility were analyzed for SVOCs, pesticide/PCBs, and metals. Additionally, two samples from the Jung Sun property and facility and one sample from a downgradient location were analyzed for grain size and total organic carbon (TOC). The soil analytical results are compared to the NYSDEC unrestricted use SCOs and presented in Table 4 for VOCs, Table 5 for SVOCs, Table 6 for pesticides and PCBs, Table 7 for metals, and Table 8 for grain size and TOC analyses. Sample detections are summarized in Figure 14 for VOCs and Figure 15 for the remaining chemical analyses.

- PCE was detected in 11 of 13 samples. PCE was not detected in the upgradient sample from SB-9 at 6-6.5 ft bgs and the downgradient sample from SB-15 at 52-52.5 ft bgs. Concentrations exceeded the 470 µg/Kg criterion in three samples at 11,000J µg/Kg (SB-10 at 7-7.5 ft bgs) on the Jung Sun property and at 3,900J µg/Kg and 83,000J µg/Kg from borings within the Jung Sun facility (SB-11 at 15.5-16 ft bgs and SB-12 at 14-14.5 µg/Kg, respectively).
- Acetone was detected at one of 13 samples; the detection is above the criterion of 50 µg/Kg at 70 µg/Kg from the downgradient sample SB-15 at 9-9.5 ft bgs.

- Aroclor 1260 was detected in two of three samples at levels above the criterion of 100 µg/Kg for total PCBs: 140 µg/Kg from SB-13 12.5-13 ft bgs duplicate sample and 910D µg/Kg from SB-11 8.5-9 ft bgs.

- Chromium was detected above the 30 µg/Kg criteria in all of the three samples at concentrations ranging from 31.7 µg/Kg (SB-13 12.5-13 ft bgs) to 85 µg/Kg (SB-10 7-7.5 ft bgs).

- Copper was detected in all three samples; one detection is above the 50 µg/Kg criteria at 129 µg/Kg (SB-10 7-7.5 ft bgs).

- Lead was detected in all three samples; detections are above the 63 µg/Kg criteria in two samples at 232 µg/Kg (SB-11 8.5-9 ft bgs) and 4030 µg/Kg (SB-10 7-7.5 ft bgs).

- Zinc was detected in all three samples; one detection is above the 109 µg/Kg criteria at 2,040E µg/Kg (SB-10 7-7.5 ft bgs).

TCE and cis-1,2-DCE were detected from samples on the Jung Sun property and the adjacent 37-24 24th Street Equities property at levels below criteria.

No SVOCs were detected above criteria. The low level detections may be indicative of historic fill found in the urban soils.

Elevated metals concentrations such as chromium may result from corrosion of the drycleaner equipment. The solvents may become corrosive if the equipment is not well maintained or the still is run too hot.

There is poor agreement between the sample and duplicate results for SB-13, indicating the fill is heterogeneous.

3.3 Temporary Well Sampling

Temporary well samples were collected from four soil borings: two located on the Jung Sun Laundry Site, one on the adjacent 37-24 24th Street Equities property, and one downgradient at the southwest corner of 38th Avenue and 24th Street. The temporary well VOC results are provided in Table 9. VOC detections are listed in Figure 16. The sample data were compared to NYS Class GA groundwater criteria.

- PCE exceeded the 5 µg/L criterion in all samples with concentrations ranging from 70 µg/L in the downgradient sample in SB-15 (48-53 ft bgs) to 50,000 µg/L (53,000 µg/L in duplicate sample) on the 37-24 24th Street Equities property, SB-14 (18-23 ft bgs).

- TCE exceeded the 5 µg/L criterion in all samples with concentrations ranging from 20 µg/L in the downgradient sample from SB-15 (48-53 ft bgs) to 1,500 µg/L (1,400 µg/L in duplicate sample) on the 37-24 24th Street Equities property, SB-14 (18-23 ft bgs).

- cis-1,2-DCE was detected in all samples and exceeded the 5 µg/L criterion at four of the sample locations with concentrations ranging from 3 µg/L in the downgradient sample from SB-15 (48-53 ft bgs) to 5,400 µg/L from a soil boring located with the Jung Sun facility (SB-

11, 16-20 ft bgs) and on the 37-24 24th Street Equities property, SB-14 (18-23 ft bgs) (5,500 µg/L in the duplicate sample).

- trans-1,2-DCE was detected in three of four samples at levels exceeding the 5 µg/L criterion with concentrations of 7 µg/L on the Jung Sun property (SB-10, 16-20 ft bgs) and 21 µg/L at the boring in the Jung Sun facility (SB-11 16-20 ft bgs) and on the 37-24 24th Street Equities property (SB-14, 18-23 ft bgs).

- VC was detected in three samples, with two samples exceeding the 2 µg/L criterion. VC was detected on the Jung Sun property (SB-10, 16-20 ft bgs) at 1 µg/L and above the criterion at 77 µg/L on the 37-24 24th Street Equities property (SB-14, 18-23 ft bgs; 76 µg/L in the duplicate sample), and at 120 µg/L within the Jung Sun facility (SB-11 16-20 ft bgs).

- 1,1-DCE was detected in the three samples, with one sample exceeding the 5 µg/L criterion. 1,1-DCE was detected on the Jung Sun property (SB-10, 16-20 ft bgs) at 1 µg/L, within the Jung Sun property (SB-11, 16-20 µg/L) at 5 µg/L, and above the criterion at 13 µg/L on the 37-24 24th Street Equities property (SB-14, 18-23 ft bgs; 13 µg/L in the duplicate sample).

- Benzene, ethylbenzene, toluene, and xylene were detected above the NYS Class GA groundwater criteria (1 µg/L for benzene and 5 µg/L for ethylbenzene, toluene, and xylene) on the 37-24 24th Street Equities property. Toluene and xylene were detected below the NYS Class GA criteria at the Jung Sun facility (SB-11 16-20 ft bgs) at levels of 1 µg/L and 2 µg/L, respectively.

Other compounds that were detected at levels below the NYS Class GA criteria include acetone, chloroform, chloroethane, isopropylbenzene, and styrene.

3.4 Monitoring Well Sampling

Two rounds of monitoring well samples were collected from the 21 overburden, permanent monitoring wells. One field duplicate sample was collected per sampling round. The groundwater VOC results are provided in Table 10. VOC detections are listed in Figure 17 for the northern portion of the study area and Figure 18 for the southern portion. The sample data were compared to NYS Class GA groundwater criteria. Samples were collected for MNA parameters from four wells in April 2012 and June 2012. The data are presented Table 11. The results of the MNA analyses are discussed in relation to fate and transport in Section 7.5.

Exceedances for VOC detections are summarized below:

- PCE
    - o Detected in 19 of 21 samples collected in April 2012; there are 19 exceedances of the 5 µg/L criterion ranging from 7J µg/L (MW-13 and MW-19) to 16,000 µg/L (MW-1);
    - o Detected in 19 of 21 samples collected in June 2012; there are 16 exceedances of the 5 µg/L criterion ranging from 6J µg/L (MW-2) to 20,000 µg/L (MW-1);

- TCE
    - Detected in 19 of 21 samples collected in April 2012; there are 16 exceedances of the 5 µg/L criterion ranging from 7J µg/L (MW-13) to 1,800J µg/L (MW-20);
    - Detected in 19 of 21 samples collected in June 2012; there are 14 exceedances of the 5 µg/L criterion ranging from 12 µg/L (MW-12) to 1,200 µg/L (MW-20);
- cis-1,2-DCE
    - Detected in 17 of 21 samples collected in April 2012; there are 11 exceedances of the 5 µg/L criterion ranging from 6J µg/L (MW-11) to 21,000 µg/L (MW-20);
    - Detected in 14 of 21 samples collected in June 2012; there are nine exceedances of the 5 µg/L criterion ranging from 10 µg/L (MW-18) to 12,000 µg/L (MW-20);
- trans-1,2-DCE
    - Detected in seven of 21 samples collected in April 2012; there are five exceedances of the 5 µg/L criterion ranging from 8J µg/L (MW-4) to 50 µg/L (MW-20);
    - Detected in seven of 21 samples collected in June 2012; there are four exceedances of the 5 µg/L criterion ranging from 10 µg/L (MW-9) to 130 µg/L (MW-20);
- VC
    - Detected in eight of 21 samples collected in April 2012; there are six exceedances of the 2 µg/L criterion ranging from 10 µg/L (MW-5) to 390 µg/L (MW-8);
    - Detected in six of 21 samples collected in June 2012; there are six exceedances of the 2 µg/L criterion ranging from 6 µg/L (MW-4; 6J µg/L in duplicate sample) to 390 µg/L (MW-8);
- 1,1-DCE
    - Detected in seven of 21 samples collected in April 2012; there are three exceedances of the 5 µg/L criterion ranging from 11 µg/L (MW-9) to 14 µg/L (MW-1);
    - Detected in five of 21 samples collected in June 2012; there is one exceedance of the 5 µg/L criterion of 9J µg/L (MW-20);
- Chloroform
    - Detected in 16 of 21 samples collected in April 2012; there are six exceedances of the 7 µg/L criterion ranging from 8J µg/L (MW-10) to 25 µg/L (MW-4);
    - Detected in 14 of 21 samples collected in June 2012; there are three exceedances of the 7 µg/L criterion ranging from 6J µg/L (MW-19) to 16 µg/L (MW-9);

- Benzene
    - o Detected in one of 21 samples collected in April 2012; there is one exceedances of the 1 µg/L criterion of 4J µg/L (MW-1);
    - o Detected in one of 21 samples collected in June 2012; there is one exceedances of the 1 µg/L criterion of 3J µg/L (MW-1);

PCE exceeded the NYS Class GA groundwater criterion in the upgradient wells MW-6 and MW-7 (assuming groundwater flow in the study area is to the southeast). Concentrations over the NYS Class GA groundwater criteria were detected in MW-6 and MW-7 in the site investigation. The groundwater elevation variation is small over the study area. These wells may be impacted from the site.

There were no VOC detections in MW-3 in April 2012 and June 2012. During the site investigation, oil was observed in MW-3, but not in any other wells. Only acetone was detected in MW-17 in April 2012. MW-3, and possibly MW-17, may not be hydraulically connected to the remainder of the study area.

The following compounds were detected at levels below the NYS Class GA groundwater criteria: carbon tetrachloride, acetone, chloroethane, methyl tert-butyl ether, trichlorofluoromethane, and 1,2-dibromoethane.

3.5 Investigation-Derived Waste (IDW) Disposal

Waste characterization data are provided in Appendix F. Veolia Environmental Services, Inc. labeled and transferred the drums to a disposal facility as nonhazardous waste on August 24, 2012. The waste stream information profile and bill of lading are provided in Appendix B.

3.6 Soil Gas Sampling

Thirteen soil gas samples, one outdoor air sample and one field duplicate soil gas sample were collected in March 2012. All air samples were analyzed for VOCs by USEPA method TO-15. The analytical results are presented in Table 12 and summarized on Figure 19. The detections were compared to the USEPA (2002) generic screening levels for an attenuation factor of 0.1 and risk of 1E-6. Exceedances of the screening criteria are listed below.

- PCE was detected in all 13 soil gas samples above the 8.1 µg/m^3 criterion with concentrations ranging from 11 µg/m^3 in downgradient location SG-17 to 2,800,000 µg/m^3 at SG-20 located on the Jung Sun property (2,400,000 µg/m^3 in the duplicate sample).

- TCE was detected in ten of 13 samples, all exceeding the 0.22 µg/m3 criterion with concentrations ranging from 1 µg/m3 at downgradient location SG-12 to 130,000 µg/m3 at SG-20 on the Jung Sun property (90,000 µg/m3 in the duplicate sample).

- cis-1,2-DCE was detected in one of 13 samples above the 350 µg/m3 criterion at 82,000 µg/m3 from SG-20 on the Jung Sun property. cis-1,2-DCE was detected in two downgradient locations (SG-15 and SG-17) below criteria.

- Chloroform was detected in nine of 13 samples above the 1.1 µg/m3 criterion with concentrations ranging from 3.1 µg/m3 (SB-12) to 78 µg/m3 (SG-14).

- Carbon tetrachloride was detected in two samples above the 1.6 μg/m3 criterion at 4 μg/m3 (SG-15) and 110 μg/m3 (SG-16). Carbon tetrachloride was detected below the criterion in three samples (SG-10, SG-12, SG-14, and SG-18).

1,1-DCA, 1,1-DCE, and 1,1,1-TCA were detected below criteria at downgradient locations (SG-15, SG-16, and SG-17).

3.7 Soil Vapor Intrusion Sampling

Soil vapor intrusion sampling was conducted in March 2012, November 2012, and March 2013. Three structures, B02, B03, and B04, were sampled in March 2012. Additional samples were collected from throughout structure B04 in November 2012. Based on review of the draft RI Report submitted in January 2013, NYSDEC and NYSDOH determined that sampling was required at eight additional structures. Of the eight structures identified, permission to sample was granted by two of the structure owners. Structures B12 and B15 were sampled in March 2013. A total of 30 air samples were collected. A field duplicate sample was collected during each event. The air samples include sub-slab vapor samples, indoor air samples, and outdoor air samples. All air samples were analyzed for VOCs by USEPA method TO-15. The analytical results are presented in Table 13. Figures showing the sampling locations were provided to NYSDEC separately to protect the confidentiality of the tenants and owners.

The indoor air and outdoor air sample results were compared to the NYSDOH (2006) air guideline values. Exceedances of the criteria are listed below:

- PCE was detected above the 100 μg/m3 criterion in one indoor air sample at 110 μg/m3 (B04-IA8). The PCE sub-slab sample result was non-detect at this location.

- TCE was detected above the 5 μg/m3 criterion in two indoor air samples at 7.3 μg/m3 (B04-IA7; sub-slab sample result 220 μg/m3) and 7 μg/m3 (Structure B12; sub-slab sample result 430 μg/m3).

- Methylene chloride was detected above the 100 μg/m3 criterion in one indoor air sample at 110 μg/m3 (B04-IA5). The methylene chloride sub-slab sample result was non-detect at this location.

The soil vapor intrusion data were also compared to the soil vapor/indoor air matrices in the NYSDOH (2006) guidance. The comparison is provided in Table 14 for PCE and TCE. Based on the matrices, the guidance recommendations for the structures are as follows:

- No further action for B03.

- Take reasonable and practical actions to identify sources and reduce exposures for B02 and B04 at IA3/SS3 and IA5/SS5.

- Monitor/Mitigate for B04 at locations IA2/SS2, IA4/SS4, and IA6/SS6, and at B15.

- Mitigate for B04 at locations IA1/SS1, IA7/SS7, IA8/SS8, and IA9/SS9, and at B12.

NYSDEC and NYSDOH will determine the appropriate course of action for the structures in consultation with the property owners.

4.0 ANALYTICAL DATA AND USABILITY

Data were generated and validated for the soil, groundwater, soil vapor, and soil vapor intrusion sampling events. The laboratory data packages and the data usability summary reports (DUSRs) are provided in Appendix F on CD. The sample data generated for this RI were validated by an independent subcontractor, Environmental Data Services, Inc. (EDS) of Williamsburg, VA. The tabulated data used in this report include any qualifiers applied during validation.

Soil and groundwater samples were analyzed by H2M Labs, Inc., Melville, New York, a NYSDOH Environmental Laboratory Approval Program (ELAP) certified lab (ELAP ID 10478). Soil gas and soil vapor intrusion samples were analyzed by TestAmerica, South Burlington, Vermont (ELAP ID 10391).

Site-specific quality control samples were collected as follows:

- Soil sampling – one field duplicate, one trip blank, and one storage blank;
- Temporary wells and facility sample (wet pit) - one field duplicate and one trip blank;
- Groundwater sampling (April 2012) - one field duplicate, two trip blanks, two storage blanks, one matrix spike/matrix spike duplicate (MS/MSD) sample pair;
- Groundwater sampling (June 2012) - one field duplicate and two trip blanks;
- Soil gas sampling - one field duplicate; and,
- Soil vapor intrusion sampling – one field duplicate per sampling event.

In addition, the laboratory performed batch quality control samples as required by the methods.

A summary of the data quality review is provided below. The data were validated for VOCs analysis only.

4.1 Soil Boring, Temporary Well, and Facility Sampling

Soil boring sampling data collected in March 2012 were reported by H2M Labs, Inc. in one sample delivery group (SDG), AECOM163. One DUSR was prepared for this SDG. A total of 13 analyses were validated, including one field duplicate, one trip blank, one storage blank, five dilutions, and five environmental samples. Data quality was generally acceptable.

There were no rejections of the data. Overall, the data are acceptable for the intended purposes as qualified for the following deficiencies:

- Two compounds (PCE and 1,2,4-trichlorobenzene) were qualified as nondetected in two samples due to method blank contamination;

- Two compounds (dichlorodifluoromethane and 1,1,2-trichloro-1,2,2-trifluoroethane) were qualified as estimated in all samples due to high initial calibration percent relative standard deviation values; and,

- Several compounds (dichlorodifluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, acetone, 2-butanone, cyclohexane, methylcyclohexane, 1,2-dibromo-3-chloropropane, and 1,2,4-trichlorobenzene) were qualified as estimated in several samples due to high continuing calibration percent difference values.

Temporary well and facility (wet pit) sampling data collected in March 2012 were reported by H2M Labs, Inc. in one SDG, AECOM164. One DUSR was prepared for this SDG. A total of 18 analyses were validated, including one field duplicate, one trip blank, three dilutions, and 13 environmental samples. Data quality was generally acceptable.

There were no rejections of the data. Overall, the data are acceptable for the intended purposes as qualified for the following deficiencies:

- Several compounds (1,2-dichloroethane, dichlorodifluoromethane, bromomethane, trichlorofluoromethane, 1,1-DCE, 1,1,1-trichloroethane, cyclohexane, carbon tetrachloride, methylcyclohexane, PCE, and 1,2,4-trichlorobenzene) were qualified as estimated in three dilution samples due to low laboratory control sample recoveries;

- PCE was qualified as nondetect in one sample due to method blank contamination; and,

- Several compounds (dichlorodifluoromethane, PCE, dichlorodifluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, acetone, 2-butanone,cyclohexane, methylcyclohexane, 1,2-dibromo-3-chloropropane, and 1,2,4-trichlorobenzene) were qualified as estimated in all soil samples due to high continuing calibration percent difference values.

4.2 Groundwater Sampling

The initial round of groundwater samples collected in April 2012 were reported by H2M Labs, Inc. in two SDGs, AECOM176 and AECOM177. Two DUSRs were prepared for these SDGs. A total of 35 analyses were validated, including one field duplicate, two trip blanks, two storage blanks, seven dilutions, one matrix spike/matrix spike duplicate sample pair, and 21 environmental samples. Data quality was generally acceptable.

AECOM176: There were no rejections of the data. Overall, the data are acceptable for the intended purposes as qualified for the following deficiencies:

- cis-1,2-DCE was qualified as estimated in four samples and two dilutions samples due to a high laboratory control sample recovery; and,

- Several compounds (dichlorodifluoromethane, acetone, cis-1,2-DCE, 4-methyl-2-pentanone, 2-hexanone, 1,2-dibromo-3-chloropropane, and 1,2,4-trichlorobenzene) were qualified as estimated in all samples due to high continuing calibration percent difference values.

AECOM177: There were no rejections of the data. Overall, the data are acceptable for the intended purposes as qualified for the following deficiencies:

- Five VOC compounds (dichlorodifluoromethane, trichlorofluoromethane, acetone, 1,2-dibromo-3-chloropropane, and 1,2,4-trichlorobenzene) were qualified as estimated in all samples due to high continuing calibration percent difference values.

The second round of groundwater samples and one waste characterization sample collected in June 2012 were reported by H2M Labs, Inc. in two SDGs, AECOM190 and AECOM191. Two DUSRs were prepared for these SDGs. A total of 33 analyses were validated, including one field duplicate, two trip blanks, eight dilutions, and 22 environmental samples. Data quality was generally acceptable.

AECOM190: There were no rejections of the data. Overall, the data are acceptable for the intended purposes as qualified for the following deficiencies:

- Four VOC compounds (acetone, chloromethane, dichlorodifluoromethane, and carbon disulfide) were qualified as estimated in all samples due to high continuing calibration percent difference values.

AECOM191: There were no rejections of the data. Overall, the data are acceptable for the intended purposes as qualified for the following deficiencies:

- Four VOC compounds (acetone, chloromethane, dichlorodifluoromethane, and carbon disulfide) were qualified as estimated in all samples due to high continuing calibration percent difference values; and,

- Acetone was qualified as non-detect in seven samples due to trip blank contamination.

4.3 Air Sampling

The soil gas samples and soil vapor intrusion samples collected in March 2012 were reported by Test America, Inc. in one SDG, H2C300465. One DUSR was prepared for this SDG. A total of 26 analyses were validated, including two field duplicates and 24 environmental samples. Data quality was generally acceptable.

H2C300465: There were no rejections of the data. Overall, the data are acceptable for the intended purposes as qualified for the following deficiencies:

- One compound (1,1-DCE) or two compounds (1,4-dioxane and 1,2,4-trichlorobenzene) were qualified as estimated in all samples due to high continuing calibration percent difference values.

The soil vapor intrusion samples collected in November 2012 were reported by Test America, Inc. in one SDG, J13821. One DUSR was prepared for this SDG. A total of 20 analyses were validated, including one field duplicates, four dilutions, and 15 environmental samples. Data quality was generally acceptable.

J13821: There were no rejections of the data. Overall, the data are acceptable for the intended purposes as qualified for the following deficiencies:

- Three compounds (benzene, toluene, and PCE) were qualified as estimated in two samples due to poor field duplicate precision.

The soil vapor intrusion samples collected in March 2013 were reported by Test America, Inc. in one SDG, J13821. One DUSR was prepared for this SDG. A total of 20 analyses were validated, including one field duplicates, four dilutions, and 15 environmental samples. Data quality was generally acceptable.

J15836: There were no rejections of the data. Overall, the data are acceptable for the intended purposes as qualified for the following deficiencies:

- Five compounds (o-xylene, m-xylene and p-xylene, 4-ethyltoluene, 1,2,3-trimethylbenzene, and total xylenes) were qualified as estimated in four samples due to low laboratory control sample recoveries; and,

- One compound (1,1,2,2-tetrachloroethane) was qualified as estimated in four samples and one dilution sample due to a high continuing calibration percent difference value.

5.0 GEOLOGY/HYDROGEOLOGY

5.1 Regional Geology

The site is located within Queens County, New York. Queens County is covered by Pleistocene and Cretaceous deposits over crystalline bedrock of Precambrian age. There are small bedrock outcrops near the East River in Astoria and Long Island City, New York. The bedrock surface drops at approximately 80 feet per mile to the southeast reaching a depth of about 1,100 feet below mean sea level (msl) in Far Rockaway. Soil thickness ranges from 100 ft in northwestern Queens County to about 1,000 ft in the southeastern portion of the county. Figure 20 provides a cross-section of the stratigraphic layers underlying Queens County.

There are three hydrogeologic units in the Pleistocene deposits: the upper glacial aquifer (UGA), the Gardiners Clay, and the Jameco aquifer. Only the UGA is present beneath the site. The Upper Pleistocene deposits in the UGA consist of terminal moraine and ground-moraine deposits. These deposits consist of poorly sorted mixtures of clay, silt, sand, gravel, and boulders, and (2) glaciofluvial outwash deposits, which consist of moderately to well-sorted mixtures of sand and gravel. Gardiners Clay is a confining layer consisting of clay and silt with interbedded sand. The Jameco Gravel is a dark, coarse sand and gravel with cobbles and boulders having a high hydraulic conductivity. Gardiners Clay and Jameco Gravel are present in southern Queens County.

Upper Cretaceous deposits are present in the southeast of Queens County. These deposits consist of the Magothy Formation and Matawan Group, undifferentiated, and the unnamed clay and Lloyd Sand Members of the Raritan Formation. The Magothy aquifer consists of sand and silty sand, with some interbedded clay. The thickness of the Magothy aquifer is more than 500 ft in southeastern Queens County. The estimated horizontal hydraulic conductivity of the Magothy aquifer ranges from 60 to 90 ft/day with local variation. The Clay Member of the Raritan Formation consists of silty clay with some interbedded sand. The depth of this layer ranges up to 200 ft. Vertical hydraulic conductivity is estimated to be 0.001 ft/day. The Lloyd Sand Member of the Raritan Formation consists of quartz sand and gravel with interbedded silt and clay. The thickness of this layer ranges up to 300 ft. Horizontal hydraulic conductivity of this unit is estimated at 50-70 ft/day (USGS, 2002).

Bedrock formations in the study area are shown in Figure 21 from USGS (1970). The site is located within alluvial surface deposits with unknown bedrock geology. From a drillers log for a well drilled for Jung Sun Laundry, bedrock is present beneath the site. The rock type is listed as gneiss or Fordham gneiss on several drilling logs for wells in Long Island City, New York. Fordham gneiss is abundant in quartz, biotite, and feldspar. It is composed of banded biotite gneiss which grades into schist. This well was abandoned because the water was hard and could not be used by the laundry. The decreasing elevation of the top of bedrock toward the southeast is shown in Figure 21 (USGS (1999b).

5.2 Site Geology

Information concerning the site stratigraphy was obtained from the soil borings collected during the RI. Fill and native soils were identified in the surface soils within the study area. Soil characterization of the direct push borings is documented in the logs provided in Appendix B. Fill typically consisted of sand with some fines. Debris, including pieces of brick, cement, and asphalt, were present in some sections of the fill. Mica was observed in soils. The native soils were typically medium sand with gravel or clay and silt, consistent with till present in the UGA. Cross-sections showing the depths of fill and native soils are shown in Figure 22. Medium sand was the primary constituent in the following borings: SB-9, SB-10, SB-11, SB-12, and SB-13. At SB-14, on the 37-24 24th Street Equities property, the soil is coarse sand, with a layer of gravelly sand from 10-18 ft bgs; between 18-29 ft bgs there is sand with gravel; from 29-39 ft bgs (refusal) there are layers of clay with varying amounts of silt among coarser layers of sand and gravel. SB-15 consisted of clay and silt to 19 ft bgs, overlying fine sand with varying amounts of silt to refusal at 53 ft bgs.

A 6-inch water supply well, Q95, was drilled in the Jung Sun facility (USGS, 1938 and 1948). The well terminated at 96 ft bgs, or approximately 74 ft below msl. The drillers log identified the following soil and thicknesses below the 8 ft deep basement:

- Loam, 8-10 ft bgs
- Sand, coarse, clean, brown, 10-35 ft bgs
- Sand, very fine, brown, considerable fine mica, 35-51 ft bgs
- Sand, fine, gray, a little gravel, 51-53 ft bgs
- Sand, coarse, and gravel, 53-58 ft bgs
- Clay, sandy, gray, 58-94 ft bgs
- Rock, 94-96 ft bgs

The clay overlying the rock may result from bedrock weathering (USGS, 1978). The rock encountered is likely to be Fordham gneiss.

Three soil samples were analyzed for particle size and TOC (Table 8). The soil descriptions are consistent with the drillers log above for soils within the depths sampled. The USCS descriptions are brown silty sand for 7-7.5 ft bgs; grey, well graded sand with silt and gravel, mica noted for 14-14.5 ft bgs; and brown poorly graded sand with silt for 50-55 ft bgs. The samples contained from 0.133 percent to 0.615 percent TOC.

5.3 Regional Hydrogeology

Four distinct aquifers occur in Queens County: the UGA, the Jameco aquifer, the Magothy aquifer, and the Lloyd aquifer. A cross-section showing the aquifers is provided in Figure 20. Only the UGA is located under the site.

The UGA consists of glacial outwash deposits of sand and gravel south of the terminal moraine and of ground-moraine deposits north of the terminal moraine. The thickness of the UGA ranges from a few feet in northwestern Queens to approximately 150 feet near Woodhaven. The porosity is 40 percent. The hydraulic conductivity is approximately 1.5 ft/day. However, groundwater movement ranges from a fraction of an inch per day in clay to hundreds of feet per day in sand and gravel deposits. Groundwater is unconfined for most of the UGA. In the UGA, most of the groundwater flows laterally north and south towards the sea. In the study area, groundwater flows toward the East River. Figure 20 shows vertical and horizontal regional flow direction. In the central part of Queens County, some groundwater can percolated downward from the UGA through leaks in confining beds into the deeper aquifers (USGS, 1971).

According to USGS (1999a), Kings and Queens Counties obtain 5 percent of their public water supply from underlying aquifers and 95 percent from upstate surface water reservoirs. Since the early 1990s, the only public supply wells in Kings and Queens County are located in the Jamaica area of Queens County (USGS, 2002). There are no known supply wells located in the vicinity of the site.

5.4 Site Hydrogeology

Groundwater elevations were measured from the 21 overburden monitoring wells to obtain information regarding the site hydrogeology. Readings were collected on April 9, 2012 and June 11, 2012. Groundwater was encountered in the overburden at depths ranging from 5.97-16.43 feet bgs in April 2012 and 5.97-16.44 ft bgs in June 2012. Table 2 summarizes the screen intervals and the depths to groundwater measured in the wells during the sampling events.

Water table surface contour maps for elevations measured are shown in Figure 23 for April 2012 and Figure 24 for June 2012. Wells MW-3 and MW-17 were excluded from the contouring. Impact to the flow regime from structures is indicated in MW-3 and MW-17 which have significantly lower groundwater elevations than in the other wells. In January 2008, during well development, oil was identified in MW-3, but not in any other monitoring wells. Based on the apparent direction of contaminant transport towards the south-southeast, it appears that MW-3 and MW-17 are not hydraulically connected to the remainder of the study area.

The groundwater elevations are relatively flat across the study area with the exception noted above. As discussed in Section 5.3, general flow of groundwater is towards the East River, as shown on Figure 20, following the topology. Localized variations in the flow regime due to in-ground infrastructure and heterogeneities in the subsurface soils may be present resulting in the slightly lower groundwater elevations to the southeast and north of the site.

6.0 CONTAMINATION – NATURE AND EXTENT

6.1 Nature of Contamination

A brief summary of chemicals used in dry cleaning operations is provided in Section 6.1.1. The chemicals of concern identified above SCGs are presented for soil, groundwater and soil gas in Section 6.1.2.

6.1.1 Dry Cleaning and Laundry Chemicals Used in Operations

The facility was used as a dry cleaner from the late 1980s through the mid 1990s. The State Coalition for Remediation of Drycleaners (SCDR, 2009) prepared a resource describing chemicals used in dry cleaning. In addition to dry cleaning solvents, chemicals may be present in the solvent as impurities or stabilizers. Other chemicals are used in dry cleaning for spots pretreating chemicals, detergents, bleaches, garment treatment chemicals, and system maintenance chemicals. A summary of chemicals that may be present at the site as a result of operations is provided below based on the SCDR (2009).

Starting in 1962, PCE was the primary solvent used by dry cleaners. PCE manufactured for dry cleaning contains 1 percent to 0.1 percent impurities. These impurities may include 1,1,1-trichloroethane, carbon tetrachloride, dicholoromethane, TCE, water, and other chlorinated solvents. The PCE purchased may be reclaimed. The reclaimed PCE may be from industries other than dry cleaning. The amount of impurities may range from 5 percent to 1 percent in the reclaimed solvent. Impurities in reclaimed PCE may include methyl ethyl ketone, mineral spirits, toluene, 1,1,1-trichloroethane and other chlorinated solvents.

The presence of water generates hydrochloric acid and acidic conditions that can corrode metals in the dry cleaning machines causing leaching of metals including chromium. Stabilizers are added to PCE to reduce degradation. Stabilizers include 4-methylmorpholine, diallylamine, tripropylene, cyclohexane oxide, betaethoxyproprionitrile, and 4-methoxyphenol. Concentrations of stabilizers in PCE range from 0.005 percent to 0.5 percent (by volume).

Detergents are added to the dry cleaning machines. Constituents of the detergents may include: soap-fatty acid mixtures, PCE, petroleum solvents, and glycol ether among other compounds.

Other chemicals used in the dry cleaning machine include: optical brighteners (bleaches and dyes), bactericides, fabric conditioners (solvent based – petroleum naphtha or PCE), and anti-static/anti-lint agents (sulfonated polystyrene or sulfonated polystyrene/maleic anhydride polymers).

Garments that are heavily stained may be pre-treated with cleaning chemicals. Following dry cleaning, the chemicals may be reapplied if the stains persist. Pre-treatment chemicals are selected based on the type of stain. Spotting agents for water soluble stains include water, neutral synthetic detergents containing surfactants, lye, ammonia, potassium hydroxide, sodium hydroxide and protein formula containing digester enzymes, acetic acid, hydrofluoric acid, oxalic acid, glycolic acid and sulfuric acid, and tannin formula agents. Spotting agents for non-water soluble stains include: PCE, TCE, 1,1,1-trichloroethane, carbon tetrachloride, methylene chloride, amyl acetate, acetone, ethanol, methanol, isopropyl alcohol and petroleum solvents. Bleaches are used when pre-treatment chemicals fail to remove the stains.

Chemicals may be used to treat garments following dry cleaning. The functions of these chemicals include waterproofing, flame retardants, refurbishing, deodorizing, stain repellents and pest control.

The facility was used as a laundry in the late 1990s through 2008. PCE, TCE and trans-1,2-DCE are listed as pollutants of concern for the industrial laundries industry (USEPA, 2000). Chloroform can be associated with rinse water from laundries (USGS, 2006).

6.1.2 Site Chemicals of Concern

6.1.2.1 Groundwater

Historical data collected at the site since 2003 have identified chlorinated VOCs among the contaminants in groundwater at the Jung Sun site and vicinity. Data collected during this RI are consistent with previous data with regard to the nature of contamination found.

As shown on Figures 17 and 18, the VOCs detected at concentrations exceeding the NYS Class GA groundwater criteria are the chlorinated aliphatics PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, VC, and 1,1-DCE. Since dry cleaners typically use PCE based solvents, PCE is considered a source contaminant. The remaining chlorinated organic compounds are likely to have been an impurity in the dry cleaning solvent or other chemicals used in operations or result from the degradation or dechlorination of PCE.

Additionally, chloroform was detected in 16 wells with exceedances of the NYSDEC Class GA criterion in wells on or in the vicinity of the site. Detections of chloroform may further indicate areas impacted from laundry wastes from the site.

Benzene was detected above the NYSDEC Class GA criterion in well MW-1. This parameter is likely to originate from another source since there are no detections of benzene in groundwater on the site wells. Benzene is not identified as a chemical of concern for this site.

The chemicals of concern in groundwater are: PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, VC, 1,1-DCE, and chloroform.

6.1.2.2 Soil

Only PCE was detected above the NYSDEC unrestricted use SCOs in three of the nine samples collected from the Jung Sun property. TCE and cis-1,2-DCE were also detected on-site, but at levels below criteria.

PCE, TCE, and cis-1,2-DCE were detected below criteria in two samples from SB-14 on the 37-24 24th Street Equities property. These samples were collected from 19-19.5 ft bgs and 24-24.5 ft bgs. These levels were lower than anticipated since this depth corresponded to elevated MIP readings and temporary groundwater sample (50,000 μg/L PCE). Potentially, the purging for MW-14 development removed the highly concentrated solvents trapped between clay and silt layers in this area.

No VOCs were detected at the upgradient location (SB-9). Acetone was detected above the NYSDEC unrestricted use SCOs at the downgradient location SB-15. Although acetone is used by some dry cleaners for spot removal, this exceedance is likely to be from another source given the distance from the site and the lack of any detections of acetone on-site. PCE was detected below the NYSDEC unrestricted use SCO at SB-15.

SVOCs were detected in the three on-site samples at levels below the NYSDEC unrestricted use SCOs. Chromium, copper, lead, mercury, and zinc were detected above the NYSDEC unrestricted use SCOs in one or more of the three samples. Total PCBs (Aroclor 1260) was detected above the NYSDEC unrestricted use SCOs. The presence of SVOCs, metals, and PCBs may be present in fill identified in the borings under the site.

The chemical of concern in the soil is PCE.

6.1.2.3 Soil Gas

Soil gas samples were collected in the site area. PCE and TCE were detected above the USEPA generic screening levels. PCE, TCE, and cis-1,2-DCE were detected at concentrations of 2,800,000 µg/m3, 13,000 µg/m3, and 82,000 µg/m3, respectively, from SG-20, indicating the site is the source area. PCE was detected above the USEPA generic screening level of 8.1 µg/m3 at all sample locations. TCE was detected above the USEPA generic screening level of 0.22 µg/m3 at nine off-site locations. cis-1,2-DCE was detected at one downgradient location below the USEPA generic screening level of 0.22 µg/m3. Chloroform was detected above the USEPA generic screening level of 1.1 µg/m3 at eight locations. Chloroform was not detected on-site, possibly because the sample was diluted due to the high levels of PCE, TCE, and cis-1,2-DCE. Carbon tetrachloride was detected at six sample locations. The highest detections are found in sample locations below 38th Avenue, indicating carbon tetrachloride may originate from a source other than the site.

The chemicals of concern in soil gas are: PCE, TCE, cis-1,2-DCE, and chloroform.

6.2 Extent of Contamination (Contaminant Distribution)

This section discusses the distribution of contamination on all properties from which samples were collected and data are available. While the major discussion of contaminant migration (transport) is in the following sections of this report, the discussion of contaminant distribution in this chapter does assume that groundwater flow is generally to the south-southeast.

6.2.1.1 Groundwater

Contaminant distribution maps were developed for PCE in the overburden wells (Figure 25 for April 2012 and Figure 26 for June 2012). Other VOC chemicals of concern are coincident with PCE in groundwater. Therefore, these figures represent the extent of site-related VOC contamination. The areas with concentrations greater than 5 µg/L approximates the horizontal extent of the groundwater plume exceeding the NYS Class GA groundwater criterion for PCE. The highest concentrations of PCE are centered on the site and adjacent 37-24 24th Street Equities property. The 5 µg/L level is extrapolated in most directions, since only wells MW-3 and MW-17 have levels consistently below this criterion.

The extent of the chlorinated solvent groundwater contamination is shown in cross-sections presented in Figure 27 based on the MIP results. This figure also shows the location of soil PCE concentrations. Concentrations approaching the PCE 5 µg/L criterion coincide with the 50,000 to 150,000 µV ECD readings. A direct relationship between ECD readings and PCE concentrations is not possible since the ECD levels are indicators of total chlorinated solvent concentrations and the fraction of PCE is not constant throughout the site. However, PCE was present in all wells with detections of chlorinated solvents and for this analysis, the ECD readings are assumed to represent PCE. Although some co-located samples were collected, the PCE concentrations in these samples were too high to provide a correlation at the lower end of the spectrum (PCE of 5 µg/L). Therefore, the ECD range used for the PCE 5 µg/L criterion was developed using the MIP readings in areas with low levels of PCE based on monitoring well data. Depths with ECD values between 50,000 and 100,000 µV are shown in Figure 27 as the lower ECD range representing the GA groundwater criterion and those with ECD values between 100,000 and 150,000 µV are shown as the upper ECD range for the criterion. Depths with ECD values below 50,000 µV and MIPs outside the plume were assigned PCE concentrations below 5 µg/L. In some cases, these locations had ECD values that were above the threshold, but these ECD values are associated with low level PCE concentrations and other chlorinated solvents as seen in the well data.

The vertical extent of the groundwater contamination was limited by the bottom of the MIP samples. During the MIP sampling the majority of the locations were sampled until the probe hit refusal. If there was no refusal and no significant ECD, flame ionization detector (FID), or PID peaks the sampling ended at 50 ft, otherwise the sampling continued until the levels declined to background or until the probe hit refusal. PCE is heavier than water; therefore, a spill of sufficient magnitude is likely to move downward through the subsurface until lower permeability features impede its progress. This often results in formation of a plume or pool(s) of dense nonaqueous phase liquid in the aquifer plus a trail of residual saturation within the downward path. The lower permeablilty features are likely to be the cause of refusal and would signify the extent of the plume. This assumption is also supported by the ECD profiles which generally declined near refusal as the probes penetrated slightly into denser soils. In many cases the ECD declined markedly near refusal indicating a steep decrease in the chlorinated solvent concentrations. The ECD profiles exhibited in Appendix C show that 14 of the 20 MIP locations had significant decreases in ECD levels near refusal. The remaining six locations either had peaks in the middle of the ECD profiles with low levels near refusal or low ECD levels throughout the profiles. The only location that did not have bottom ECD levels in the range of 150,000 µV or lower was MIP-33. At MIP-33 the probe detected the ECD levels greater than 15,000,000 µV (the maximum level the MIP can quantify) while the bottom was only at 500,000 µV. When sampling through such highly concentrated zones a portion of the diffusing contaminants will adsorb onto the membrane material and take a longer time to clear off the membrane. Contaminants may also load up in the trunk line and take time to flush out. This could account for the elevated ECD levels near refusal at MIP-33.

Based on the MIP results and supported by groundwater measurements, the highest PCE concentrations are located within 20 ft bgs under the Jung Sun property, from approximately 20-40 ft bgs on the 37-24 24th Street Equities property by MW-14, and at the corner of 24th Street and 38th Avenue by MW-1. It is possible that the chemicals of concern are held within soils with either higher organic content or fines content.

6.2.1.2 Soil

The soil underneath the Jung Sun property was identified as fill. The depth of fill corresponds to the depth of the highest MIP ECD readings. TOC and grain size were measured in three samples from the Jung Sun site (Table 8). If a normal range of TOC is 0.5 percent to 5 percent, the soils under the Jung Sun facility have relatively low organic content ranging from 0.1 percent to 0.6 percent. The amount of fines is 46.8 percent in the soil sample from SB-10 at 7-7.5 ft bgs, identified by the laboratory as a brown, silty sand. The concentration of PCE in this sample was elevated at 11,000J µg/Kg. For the soil sample from SB-12 at 14-14.5 ft, the amount of fines is 11.6 percent. The soil is identified as gray, well-graded sand with silt and gravel mica. The PCE concentration is elevated at 3,900J µg/L. Both samples have elevated PCE concentrations, but only one has high fines content. It is not clear from the available data why the solvents remain in this soil matrix. The higher MIP readings near MW-14 are coincident with soil identified by layers of coarser soil with layers of clay and silt which may slow the movement of the solvents in this area.

A contour map was prepared for the PCE soil sample results incorporating the soil data and PID readings collected during the NYSDEC site investigations and the RI. Other VOC chemicals of concern are coincident with PCE in soil. The MIP PID readings from the site investigation and RI were also considered. Only measurements taken from soil above the groundwater were considered. The contour map is shown in Figure 28. The area exceeding the PCE NYSDEC unrestricted use SCO is limited to the Jung Sun property and adjacent 37-24 24th Street Equities property. The area is approximately 12,600 SF. The volume of soil within this area is approximately 7,000 CF. Cross-sections showing the vertical extent of the impacted soil are shown in Figure 29.

6.2.1.3 Soil Gas

PCE soil gas isopleths are shown in Figure 30. The figure does not include the results of the soil vapor intrusion samples to protect the confidentiality of the property owners. The PCE levels exceed the USEPA generic screening level of 8.1 µg/m3 in all areas of the study area. The highest levels are found on-site. NYSDEC and NYSDOH will identify any remaining structures that require soil vapor intrusion sampling or remedial actions.

6.3 Volume of PCE Contaminated Groundwater

The volume between the groundwater surface and the depth of PCE contamination was estimated. The horizontal extent is limited to the area exceeding 5 µg/L shown on Figure 25 and Figure 26 for the overburden wells. The impacted area is approximately 270,000 ft^2. The vertical extent was estimated using the MIP results. Concentrations approaching the 5 µg/L criterion coincide with the 50,000-150,000 µV ECD readings. The volume of soil and groundwater is estimated at 8.5E6 ft^3. This volume was multiplied by the effective porosity to estimate the volume of impacted groundwater. A default effective porosity value of 0.4 was selected from USGS (1971) for the UGA. The estimated volume of contaminated groundwater is 25 million gallons (MG).

6.4 Uncertainties in Nature and Extent of Contaminant Distribution

The identity of the contaminants is well-established, with data collected from the RI wells generally confirming findings from the site investigation in terms of compounds detected (PCE, TCE, DCE, and VC), and the spatial distribution of the contamination.

The vertical extent of contamination is estimated based on the MIP readings. These reading provide a reasonable approximation of the vertical extent of contamination. A cross-section showing the MIP results is provided in Figure 8. The depth of the VOC contamination varies across the study area. On the Jung Sun property, the highest concentrations are found within 20 ft of the surface (MIP-33); VOC concentrations are elevated down to 44 ft bgs. Downgradient at the 37-24 24th Street Equities property, the elevated concentrations are found between 16 ft and 44 ft bgs (MIP-23).

The horizontal (areal) extent of contamination is fully defined to the southwest. Groundwater PCE contours are shown in Figures 25 and 26 for the April 2012 and June 2012 sampling events, respectively. The PCE concentrations approach the 5 µg/L criterion in wells located to the south, east and north east of the site. The extrapolation to the northwest and west is less certain.

The estimated volume of PCE contaminated groundwater is based on the approximate extents of the plume and effective porosity assigned by a literature value for the UGA.

7.0 CONTAMINANT FATE AND TRANSPORT

Fate and transport properties are important for understanding the behavior of the chemicals of concern at the site. As discussed in Chapter 6, the chemicals of concern are PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, VC, 1,1-DCE, and chloroform. This section focuses on the subsurface fate and the mobility of the chemicals of concern in groundwater. An understanding of the fate and transport of the chemicals of concern is necessary to evaluate future potential exposure risks and to evaluate remedial technologies at the feasibility study stage. Physical properties of the solvents are summarized on Table 15.

7.1 Potential Routes of Contaminant Transport

Contaminant transport pathways provide the mechanisms for chemicals of concern to travel from the area of deposition and to potentially leave the site. Potential contaminant transport pathways include:

- Groundwater flow off site
- Vertical infiltration of free phase chemicals into the unconfined and/or semi-confined aquifer(s)
- Discharge of contaminated groundwater to downgradient surface water bodies
- Rainwater flow through contaminated soils with subsequent flushing and dissolution into the deeper vadose zone and aquifer matrix

Of these potential mechanisms, groundwater flow, and movement of contaminants with groundwater, is the most significant route of migration for chlorinated contaminants. Vertical infiltration of free-phase chemicals (non-aqueous phase) is not relevant as no non-aqueous phase liquid (NAPL) has been observed at the site, and observed contaminant concentrations do not suggest the potential presence of NAPL. The groundwater plume is expected to terminate toward the west prior to entering the East River. Rainwater flow through contaminated soils (contaminant leaching) is not a probable transport mechanism because the site and surrounding area is paved.

7.2 Groundwater Flow

Groundwater surface elevation data was collected during each sampling round. Groundwater contours are presented in Figure 23 for the April 2012 sampling event and Figure 24 for the June 2012 sampling event. The groundwater elevation data are summarized in Table 2. As illustrated in these figures, the groundwater elevations are relatively flat across the study area. Groundwater flow may be influenced by subsurface features. Considering the contaminant distribution (Figure 25 and Figure 26 for PCE contours), groundwater appears to be toward the southeast.

The following modified Darcy equation provides an estimate of the local groundwater seepage velocity, using the hydraulic gradient information with an average hydraulic conductivity:

$$V_s = KI/n_e$$

Where:

Vs -- groundwater seepage velocity (ft/day),

K-- hydraulic conductivity (ft/day),

i -- hydraulic gradient (ft/ft), and

n_e -- effective porosity.

Groundwater flow is estimated at 11.2 ft/day for outwash deposits, assuming a hydraulic conductivity of 270 ft/day (USGS, 1971), hydraulic gradient of 0.02 ft/ft, and effective porosity of 0.4 (USGS, 1971). This groundwater flow estimate is representative of average conditions in the UGA. Since the solvent concentrations have persisted in the study area for more than a decade, the soil type in this area is likely to differ from the norm in the UGA. For areas higher in clay and silt content, the groundwater flow is estimated at 0.06 ft/day assuming a hydraulic conductivity of 1.5 ft/day.

7.3 Contaminant Transport

The process by which a solute (dissolved phase contaminant) is transported by the bulk movement of groundwater flow is referred to as advection (Driscoll, 1986). The average linear velocity of groundwater through a porous aquifer is determined by the hydraulic conductivity, effective porosity of the aquifer formation, and hydraulic gradient (Freeze and Cherry, 1979). The velocity of a contaminant in the groundwater can be decreased if there is precipitation/dissolution or partitioning of the contaminant into other media (e.g., adsorption). These physiochemical processes are discussed below.

7.3.1 Adsorption

One of the most important geochemical processes affecting the rate of migration of chemicals dissolved in groundwater is adsorption to and desorption from the soil matrix. If the organic chemical is strongly adsorbed to the solid matrix (i.e., the aquifer material), the chemical is relatively immobile and will not be leached or transported from the source. If the organic chemical is weakly adsorbed, the chemical can be transported large distances from the source, contaminating large quantities of groundwater. The degree of adsorption also affects other transformation reactions such as volatilization, hydrolysis, and biodegradation since these reactions require the chemical to be in the dissolved phase.

The distribution of chemicals between water and the adjoining solid matrix is often described by the soil/water distribution coefficient, K_d. For dissolved chemicals at environmental concentrations, the distribution coefficient is usually defined as the ratio of concentrations in the solid and water phase (Freeze and Cherry, 1979). K_d has been shown to be proportional to the fraction of natural organic carbon (f_{oc}) in the solid matrix, the solubility of the chemical in the aqueous phase and the n-octanol/water or octanol/carbon partition coefficient (K_{ow} or K_{oc}, respectively). Retardation factors, described below, and K_d values are site specific.

A convenient way to express chemical mobility is by use of the retardation factor (R_d), which is a function of the average velocity of the retarded constituent, velocity of the groundwater, soil bulk density, and total porosity. If K_d = 0, the chemical species of concern is not affected by physiochemical reactions and migrates at the same velocity as the water based on convective-dispersive mechanisms. If K_d is greater than zero, the chemical species will be retarded. More accurately, the retardation factor is the average linear velocity of the groundwater divided by the velocity of the contaminant chemical at the point when the chemical concentration is one-half the concentration of the chemical at its source. When K_d equals zero (no adsorption), R equals one (i.e., the chemical and water move at the same velocity). If R equals 10, the contaminant chemicals move at 1/10 the velocity of the groundwater.

Adsorption of chlorinated aliphatics at the site may be an important process influencing the transport of contaminants in groundwater. The importance of adsorption depends significantly upon the characteristics of the aquifer matrix material, which acts as the adsorbing medium. In particular, adsorption of hydrophobic organic compounds has been shown to be a function of the amount of natural organic carbon in the aquifer matrix. PCE has a K_d greater than 0 and will be adsorbed/retarded to a degree. The calculated retardation factors are based on literature default values for some aquifer characteristics for which site-specific data are not available.

7.3.2 Dispersion

The study of dispersion at a site is important to determine the concentration of a contaminant and the time it will take to reach a specific location (e.g., a drinking water well). In other words, dispersion of a contaminant affects the velocity and spatial distribution of a contaminant. Although the above discussion implies one-dimensional dispersion, in actuality, dispersion is three dimensional (i.e., longitudinal, transverse, and vertical).

7.3.3 Dilution

Dilution is an effect of dispersion. When contaminants come in contact with uncontaminated groundwater, mixing occurs, resulting in a decrease in contaminant concentration. Rainwater precipitation can also cause dilution of contaminant concentrations. The majority of the study area is paved.

7.4 Contaminant-Specific Transport Velocity

As noted above, contaminant-specific migration in the groundwater is affected (reduced) by adsorption, expressed as the retardation factor. The retardation factor, R_d, is calculated as:

$$\mathbf{R_d = 1 + \mathit{K_{oc}} * \mathit{f_{oc}}\, p_b / n_e}$$

where:

R_d = retardation factor

K_{oc} = organic carbon partition coefficient

f_{oc} = fraction of organic carbon

p_b = dry bulk density of aquifer matrix

n_e -- effective porosity

The fraction of organic carbon is estimated at 0.49 percent based on the average TOC measurement in the three soil samples collected from the Jung Sun site (Table 9). The K_{oc} values for the solvents were obtained from www.state.nj.us/dep/srp/vaporintrusion.htm. Bulk density is estimated at 1.5 g/cc for sand (Natural Resources Conservation Service, 2010).

The contaminant transport rate V_{pt} is determined by dividing the groundwater seepage velocity V_s by the retardation factor R_d:

$$\mathbf{V_{pt} = \mathit{V_s} / R_d}$$

The distance (D) that a contaminant travels in a given time (t) is calculated using the following equation:

$$\mathbf{D = V_{pt} * t}$$

Using the equations above, the transport rate and distance for the principle contaminants were calculated for two soil types and are shown on Table 16. For outwash deposits, the estimated seepage rates range from 1.5 ft/yr to 8 ft/yr. For soils with higher amounts of clay and silt, the estimated seepage rates are lower ranging from 0.01 ft/yr to 0.05 ft/yr. Depending on the type of soil, it would take from less than a two years to more than 300 years for the solvents to move a distance of 1,000 ft. Given the persistence of the solvents at the site, movement of the solvents is likely to be relatively slow.

7.5 Contaminant Fate

The fate of organic chemicals in the subsurface environment is affected by a variety of physiochemical and biological processes. Abiotic transformations are not significant factors in contaminant fate. Biodegradation is the one process which may have reduced PCE concentrations because breakdown products were detected in groundwater samples near the site.

The process of natural attenuation includes a range of physical, chemical and biological processes, which, under favorable conditions, act with no human intervention to decrease the mass, toxicity, mobility, volume, and concentration of pollutants in soil or groundwater. Such processes include biodegradation, dispersion, dilution, sorption, volatilization, chemical and biological stabilization, transformation and destruction of pollutants (USEPA, 1999).

The primary site contaminants are chlorinated ethenes (PCE and degradation products). Several degradation processes occur for these VOCs naturally or can be enhanced with in-situ remediation. MNA parameters were analyzed for groundwater samples from five selected site monitoring wells, and the results are presented on Table 11. This section evaluates site data to determine which degradation processes may be occurring and reducing concentrations in groundwater.

Biologically-mediated reductive dechlorination of chlorinated VOCs occurs through a series of progressive biochemical reactions where chloride atoms are replaced by hydrogen atoms (PCE → TCE → DCE → VC → ethene). Naturally occurring bacteria create hydrogen under reducing conditions that replaces chlorine to sequentially dechlorinate the solvents. These biologically-mediated reactions occur favorably in anaerobic (negligible DO), reducing (oxidation reduction potential or ORP is less than -75 mV), and circum-neutral (pH between 6.0 and 8.5) groundwater. For microbial mediated reactions, aerobic reactions are the most energetically favorable. As DO is consumed, microbes use electron acceptors in the order of reducing energy efficiencies (denitrification of nitrate, manganese reduction, ferric iron reduction, sulfate reduction, and carbon dioxide in methanogenesis). Biotic reductive dechlorination typically occurs most favorably in the ORP range needed for sulfate reduction or methanogenesis (i.e., -100 to -200 mV). MNA parameters and field water quality parameters from site groundwater are evaluated below with respect to biodegradation of chlorinated VOCs.

- pH: Site groundwater pH has been measured to be circumneutral ranging between 6.0 and 8.0 (average 7.3). This range is favorable to support biological natural attenuation processes.

- ORP and DO: Water quality measurements indicate that the groundwater is generally aerobic, with most wells having ORP values of 50-150 mV and DO greater than 2 mg/L in nearly all wells. Biotic reductive dechlorination does not occur favorably under these observed aerobic conditions. Additionally, the wells where negative ORP or low DO (<1 mg/L) have been recorded are down- and/or cross-gradient and have low or no VOC impacts.

- Nitrate was detected in four of five wells sampled for MNA parameters (3.7-10.6 µg/L). Under anaerobic conditions required for reductive dechlorination, nitrate would not be expected to be detected due to conversion to ammonia through denitrification.

- Sulfate was detected in all five wells sampled for MNA parameters (11.8-117 mg/L). Under anaerobic conditions required for reductive dechlorination, sulfate reducing bacteria would be convert sulfate to sulfide, and sulfate would be low to non-detect in groundwater.

- Methane is a byproduct microbial degradation using carbon dioxide as an electron acceptor, and the presence of methane is an indicator of reducing conditions in groundwater. Methane was below detection limits in three wells and detected at low concentrations (7-11 µg/L) in two wells sampled for MNA parameters.

- Daughter products are another indicator of biotic reductive dechlorination processes, and increases in daughter products accompany decreases in parent VOCs as shown in the reactions above (i.e., increase in cis-1,2-DCE as PCE and/or TCE decrease). TCE and cis-1,2-DCE were detected less frequently, but are detected in nearly all site monitoring wells. These detections indicate that biotic reductive dechlorination is or has occurred to some degree.

- Ethene is the product of complete dechlorination of chlorinated ethenes. Ethene was measured at very low concentrations or below detection limits (<1-4.8 µg/L) suggesting that complete reductive dechlorination is not occurring at the site.

MNA parameters and field water quality parameters suggest the site groundwater conditions are favorable for biotic reductive dechlorination. Despite these parameters, cis-1,2-DCE is the VOC measured in the highest concentrations in many of the wells located on or near the site with the highest reported VOC concentrations (MW-4, MW-5, MW-8, MW-20). Microorganisms capable of degrading PCE and TCE to cis-1,2-DCE are omnipresent in most subsurface environments. However, dehalococcoides (DHC) are the only know bacteria capable of fully dechlorinating PCE to ethene, and DHC is not present in the subsurface at all sites or uniformly at a given site. VC concentrations in groundwater consist of only a small fraction of the total chlorinated ethenes (<1-7 percent) and the low to non-detect ethene concentrations suggest that dechlorination reactions have stalled at cis-1,2-DCE. DHC and complete dechlorination are likely inhibited as the site groundwater is not sufficiently reducing to support these bacteria (see ORP, nitrate, sulfate, and methane above).

VOC analysis from Phase 1 and Phase 2 investigations allow evaluation of temporal concentrations trends in select wells: MW-1 through MW-8 [AECOM, 2008; AECOM, 2010]. Four of these wells are located upgradient, crossgradient, and/or downgradient, and little change in VOC concentrations was noted or measurable VOCs were not reported. In wells MW-4 and MW-5 significant reductions in PCE and chlorinated ethenes have been observed since 2008 and 2009 compared to 2012. In well MW-8 PCE has been observed to decrease since 2008 and 2009, while cis-1,2-DCE and VC increased in concentration. However, in the downgradient well MW-1, PCE concentration has increased from 2008 to 2012, and this is the monitoring well with the highest observed PCE concentration in 2012. The decreases in chlorinated VOCs in these wells closer to the source in relatively aerobic groundwater and the increase in concentrations in the downgradient well MW-1 suggest that dilution and advection are the primary processes responsible for much of these concentration reductions.

Overall, groundwater monitoring indicates some degree of that anaerobic reductive dechlorination from the occurrence of lesser chlorinated daughter products. However, as groundwater conditions are slightly anaerobic to aerobic, reductive dechlorination is limited in extent and rates without further enhancement.

8.0 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

A qualitative human health exposure assessment was completed based on the information presented in the preceding sections of this RI report. This exposure assessment discusses potential migration routes by which chemicals in the environment may be able to reach human receptors. This discussion is based on current and hypothetical future site conditions. The assessment is based on the requirements in DER-10 Appendix 3B. A summary of the assessment is provided in Table 17. The five elements associated with exposure pathways are described below for the study area.

8.1 Contaminant Source Description

Based on the RI findings, the source of contamination is soil and groundwater contamination beneath the site and adjacent areas. The chemicals of concern are PCE, TCE, cis-1,2-DCE, t-1,2-DCE, VC, 1,1-DCE, and chloroform. Additionally, metals and PCB were detected in the site soil samples. Chromium contamination may be site-related. The remaining metals and PCB may result from presence of fill and are not related to known site operations. The extent of contamination was discussed in Sections 6 of this RI. The extent of contamination is represented by PCE isopleths shown in Figure 25 and Figure 26 for groundwater and Figure 30 for soil gas.

8.2 Contaminant Release and Transport Mechanisms

The regional groundwater flow direction is towards the East River in this area. Across the site, the groundwater elevations are relatively flat. Considering the PCE contaminant distribution, it appears that groundwater flow is towards the southeast. Soil gas is transported through pores in the soil and cracks in building slabs and basement floors and walls.

8.3 Potential Exposure Points

Workers at the facility could be exposed to wastewater in trenches through direct contact. There is no exposure to groundwater from wells because the UGA is not used for water supply in this section of Queens County. There are no known public wells in the vicinity of the site. There is currently no exposure to soils beneath the site, because the property is paved and covered by the Jung Sun facility. Downgradient, there is currently no exposure to soils beneath the 37-24 24th Street Equities property, because this property is also paved or covered by buildings. Soil gas may enter the on-site and off-site buildings through soil vapor intrusion currently and in the future. Future exposure to groundwater, soil, and soil gas due to construction activities, utility work, and other similar ground intrusive activities may occur since the groundwater varies from 6-16 ft bgs in the study area.

8.4 Routes of Exposure

The future route of exposure for wastewater is dermal contact by workers on-site if the trenches on-site are not cleaned. The future route of exposure for groundwater and soil is dermal contact during construction, utility work or other ground intrusion activities on-site. There are no current routes of exposure for groundwater and soil because the area is paved. The current and future route of exposure for soil gas is inhalation on-site and off-site.

8.5 Receptor Populations

Currently, the site is empty and is being offered as rental warehouse space. Construction, utility work or other ground intrusive activities may be completed on-site in the future. Probable future receptor populations on-site are industrial workers, construction workers, utility workers, and other workers engaged in ground intrusive activities. Off-site, current and future receptors are workers and residents in the adjacent areas as well as construction workers, utility workers, and other workers engaged in ground intrusive activities on the 37-24 24th Street Equities property. Occupants of buildings where soil vapor intrusion is, or may be occurring, are also potential current receptors.

8.6 Exposure Pathways

There are currently no complete exposure pathways for groundwater because the aquifer is not used for water supply in this area of Queens County. There are currently no complete exposure pathways for soil because the facility and downgradient property (37-24 24th Street Equities property) are paved. There are currently no complete exposure pathways for wastewater because there are no workers at the facility. In the future, workers could come into contact with wastewater; and construction activities may result in complete exposure pathways for construction workers to contaminated groundwater and water.

There is currently a complete exposure pathway for inhalation of soil gas to some off-site receptors. This pathway is being investigated by soil vapor intrusion sampling as documented in Section 3. This pathway is expected to be complete in the future unless steps are taken to mitigate exposure or remediate the contaminated material. Currently the soil gas exposure pathway is incomplete on-site because there are no receptors. This pathway will be complete in the future when workers are on-site.

9.0 FISH & WILDLIFE IMPACT ANALYSIS

The Jung Sun Laundry Plume site is located in an urban residential/commercial area. There are no natural resources at or in the vicinity of the site. Therefore, per Appendix 3C of DER-10, no fish and wildlife resources impact analysis is needed.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 Extent of the Areas of Concern

The chemicals of concern found in groundwater are PCE, TCE, cis-1,2-DCE, t-1,2-DCE, VC, 1,1-DCE, and chloroform.

PCE was detected in all wells except MW-3 and MW-17 at a concentration above the NYSDEC Class GA groundwater criteria in at least one of the two sampling events in 2012. PCE concentrations were used to represent the outer extent of site-related contamination. PCE groundwater isopleths are shown on Figure 25 and Figure 26 for the two rounds of groundwater contamination. PCE concentrations were detected below the GA groundwater criterion of 5 µg/L near the corner of 23rd Street and 38th Avenue (monitoring wells (MW-3 and MW-17). At the corner of 24th Street and 38th Avenue, PCE was at 5 µg/L or was approaching the GA groundwater criterion (monitoring wells MW-13, MW-15, and MW-16). The MIP results in this area are low throughout the soil column. Along 24th Street, the highest PCE concentrations within the study area were detected at MW-1 (16,000 µg/L and 20,000 µg/L). The PCE concentrations in wells along 24th Street east of MW-1 ranged from 6 µg/L (MW-2) to 72 µg/L (MW-10). PCE concentrations in this area are lower than the elevated concentrations on the Jung Sun facility and downgradient 37-24 24th Street Equities property, but still over the PCE GA groundwater criterion in this area. Similarly, along 23rd Street, the PCE concentrations in MW-9 (400 µg/L and 830 µg/L) and MW-21r (400 µg/L and 350 µg/L) are elevated compared to the GA groundwater criterion. Upgradient wells MW-6 (130 µg/L and 110 µg/L) and MW-7 (29 µg/L and 33 µg/L) exceed the GA groundwater PCE criterion. In summary, the PCE delineation is only complete or nearing completion downgradient from the site to the south and southwest.

The MIP results were used to determine the vertical extent of contamination and verified by groundwater samples from permanent wells. As shown in Figure 8 and Figure 27, VOC levels are bounded in this cross-section that covers the areas of elevated contamination. Vertical delineation of VOC groundwater contamination is complete within the study area with the exception of MIP-33, however, the levels at the lower end of MIP-33 are declining with depth and may result from residual contamination within the MIP equipment due to the peak levels within the profile.

Despite the lack of a complete horizontal delineation, the available data shows PCE concentrations in all directions from the Jung Sun facility and 37-24 24th Street Equities property. The general extent of contamination is characterized and is sufficient to proceed with alternatives evaluation. Additional delineation could be required as part of design or implementation of the selected remedy, if necessary.

Wastewater sampled in a trench within the Jung Sun facility had an elevated level of PCE. The extent of contamination for wastewater is limited to the facility.

Soil samples were collected upgradient, on-site, at the 37-24 24th Street Equities property, and downgradient. PCE was the only chemical of concern with detections over the NYSDEC unrestricted use SCOs. Metals and PCB were detected in the on-site borings. The metals and PCB contamination in soil may result from the fill identified in the borings. These detections are in borings located on the site. Based on these findings, site-related soil contamination is limited to the site.

A contour map was prepared for the PCE soil sample results incorporating the soil data and PID readings collected during the NYSDEC site investigations and the RI. Other VOC chemicals of concern are coincident with PCE in soil. The MIP PID readings from the site investigation and RI were also considered. Only measurements taken from soil above the groundwater were considered. The contour map is shown in Figure 28. The area exceeding the PCE NYSDEC unrestricted use SCO is limited to the Jung Sun property and adjacent 37-24 24th Street Equities property. The area of approximately 12,600 SF. The volume of soil within this area is approximately 7,000 CF. Cross-sections showing the vertical extent of the impacted soil are shown in Figure 29.

Soil gas samples were collected on-site and off-site throughout the study area. PCE was detected in all samples above the USEPA generic screening level of 8.1 µg/m3. Other chemicals of concern detected in the soil gas samples included TCE, cis-1,2-DCE, and chloroform. PCE isopleths are shown in Figure 30 to identify the extent of site-related contamination. Based on this information, NYSDEC and NYSDOH will evaluate whether soil vapor intrusion sampling is required at additional structures.

10.2 Conceptual Site Model

The original sources of the primary contamination were PCE wastes (likely as liquid) from dry cleaning and laundry operations that were disposed on-site. This waste flowed downward through the soil and entered the ground water. Some of the PCE remains in the on-site soils, while much of it has dissolved into the groundwater. The groundwater flowing to the south-southeast carried the dissolved phase PCE, contaminating ground water for at least 200 to 300 feet. In a secondary transport mechanism, PCE dissolved in the groundwater has volatilized into the soil vapor of the vadose zone, allowing for potential soil vapor intrusion into buildings. There is evidence that bacteria in the groundwater have degraded some of the PCE. However, the degradation has stalled at cis-1,2-DCE. Sampling over the course of five years suggests that the plume of contaminated ground water is moving, with dilution and advection causing a possible declining trend of on-site PCE concentrations. Minor contaminants include lower concentrations of PCBs and metals. Fill was identified in borings and may be the source of metals and PCB contamination in soil.

PCE was detected above the NYSDEC Class GA groundwater criterion in wastewater collected from a trench in the Jung Sun facility. PCE, TCE, cis-1,2-DCE, t-1,2-DCE, VC, 1,1-DCE, and chloroform were detected in groundwater samples collected within the study area above the NYSDEC Class GA groundwater criteria. PCE, metals, and PCBs were detected in soil samples from the site property at levels above the NYSDEC unrestricted use SCOs. Metals and PCBs contaminants are assumed by be associated with fill beneath the site. PCE, TCE, cis-1,2-DCE, and chloroform are site-related compounds detected in the soil gas above the USEPA generic screening levels for shallow soil gas (risk of 1E6).

VOCs may volatilize from the soil and groundwater matrix. The contaminants may then enter structures through soil vapor intrusion. VOCs contamination in the groundwater may be transported and diluted by groundwater flow. The contamination appears to be transported to the southeast of the site. Contaminant movement may be slowed by sorption to the soil matrix. Biodegradation has occurred, but appears to have stalled at cis-1,2-DCE. The primary processes responsible for concentration reductions over time are dilution and advection.

There are currently no workers at the Jung Sun facility that could come into contact with wastewater or soil vapor. The aquifer in this section of Queens County is not used for water supply. Future construction could potentially contact contaminated soil or groundwater. There is the potential for exposure through soil vapor intrusion in off-site structures. No environmental receptors were identified in this urban setting.

10.3 Complete Exposure Pathways

The exposure pathway is complete for off-site soil gas inhalation. NYSDEC and NYSDOH will determine if sampling at additional structures or mitigation actions are required.

10.4 Future Work Recommendations

AECOM recommends an evaluation of remedial alternatives for contaminated soil and groundwater related to the past operations at the site.

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Table 1
Well Construction Data
Jung Sun Laundry Plume (241102)

Well Number	Installed	Northing	Easting	Ground Elevation (ft)	Top of Casing Elevation (ft)	Total Depth of Well (ft)	Well Material	Aquifer	Depth to Screen (ft)	Screen Length (ft)	Well Diameter (ft)
MW-1	12/2-3/03	214,861.16	1,001,839.28	20.46	19.938	19.8	PVC	Overburden	10.2	9.6	0.17
MW-2	12/2-3/03	215,077.87	1,001,996.25	21.07	20.9747	18.3	PVC	Overburden	9.6	8.7	0.17
MW-3	12/2-3/03	215,019.66	1,001,693.63	15.28	15.0229	23	PVC	Overburden	14.7	8.3	0.17
MW-4	12/2-3/03	215,148.43	1,001,903.57	19.70	19.4157	19.1	PVC	Overburden	13.2	5.9	0.17
MW-5	12/2-3/03	215,040.62	1,001,840.30	11.18	10.9202	14	PVC	Overburden	5.8	8.2	0.17
MW-6	1/24/08	215,343.47	1,002,000.00	17.91	17.6791	23.5	PVC	Overburden	13.5	10	0.17
MW-7	1/24/08	215,264.89	1,002,120.84	19.93	19.7567	23.5	PVC	Overburden	13.5	10	0.17
MW-8	1/24/08	215,186.59	1,001,938.37	19.87	19.5461	23.5	PVC	Overburden	13.5	10	0.17
MW-9	3/9/12	215,197.69	1,001,845.68	18.08	17.67	30	PVC	Overburden	15	15	0.17
MW-10	3/8/12	215,146.66	1,002,036.05	20.53	20.24	40	PVC	Overburden	30	10	0.17
MW-11	3/12/12	215,004.94	1,001,995.78	21.76	21.4	50	PVC	Overburden	40	10	0.17
MW-12	3/12/12	214,973.42	1,001,916.30	21.4	21.06	40	PVC	Overburden	30	10	0.17
MW-13	3/12/12	214,804.57	1,001,861.96	20.59	20.28	45	PVC	Overburden	35	10	0.17
MW-14	3/9/12	215,033.53	1,001,845.68	11.44	11.24	40	PVC	Overburden	30	10	0.17
MW-15	3/13/12	214,742.17	1,001,812.77	19.46	19.08	45	PVC	Overburden	35	10	0.17
MW-16	3/19/12	214,737.02	1,001,754.15	18.99	18.7	55	PVC	Overburden	45	10	0.085
MW-17	3/8/12	214,891.48	1,001,626.64	14.6	14.27	38	PVC	Overburden	23	15	0.17
MW-18	3/13/12	214,891.05	1,001,717.27	16.59	16.34	34	PVC	Overburden	24	10	0.17
MW-19	3/9/12	214,957.11	1,001,790.89	11.77	11.57	44.5	PVC	Overburden	29.5	15	0.17
MW-20	3/13/12	215,165.50	1,001,955.52	20.34	20.03	25	PVC	Overburden	15	10	0.17
MW-21	3/14/12	215,248.77	1,001,800.18	17.28	16.98	27	PVC	Overburden	17	10	0.17

Notes:
Vertical datum: NAVD88
Horizontal datum: NY State Plane NAD83

Table 2
Groundwater Elevation Data
Jung Sun Laundry Plume (241102)

Well	Top of Inner Casing Elevation (ft MSL)	Depth of Well (ft)	Screened Interval (ft bgs)	February 7, 2009		April 9, 2012		June 11, 2012	
				Depth to Water (ft bgs)	Groundwater Elevation (ft MSL)	Depth to Water (ft bgs)	Groundwater Elevation (ft MSL)	Depth to Water (ft bgs)	Groundwater Elevation (ft MSL)
MW-1	19.94	19.80	10.2-19.8	14.41	5.53	15.03	4.91	15.02	4.92
MW-2	20.97	18.30	9.6-18.3	15.23	5.74	15.96	5.01	15.95	5.02
MW-3	15.02	23.00	14.7-23	11.00	4.02	12.22	2.80	11.93	3.09
MW-4	19.42	19.10	13.2-19.1	13.68	5.74	14.48	4.94	14.47	4.95
MW-5	10.92	14.00	5.8-14	5.30	5.62	5.97	4.95	5.97	4.95
MW-6	17.68	23.50	13.5-23.5	11.92	5.76	12.54	5.14	12.50	5.18
MW-7	19.76	23.50	13.5-23.5	14.36	5.40	14.85	4.91	14.81	4.95
MW-8	19.55	23.50	13.5-23.5	14.62	5.25	14.53	5.02	14.52	5.03
MW-9	17.67	30.00	15-30	--	--	12.83	4.84	12.82	4.85
MW-10	20.24	40.00	30-40	--	--	15.39	4.85	15.37	4.87
MW-11	21.40	50.00	40-50	--	--	16.43	4.97	16.44	4.96
MW-12	21.06	40.00	30-40	--	--	16.21	4.85	16.21	4.85
MW-13	20.28	45.00	35-45	--	--	15.22	5.06	15.21	5.07
MW-14	11.24	40.00	30-40	--	--	6.35	4.89	6.35	4.89
MW-15	19.08	45.00	35-45	--	--	13.94	5.14	13.96	5.12
MW-16	18.70	55.00	45-55	--	--	13.59	5.11	13.60	5.10
MW-17	14.27	38.00	23-38	--	--	11.53	2.74	11.22	3.05
MW-18	16.34	34.00	24-34	--	--	11.50	4.84	11.37	4.97
MW-19	11.57	44.50	29.5-44.5	--	--	6.66	4.91	6.63	4.94
MW-20	20.03	25.00	15-25	--	--	15.09	4.94	15.01	5.02
MW-21	16.98	27.00	17-27	--	--	12.21	4.77	12.16	4.82

Notes:
ft. MSL: Elevation in feet with reference to Mean Sea Level

Table 3
VOCs in Water Sample Collected in the Jung Sun Facility
Jung Sun Laundry Plume Site

	Sample ID:	WET PIT
	Sample Date:	3/15/2012
Units: µg/L	Criteria	Env. Sample
1,1,1-Trichloroethane	5	10 U
1,1,2,2-Tetrachloroethane	5	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	10 UJ
1,1,2-Trichloroethane	1	10 U
1,1-Dichloroethane	5	10 U
1,1-Dichloroethene	5	**6** J
1,2,4-Trichlorobenzene	5	10 U
1,2-Dibromo-3-chloropropane	0.04	10 U
1,2-Dibromoethane	NA	10 U
1,2-Dichlorobenzene	3	10 U
1,2-Dichloroethane	0.6	10 U
1,2-Dichloropropane	1	10 U
1,3-Dichlorobenzene	3	10 U
1,4-Dichlorobenzene	3	10 U
2-Hexanone	50	10 U
Acetone	50	**2** J
Benzene	1	10 U
Bromodichloromethane	50	10 U
Bromoform	50	10 U
Bromomethane	5	10 U
Carbon disulfide	60	10 U
Carbon tetrachloride	5	10 U
Chlorobenzene	5	10 U
Chloroethane	5	10 U
Chloroform	7	10 U
Chloromethane	5	10 U
cis-1,2-Dichloroethene	5	**8300** J
cis-1,3-Dichloropropene	0.4	10 U
Cyclohexane	NA	10 U
Dibromochloromethane	50	10 U
Dichlorodifluoromethane	5	10 UJ
Ethylbenzene	5	10 U
Isopropylbenzene	5	10 U
Methyl acetate	NA	10 U
2-Butanone	50	10 U
4-Methyl-2-pentanone	NA	**7.1** J
Methylcyclohexane	NA	10 U
Methylene chloride	5	10 U
Styrene	5	**2** J
Methyl tert-butyl ether	10	10 U
Tetrachloroethene (PCE)	5	**150000**
Toluene	5	10 U

Table 3
VOCs in Water Sample Collected in the Jung Sun Facility
Jung Sun Laundry Plume Site

	Sample ID:	WET PIT	
	Sample Date:	3/15/2012	
Units: µg/L	Criteria	Env. Sample	
trans-1,2-Dichloroethene	5	**12**	
trans-1,3-Dichloropropene	0.4	10	U
Trichloroethene (TCE)	5	**2300**	J
Trichlorofluoromethane	5	10	UJ
Vinyl chloride	2	10	U
Xylene (Total)	5	10	U

Criteria: NYSDEC Class GA
U - Not detected.
J - Estimated concentration.
NA - Not available.
Detections are bolded.
Exceedances are highlighted

Table 4
VOCs in Soil Samples
Jung Sun Laundry Plume Site

	Station ID:	SB-9	SB-10	SB-10	SB-11	SB-11	SB-12	SB-12	SB-12	SB-13
	Depth:	6 - 6.5 ft	16.5 - 17 ft	7 - 7.5 ft	15.5 - 16 ft	8.5 - 9 ft	14 - 14.5 ft	5 - 5.5 ft	9.5 - 10 ft	12.5 - 13 ft
	Sample ID:	SB-9-6	SB-10-16.5	SB-10-7	SB-11-15.5	SB-11-8.5	SB-12-14	SB-12-5.0	SB-12-9.5	SB-13-12.5
	Sample Date:	3/20/2012	3/15/2012	3/15/2012	3/15/2012	3/15/2012	3/15/2012	3/15/2012	3/15/2012	3/15/2012
Units: µg/kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1-Trichloroethane	680	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,1,2,2-Tetrachloroethane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,1,2-Trichloroethane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,1-Dichloroethane	270	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,1-Dichloroethene	330	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,2,4-Trichlorobenzene	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,2-Dibromo-3-Chloropropane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,2-Dibromoethane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,2-Dichlorobenzene	1100	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,2-Dichloroethane	20	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,2-Dichloropropane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,3-Dichlorobenzene	2400	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
1,4-Dichlorobenzene	1800	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
2-Hexanone	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Acetone	50	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Benzene	60	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Bromodichloromethane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Bromoform	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Bromomethane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Carbon disulfide	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Carbon tetrachloride	760	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Chlorobenzene	1100	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Chloroethane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Chloroform	370	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Chloromethane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
cis-1,2-Dichloroethene	250	11 U	12 U	**170**	**7** J	**3** J	**7** J	**9** J	11 U	11 U
cis-1,3-Dichloropropene	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Cyclohexane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Dibromochloromethane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Dichlorodifluoromethane	NA	11 UJ	12 UJ	12 UJ	10 UJ	11 UJ	12 UJ	11 UJ	11 UJ	11 UJ
Ethylbenzene	1000	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Isopropylbenzene	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Methyl Acetate	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
2-Butanone	120	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
4-Methyl-2-pentanone	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Methylcyclohexane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Methylene chloride	50	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Styrene	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Methyl tert butyl ether	930	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U

Table 4
VOCs in Soil Samples
Jung Sun Laundry Plume Site

Station ID:		SB-9	SB-10	SB-10	SB-11	SB-11	SB-12	SB-12	SB-12	SB-13
Depth:		6 - 6.5 ft	16.5 - 17 ft	7 - 7.5 ft	15.5 - 16 ft	8.5 - 9 ft	14 - 14.5 ft	5 - 5.5 ft	9.5 - 10 ft	12.5 - 13 ft
Sample ID:		SB-9-6	SB-10-16.5	SB-10-7	SB-11-15.5	SB-11-8.5	SB-12-14	SB-12-5.0	SB-12-9.5	SB-13-12.5
Sample Date:		3/20/2012	3/15/2012	3/15/2012	3/15/2012	3/15/2012	3/15/2012	3/15/2012	3/15/2012	3/15/2012
Units: µg/kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
Tetrachloroethene (PCE)	1300	11 UJ	**3** J	**11000** J	**83000** J	**140** J	**3900** J	**79** J	**7** J	**6** J
Toluene	700	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
trans-1,2-Dichloroethene	190	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
trans-1,3-Dichloropropene	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Trichloroethene (TCE)	470	11 U	12 U	**220**	**76**	11 U	**2** J	**1** J	11 U	11 U
Trichlorofluoromethane	NA	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Vinyl chloride	20	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U
Xylene (Total)	260	11 U	12 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U

Table 4
VOCs in Soil Samples
Jung Sun Laundry Plume Site

	Station ID:	SB-63	SB-14	SB-14	SB-15	SB-15
	Depth:	12.5 - 13 ft	19 -20 ft	24 - 25 ft	52 -53 ft	9 - 10 ft
	Sample ID:	SB-63-12.5	SB-14-19-20	SB-14-24-25	SB-15-52-53	SB-15-9-10
	Sample Date:	3/16/2012	3/16/2012	3/16/2012	3/16/2012	3/16/2012
Units: µg/kg	Criteria	Dup. SB-13	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1-Trichloroethane	680	12 U	13 U	12 U	12 U	11 U
1,1,2,2-Tetrachloroethane	NA	12 U	13 U	12 U	12 U	11 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	12 U	13 U	12 U	12 U	11 U
1,1,2-Trichloroethane	NA	12 U	13 U	12 U	12 U	11 U
1,1-Dichloroethane	270	12 U	13 U	12 U	12 U	11 U
1,1-Dichloroethene	330	12 U	13 U	12 U	12 U	11 U
1,2,4-Trichlorobenzene	NA	12 U	13 U	12 U	12 U	11 U
1,2-Dibromo-3-Chloropropane	NA	12 U	13 U	12 U	12 U	11 U
1,2-Dibromoethane	NA	12 U	13 U	12 U	12 U	11 U
1,2-Dichlorobenzene	1100	12 U	13 U	12 U	12 U	11 U
1,2-Dichloroethane	20	12 U	13 U	12 U	12 U	11 U
1,2-Dichloropropane	NA	12 U	13 U	12 U	12 U	11 U
1,3-Dichlorobenzene	2400	12 U	13 U	12 U	12 U	11 U
1,4-Dichlorobenzene	1800	12 U	13 U	12 U	12 U	11 U
2-Hexanone	NA	12 U	13 U	12 U	12 U	11 U
Acetone	50	12 U	13 U	12 U	12 U	**70**
Benzene	60	12 U	13 U	12 U	12 U	11 U
Bromodichloromethane	NA	12 U	13 U	12 U	12 U	11 U
Bromoform	NA	12 U	13 U	12 U	12 U	11 U
Bromomethane	NA	12 U	13 U	12 U	12 U	11 U
Carbon disulfide	NA	12 U	13 U	12 U	12 U	11 U
Carbon tetrachloride	760	12 U	13 U	12 U	12 U	11 U
Chlorobenzene	1100	12 U	13 U	12 U	12 U	11 U
Chloroethane	NA	12 U	13 U	12 U	12 U	11 U
Chloroform	370	12 U	13 U	12 U	12 U	11 U
Chloromethane	NA	12 U	13 U	12 U	12 U	11 U
cis-1,2-Dichloroethene	250	**3** J	**10** J	**4** J	12 U	11 U
cis-1,3-Dichloropropene	NA	12 U	13 U	12 U	12 U	11 U
Cyclohexane	NA	12 U	13 U	12 U	12 U	11 U
Dibromochloromethane	NA	12 U	13 U	12 U	12 U	11 U
Dichlorodifluoromethane	NA	12 UJ	13 UJ	12 UJ	12 UJ	11 UJ
Ethylbenzene	1000	12 U	13 U	12 U	12 U	11 U
Isopropylbenzene	NA	12 U	13 U	12 U	12 U	11 U
Methyl Acetate	NA	12 U	13 U	12 U	12 U	11 U
2-Butanone	120	12 U	13 U	12 U	12 U	**16**
4-Methyl-2-pentanone	NA	12 U	13 U	12 U	12 U	11 U
Methylcyclohexane	NA	12 U	13 U	12 U	12 U	11 U
Methylene chloride	50	12 U	13 U	12 U	12 U	11 U
Styrene	NA	12 U	13 U	12 U	12 U	11 U
Methyl tert butyl ether	930	12 U	13 U	12 U	12 U	11 U

Table 4
VOCs in Soil Samples
Jung Sun Laundry Plume Site

	Station ID:	SB-63		SB-14		SB-14		SB-15		SB-15	
	Depth:	12.5 - 13 ft		19 -20 ft		24 - 25 ft		52 -53 ft		9 - 10 ft	
	Sample ID:	SB-63-12.5		SB-14-19-20		SB-14-24-25		SB-15-52-53		SB-15-9-10	
	Sample Date:	3/16/2012		3/16/2012		3/16/2012		3/16/2012		3/16/2012	
Units: µg/kg	Criteria	Dup. SB-13		Env. Sample		Env. Sample		Env. Sample		Env. Sample	
Tetrachloroethene (PCE)	1300	**41**	J	**60**	J	**43**	J	12	UJ	**1**	J
Toluene	700	12	U	13	U	12	U	12	U	11	U
trans-1,2-Dichloroethene	190	12	U	13	U	12	U	12	U	11	U
trans-1,3-Dichloropropene	NA	12	U	13	U	12	U	12	U	11	U
Trichloroethene (TCE)	470	12	U	**1**	J	**1**	J	12	U	11	U
Trichlorofluoromethane	NA	12	U	13	U	12	U	12	U	11	U
Vinyl chloride	20	12	U	13	U	12	U	12	U	11	U
Xylene (Total)	260	12	U	13	U	12	U	12	U	11	U

Criteria: NYSDEC Part 375 Unrestricted Use
U - Not detected.
J - Estimated concentration.
NA - Not available.
Dup. - Field duplicate sample.
Detections are bolded.
Exceedances are highlighted

Table 5
SVOCs in Soil Samples
Jung Sun Laundry Plume Site

	Station ID:	SB-10	SB-11	SB-13	SB-13
	Depth:	7 - 7.5 ft	8.5 - 9 ft	12.5 - 13 ft	12.5 - 13 ft
	Sample ID:	SB-10-7	SB-11-8.5	SB-13-12.5	SB-63-12.5
	Sample Date:	3/15/2012	3/15/2012	3/15/2012	3/15/2012
Units: µg/kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Dup. SB-13
1,2,4,5-Tetrachlorobenzene	NA	210 U	180 U	190 U	200 U
2,4,5-Trichlorophenol	NA	410 U	360 U	380 U	380 U
2,4,6-Trichlorophenol	NA	210 U	180 U	190 U	200 U
2,4-Dichlorophenol	NA	210 U	180 U	190 U	200 U
2,4-Dimethylphenol	NA	210 U	180 U	190 U	200 U
2,4-Dinitrophenol	NA	410 U	360 U	380 U	380 U
2,4-Dinitrotoluene	NA	210 U	180 U	190 U	200 U
2,6-Dinitrotoluene	NA	210 U	180 U	190 U	200 U
2-Chloronaphthalene	NA	210 U	180 U	190 U	200 U
2-Chlorophenol	NA	210 U	180 U	190 U	200 U
2-Methylnaphthalene	NA	210 U	180 U	190 U	200 U
2-Methylphenol (O-Cresol)	330	210 U	180 U	190 U	200 U
2-Nitroaniline	NA	410 U	360 U	380 U	380 U
2-Nitrophenol	NA	210 U	180 U	190 U	200 U
3,3'-Dichlorobenzidine	NA	210 U	180 U	190 U	200 U
3-Nitroaniline	NA	410 U	360 U	380 U	380 U
4,6-Dinitro-2-Methylphenol	NA	410 U	360 U	380 U	380 U
4-Bromophenyl Phenyl Ether	NA	210 U	180 U	190 U	200 U
4-Chloro-3-Methylphenol	NA	210 U	180 U	190 U	200 U
4-Chloroaniline	NA	210 U	180 U	190 U	200 U
4-Chlorophenyl Phenyl Ether	NA	210 U	180 U	190 U	200 U
4-Methylphenol (P-Cresol)	330	210 U	180 U	190 U	200 U
4-Nitroaniline	NA	410 U	360 U	380 U	380 U
4-Nitrophenol	NA	410 U	360 U	380 U	380 U
Acenaphthene	20000	210 U	180 U	190 U	200 U
Acenaphthylene	100000	210 U	180 U	190 U	200 U
Acetophenone	NA	210 U	180 U	190 U	200 U
Anthracene	100000	210 U	180 U	190 U	**160** J
Atrazine	NA	210 U	180 U	190 U	200 U
Benzaldehyde	NA	210 U	**150** J	190 U	200 U
Benzo(A)Anthracene	1000	**240**	**79** J	**120** J	**620**
Benzo(A)Pyrene	1000	**290**	**86** J	**120** J	**560**
Benzo(B)Fluoranthene	1000	**350**	**110** J	**150** J	**650**
Benzo(G,H,I)Perylene	100000	**180** J	180 U	190 U	**270**
Benzo(K)Fluoranthene	800	**170** J	180 U	190 U	**270**
Benzyl Butyl Phthalate	NA	210 U	180 U	190 U	200 U
Biphenyl (Diphenyl)	NA	210 U	180 U	190 U	200 U
Bis(2-Chloroethoxy) Methane	NA	210 U	180 U	190 U	200 U
Bis(2-Chloroethyl) Ether	NA	210 U	180 U	190 U	200 U
Bis(2-Chloroisopropyl) Ether	NA	210 U	180 U	190 U	200 U

Table 5
SVOCs in Soil Samples
Jung Sun Laundry Plume Site

	Station ID:	SB-10	SB-11	SB-13	SB-13
	Depth:	7 - 7.5 ft	8.5 - 9 ft	12.5 - 13 ft	12.5 - 13 ft
	Sample ID:	SB-10-7	SB-11-8.5	SB-13-12.5	SB-63-12.5
	Sample Date:	3/15/2012	3/15/2012	3/15/2012	3/15/2012
Units: µg/kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Dup. SB-13
Bis(2-Ethylhexyl) Phthalate	NA	210 U	**320**	**790**	**410**
Caprolactam	NA	210 U	180 U	190 U	200 U
Carbazole	NA	210 U	180 U	190 U	200 U
Chrysene	1000	**250**	**77** J	**130** J	**550**
Dibenz(A,H)Anthracene	330	210 U	180 U	190 U	**81** J
Dibenzofuran	NA	210 U	180 U	190 U	200 U
Diethyl Phthalate	NA	210 U	180 U	190 U	200 U
Dimethyl Phthalate	NA	210 U	180 U	190 U	200 U
Di-N-Butyl Phthalate	NA	210 U	180 U	190 U	200 U
Di-N-Octylphthalate	NA	210 U	180 U	190 U	200 U
Fluoranthene	100000	**460**	**130** J	**260**	**1500**
Fluorene	30000	210 U	180 U	190 U	200 U
Hexachlorobenzene	NA	210 U	180 U	190 U	200 U
Hexachlorobutadiene	NA	210 U	180 U	190 U	200 U
Hexachlorocyclopentadiene	NA	210 U	180 U	190 U	200 U
Hexachloroethane	NA	210 U	180 U	190 U	200 U
Indeno(1,2,3-C,D)Pyrene	500	**140** J	180 U	190 U	**230**
Isophorone	NA	210 U	180 U	190 U	200 U
Naphthalene	12000	210 U	180 U	190 U	200 U
Nitrobenzene	NA	210 U	180 U	190 U	200 U
N-Nitrosodi-N-Propylamine	NA	210 U	180 U	190 U	200 U
N-Nitrosodiphenylamine	NA	210 U	180 U	190 U	200 U
Pentachlorophenol	800	410 U	360 U	380 U	380 U
Phenanthrene	100000	**290**	180 U	**130** J	**910**
Phenol	330	210 U	180 U	190 U	200 U
Pyrene	100000	**380**	**130** J	**240**	**1300**

Criteria: NYSDEC Part 375 Unrestricted Use
U - Not detected.
J - Estimated concentration.
NA - Not available.
Dup. - Field duplicate sample.
Detections are bolded.

Table 6
Pesticides and PCBs in Soil Samples
Jung Sun Laundry Plume Site

	Station ID:	SB-10	SB-11	SB-13	SB-13
	Depth:	7 - 7.5 ft	8.5 - 9 ft	12.5 - 13 ft	12.5 - 13 ft
	Sample ID:	SB-10-7	SB-11-8.5	SB-13-12.5	SB-63-12.5
	Sample Date:	3/15/2012	3/15/2012	3/15/2012	3/15/2012
Units: µg/kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Dup. SB-13
Aldrin	5	2.1 U	1.8 U	1.9 U	2 U
Alpha BHC	20	2.1 U	1.8 U	1.9 U	2 U
Alpha Endosulfan	2400	2.1 U	1.8 U	1.9 U	2 U
Alpha-Chlordane	94	2.1 U	1.8 U	1.9 U	2 U
Beta BHC	36	2.1 U	1.8 U	1.9 U	2 U
Beta Endosulfan	2400	4.1 U	3.6 U	3.8 U	3.8 U
Delta BHC	40	2.1 U	1.8 U	1.9 U	2 U
Dieldrin	5	4.1 U	**4.2** PX	3.8 U	3.8 U
Endosulfan Sulfate	2400	4.1 U	3.6 U	3.8 U	3.8 U
Endrin	14	4.1 U	3.6 U	3.8 U	3.8 U
Endrin Aldehyde	NA	4.1 U	**6.8** PX	3.8 U	3.8 U
Endrin Ketone	NA	4.1 U	3.6 U	3.8 U	3.8 U
Gamma BHC (Lindane)	100	2.1 U	1.8 U	1.9 U	2 U
Gamma-Chlordane	NA	2.1 U	1.8 U	1.9 U	2 U
Heptachlor	42	2.1 U	1.8 U	1.9 U	2 U
Heptachlor Epoxide	NA	2.1 U	**1.4** PJX	1.9 U	2 U
Methoxychlor	NA	21 U	18 U	19 U	20 U
P,P'-DDD	3.3	4.1 U	**2** PJX	3.8 U	3.8 U
P,P'-DDE	3.3	4.1 U	**8.3** X	3.8 U	3.8 U
P,P'-DDT	3.3	4.1 U	**20** PX	3.8 U	**2.6** PJX
Toxaphene	NA	210 U	180 U	190 U	200 U
Total PCBs	100	83 U	**910** D	77 U	**140**
Aroclor 1016	NA	41 U	36 U	38 U	38 U
Aroclor 1221	NA	83 U	72 U	77 U	78 U
Aroclor 1232	NA	41 U	36 U	38 U	38 U
Aroclor 1242	NA	41 U	36 U	38 U	38 U
Aroclor 1248	NA	41 U	36 U	38 U	38 U
Aroclor 1254	NA	41 U	36 UX	38 U	38 U
Aroclor 1260	NA	41 U	**910** D	38 U	**140**

Criteria: NYSDEC Part 375 Unrestricted Use
U - Not detected.
J - Estimated concentration.
D - Value is from a dilution.
P - Greater than 25% difference for detected concentrations between the two GC columns.
X - Some or all of the reported concentration is due to the interference by a co-eluting PCB congener.
NA - Not available.
Dup. - Field duplicate sample.
Detections are bolded.
Exceedances are highlighted

Table 7
Metals in Soil Samples
Jung Sun Laundry Plume Site

	Station ID:	SB-10	SB-11	SB-13	SB-13
	Depth:	7 - 7.5 ft	8.5 - 9 ft	12.5 - 13 ft	12.5 - 13 ft
	Sample ID:	SB-10-7	SB-11-8.5	SB-13-12.5	SB-63-12.5
	Sample Date:	3/15/2012	3/15/2012	3/15/2012	3/15/2012
Units: mg/kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Dup. SB-13
Antimony	NA	**3.7** B	0.12 U	**0.19** B	**0.31** B
Arsenic	13	**10**	**2.2**	**1.7**	**1.8**
Beryllium	7.2	**0.28** B	**0.086** B	**0.17** B	**0.27** B
Cadmium	2.5	**1.9** *E	**0.13** B*E	**0.057** B*E	**0.035** B*E
Chromium	30	**85**	**32.7**	**31.7**	**25.5**
Copper	50	**129**	**19.8**	**20.9**	**16.4**
Lead	63	**4030** *	**232** *	**13.6** *	**15.5** *
Mercury	0.18	**0.21**	**0.064**	**0.15**	**0.1**
Nickel	30	**23.6**	**13.8**	**23**	**15.2**
Selenium	3.9	0.35 U	0.31 U	0.32 U	0.33 U
Silver	2	**0.44** B	0.034 U	0.036 U	0.037 U
Thallium	NA	0.39 U	0.34 U	0.36 U	0.37 U
Zinc	109	**2040** E	**107** E	**60.3** E	**37.6** E

Criteria: NYSDEC Part 375 Unrestricted Use
U - Not detected.
B - Reported value is less than the contract required detection limit
but greater than the intrument detection limit
E - Serial dilution is not within acceptance criteria
* - Duplicate analysis is not within control limits
NA - Not available.
Dup. - Field duplicate sample.
Detections are bolded.
Exceedances are highlighted

Table 8
Grain Size and TOC in Soil Samples
Jung Sun Laundry Plume Site

Station ID:		SB-10	SB-12	SB-15
Depth:		7 - 7.5 ft	14 - 14.5 ft	50 - 50.5 ft
Sample ID:		SB-10-7	SB-12-14	SB-15-50
Sample Date:		3/15/2012	3/15/2012	3/16/2012
% +3"	%	0.0	0.0	0.0
% Gravel	%	10.0	28.3	0.0
% Sand	%	43.2	60.1	90.9
%C Sand	%	3.1	11.8	0.0
%M Sand	%	10.2	23.7	7.4
%F Sand	%	29.9	24.5	83.5
% Fines	%	46.8	11.6	9.1
% -2µ	%	12.0	3.0	1.0
3/4"	%	100.0	100.0	--
3/8"	%	93.3	86.3	--
4	%	90.0	71.7	--
10	%	86.9	59.8	100.0
20	%	84.0	48.8	98.4
40	%	76.7	36.2	92.5
60	%	67.0	26.0	69.8
100	%	58.1	18.2	29.6
200	%	46.8	11.6	9.1
D_{100}	mm	19.00	19.00	4.75
D_{60}	mm	0.17	2.04	0.23
D_{30}	mm	0.03	0.32	0.15
D_{10}	mm	--	0.03	0.08
Total Organic Carbon	mg/kg	4230	1330	6150
Moisture	%	9.3	11.1	20
USCS Classification		SM	SW-SM	SP-SM
Description		Brown, Silty sand	Gray, Well-graded sand with silt and gravel mica noted	Brown, Poorly-graded sand with silt

% - Percent
mm - Millimeter

Table 9
VOCs in Temporary Well Samples
Jung Sun Laundry Plume Site

	Station ID:	SB-10		SB-11		SB-14		SB-64		SB-15	
	Depth:	16-20 ft		16-20 ft		18-23 ft		18-23 ft		48-53 ft	
	Sample ID:	SB-10-16-20		SB-11-16-20		SB-14-18-23		SB-64-18-23		SB-15-48-53	
	Sample Date:	3/15/2012		3/15/2012		3/16/2012		3/16/2012		3/16/2012	
Units: µg/L	Criteria	Env. Sample		Env. Sample		Env. Sample		Dup. SB-14		Env. Sample	
1,1,1-Trichloroethane	5	10	U	10	U	10	U	10	U	10	U
1,1,2,2-Tetrachloroethane	5	10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
1,1,2-Trichloroethane	1	10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethane	5	10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethene	5	**1**	J	**5**	J	**13**		**13**		10	U
1,2,4-Trichlorobenzene	5	10	U	10	U	10	U	10	U	10	UJ
1,2-Dibromo-3-chloropropane	0.04	10	U	10	U	10	U	10	U	10	UJ
1,2-Dibromoethane	NA	10	U	10	U	10	U	10	U	10	U
1,2-Dichlorobenzene	3	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethane	0.6	10	U	10	U	10	U	10	U	10	U
1,2-Dichloropropane	1	10	U	10	U	10	U	10	U	10	U
1,3-Dichlorobenzene	3	10	U	10	U	10	U	10	U	10	U
1,4-Dichlorobenzene	3	10	U	10	U	10	U	10	U	10	U
2-Hexanone	50	10	U	10	U	10	U	10	U	10	U
Acetone	50	**2**	J	10	U	10	U	10	U	10	U
Benzene	1	10	U	10	U	**10**		**10**		10	U
Bromodichloromethane	50	10	U	10	U	10	U	10	U	10	U
Bromoform	50	10	U	10	U	10	U	10	U	10	U
Bromomethane	5	10	U	10	U	10	U	10	U	10	U
Carbon disulfide	60	10	U	10	U	10	U	10	U	10	U
Carbon tetrachloride	5	10	U	10	U	10	U	10	U	10	U
Chlorobenzene	5	10	U	10	U	10	U	10	U	10	U
Chloroethane	5	10	U	**3**	J	10	U	10	U	10	U
Chloroform	7	10	U	**7**	J	10	U	10	U	**6**	J
Chloromethane	5	10	U	10	U	10	U	10	U	10	U
cis-1,2-Dichloroethene	5	**1300**		**5400**		**5400**	J	**5500**	J	**3**	J
cis-1,3-Dichloropropene	0.4	10	U	10	U	10	U	10	U	10	U
Cyclohexane	NA	10	U	10	U	10	U	10	U	10	UJ
Dibromochloromethane	50	10	U	10	U	10	U	10	U	10	U
Dichlorodifluoromethane	5	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Ethylbenzene	5	10	U	10	U	**7**	J	**7**	J	10	U
Isopropylbenzene	5	10	U	10	U	**2**	J	**2**	J	10	U
Methyl acetate	NA	10	U	10	U	10	U	10	U	10	U
2-Butanone	50	10	U	10	U	10	U	10	U	10	UJ
4-Methyl-2-pentanone	NA	10	U	10	U	10	U	10	U	10	U
Methylcyclohexane	NA	10	U	10	U	10	U	10	U	10	UJ
Methylene chloride	5	10	U	10	U	10	U	10	U	10	U
Styrene	5	10	U	10	U	**3**	J	**3**	J	10	U
Methyl tert-butyl ether	10	10	U	10	U	10	U	10	U	10	U

Table 9
VOCs in Temporary Well Samples
Jung Sun Laundry Plume Site

	Station ID:	SB-10	SB-11	SB-14	SB-64	SB-15
	Depth:	16-20 ft	16-20 ft	18-23 ft	18-23 ft	48-53 ft
	Sample ID:	SB-10-16-20	SB-11-16-20	SB-14-18-23	SB-64-18-23	SB-15-48-53
	Sample Date:	3/15/2012	3/15/2012	3/16/2012	3/16/2012	3/16/2012
Units: µg/L	Criteria	Env. Sample	Env. Sample	Env. Sample	Dup. SB-14	Env. Sample
Tetrachloroethene (PCE)	5	**1700**	**2700**	**50000**	**53000**	**70**
Toluene	5	10 U	**1** J	**24**	**23**	10 U
trans-1,2-Dichloroethene	5	**7** J	**21**	**21**	**21**	10 U
trans-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)	5	**220**	**540**	**1500** J	**1400** J	**20**
Trichlorofluoromethane	5	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Vinyl chloride	2	**1** J	**120**	**77**	**76**	10 U
Xylene (Total)	5	10 U	**2** J	**20**	**20**	10 U

Criteria: NYSDEC Class GA
U - Not detected.
J - Estimated concentration.
NA - Not available.
Dup. - Field duplicate sample.
Detections are bolded.
Exceedances are highlighted

Table 10
VOCs in Groundwater
Jung Sun Laundry Plume Site

AECOM

Well ID:		MW-1	MW-1	MW-2	MW-2	MW-3	MW-3	MW-4	MW-4	MW-4	MW-5
Sample Date:		4/9/2012	6/11/2012	4/9/2012	6/11/2012	4/11/2012	6/13/2012	4/10/2012	6/13/2012	6/13/2012	4/10/2012
Units: µg/L	Critera	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Dup. MW-4	Env. Sample
1,1,1-Trichloroethane	5	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	5	**14**	10 U	10 U	10 U	10 U	10 U	**4** J	10 U	10 U	10 U
1,2,4-Trichlorobenzene	5	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 UJ
1,2-Dibromo-3-chloropropane	0.04	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 UJ
1,2-Dibromoethane	NA	10 U	**11**	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	3	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	0.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 UJ	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 UJ
Acetone	50	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 U	10 UJ
Benzene	1	**4** J	**3** J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	60	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 UJ	10 U
Carbon tetrachloride	5	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	7	**3** J	**4** J	10 U	10 U	10 U	10 U	**25**	**8** J	**8** J	**1** J
Chloromethane	5	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 UJ	10 U
cis-1,2-Dichloroethene	5	**1700** J	**2000**	**5** J	**2** J	10 U	10 U	**2600** J	**240**	**250**	**460** J
cis-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	5	10 UJ	10 U	10 UJ	10 U	10 UJ	10 UJ	10 UJ	10 U	10 UJ	10 UJ
Ethylbenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	5	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl acetate	NA	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 UJ
Methylcyclohexane	NA	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene (PCE)	5	**16000**	**20000**	**13** J	**6** J	10 U	10 U	**830** J	**400**	**390**	**140**
Toluene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	5	**31**	**23**	10 U	10 U	10 U	10 U	**8** J	**1** J	**1** J	**4** J

Table 10
VOCs in Groundwater
Jung Sun Laundry Plume Site

Well ID:		MW-1	MW-1	MW-2	MW-2	MW-3	MW-3	MW-4	MW-4	MW-4	MW-5
Sample Date:		4/9/2012	6/11/2012	4/9/2012	6/11/2012	4/11/2012	6/13/2012	4/10/2012	6/13/2012	6/13/2012	4/10/2012
Units: µg/L	Critera	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Dup. MW-4	Env. Sample
trans-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)	5	**780**	**930** J	**4** J	**2** J	10 U	10 U	**150**	**32**	**30**	**57**
Trichlorofluoromethane	5	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	2	**80**	**80**	**1** J	10 U	10 U	10 U	**110**	**6** J	**6** J	**10**
Xylene (Total)	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Table 10
VOCs in Groundwater
Jung Sun Laundry Plume Site

	Well ID:	MW-5	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8	MW-9	MW-9	MW-10
	Sample Date:	6/12/2012	4/11/2012	6/13/2012	4/11/2012	6/13/2012	4/11/2012	6/13/2012	4/10/2012	6/13/2012	4/9/2012
Units: µg/L	Critera	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1-Trichloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
1,1,2,2-Tetrachloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
1,1,2-Trichloroethane	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	5	**1** J	10 U	10 U	10 U	10 U	**5** J	**4** J	**11**	**3** J	**1** J
1,2,4-Trichlorobenzene	5	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ
1,2-Dibromo-3-chloropropane	0.04	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ
1,2-Dibromoethane	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
1,2-Dichloroethane	0.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U
Acetone	50	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 UJ	10 U	10 U
Benzene	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	60	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U
Carbon tetrachloride	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**2** J
Chlorobenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**1** J	10 U
Chloroform	7	10 U	10 U	10 U	**2** J	**2** J	**10**	**7** J	**15**	**16**	**8** J
Chloromethane	5	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
cis-1,2-Dichloroethene	5	**400**	**3** J	**3** J	10 U	10 U	**3700**	**3200**	**5200**	**2400**	**59** J
cis-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	NA	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U
Dibromochloromethane	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	5	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ
Ethylbenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Methyl acetate	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
2-Butanone	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U
Methylcyclohexane	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Methylene chloride	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Styrene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**1** J	**2** J	10 UJ
Tetrachloroethene (PCE)	5	**190**	**130**	**110**	**29**	**33**	**690**	**1300**	**11000**	**3700**	**72** J
Toluene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	5	**3** J	10 U	10 U	10 U	10 U	**16**	**13**	**39**	**10**	10 U

Table 10
VOCs in Groundwater
Jung Sun Laundry Plume Site

Well ID:		MW-5	MW-6	MW-6	MW-7	MW-7	MW-8	MW-8	MW-9	MW-9	MW-10
Sample Date:		6/12/2012	4/11/2012	6/13/2012	4/11/2012	6/13/2012	4/11/2012	6/13/2012	4/10/2012	6/13/2012	4/9/2012
Units: µg/L	Critera	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
trans-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)	5	**78**	**4** J	**4** J	**1** J	**1** J	**64**	**92**	**770** J	**320**	**38**
Trichlorofluoromethane	5	10 U	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	**1** J
Vinyl chloride	2	**19**	10 U	10 U	10 U	10 U	**390**	**390**	**380** J	**90**	**1** J
Xylene (Total)	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Table 10
VOCs in Groundwater
Jung Sun Laundry Plume Site

AECOM

	Well ID:	MW-10	MW-11	MW-11	MW-12	MW-12	MW-13	MW-13	MW-14	MW-14	MW-64
	Sample Date:	6/11/2012	4/9/2012	6/11/2012	4/9/2012	6/11/2012	4/9/2012	6/12/2012	4/10/2012	6/12/2012	4/10/2012
Units: µg/L	Critera	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Dup. MW-14
1,1,1-Trichloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
1,1,2,2-Tetrachloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
1,1,2-Trichloroethane	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	5	10 U	**2** J	**1** J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	5	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ
1,2-Dibromo-3-chloropropane	0.04	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ
1,2-Dibromoethane	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
1,2-Dichloroethane	0.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 U
Acetone	50	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U
Benzene	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	60	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	5	10 U	**2** J	10 U	10 U	10 U	10 U	10 U	**2** J	10 U	**3** J
Chlorobenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	7	**4** J	**5** J	**4** J	**5** J	**4** J	**5** J	**4** J	**2** J	**2** J	**3** J
Chloromethane	5	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
cis-1,2-Dichloroethene	5	**35**	**6** J	**2** J	**5** J	**2** J	**1** J	10 U	**13** J	**3** J	**14** J
cis-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	5	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ
Ethylbenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Methyl acetate	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
2-Butanone	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	NA	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 U
Methylcyclohexane	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Methylene chloride	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Styrene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Tetrachloroethene (PCE)	5	**51**	**25**	**12**	**28**	**17**	**7** J	**5** J	**36**	**5** J	**30** J
Toluene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Table 10
VOCs in Groundwater
Jung Sun Laundry Plume Site

	Well ID:	MW-10	MW-11	MW-11	MW-12	MW-12	MW-13	MW-13	MW-14	MW-14	MW-64
	Sample Date:	6/11/2012	4/9/2012	6/11/2012	4/9/2012	6/11/2012	4/9/2012	6/12/2012	4/10/2012	6/12/2012	4/10/2012
Units: µg/L	Critera	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Dup. MW-14
trans-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)	5	**31**	**32**	**26**	**17**	**12**	**7** J	**5** J	**34**	**28**	**36**
Trichlorofluoromethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**1** J
Vinyl chloride	2	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene (Total)	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Table 10
VOCs in Groundwater
Jung Sun Laundry Plume Site

AECOM

Well ID:		MW-15	MW-15	MW-16	MW-16	MW-17	MW-17	MW-18	MW-18	MW-19	MW-19
Sample Date:		4/10/2012	6/12/2012	4/10/2012	6/12/2012	4/10/2012	6/12/2012	4/10/2012	6/12/2012	4/10/2012	6/12/2012
Units: µg/L	Critera	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1-Trichloroethane	5	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
1,1,2,2-Tetrachloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
1,1,2-Trichloroethane	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	5	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
1,2-Dibromo-3-chloropropane	0.04	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
1,2-Dibromoethane	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
1,2-Dichloroethane	0.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	50	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50	10 UJ	10 UJ	10 UJ	10 UJ	**3** J	10 UJ	10 U	**3** J	10 U	10 UJ
Benzene	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	60	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	5	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	**2** J	10 U
Chlorobenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	7	**4** J	**3** J	**4** J	**3** J	10 U	10 U	10 U	10 U	**10**	**6** J
Chloromethane	5	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ
cis-1,2-Dichloroethene	5	**2** J	10 U	**1** J	10 U	10 UJ	10 U	**44** J	**10**	10 UJ	10 U
cis-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	5	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
Ethylbenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	5	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
Methyl acetate	NA	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
2-Butanone	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	NA	10 UJ	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	NA	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
Methylene chloride	5	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
Styrene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	10 U	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U
Tetrachloroethene (PCE)	5	**10**	**8** J	**11**	**8** J	10 UJ	10 U	**41** J	**4** J	**7** J	**7** J
Toluene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	5	10 U	10 U	10 U	10 U	10 U	10 U	**2** J	10 U	10 U	10 U

Table 10
VOCs in Groundwater
Jung Sun Laundry Plume Site

	Well ID:	MW-15	MW-15	MW-16	MW-16	MW-17	MW-17	MW-18	MW-18	MW-19	MW-19
	Sample Date:	4/10/2012	6/12/2012	4/10/2012	6/12/2012	4/10/2012	6/12/2012	4/10/2012	6/12/2012	4/10/2012	6/12/2012
Units: µg/L	Critera	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
trans-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)	5	**10**	**10**	**12**	**12**	10 U	10 U	**15**	**2** J	**25**	**21**
Trichlorofluoromethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	2	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene (Total)	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Table 10
VOCs in Groundwater
Jung Sun Laundry Plume Site

Well ID:		MW-20	MW-20	MW-21	MW-21
Sample Date:		4/11/2012	6/13/2012	4/11/2012	6/12/2012
Units: µg/L	Critera	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1-Trichloroethane	5	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	5	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	1	10 U	10 U	10 U	10 U
1,1-Dichloroethane	5	10 U	10 U	10 U	10 U
1,1-Dichloroethene	5	**12**	**9** J	10 U	10 U
1,2,4-Trichlorobenzene	5	10 UJ	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	0.04	10 UJ	10 U	10 UJ	10 U
1,2-Dibromoethane	NA	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	3	10 U	10 U	10 U	10 U
1,2-Dichloroethane	0.6	10 U	10 U	10 U	10 U
1,2-Dichloropropane	1	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	3	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	3	10 U	10 U	10 U	10 U
2-Hexanone	50	10 U	10 U	10 U	10 U
Acetone	50	10 UJ	10 U	10 U	10 U
Benzene	1	10 U	10 U	10 U	10 U
Bromodichloromethane	50	10 U	10 U	10 U	10 U
Bromoform	50	10 U	10 U	10 U	10 U
Bromomethane	5	10 U	10 U	10 U	10 U
Carbon disulfide	60	10 U	10 UJ	10 U	10 UJ
Carbon tetrachloride	5	10 U	10 U	10 U	10 U
Chlorobenzene	5	10 U	10 U	10 U	10 U
Chloroethane	5	10 U	10 U	10 U	10 U
Chloroform	7	**13**	**8** J	10 U	10 U
Chloromethane	5	10 U	10 UJ	10 U	10 UJ
cis-1,2-Dichloroethene	5	**21000**	**12000**	**83**	**93**
cis-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U
Cyclohexane	NA	10 U	10 U	10 UJ	10 U
Dibromochloromethane	50	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	5	10 UJ	10 UJ	10 U	10 UJ
Ethylbenzene	5	10 U	10 U	10 U	10 U
Isopropylbenzene	5	10 U	10 U	10 U	10 U
Methyl acetate	NA	10 U	10 U	10 U	10 U
2-Butanone	50	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	NA	10 U	10 U	10 U	10 U
Methylcyclohexane	NA	10 U	10 U	10 U	10 U
Methylene chloride	5	10 U	10 U	10 U	10 U
Styrene	5	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	**2** J	**2** J
Tetrachloroethene (PCE)	5	**6300**	**4000**	**400**	**350**
Toluene	5	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	5	**50**	**130**	10 U	10 U

Table 10
VOCs in Groundwater
Jung Sun Laundry Plume Site

Well ID:		MW-20	MW-20	MW-21	MW-21
Sample Date:		4/11/2012	6/13/2012	4/11/2012	6/12/2012
Units: µg/L	Critera	Env. Sample	Env. Sample	Env. Sample	Env. Sample
trans-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U
Trichloroethene (TCE)	5	**1800** J	**1200**	**17**	**16**
Trichlorofluoromethane	5	10 UJ	10 U	10 U	10 U
Vinyl chloride	2	**110**	**240**	10 U	10 U
Xylene (Total)	5	10 U	10 U	10 U	10 U

Criteria: NYSDEC Class GA
U - Not detected.
J - Estimated concentration.
NA - Not available.
Dup. - Field duplicate sample.
Detections are bolded.
Exceedances are highlighted

Table 11
MNA Parameters in Groundwater
Jung Sun Laundry Plume Site

Well ID:		MW-4	MW-4	MW-7	MW-14	MW-14	MW-19	MW-19	MW-20
Sample Date:		4/10/2012	6/13/2012	6/13/2012	4/10/2012	6/12/2012	4/10/2012	6/12/2012	4/11/2012
	Units	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
Alkalinity, Total (As CaCo3)	mg/L	69.5 D	103 D	252 D	206 D	207 D	188 D	171 D	214 D
Biochemical Oxygen Demand	mg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chemical Oxygen Demand	mg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	23.7
Chloride (as Cl)	mg/L	19	12.8	214 D	169 D	183 D	175 D	169 D	42.5
Ethane	µg/L	1 U	1 U	1 U	0.66 J	1 U	1 U	1 U	1 U
Ethene	µg/L	4.8	1 U	1 U	0.5 J	1 U	1 U	1 U	1.2
Iron - Dissolved	µg/L	33.1 B	548	1050	82.4 B	2510	180	2220	52.8 B
Iron - Total	µg/L	1360	0	0	1060	0	1710	0	472
Manganese - Dissolved	µg/L	89.8 E	148	41	188 E	218	25.8 E	92.9	334 E
Manganese - Total	µg/L	150 E	0	0	261 E	0	107 E	0	322 E
Methane	µg/L	7	4.9	1 U	1	1 U	1 U	1 U	11
Nitrogen, Ammonia (as N)	mg/L	0.12	0.44	0.15	0.1 U	0.16	0.1 U	0.13	0.48
Nitrogen, Nitrate (as N)	mg/L	0.59	3.72 D	8.5 D	7.74 D	7.48 D	10.6 D	9.36 D	0.1 U
Nitrogen, Nitrite	mg/L	0.1 U	0.13	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Phosphorus, Dissolved (as P)	mg/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Sulfate (as So4)	mg/L	11.8	15.4	78.8 D	115 D	117 D	55.7 D	55.7 D	100 D
Sulfide	mg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Total Organic Carbon	mg/L	1.2	1.8	1.3	1.1	1.5	1 U	1.2	4.5
pH (field measurement)	pH	7.76	7.76	6.92	6.02	7.29	7.53	7.32	7.73

U - Not detected.
D - Value is from a dilution.
B - The parameter was also found in the blank.
E - The value is above the quantitation range.

Table 12
VOCs in Soil Gas
Jung Sun Laundry Plume Site

AECOM

Sample ID:		SG-8	SG-9	SG-10	SG-11	SG-12	SG-13	SG-14	SG-15	SG-16
Sample Date:		3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012
Units: µg/m3	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1-Trichloroethane	22000	4.6 U	0.87 U	**2.6**	4.4 U	0.44 U	0.44 U	0.44 U	**6.8**	**3.1**
1,1,2,2-Tetrachloroethane	0.42	5.8 U	1.1 U	1.4 U	5.5 U	0.55 U	0.55 U	0.55 U	1.1 U	2.7 U
1,1,2-Trichloroethane	1.5	4.6 U	0.87 U	1.1 U	4.4 U	0.44 U	0.44 U	0.44 U	0.87 U	2.2 U
1,1,2-Trichlorotrifluoroethane	0.00003	6.5 U	1.2 U	1.5 U	6.1 U	0.61 U	0.61 U	0.61 U	1.2 U	3.1 U
1,1-Dichloroethane	5000	3.4 U	0.65 U	0.81 U	3.2 U	0.32 U	0.32 U	0.32 U	0.65 U	1.6 U
1,1-Dichloroethene	2000	3.4 U	0.63 UJ	0.79 UJ	3.2 U	0.32 UJ	0.32 UJ	0.32 UJ	0.63 UJ	1.6 UJ
1,2,4-Trichlorobenzene	2000	6.3 UJ	1.2 U	1.5 U	5.9 UJ	0.59 U	0.59 U	0.59 U	1.2 U	3 U
1,2,4-Trimethylbenzene	60	4.2 U	**7**	0.98 U	3.9 U	**3.9**	**9.4**	**4**	0.79 U	**18**
1,2-Dibromoethane	0.11	6.5 U	1.2 U	1.5 U	6.1 U	0.61 U	0.61 U	0.61 U	1.2 U	3.1 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NA	5.9 U	1.1 U	1.4 U	5.6 U	0.56 U	0.56 U	0.56 U	1.1 U	2.8 U
1,2-Dichlorobenzene	2000	5.1 U	0.96 U	1.2 U	4.8 U	0.48 U	0.48 U	0.48 U	0.96 U	2.4 U
1,2-Dichloroethane	0.94	3.4 U	0.65 U	0.81 U	3.2 U	0.32 U	0.32 U	0.32 U	0.65 U	1.6 U
1,2-Dichloropropane	40	3.9 U	0.74 U	0.92 U	3.7 U	0.37 U	0.37 U	0.37 U	0.74 U	1.8 U
1,3,5-Trimethylbenzene	60	4.2 U	**1.4**	0.98 U	3.9 U	**0.69**	**22**	**0.74**	**31**	**5.9**
1,3-Dichlorobenzene	1100	5.1 U	0.96 U	1.2 U	4.8 U	0.48 U	0.48 U	**0.52**	0.96 U	2.4 U
1,4-Dichlorobenzene	8000	5.1 U	0.96 U	1.2 U	4.8 U	0.48 U	0.48 U	0.48 U	0.96 U	2.4 U
1,4-Dioxane	NA	7.6 UJ	1.4 U	1.8 U	7.2 UJ	0.72 U	0.72 U	0.72 U	1.4 U	3.6 U
2,2,4-Trimethylpentane	NA	9.9 U	1.9 U	2.3 U	9.3 U	0.93 U	**6.6**	0.93 U	**34**	**9.6**
2-Butanone (MEK)	10000	10 U	1.9 U	2.4 U	9.4 U	**2.6**	**1.6**	**4.4**	**25**	**7.9**
4-Methyl-2-pentanone (MIBK)	800	8.7 U	1.6 U	2 U	8.2 U	0.82 U	0.82 U	0.82 U	**4.7**	4.1 U
Benzene	3.1	2.7 U	0.51 U	**5.4**	2.6 U	0.26 U	**1.1**	**0.91**	**14**	**2.9**
Benzyl chloride	0.5	8.8 U	1.7 U	2.1 U	8.3 U	0.83 U	0.83 U	0.83 U	1.7 U	4.1 U
Bromodichloromethane	1.4	5.7 U	1.1 U	1.3 U	5.4 U	0.54 U	0.54 U	**1.9**	1.1 U	2.7 U
Bromoform	22	8.7 U	1.7 U	2.1 U	8.3 U	0.83 U	0.83 U	0.83 U	1.7 U	4.1 U
Bromomethane	NA	3.3 U	0.62 U	0.78 U	3.1 U	0.31 U	0.31 U	0.31 U	0.62 U	1.6 U
Carbon Tetrachloride	1.6	2.7 U	0.5 U	**0.78**	2.5 U	**0.61**	0.25 U	**0.74**	**4**	**110**
Chlorobenzene	600	3.9 U	0.74 U	0.92 U	3.7 U	0.37 U	0.37 U	0.37 U	0.74 U	1.8 U
Chloroethane	100000	2.2 U	0.42 U	0.53 U	2.1 U	0.21 U	0.21 U	0.21 U	**0.87**	1.1 U
Chloroform	1.1	**53**	**7.8**	**11**	3.9 U	**3.1**	**22**	**78**	**60**	**40**
Chloromethane	NA	4.4 U	0.83 U	1 U	**10**	0.41 U	0.41 U	0.41 U	0.83 U	2.1 U
cis-1,2-Dichloroethene	350	3.4 U	0.63 U	0.79 U	3.2 U	0.32 U	0.32 U	0.32 U	**11**	1.6 U
cis-1,3-Dichloropropene	6.1	3.8 U	0.73 U	0.91 U	3.6 U	0.36 U	0.36 U	0.36 U	0.73 U	1.8 U
Cyclohexane	NA	7.3 U	1.4 U	1.7 U	6.9 U	0.69 U	**1.1**	0.69 U	**7.4**	3.4 U
Dibromochloromethane	1	7.2 U	1.4 U	1.7 U	6.8 U	0.68 U	0.68 U	0.68 U	1.4 U	3.4 U
Dichlorodifluoromethane	2000	4.2 U	**2.2**	**2.8**	4 U	**2.1**	**2**	**2.4**	**2.7**	**2.5**
Ethanol	NA	**22**	**9.2**	**6.7**	15 U	**8.1**	**8.4**	**24**	**160**	**13**
Ethylbenzene	22	3.7 U	**2.2**	**1.7**	3.5 U	**0.99**	**23**	**1.2**	**97**	**11**
Hexachlorobutadiene	1.1	9 U	1.7 U	2.1 U	8.5 U	0.85 U	0.85 U	0.85 U	1.7 U	4.3 U
Methyl Tert Butyl Ether	30000	6.1 U	1.2 U	1.4 U	5.8 U	0.58 U	0.58 U	0.58 U	1.2 U	2.9 U
Methylene Chloride	52	7.4 U	1.4 U	1.7 U	6.9 U	0.69 U	**0.88**	**2.2**	**6.5**	3.5 U
M-P-Xylene	70000	**3.7**	**9.4**	**3.6**	3.5 U	**3.4**	**29**	**5.5**	**210**	**47**
N-Hexane	2000	7.5 U	**4.2**	1.8 U	7 U	0.7 U	**1.4**	**2.8**	**8.4**	3.5 U
O-Xylene	70000	3.7 U	**3.1**	**1.2**	3.5 U	**1.4**	**32**	**1.6**	**130**	**16**
Styrene	10000	3.6 U	0.68 U	0.85 U	3.4 U	0.34 U	0.34 U	0.34 U	**2.8**	1.7 U
tert-Butyl alcohol	NA	10 U	1.9 U	2.4 U	9.7 U	0.97 U	0.97 U	0.97 U	1.9 U	4.9 U

Table 12
VOCs in Soil Gas
Jung Sun Laundry Plume Site

	Sample ID:	SG-8	SG-9	SG-10	SG-11	SG-12	SG-13	SG-14	SG-15	SG-16
	Sample Date:	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012
Units: µg/m3	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
Tetrachloroethene (PCE)	8.1	**450**	**190**	**510**	**140**	**21**	**25**	**36**	**500**	**42**
Toluene	4000	**4.6**	**3.8**	**1.8**	**4.3**	**2.1**	**32**	**5.5**	**160**	**55**
Trans-1,2-Dichloroethene	700	3.4 U	0.63 U	0.79 U	3.2 U	0.32 U	0.32 U	0.32 U	0.63 U	1.6 U
Trans-1,3-Dichloropropene	NA	3.8 U	0.73 U	0.91 U	3.6 U	0.36 U	0.36 U	0.36 U	0.73 U	1.8 U
Trichloroethene (TCE)	0.22	**5.1**	**1.7**	**15**	2.1 U	**1**	0.21 U	**3.6**	**540**	**520**
Trichlorofluoromethane	7000	4.8 U	**1.9**	**2.6**	4.5 U	**1.4**	**1.3**	**1.6**	**4.2**	**35**
Vinyl Chloride	2.8	2.2 U	0.41 U	0.51 U	2 U	0.2 U	0.2 U	0.2 U	0.41 U	1 U

Table 12
VOCs in Soil Gas
Jung Sun Laundry Plume Site

AECOM

Sample ID:		SG-17	SG-18	SG-19	SG-20	SG-70	OA-1
Sample Date:		3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012
Units: µg/m3	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Dup. SG-20	Ambient Air
1,1,1-Trichloroethane	22000	2.2 U	1.8 U	120 U	9100 U	9700 U	0.44 U
1,1,2,2-Tetrachloroethane	0.42	2.7 U	2.3 U	140 U	11000 U	12000 U	0.55 U
1,1,2-Trichloroethane	1.5	2.2 U	1.8 U	120 U	9100 U	9700 U	0.44 U
1,1,2-Trichlorotrifluoroethane	0.00003	3.1 U	2.6 U	160 U	13000 U	14000 U	**0.63**
1,1-Dichloroethane	5000	**1.9** J	1.3 U	85 U	6700 U	7200 U	0.32 U
1,1-Dichloroethene	2000	**1.9** J	1.3 U	84 U	6600 U	7100 U	0.32 UJ
1,2,4-Trichlorobenzene	2000	3 U	2.5 UJ	160 UJ	12000 UJ	13000 UJ	0.59 U
1,2,4-Trimethylbenzene	60	2 U	1.6 U	100 U	8200 U	8700 U	**1.2**
1,2-Dibromoethane	0.11	3.1 U	2.6 U	160 U	13000 U	14000 U	0.61 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NA	2.8 U	2.3 U	150 U	12000 U	12000 U	0.56 U
1,2-Dichlorobenzene	2000	2.4 U	2 U	130 U	10000 U	11000 U	0.48 U
1,2-Dichloroethane	0.94	1.6 U	1.3 U	85 U	6700 U	7200 U	0.32 U
1,2-Dichloropropane	40	1.8 U	1.5 U	98 U	7700 U	8200 U	0.37 U
1,3,5-Trimethylbenzene	60	2 U	1.6 U	100 U	8200 U	8700 U	0.39 U
1,3-Dichlorobenzene	1100	2.4 U	2 U	130 U	10000 U	11000 U	0.48 U
1,4-Dichlorobenzene	8000	2.4 U	2 U	130 U	10000 U	11000 U	0.48 U
1,4-Dioxane	NA	3.6 U	3 UJ	190 UJ	15000 UJ	16000 UJ	0.72 U
2,2,4-Trimethylpentane	NA	4.7 U	3.9 U	250 U	19000 U	21000 U	0.93 U
2-Butanone (MEK)	10000	4.7 U	3.9 U	250 U	20000 U	21000 U	**2.4**
4-Methyl-2-pentanone (MIBK)	800	4.1 U	3.4 U	220 U	17000 U	18000 U	0.82 U
Benzene	3.1	**10**	**3.4**	67 U	5300 U	5700 U	**0.7**
Benzyl chloride	0.5	4.1 U	3.4 U	220 U	17000 U	18000 U	0.83 U
Bromodichloromethane	1.4	2.7 U	2.2 U	140 U	11000 U	12000 U	0.54 U
Bromoform	22	4.1 U	3.4 U	220 U	17000 U	18000 U	0.83 U
Bromomethane	NA	1.6 U	1.3 U	82 U	6500 U	6900 U	0.31 U
Carbon Tetrachloride	1.6	1.3 U	**1.1**	66 U	5200 U	5600 U	**0.67**
Chlorobenzene	600	1.8 U	1.5 U	97 U	7700 U	8200 U	0.37 U
Chloroethane	100000	1.1 U	0.88 U	56 U	4400 U	4700 U	0.21 U
Chloroform	1.1	2 U	**3.4**	100 U	8100 U	8700 U	0.39 U
Chloromethane	NA	2.1 U	1.7 U	110 U	8600 U	9200 U	**1.3**
cis-1,2-Dichloroethene	350	**4.5**	1.3 U	84 U	**82000**	**54000**	0.32 U
cis-1,3-Dichloropropene	6.1	1.8 U	1.5 U	96 U	7600 U	8100 U	0.36 U
Cyclohexane	NA	**110**	2.9 U	180 U	14000 U	15000 U	0.69 U
Dibromochloromethane	1	3.4 U	2.8 U	180 U	14000 U	15000 U	0.68 U
Dichlorodifluoromethane	2000	2 U	1.6 U	100 U	8200 U	8800 U	**2.3**
Ethanol	NA	**8.8**	**15**	400 U	31000 U	34000 U	**26**
Ethylbenzene	22	1.7 U	1.4 U	92 U	7200 U	7700 U	**0.68**
Hexachlorobutadiene	1.1	4.3 U	3.5 U	230 U	18000 U	19000 U	0.85 U
Methyl Tert Butyl Ether	30000	2.9 U	2.4 U	150 U	12000 U	13000 U	0.58 U
Methylene Chloride	52	3.5 U	2.9 U	180 U	14000 U	15000 U	**2.6**
M-P-Xylene	70000	**3.8**	**3**	92 U	7200 U	7700 U	**2.6**
N-Hexane	2000	**70**	2.9 U	190 U	15000 U	16000 U	**1.2**
O-Xylene	70000	1.7 U	1.4 U	92 U	7200 U	7700 U	**0.81**
Styrene	10000	1.7 U	1.4 U	90 U	7100 U	7600 U	0.34 U
tert-Butyl alcohol	NA	4.9 U	4 U	260 U	20000 U	22000 U	0.97 U

Table 12
VOCs in Soil Gas
Jung Sun Laundry Plume Site

AECOM

	Sample ID:	SG-17	SG-18	SG-19	SG-20	SG-70	OA-1
	Sample Date:	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012	3/23/2012
Units: µg/m3	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Dup. SG-20	Ambient Air
Tetrachloroethene (PCE)	8.1	**11**	**110**	**13000**	**2800000**	**2400000**	**8.9**
Toluene	4000	**2.5**	**3.4**	80 U	6300 U	6700 U	**5.7**
Trans-1,2-Dichloroethene	700	1.6 U	1.3 U	84 U	6600 U	7100 U	0.32 U
Trans-1,3-Dichloropropene	NA	1.8 U	1.5 U	96 U	7600 U	8100 U	0.36 U
Trichloroethene (TCE)	0.22	**56**	0.89 U	**420**	**130000**	**90000**	0.21 U
Trichlorofluoromethane	7000	2.2 U	1.9 U	120 U	9400 U	10000 U	**1.7**
Vinyl Chloride	2.8	1 U	0.85 U	54 U	4300 U	4500 U	0.2 U

Criteria: EPA, 2002; generic screening level for shallow soil gas; risk = $1x10^6$
U - Not detected.
J - Estimated concentration.
NA - Not available.
Dup. - Field duplicate sample.
Detections are bolded.
Exceedances are highlighted

Table 13
VOCs in Soil Vapor Intrusion Samples
Jung Sun Laundry Plume Site

	Structure:	B02	B02	B02	B02	B03	B03	B04	B04
	Sample Type:	Indoor	Indoor	Sub-Slab	Ambient	Indoor	Sub-Slab	Indoor	Indoor
	Sample ID:	BO2-IA1	BO2-IA51	BO2-SS1	BO2-OA1	BO3-IA1	BO3-SS1	BO4-IA1	BO4-IA2
	Sample Date:	3/19/12	3/19/12	3/19/12	3/19/12	3/19/12	3/19/12	3/20/12	3/20/12
Units: µg/m3	Criteria	Env. Sample	Dup. BO2-IA1	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1-Trichloroethane	NA	**2**	**1.9**	**2.6**	0.44 U	0.44 U	0.44 U	4.4 U	0.87 U
1,1,2,2-Tetrachloroethane	NA	0.55 U	0.55 U	2.7 U	0.55 U	0.55 U	0.55 U	5.5 U	1.1 U
1,1,2-Trichloroethane	NA	0.44 U	0.44 U	2.2 U	0.44 U	0.44 U	0.44 U	4.4 U	0.87 U
1,1,2-Trichlorotrifluoroethane	NA	0.61 U	0.61 U	3.1 U	0.61 U	0.61 U	0.61 U	6.1 U	1.2 U
1,1-Dichloroethane	NA	0.32 U	0.32 U	1.6 U	0.32 U	0.32 U	0.32 U	3.2 U	0.65 U
1,1-Dichloroethene	NA	0.32 UJ	0.32 UJ	1.6 U	0.32 UJ	0.32 UJ	0.32 UJ	3.2 U	0.63 UJ
1,2,4-Trichlorobenzene	NA	0.59 U	0.59 U	3 UJ	0.59 U	0.59 U	0.59 U	5.9 UJ	1.2 U
1,2,4-Trimethylbenzene	NA	**1.9**	**1.3**	**110**	**4.6**	**4.3**	**5.4**	3.9 U	**4.9**
1,2-Dibromoethane	NA	0.61 U	0.61 U	3.1 U	0.61 U	0.61 U	0.61 U	6.1 U	1.2 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NA	0.56 U	0.56 U	2.8 U	0.56 U	0.56 U	0.56 U	5.6 U	1.1 U
1,2-Dichlorobenzene	NA	0.48 U	0.48 U	2.4 U	0.48 U	0.48 U	0.48 U	4.8 U	0.96 U
1,2-Dichloroethane	NA	0.32 U	0.32 U	1.6 U	0.32 U	0.32 U	0.32 U	3.2 U	0.65 U
1,2-Dichloroethene, Total	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	0.37 U	0.37 U	1.8 U	0.37 U	0.37 U	0.37 U	3.7 U	0.74 U
1,2-Dichlorotetrafluoroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	NA	**0.49**	**0.4**	**55**	**1.2**	**1**	**1.9**	3.9 U	**1.1**
1,3-Butadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	0.48 U	0.48 U	2.4 U	0.48 U	0.48 U	0.48 U	4.8 U	0.96 U
1,4-Dichlorobenzene	NA	0.48 U	0.48 U	2.4 U	0.48 U	**0.51**	0.48 U	4.8 U	0.96 U
1,4-Dioxane	NA	0.72 U	0.72 U	3.6 UJ	0.72 U	0.72 U	0.72 U	7.2 UJ	1.4 U
2,2,4-Trimethylpentane	NA	**1**	**1.1**	4.7 U	**2.5**	**1.3**	0.93 U	9.3 U	1.9 U
3-Chloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	NA	**5.4**	**4.9**	**4.8**	**5.2**	**3.7**	**2.2**	**50**	**32**
4-Methyl-2-pentanone (MIBK)	NA	0.82 U	0.82 U	4.1 U	0.82 U	**1.1**	0.82 U	8.2 U	**7.3**
Benzene	NA	**1.7**	**1.6**	1.3 U	**1.9**	**15**	**1.4**	2.6 U	**1.3**
Benzyl chloride	NA	0.83 U	0.83 U	4.1 U	0.83 U	0.83 U	0.83 U	8.3 U	1.7 U
Bromodichloromethane	NA	0.54 U	0.54 U	2.7 U	0.54 U	0.54 U	0.54 U	5.4 U	1.1 U
Bromoethene (Vinyl Bromide)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	0.83 U	0.83 U	4.1 U	0.83 U	0.83 U	0.83 U	8.3 U	1.7 U
Bromomethane	NA	0.31 U	0.31 U	1.6 U	0.31 U	0.31 U	0.31 U	3.1 U	0.62 U
Carbon tetrachloride	NA	**0.52**	**0.54**	1.3 U	**0.6**	**0.56**	**0.44**	2.5 U	**0.57**
Chlorobenzene	NA	0.37 U	0.37 U	1.8 U	0.37 U	0.37 U	0.37 U	3.7 U	0.74 U
Chloroethane	NA	0.21 U	0.21 U	1.1 U	0.21 U	0.21 U	0.21 U	2.1 U	0.42 U
Chloroform	NA	0.39 U	0.39 U	2 U	0.39 U	**1.5**	**7.9**	3.9 U	0.78 U
Chloromethane	NA	**1.5**	**1.2**	2.1 U	**1.2**	**2.1**	0.41 U	4.1 U	**1.4**
cis-1,2-Dichloroethene	NA	0.32 U	0.32 U	1.6 U	0.32 U	0.32 U	0.32 U	**3.6**	0.63 U
cis-1,3-Dichloropropene	NA	0.36 U	0.36 U	1.8 U	0.36 U	0.36 U	0.36 U	3.6 U	0.73 U
Cyclohexane	NA	**0.71**	**0.79**	3.4 U	**1.2**	0.69 U	0.69 U	**7.1**	**2.9**
Dibromochloromethane	NA	0.68 U	0.68 U	3.4 U	0.68 U	0.68 U	0.68 U	6.8 U	1.4 U
Dichlorodifluoromethane	NA	**2.1**	**2.1**	**2.5**	**2.2**	**2.1**	**2.1**	4 U	**2.2**
Ethanol	NA	**620**	**680**	**130**	**42**	**740**	**17**	**83**	**160**
Ethylbenzene	NA	**0.86**	**1.1**	1.7 U	**2.1**	**1.7**	**0.7**	3.5 U	**3.7**

Table 13
VOCs in Soil Vapor Intrusion Samples
Jung Sun Laundry Plume Site

	Structure:	B02	B02	B02	B02	B03	B03	B04	B04
	Sample Type:	Indoor	Indoor	Sub-Slab	Ambient	Indoor	Sub-Slab	Indoor	Indoor
	Sample ID:	BO2-IA1	BO2-IA51	BO2-SS1	BO2-OA1	BO3-IA1	BO3-SS1	BO4-IA1	BO4-IA2
	Sample Date:	3/19/12	3/19/12	3/19/12	3/19/12	3/19/12	3/19/12	3/20/12	3/20/12
Units: µg/m3	Criteria	Env. Sample	Dup. BO2-IA1	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
Hexachlorobutadiene	NA	0.85 U	0.85 U	4.3 U	0.85 U	0.85 U	0.85 U	8.5 U	1.7 U
Methyl Tert Butyl Ether	NA	0.58 U	0.58 U	2.9 U	0.58 U	0.58 U	0.58 U	5.8 U	1.2 U
Methylene chloride	60	**2.6**	**3**	3.5 U	**2.9**	**4.3**	0.69 U	**8.1**	**11**
M-P-Xylene	NA	**3.1**	**4.6**	**6.1**	**8**	**6.6**	**2.8**	**4.4**	**14**
n-Heptane	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Hexane	NA	**1.7**	**1.8**	**19**	**2.3**	**2.5**	**1.8**	**22**	**9.6**
O-Xylene	NA	**1.1**	**1.6**	**14**	**2.9**	**2.3**	**1.3**	3.5 U	**4.3**
Styrene	NA	0.34 U	0.34 U	1.7 U	0.34 U	**0.81**	**0.36**	3.4 U	**1**
tert-Butyl alcohol	NA	0.97 U	0.97 U	4.9 U	0.97 U	0.97 U	0.97 U	9.7 U	1.9 U
Tetrachloroethene (PCE)	100	**2.6**	**2.6**	**2.9**	**2.4**	**2.4**	**51**	**25**	**10**
Toluene	NA	**7.9**	**10**	**8.4**	**12**	**11**	**4.2**	**340**	**120**
trans-1,2-Dichloroethene	NA	0.32 U	0.32 U	1.6 U	0.32 U	0.32 U	0.32 U	3.2 U	0.63 U
trans-1,3-Dichloropropene	NA	0.36 U	0.36 U	1.8 U	0.36 U	0.36 U	0.36 U	3.6 U	0.73 U
Trichloroethene (TCE)	5	**0.28**	0.21 U	1.1 U	0.21 U	0.21 U	**0.41**	**2.2**	**0.49**
Trichlorofluoromethane	NA	**1.1**	**1.2**	2.2 U	**1.2**	**1.8**	**1.3**	4.5 U	**1.3**
Vinyl chloride	NA	0.2 U	0.2 U	1 U	0.2 U	0.2 U	0.2 U	2 U	0.41 U

Table 13
VOCs in Soil Vapor Intrusion Samples
Jung Sun Laundry Plume Site

Structure:		B04	B04	B04	B04	B04	B04	B04	B04
Sample Type:		Sub-Slab	Sub-Slab	Ambient	Indoor	Indoor	Sub-Slab	Indoor	Sub-Slab
Sample ID:		BO4-SS1	BO4-SS2	BO4-OA1	B04-IA3	B04-IA53	B04-SS3	B04-IA4	B04-SS4
Sample Date:		3/20/12	3/20/12	3/20/12	11/15/12	11/15/12	11/15/12	11/15/12	11/15/12
Units: µg/m3	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Dup. B04-IA3	Env. Sample	Env. Sample	Env. Sample
1,1,1-Trichloroethane	NA	42 U	**25**	0.44 U	0.22 U	0.22 U	1.1 U	0.22 U	**3.4**
1,1,2,2-Tetrachloroethane	NA	53 U	2.7 U	0.55 U	0.27 U	0.27 U	1.4 U	0.27 U	1.4 U
1,1,2-Trichloroethane	NA	42 U	2.2 U	0.44 U	0.22 U	0.22 U	1.1 U	0.22 U	1.1 U
1,1,2-Trichlorotrifluoroethane	NA	59 U	3.1 U	0.61 U	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	31 U	1.6 U	0.32 U	0.16 U	0.16 U	0.81 U	0.16 U	0.81 U
1,1-Dichloroethene	NA	31 U	1.6 U	0.32 UJ	0.16 U	0.16 U	0.79 U	0.16 U	0.79 U
1,2,4-Trichlorobenzene	NA	58 UJ	3 UJ	0.59 U	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NA	38 U	**2.7**	**1.4**	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	60 U	3.1 U	0.61 U	0.31 U	0.31 U	1.5 U	0.31 U	1.5 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NA	54 U	2.8 U	0.56 U	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	47 U	2.4 U	0.48 U	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	31 U	1.6 U	0.32 U	0.32 U	0.32 U	0.81 U	0.32 U	0.81 U
1,2-Dichloroethene, Total	NA	NA	NA	NA	0.16 U	0.16 U	0.79 U	0.16 U	**1.9**
1,2-Dichloropropane	NA	36 U	1.8 U	0.37 U	0.37 U	0.37 U	0.92 U	0.37 U	0.92 U
1,2-Dichlorotetrafluoroethane	NA	NA	NA	NA	0.28 U	0.28 U	1.4 U	0.28 U	1.4 U
1,3,5-Trimethylbenzene	NA	38 U	2 U	0.39 U	0.39 U	**0.45**	**1.2**	**0.44**	**1.8**
1,3-Butadiene	NA	NA	NA	NA	**0.49**	**0.58**	0.44 U	**0.57**	0.44 U
1,3-Dichlorobenzene	NA	47 U	2.4 U	0.48 U	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	47 U	2.4 U	0.48 U	NA	NA	NA	NA	NA
1,4-Dioxane	NA	70 UJ	3.6 UJ	0.72 U	NA	NA	NA	NA	NA
2,2,4-Trimethylpentane	NA	91 U	4.7 U	0.93 U	0.19 U	**1.4**	0.93 U	**2**	0.93 U
3-Chloropropene	NA	NA	NA	NA	0.25 U	0.25 U	1.6 U	0.25 U	1.6 U
4-Ethyltoluene	NA	NA	NA	NA	0.2 U	**0.34**	**1.5**	**0.39**	**1.3**
2-Butanone (MEK)	NA	92 U	**11**	**1.9**	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	NA	79 U	4.1 U	0.82 U	NA	NA	NA	NA	NA
Benzene	NA	25 U	1.3 U	**1.2**	**0.46**	**1.6**	**0.92**	**2**	0.64 U
Benzyl chloride	NA	80 U	4.1 U	0.83 U	NA	NA	NA	NA	NA
Bromodichloromethane	NA	52 U	2.7 U	0.54 U	0.27 U	0.27 U	1.3 U	0.27 U	1.3 U
Bromoethene (Vinyl Bromide)	NA	NA	NA	NA	0.35 U	0.35 U	0.87 U	0.35 U	0.87 U
Bromoform	NA	80 U	4.1 U	0.83 U	0.41 U	0.41 U	2.1 U	0.41 U	2.1 U
Bromomethane	NA	30 U	1.6 U	0.31 U	0.31 U	0.31 U	0.78 U	0.31 U	0.78 U
Carbon tetrachloride	NA	24 U	1.3 U	**0.56**	**0.3**	**0.4**	1.3 U	**0.8**	1.3 U
Chlorobenzene	NA	36 U	1.8 U	0.37 U	NA	NA	NA	NA	NA
Chloroethane	NA	20 U	1.1 U	0.21 U	0.21 U	0.21 U	1.3 U	0.21 U	1.3 U
Chloroform	NA	38 U	**6.5**	0.39 U	0.2 U	0.2 U	**3.6**	**0.3**	0.98 U
Chloromethane	NA	40 U	2.1 U	**1.3**	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	**1800**	**140**	0.32 U	0.16 U	0.16 U	0.79 U	0.16 U	**1.9**
cis-1,3-Dichloropropene	NA	35 U	1.8 U	0.36 U	0.18 U	0.18 U	0.91 U	0.18 U	0.91 U
Cyclohexane	NA	67 U	3.4 U	0.69 U	**0.7**	**1.2**	**1**	**0.65**	0.69 U
Dibromochloromethane	NA	66 U	3.4 U	0.68 U	0.34 U	0.34 U	1.7 U	0.34 U	1.7 U
Dichlorodifluoromethane	NA	38 U	**2**	**2.2**	**3.2**	**3.7**	**3**	**6**	**2.5**
Ethanol	NA	150 U	**51**	**22**	NA	NA	NA	NA	NA
Ethylbenzene	NA	34 U	**2.9**	**0.53**	0.17 U	**1.3**	**3.4**	**1.3**	**1.7**

Table 13
VOCs in Soil Vapor Intrusion Samples
Jung Sun Laundry Plume Site

	Structure:	B04	B04	B04	B04	B04	B04	B04	B04
	Sample Type:	Sub-Slab	Sub-Slab	Ambient	Indoor	Indoor	Sub-Slab	Indoor	Sub-Slab
	Sample ID:	BO4-SS1	BO4-SS2	BO4-OA1	B04-IA3	B04-IA53	B04-SS3	B04-IA4	B04-SS4
	Sample Date:	3/20/12	3/20/12	3/20/12	11/15/12	11/15/12	11/15/12	11/15/12	11/15/12
Units: µg/m3	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Dup. B04-IA3	Env. Sample	Env. Sample	Env. Sample
Hexachlorobutadiene	NA	83 U	4.3 U	0.85 U	NA	NA	NA	NA	NA
Methyl Tert Butyl Ether	NA	56 U	2.9 U	0.58 U	0.14 U	0.14 U	0.72 U	0.14 U	0.72 U
Methylene chloride	60	67 U	**3.8**	**2**	**9.2**	**8.4**	**3**	**19**	1.7 U
M-P-Xylene	NA	34 U	**11**	**2**	0.35 U	**4.2**	**12**	**4.5**	**6.3**
n-Heptane	NA	NA	NA	NA	0.16 U	**0.97**	**1.2**	**1.2**	0.82 U
n-Hexane	NA	68 U	**4**	**1.4**	**1.3**	**2**	**2.1**	**2.3**	**2**
O-Xylene	NA	34 U	**3.3**	**0.75**	0.17 U	**1.4**	**4.8**	**1.5**	**2.6**
Styrene	NA	33 U	1.7 U	0.34 U	NA	NA	NA	NA	NA
tert-Butyl alcohol	NA	94 U	4.9 U	0.97 U	NA	NA	NA	NA	NA
Tetrachloroethene (PCE)	100	**3200**	**490**	**1.6**	**1.6**	**7.7**	**21**	**10**	**200**
Toluene	NA	**180**	**130**	**3.9**	**0.24**	**11**	**14**	**11**	**6.6**
trans-1,2-Dichloroethene	NA	31 U	**3.6**	0.32 U	0.16 U	0.16 U	0.79 U	0.16 U	0.79 U
trans-1,3-Dichloropropene	NA	35 U	1.8 U	0.36 U	0.18 U	0.18 U	0.91 U	0.18 U	0.91 U
Trichloroethene (TCE)	5	**1300**	**170**	0.21 U	0.21 U	0.21 U	1.1 U	0.21 U	**23**
Trichlorofluoromethane	NA	44 U	2.2 U	**1.2**	**1.4**	**1.5**	**1.5**	**2.5**	**1.3**
Vinyl chloride	NA	20 U	1 U	0.2 U	0.2 U	0.2 U	0.51 U	0.2 U	0.51 U

Table 13
VOCs in Soil Vapor Intrusion Samples
Jung Sun Laundry Plume Site

	Structure:	B04	B04	B04	B04	B04	B04	B04	B04
	Sample Type:	Indoor	Sub-Slab	Indoor	Sub-Slab	Indoor	Sub-Slab	Indoor	Sub-Slab
	Sample ID:	B04-IA5	B04-SS5	B04-IA6	B04-SS6	B04-IA7	B04-SS7	B04-IA8	B04-SS8
	Sample Date:	11/15/12	11/15/12	11/15/12	11/15/12	11/15/12	11/15/12	11/15/12	11/15/12
Units: µg/m3	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1-Trichloroethane	NA	0.22 U	**3.6**	**0.25**	**19**	0.22 U	5.5 U	0.22 U	76 U
1,1,2,2-Tetrachloroethane	NA	0.27 U	2.1 U	0.27 U	1.4 U	0.27 U	6.9 U	0.27 U	96 U
1,1,2-Trichloroethane	NA	0.22 U	1.6 U	0.22 U	1.1 U	0.22 U	5.5 U	0.22 U	76 U
1,1,2-Trichlorotrifluoroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	0.16 U	1.2 U	0.16 U	0.81 U	0.16 U	4 U	0.16 U	57 U
1,1-Dichloroethene	NA	0.16 U	1.2 U	0.16 U	0.79 U	0.16 U	4 U	0.16 U	56 U
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	0.31 U	2.3 U	0.31 U	1.5 U	0.31 U	7.7 U	0.31 U	110 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	0.32 U	1.2 U	0.32 U	0.81 U	0.32 U	4 U	0.32 U	57 U
1,2-Dichloroethene, Total	NA	**0.17**	1.2 U	**0.36**	0.79 U	**9.4**	4 U	**0.58**	**900**
1,2-Dichloropropane	NA	0.37 U	1.4 U	0.37 U	0.92 U	0.37 U	4.6 U	0.37 U	65 U
1,2-Dichlorotetrafluoroethane	NA	0.28 U	2.1 U	0.28 U	1.4 U	0.28 U	7 U	**0.33**	98 U
1,3,5-Trimethylbenzene	NA	**0.84**	**1.7**	**0.39**	**2**	0.39 U	**5.1**	**1.5**	69 U
1,3-Butadiene	NA	**1.5**	0.66 U	**0.26**	0.44 U	**0.3**	2.2 U	**0.42**	31 U
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2,4-Trimethylpentane	NA	**3.5**	**2.3**	**0.74**	**0.95**	**0.99**	4.7 U	**9.4**	65 U
3-Chloropropene	NA	0.25 U	2.3 U	0.25 U	1.6 U	0.25 U	7.8 U	0.25 U	110 U
4-Ethyltoluene	NA	**0.78**	**1.7**	**0.49**	**1.9**	**0.24**	**7**	**1.7**	69 U
2-Butanone (MEK)	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	**8.2**	**5.9**	**0.94**	**1.4**	**1**	**3.4**	**2.8**	45 U
Benzyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	0.27 U	2 U	0.27 U	1.3 U	0.27 U	6.7 U	0.27 U	94 U
Bromoethene (Vinyl Bromide)	NA	0.35 U	1.3 U	0.35 U	0.87 U	0.35 U	4.4 U	0.35 U	61 U
Bromoform	NA	0.41 U	3.1 U	0.41 U	2.1 U	0.41 U	10 U	0.41 U	140 U
Bromomethane	NA	0.31 U	1.2 U	0.31 U	0.78 U	0.31 U	3.9 U	0.31 U	54 U
Carbon tetrachloride	NA	**0.96**	1.9 U	**0.42**	1.3 U	**0.46**	6.3 U	**0.42**	88 U
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	**0.52**	2 U	0.21 U	1.3 U	0.21 U	6.6 U	0.21 U	92 U
Chloroform	NA	**0.35**	**6.7**	**0.38**	**1.5**	**0.4**	4.9 U	0.2 U	68 U
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	**0.17**	1.2 U	**0.36**	0.79 U	**9.3**	4 U	**0.58**	**900**
cis-1,3-Dichloropropene	NA	0.18 U	1.4 U	0.18 U	0.91 U	0.18 U	4.5 U	0.18 U	64 U
Cyclohexane	NA	**0.99**	**1.1**	**1.7**	0.69 U	**0.36**	3.4 U	**2**	48 U
Dibromochloromethane	NA	0.34 U	2.6 U	0.34 U	1.7 U	0.34 U	8.5 U	0.34 U	120 U
Dichlorodifluoromethane	NA	**7.8**	3.7 U	**3.3**	**3.3**	**3.3**	12 U	**3.2**	170 U
Ethanol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	**2.6**	**6.3**	**0.99**	**5.1**	**0.56**	4.3 U	**3.4**	61 U

Table 13
VOCs in Soil Vapor Intrusion Samples
Jung Sun Laundry Plume Site

	Structure:	B04	B04	B04	B04	B04	B04	B04	B04
	Sample Type:	Indoor	Sub-Slab	Indoor	Sub-Slab	Indoor	Sub-Slab	Indoor	Sub-Slab
	Sample ID:	B04-IA5	B04-SS5	B04-IA6	B04-SS6	B04-IA7	B04-SS7	B04-IA8	B04-SS8
	Sample Date:	11/15/12	11/15/12	11/15/12	11/15/12	11/15/12	11/15/12	11/15/12	11/15/12
Units: µg/m3	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl Tert Butyl Ether	NA	0.14 U	**25**	0.14 U	**18**	0.14 U	**11**	0.14 U	150 U
Methylene chloride	60	**210** D	1.1 U	**4.4**	0.72 U	**3.9**	3.6 U	**6.3**	50 U
M-P-Xylene	NA	**10**	**110**	**2.9**	**2**	**1.8**	8.7 U	**12**	120 U
n-Heptane	NA	**3.1**	**4.1**	**1.2**	**3.6**	**1.6**	**7.9**	**4.2**	57 U
n-Hexane	NA	**8**	**19**	**2.6**	**33**	**3.5**	**83**	**7.8**	**56**
O-Xylene	NA	**3**	**90**	**0.98**	**240**	**0.65**	**1100**	**4.3**	**15000**
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene (PCE)	100	**61** D	**49**	**10**	**23**	**81** D	**15**	**110** D	53 U
Toluene	NA	**30** D	1.2 U	**13**	0.79 U	**9.1**	4 U	**18** D	56 U
trans-1,2-Dichloroethene	NA	0.16 U	1.4 U	0.16 U	0.91 U	0.16 U	4.5 U	0.16 U	64 U
trans-1,3-Dichloropropene	NA	0.18 U	1.6 U	0.18 U	**36**	0.18 U	**97**	0.18 U	**1400**
Trichloroethene (TCE)	5	0.21 U	1.7 U	**0.52**	**3.1**	**7.3**	**220**	**0.55**	79 U
Trichlorofluoromethane	NA	**3.3**	0.77 U	**1.5**	0.51 U	**1.6**	2.6 U	**1.4**	36 U
Vinyl chloride	NA	0.2 U	**33**	0.2 U	**26**	0.2 U	**18**	0.2 U	61 U

Table 13
VOCs in Soil Vapor Intrusion Samples
Jung Sun Laundry Plume Site

	Structure:	B04	B04	B04	B12	B12	B15	B15	B15
	Sample Type:	Indoor	Sub-Slab	Ambient	Indoor	Sub-Slab	Indoor	Indoor	Sub-Slab
	Sample ID:	B04-IA9	B04-SS9	B04-OA1	B04-IA4	B04-SS4	B04-IA3	B04-IA33	B04-SS3
	Sample Date:	11/15/12	11/15/12	11/15/12	3/27/13	3/27/13	3/27/13	3/27/13	3/27/13
Units: µg/m3	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Dup. B04-IA3	Env. Sample
1,1,1-Trichloroethane	NA	0.22 U	**55**	0.22 U	0.22 U	2.7 U	0.22 U	0.22 U	5.5 U
1,1,2,2-Tetrachloroethane	NA	0.27 U	2.1 U	0.27 U	0.27 UJ	3.4 U	0.27 UJ	0.27 UJ	6.9 U
1,1,2-Trichloroethane	NA	0.22 U	1.6 U	0.22 U	0.22 U	2.7 U	0.22 U	0.22 U	5.5 U
1,1,2-Trichlorotrifluoroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	0.16 U	1.2 U	0.16 U	0.16 U	2 U	0.16 U	0.16 U	4 U
1,1-Dichloroethene	NA	0.16 U	1.2 U	0.16 U	0.16 U	2 U	0.16 U	0.16 U	4 U
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	0.31 U	2.3 U	0.31 U	0.31 U	3.8 U	0.31 U	0.31 U	7.7 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	0.32 U	1.2 U	0.32 U	**0.38**	2 U	0.32 U	0.32 U	4 U
1,2-Dichloroethene, Total	NA	**0.53**	1.2 U	0.16 U	0.16 U	2 U	0.16 U	0.16 U	4 U
1,2-Dichloropropane	NA	0.37 U	1.4 U	0.37 U	0.37 U	2.3 U	0.37 U	0.37 U	4.6 U
1,2-Dichlorotetrafluoroethane	NA	**0.29**	2.1 U	0.28 U	0.28 U	3.5 U	0.28 U	0.28 U	7 U
1,3,5-Trimethylbenzene	NA	**1.2**	**3.8**	0.39 U	**0.46** J	2.5 U	0.39 UJ	**0.43** J	4.9 U
1,3-Butadiene	NA	**0.31**	0.66 U	**0.23**	0.18 U	1.1 U	0.18 U	0.18 U	2.2 U
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2,4-Trimethylpentane	NA	**3.8**	**1.8**	**0.54**	**0.75**	2.3 U	**1.1**	**1**	4.7 U
3-Chloropropene	NA	0.25 U	2.3 U	0.25 U	0.25 U	3.9 U	0.25 U	0.25 U	7.8 U
4-Ethyltoluene	NA	**1.1**	**5.8**	0.2 U	**0.56** J	2.5 U	**0.31** J	**0.25** J	4.9 U
2-Butanone (MEK)	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	**1.8**	**1.9**	**0.82**	**1.8**	1.6 U	**0.79**	**0.74**	3.2 U
Benzyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	0.27 U	2 U	0.27 U	0.27 U	3.4 U	0.27 U	0.27 U	6.7 U
Bromoethene (Vinyl Bromide)	NA	0.35 U	1.3 U	0.35 U	0.35 U	2.2 U	0.35 U	0.35 U	4.4 U
Bromoform	NA	0.41 U	3.1 U	0.41 U	0.41 U	5.2 U	0.41 U	0.41 U	10 U
Bromomethane	NA	0.31 U	1.2 U	0.31 U	0.31 U	1.9 U	0.31 U	0.31 U	3.9 U
Carbon tetrachloride	NA	**0.48**	1.9 U	**0.47**	**0.41**	3.1 U	**0.4**	**0.42**	6.3 U
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	0.21 U	2 U	0.21 U	0.21 U	3.3 U	0.21 U	0.21 U	6.6 U
Chloroform	NA	**0.22**	**5.5**	0.2 U	**3.2**	**16**	**0.3**	**0.27**	**5**
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	**0.53**	1.2 U	0.16 U	0.16 U	2 U	0.16 U	0.16 U	4 U
cis-1,3-Dichloropropene	NA	0.18 U	1.4 U	0.18 U	0.18 U	2.3 U	0.18 U	0.18 U	4.5 U
Cyclohexane	NA	**1**	1 U	**0.23**	**0.36**	1.7 U	**0.3**	**0.28**	3.4 U
Dibromochloromethane	NA	0.34 U	2.6 U	0.34 U	0.34 U	4.3 U	0.34 U	0.34 U	8.5 U
Dichlorodifluoromethane	NA	**3.2**	3.7 U	**3.4**	**2.4**	6.2 U	**2.2**	**2.3**	12 U
Ethanol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	**2.2**	**5.9**	**0.64**	**2.4**	2.2 U	**1.4**	**1.2**	4.3 U

Table 13
VOCs in Soil Vapor Intrusion Samples
Jung Sun Laundry Plume Site

	Structure:	B04	B04	B04	B12	B12	B15	B15	B15
	Sample Type:	Indoor	Sub-Slab	Ambient	Indoor	Sub-Slab	Indoor	Indoor	Sub-Slab
	Sample ID:	B04-IA9	B04-SS9	B04-OA1	B04-IA4	B04-SS4	B04-IA3	B04-IA33	B04-SS3
	Sample Date:	11/15/12	11/15/12	11/15/12	3/27/13	3/27/13	3/27/13	3/27/13	3/27/13
Units: µg/m3	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Dup. B04-IA3	Env. Sample
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl Tert Butyl Ether	NA	0.14 U	**18**	0.14 U	0.14 U	1.8 U	0.14 U	0.14 U	3.6 U
Methylene chloride	60	**6.7**	1.1 U	**6.1**	**6**	4.3 U	**14**	**13**	**11**
M-P-Xylene	NA	**8.1**	**5.5**	**2.2**	**8.2** J	5.4 U	**4.9** J	**4.5** J	11 U
n-Heptane	NA	**1.8**	**18**	**0.49**	**3.2**	2 U	**1.1**	**0.88**	4.1 U
n-Hexane	NA	**3.7**	**150**	**0.91**	**1.1**	**10**	**0.91**	**0.85**	**19**
O-Xylene	NA	**2.8**	**170**	**0.76**	**3.3** J	2.2 U	**1.7** J	**2** J	4.3 U
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene (PCE)	100	**38** D	**26**	**4.9**	**19**	**520**	**13**	**13**	**800**
Toluene	NA	**12**	1.2 U	**6.1**	**19**	**2.3**	**14**	**12**	**4.1**
trans-1,2-Dichloroethene	NA	0.16 U	1.4 U	0.16 U	0.16 U	2 U	0.16 U	0.16 U	4 U
trans-1,3-Dichloropropene	NA	0.18 U	**140**	0.18 U	0.18 U	2.3 U	0.18 U	0.18 U	4.5 U
Trichloroethene (TCE)	5	**0.44**	1.7 U	0.21 U	**7**	**430**	0.21 U	0.21 U	**12**
Trichlorofluoromethane	NA	**1.4**	0.77 U	**1.4**	**4.6**	**160**	**1.1**	**1.2**	**20**
Vinyl chloride	NA	0.2 U	**27**	0.2 U	0.2 U	1.3 U	0.2 U	0.2 U	2.6 U

Table 13
VOCs in Soil Vapor Intrusion Samples
Jung Sun Laundry Plume Site

	Structure:	B15
	Sample Type:	Ambient
	Sample ID:	B04-OA3
	Sample Date:	3/27/13
Units: µg/m3	Criteria	Env. Sample
1,1,1-Trichloroethane	NA	0.22 U
1,1,2,2-Tetrachloroethane	NA	0.27 UJ
1,1,2-Trichloroethane	NA	0.22 U
1,1,2-Trichlorotrifluoroethane	NA	NA
1,1-Dichloroethane	NA	0.16 U
1,1-Dichloroethene	NA	0.16 U
1,2,4-Trichlorobenzene	NA	NA
1,2,4-Trimethylbenzene	NA	NA
1,2-Dibromoethane	NA	0.31 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NA	NA
1,2-Dichlorobenzene	NA	NA
1,2-Dichloroethane	NA	0.32 U
1,2-Dichloroethene, Total	NA	0.16 U
1,2-Dichloropropane	NA	0.37 U
1,2-Dichlorotetrafluoroethane	NA	0.28 U
1,3,5-Trimethylbenzene	NA	0.39 UJ
1,3-Butadiene	NA	0.18 U
1,3-Dichlorobenzene	NA	NA
1,4-Dichlorobenzene	NA	NA
1,4-Dioxane	NA	NA
2,2,4-Trimethylpentane	NA	**0.21**
3-Chloropropene	NA	0.25 U
4-Ethyltoluene	NA	0.2 UJ
2-Butanone (MEK)	NA	NA
4-Methyl-2-pentanone (MIBK)	NA	NA
Benzene	NA	**0.49**
Benzyl chloride	NA	NA
Bromodichloromethane	NA	0.27 U
Bromoethene (Vinyl Bromide)	NA	0.35 U
Bromoform	NA	0.41 U
Bromomethane	NA	0.31 U
Carbon tetrachloride	NA	**0.43**
Chlorobenzene	NA	NA
Chloroethane	NA	0.21 U
Chloroform	NA	0.2 U
Chloromethane	NA	NA
cis-1,2-Dichloroethene	NA	0.16 U
cis-1,3-Dichloropropene	NA	0.18 U
Cyclohexane	NA	**0.25**
Dibromochloromethane	NA	0.34 U
Dichlorodifluoromethane	NA	**2.3**
Ethanol	NA	NA
Ethylbenzene	NA	**0.78**

Table 13
VOCs in Soil Vapor Intrusion Samples
Jung Sun Laundry Plume Site

	Structure:	B15
	Sample Type:	Ambient
	Sample ID:	B04-OA3
	Sample Date:	3/27/13
Units: µg/m3	Criteria	Env. Sample
Hexachlorobutadiene	NA	NA
Methyl Tert Butyl Ether	NA	0.14 U
Methylene chloride	60	**7.2**
M-P-Xylene	NA	**3** J
n-Heptane	NA	**0.7**
n-Hexane	NA	**0.35**
O-Xylene	NA	**1.1** J
Styrene	NA	NA
tert-Butyl alcohol	NA	NA
Tetrachloroethene (PCE)	100	**11**
Toluene	NA	**14**
trans-1,2-Dichloroethene	NA	0.16 U
trans-1,3-Dichloropropene	NA	0.18 U
Trichloroethene (TCE)	5	0.21 U
Trichlorofluoromethane	NA	**1.2**
Vinyl chloride	NA	0.2 U

Criteria: NYSDOH air guideline values for indoor and ambient air.
U - Not detected.
J - Estimated concentration.
NA - Not available.
Dup. - Field duplicate sample.
Detections are bolded.
Exceedances are highlighted.

Table 14
SVI Data Comparison to NYSDOH Matrices
Jung Sun Laundry Plume Site

Units: µg/m3			Concentrations			Concentration Range		Matrix
Parameter	Structure		Indoor	Sub-Slab	Outdoor	Indoor	Sub-Slab	Recommendation
PCE	B02	3/19/12	2.6	2.9	2.4	<3	<100	No further action
Matrix 2	B03	3/19/12	2.4	51		<3	<100	No further action
	B04 (1)	3/20/12	25	3200	1.6	3-<30	1000+	Mitigate
	B04 (2)	3/20/12	10	490		3-<30	100-<1000	Monitor/Mitigate
	B04 (3)	11/15/12	1.6 (7.7)	21	4.9	3-<30	<100	Take actions to idenify sources and reduce exposure
	B04 (4)	11/15/12	10	200		3-<30	100-<1000	Monitor/Mitigate
	B04 (5)	11/15/12	61	90		30-<100	<100	Take actions to idenify sources and reduce exposure
	B04 (6)	11/15/12	10	240		3-<30	100-<1000	Monitor/Mitigate
	B04 (7)	11/15/12	81	1100		30-<100	1000+	Mitigate
	B04 (8)	11/15/12	110	15000		100+	1000+	Mitigate
	B04 (9)	11/15/12	38	170		30-<100	100-<1000	Mitigate
	B12	3/27/13	19	520		3-<30	100-<1000	Monitor/Mitigate
	B15	3/27/13	13	800	11	3-<30	100-<1000	Monitor/Mitigate
TCE	B02	3/19/12	0.28	1.1U	0.21U	0.25-<1	<5	Take actions to idenify sources and reduce exposure
Matrix 1	B03	3/19/12	0.21U	0.41		<0.25	<5	No further action
	B04 (1)	3/20/12	2.2	1300	0.21U	1-<5	250+	Mitigate
	B04 (2)	3/20/12	0.49	170		0.25-<1	50-<250	Monitor/Mitigate
	B04 (3)	11/15/12	0.21U (0.21)	1.1U	0.21U	<0.25	<5	No further action
	B04 (4)	11/15/12	0.21U	23		<0.25	5-<50	No further action
	B04 (5)	11/15/12	0.21U	1.6U		<0.25	<5	No further action
	B04 (6)	11/15/12	0.52	36		0.25-<1	5-<50	Monitor
	B04 (7)	11/15/12	7.3	97		5+	50-<250	Mitigate
	B04 (8)	11/15/12	0.55	1400		0.25-<1	250+	Mitigate
	B04 (9)	11/15/12	0.44	140		0.25-<1	50-<250	Monitor/Mitigate
	B12	3/27/13	7	430		5+	250+	Mitigate
	B15	3/27/13	0.21U (0.21)	12	0.21U	<0.25	5-<50	No further action

U - Not detected.
J - Estimated concentration.
NA - Not available.
() - Field duplicate sample result.

Table 15
Properties of PCE and Breakdown Compounds
Jung Sun Laundry Plume Site

CAS No.	Chemical	Org. Car. partition coefficient K_{oc} (cm^3/g)	Log K_{oc} (unitless)	Diffusivity in air D_a (cm^2/s)	Diffusivity in water D_w (cm^2/s)	Pure component water sol S (mg/L)	Henry's Law Constant H' (unitless)	Normal boiling point (bp) T_B (^oC)	Density (Specific Gravity) ρ (g/cm^3)
127184	PCE	1.55E+02	2.19E+00	7.20E-02	8.20E-06	2.00E+02	7.53E-01	121.3	1.624
79016	TCE	1.66E+02	2.22E+00	7.90E-02	9.10E-06	1.47E+03	4.21E-01	87.2	1.466
156592	cis-1,2-DCE	3.55E+01	1.55E+00	7.36E-02	1.13E-05	3.50E+03	1.67E-01	60.5	1.284
156605	trans-1,2-DCE	5.25E+01	5.25E+01	7.07E-02	1.19E-05	6.30E+03	3.84E-01	47.7	1.2565
75014	VC	1.86E+01	1.27E+00	1.06E-01	1.23E-05	8.80E+03	1.10E+00	-13.9	0.908
75354	1,1-DCE	5.89E+01	1.77E+00	9.00E-02	1.04E-05	2.25E+03	1.07E+00	31.6	1.2129

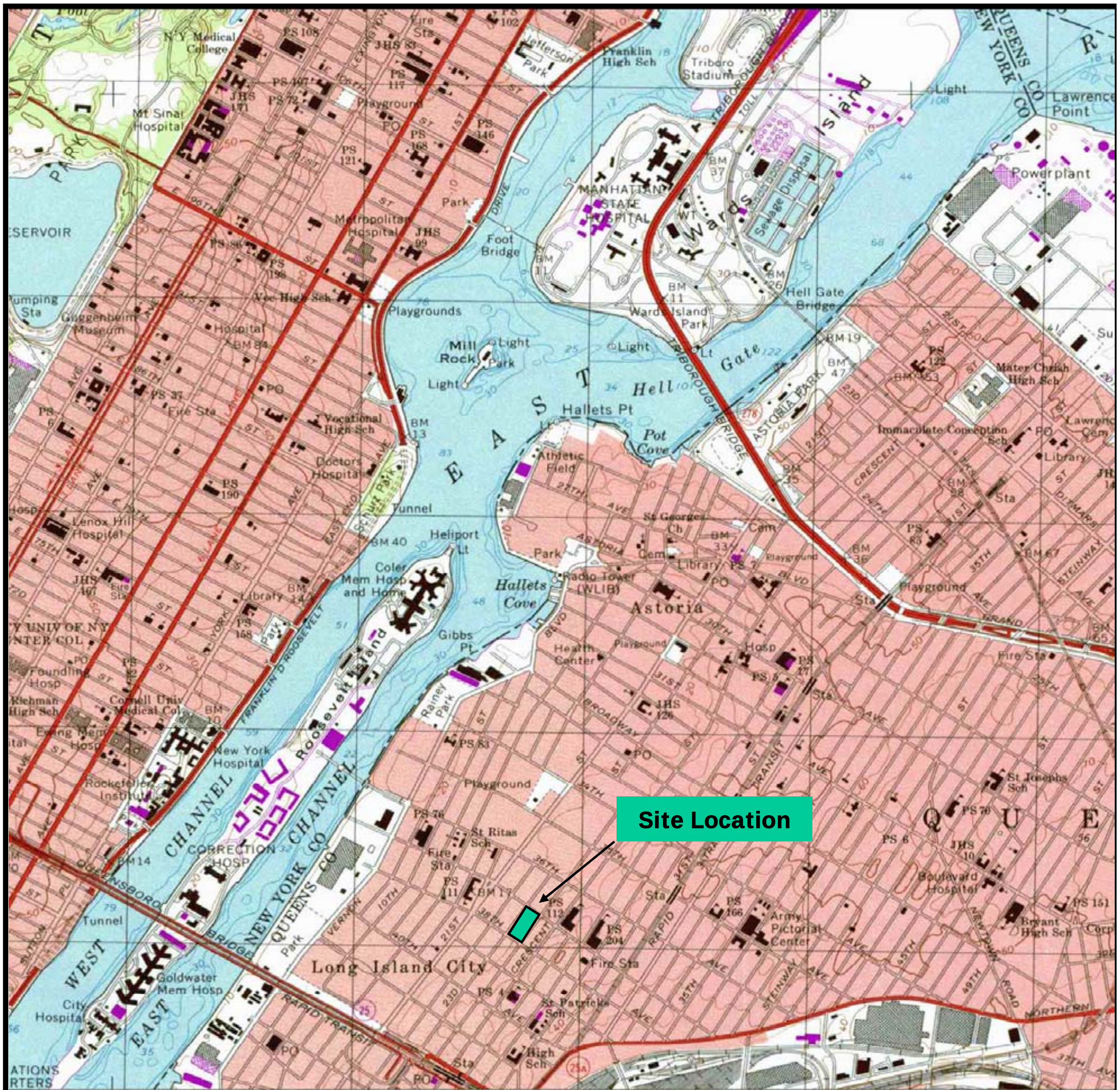
Table adapted from NJDEP (2005; Table G-2)
Density from the Hazardous Substances Databank (http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB)

Table 16
Groundwater Flow and Contaminant Migration
Jung Sun Laundry Plume Site

Contaminant	Horizontal Gradient (ft/ft)	Hydraulic Cond. (ft/day)	Effective Porosity	GW Flow (ft/day)	Partition K_{oc}	Carbon f_{oc}	Density P_b (g/cc)	Retardation Rd	Contaminant Transport ft/day	Contaminant Transport ft/year	Distance (ft)	Time (yrs)
UGA- Outwash Deposits												
PCE	0.0166	270.0	0.4	11.20	155	0.0049	1.5	3.85	2.91	1061.6	1000	0.9
TCE	0.0166	270.0	0.4	11.20	166	0.0049	1.5	4.05	2.76	1008.6	1000	1.0
cis-1,2-DCE	0.0166	270.0	0.4	11.20	355	0.0049	1.5	7.53	1.49	543.0	1000	1.8
trans-1,2-DCE	0.0166	270.0	0.4	11.20	53	0.0049	1.5	1.97	5.70	2079.7	1000	0.5
VC	0.0166	270.0	0.4	11.20	19	0.0049	1.5	1.34	8.34	3045.7	1000	0.3
1,1-DCE	0.0166	270.0	0.4	11.20	58.9	0.0049	1.5	2.08	5.38	1962.2	1000	0.5
Deposits High in Clay and Silt												
PCE	0.0166	1.5	0.4	0.06	155	0.0049	1.5	3.85	0.02	5.9	1000	169.5
TCE	0.0166	1.5	0.4	0.06	166	0.0049	1.5	4.05	0.02	5.6	1000	178.5
cis-1,2-DCE	0.0166	1.5	0.4	0.06	355	0.0049	1.5	7.53	0.01	3.0	1000	331.5
trans-1,2-DCE	0.0166	1.5	0.4	0.06	53	0.0049	1.5	1.97	0.03	11.6	1000	86.6
VC	0.0166	1.5	0.4	0.06	19	0.0049	1.5	1.34	0.05	16.9	1000	59.1
1,1-DCE	0.0166	1.5	0.4	0.06	58.9	0.0049	1.5	2.08	0.03	10.9	1000	91.7

Table 17
Qualitative Human Health Exposure Assessment
Jung Sun Laundry Plume Site

Environmental Media & Exposure Route	Human Exposure Assessment
Direct contact with wastewater in trenches (and incidental ingestion)	People may come into contact with wastewater if the building is rented and the trenches have not been remediated.
Ingestion of groundwater	Contaminated groundwater is not being used for drinking water, as the area is served by the public water supply. There are no known water supply wells in the area.
Direct contact with groundwater	People can come into contact if they complete ground-intrusive work at the site or off-site areas within the plume.
Direct contact with surface soils (and incidental ingestion)	People are not coming into contact because contaminated surface soils are covered with pavement.
Direct contact with subsurface soils (and incidental ingestion)	People can come into contact if they complete ground-intrusive work at the site.
Inhalation of air (exposures related to soil vapor intrusion)	A soil vapor intrusion evaluation conducted in adjacent buildings. NYSDEC and NYSDOH to evaluate remedial actions.



MN GN

12° / 213 MILS

0° 42' / 12 MILS

USGS Central Park (NY) Quadrangle

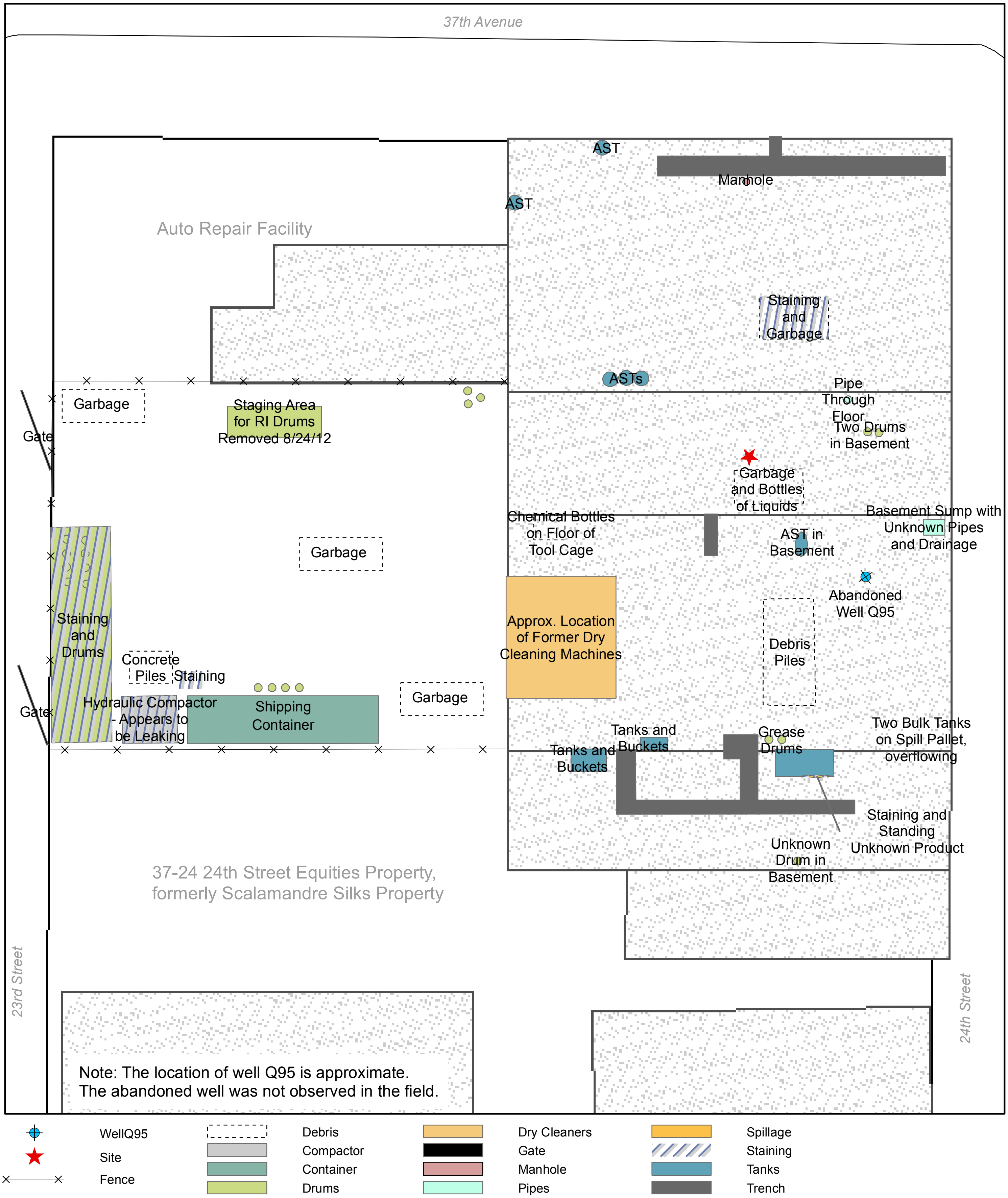
U.S.G.S. 1:24 000 SCALE TOPOGRAPHIC MAP

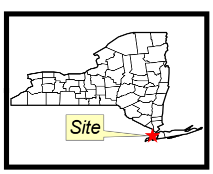
UTM GRID & 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

100 Red Schoolhouse Road,
Chestnut Ridge, New York 10977

ENVIRONMENTAL/CONSULTING ENGINEERS

AECOM	PROJECT: **JUNG SUN LAUNDRY PLUME** 37-10 24th Street. Long Island City, New York	SITE LOCATION MAP Project No: 60237880 Figure No: 1





Prepared for:

Prepared by:

AECOM

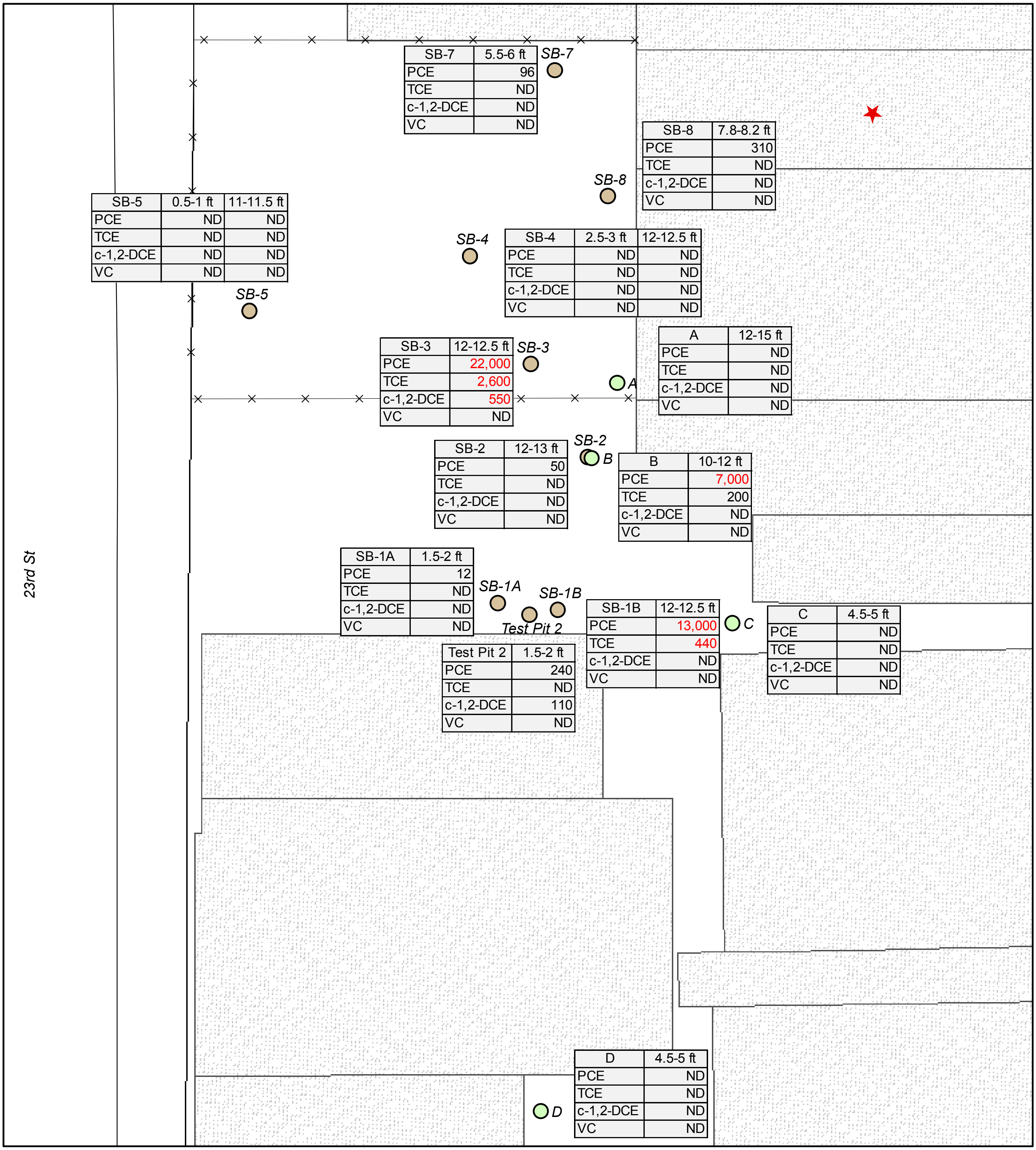
Facility Layout

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 12.5 25 Feet	5/6/2013	60237880	L:\work\101962\Working Draft\RI\Figures\F02 Layout.mxd

FIGURE:

2



SB-7	5.5-6 ft
PCE	96
TCE	ND
c-1,2-DCE	ND
VC	ND

SB-8	7.8-8.2 ft
PCE	310
TCE	ND
c-1,2-DCE	ND
VC	ND

SB-5	0.5-1 ft	11-11.5 ft
PCE	ND	ND
TCE	ND	ND
c-1,2-DCE	ND	ND
VC	ND	ND

SB-4	2.5-3 ft	12-12.5 ft
PCE	ND	ND
TCE	ND	ND
c-1,2-DCE	ND	ND
VC	ND	ND

SB-3	12-12.5 ft
PCE	22,000
TCE	2,600
c-1,2-DCE	550
VC	ND

A	12-15 ft
PCE	ND
TCE	ND
c-1,2-DCE	ND
VC	ND

SB-2	12-13 ft
PCE	50
TCE	ND
c-1,2-DCE	ND
VC	ND

B	10-12 ft
PCE	7,000
TCE	200
c-1,2-DCE	ND
VC	ND

SB-1A	1.5-2 ft
PCE	12
TCE	ND
c-1,2-DCE	ND
VC	ND

SB-1B	12-12.5 ft
PCE	13,000
TCE	440
c-1,2-DCE	ND
VC	ND

C	4.5-5 ft
PCE	ND
TCE	ND
c-1,2-DCE	ND
VC	ND

Test Pit 2	1.5-2 ft
PCE	240
TCE	ND
c-1,2-DCE	110
VC	ND

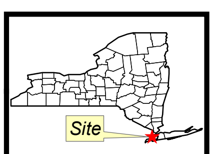
D	4.5-5 ft
PCE	ND
TCE	ND
c-1,2-DCE	ND
VC	ND

Phase 1 Soil Sample
Phase 2 Soil Sample
Site

ND - Not Detected

Units: µg/kg
PCE - Tetrachloroethene
TCE - Trichloroethene
DCE - Dichloroethene
VC - Vinyl chloride

Units: µg/kg
Sample results were compared to NYSDEC Part 375 Unrestricted Use criteria:
PCE - 1300 µg/kg, TCE - 470 µg/kg, and cis-1,2-DCE - 250 µg/kg.
Exceedances of the criteria are in red.



Prepared for:

Prepared by:

AECOM

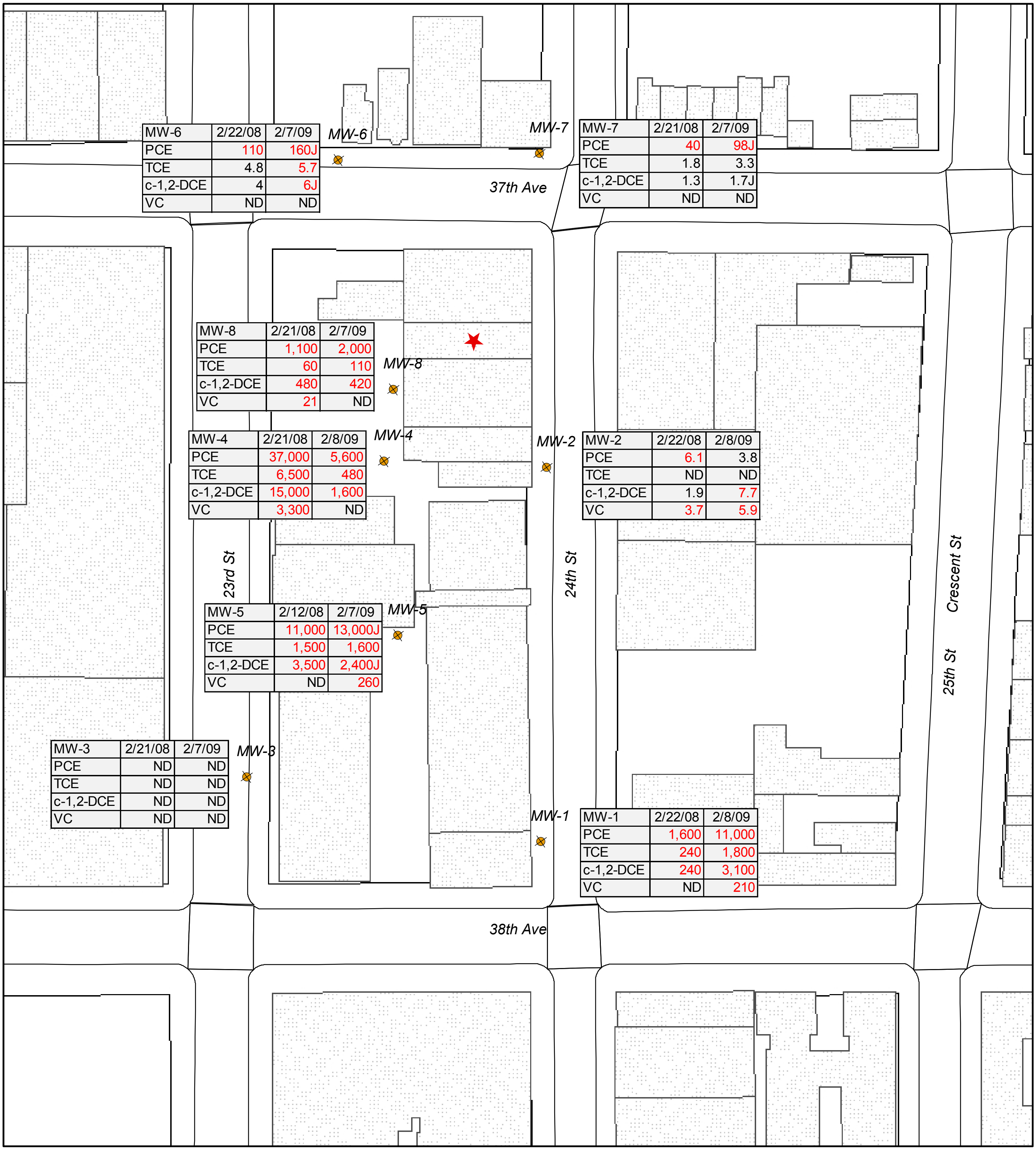
Site Characterization Soil Sample Results

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 10 20 Feet	12/19/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F03 Soil SI.mxd

FIGURE:

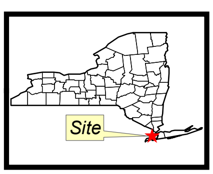
3



Monitoring Well
Site

PCE - Tetrachloroethene
TCE - Trichloroethene
DCE - Dichloroethene
VC - Vinyl chloride
ND - Not Detected

Units: µg/L.
The NYSDEC Class GA criteria are 2 µg/L for VC and 5 µg/L for the remaining compounds.
Exceedances of the criteria are in red.



Prepared for:

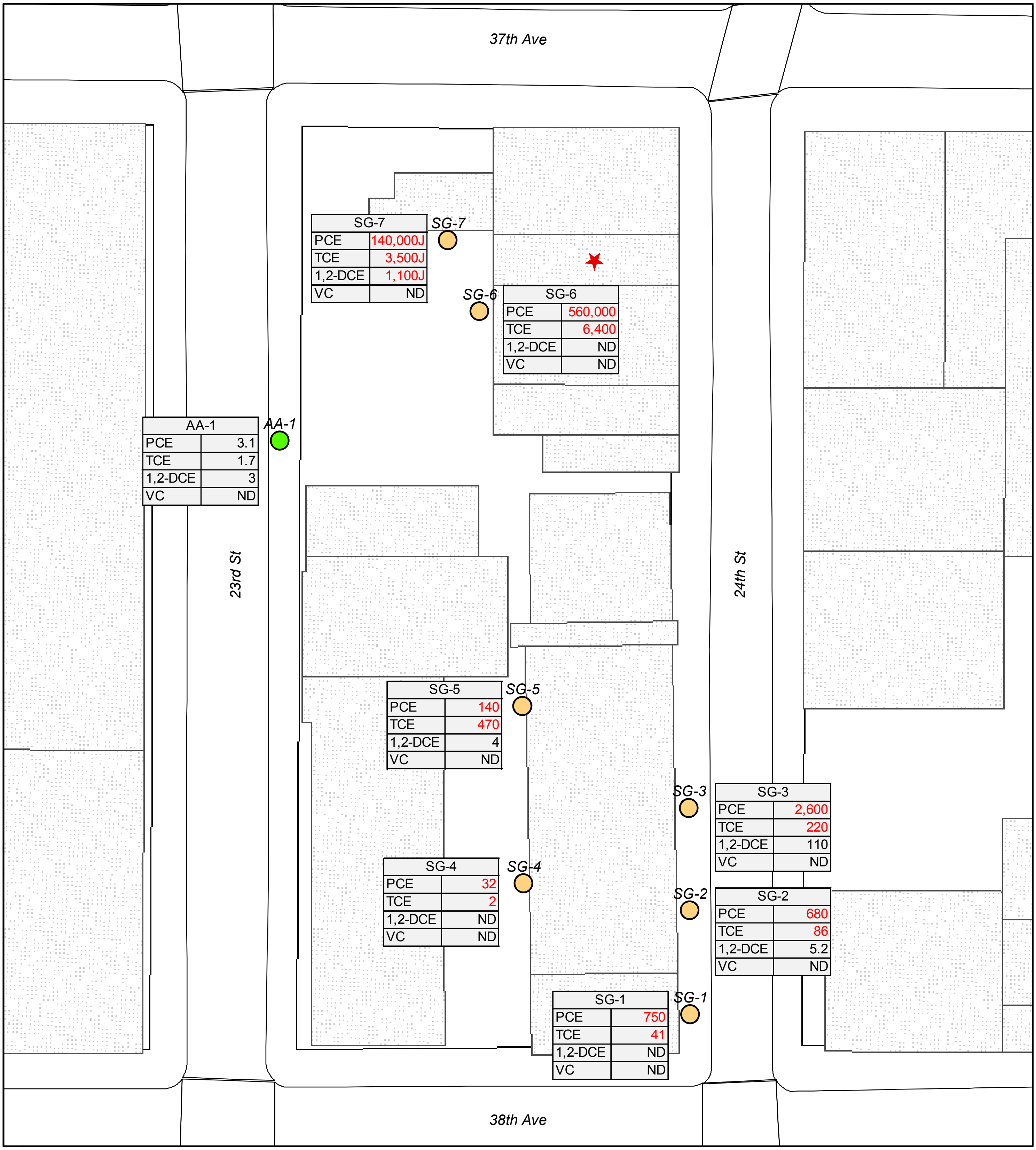
Prepared by:
AECOM

Site Characterization Groundwater Sample Results

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 47.5 95 Feet	12/19/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F04 GW SI.mxd

FIGURE:
4



Soil Gas (May 2009)
Outdoor Air
Site

Units: µg/m3.
PCE - Tetrachloroethene
TCE - Trichloroethene
DCE - Dichloroethene
VC - Vinyl chloride

ND - Not Detected

Units: µg/m3
Sampling results were compared to EPA (2002) genric screening levels for shallow soil gas; risk 1E6. The thresholds are: PCE - 8.1 µg/m3, TCE - 0.22 µg/m3, and cis-1,2-DCE - 350.
Exceedances of the thresholds are in red.

Site

Prepared for:

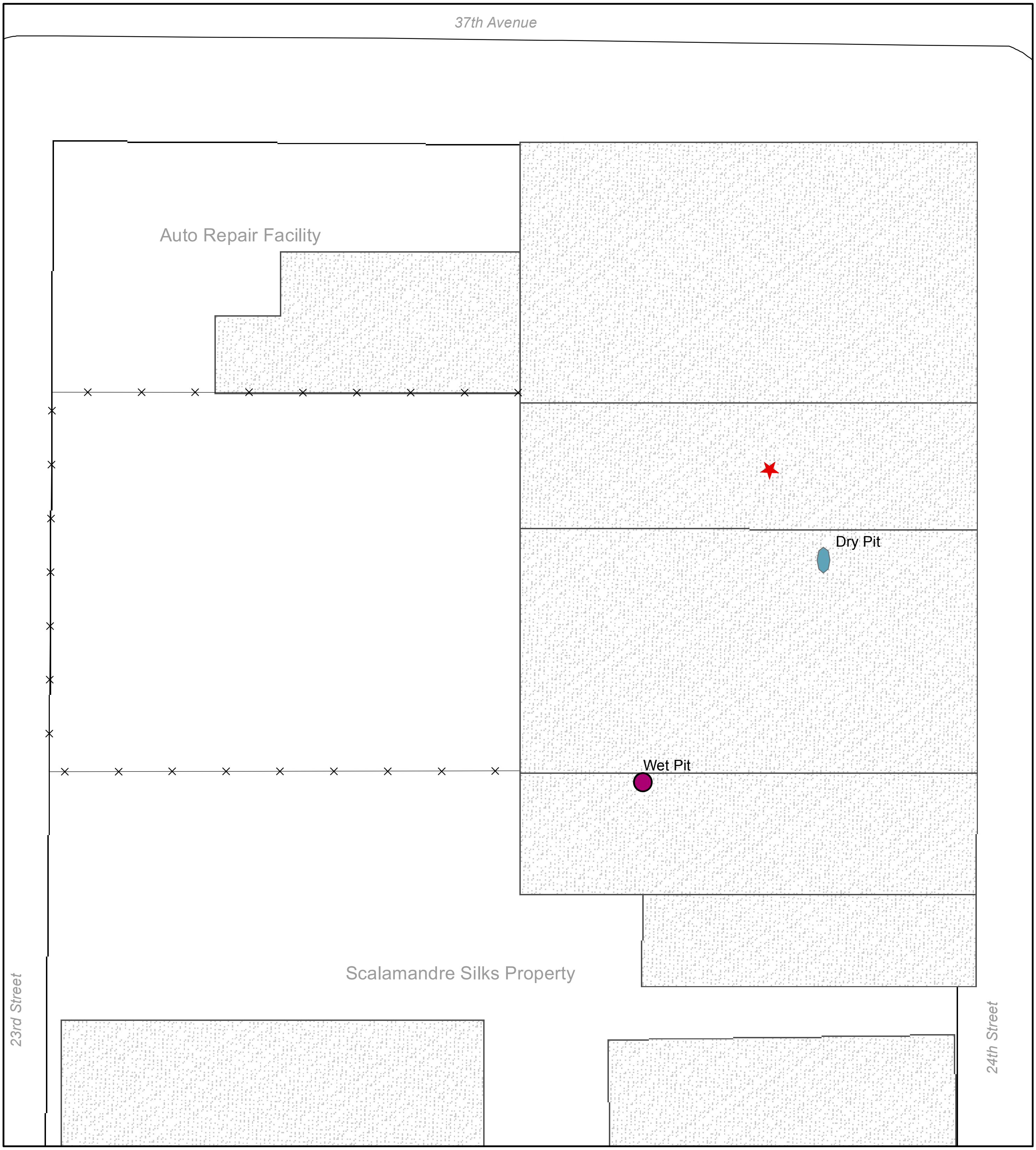
Prepared by:
AECOM

Site Characterization Soil Gas Sample Results

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 32.5 65 Feet	12/19/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F05 SG SI.mxd

FIGURE: 5



Wet Pit Sample
Site

Site

Prepared for:

Prepared by:

AECOM

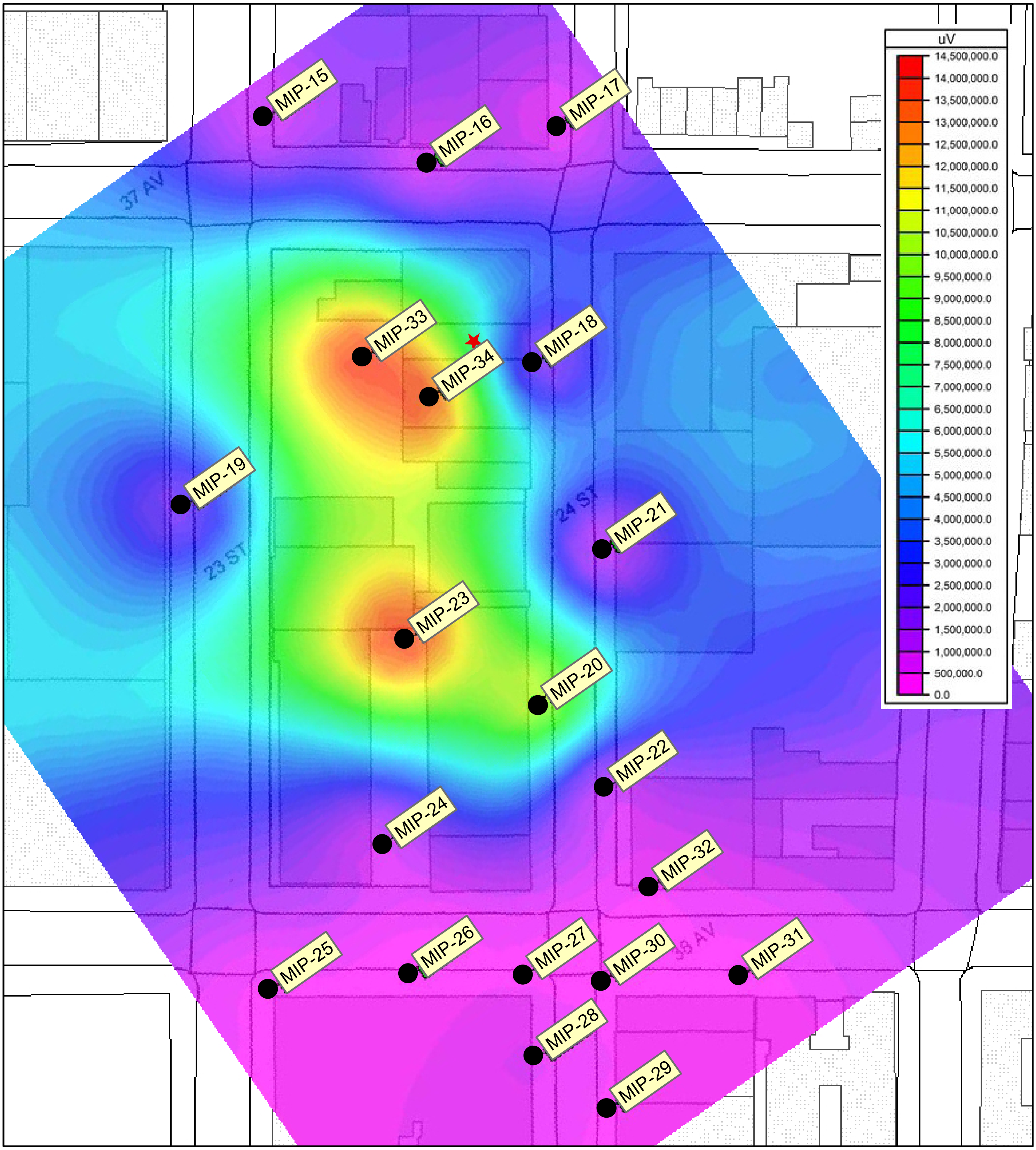
Facility Sample Location

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 13.5 27 Feet	12/10/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F06 WP Loc.mxd

FIGURE:

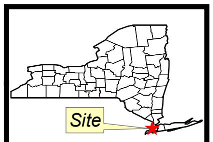
6



● MIP Location

★ Site

The maximum reading at each location formed the basis of the interpolation.



Prepared for:

Prepared by: AECOM

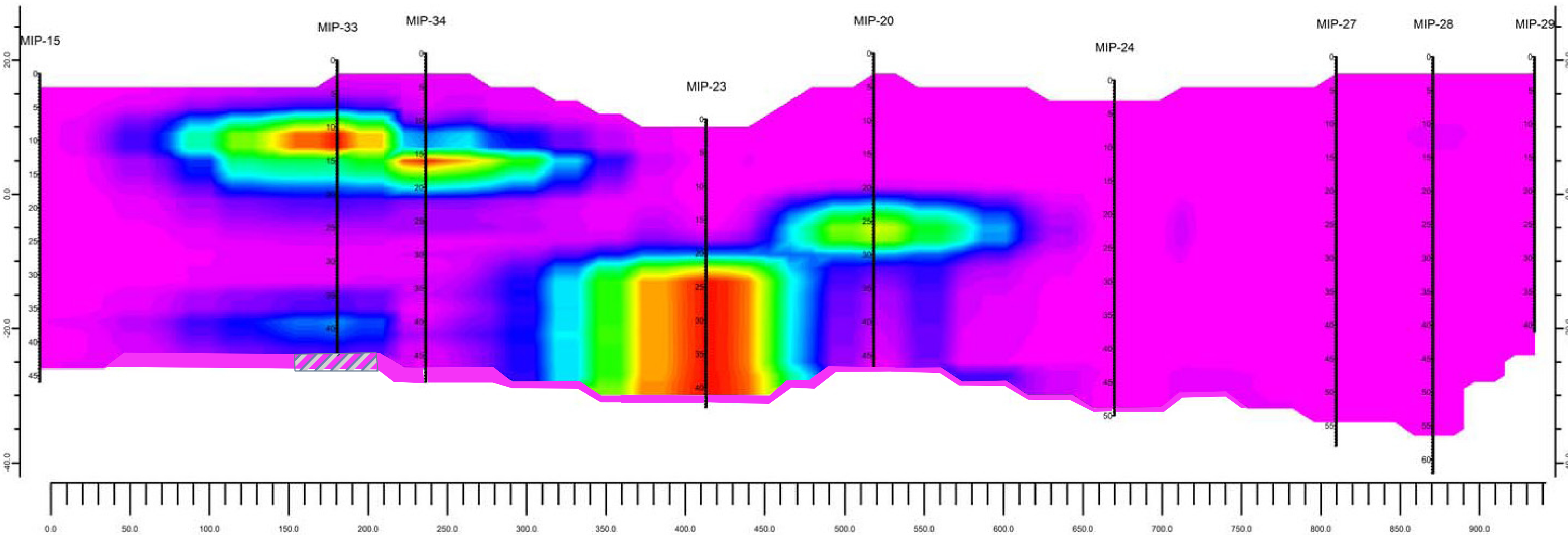
MIP Electron Capture Detector Results Plan View

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 42.5 85 Feet	12/10/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F07 MIP Plan.mxd

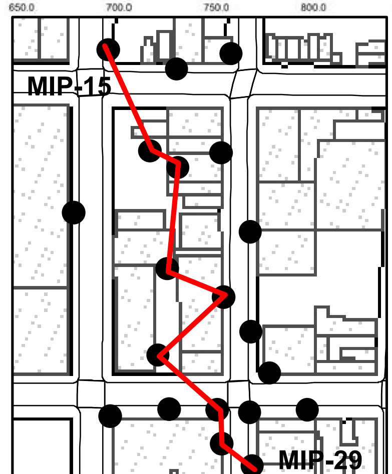
FIGURE: 7

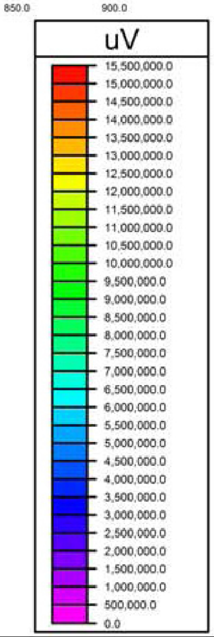
ECD Cross-Section

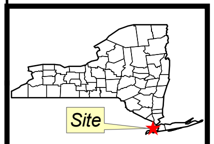


Notes: The software used by Zebra Environmental to create the cross-section truncated the figure at depth. The original figure was modified with Zebra Environmental's approval to show the layer of low ECD readings to appropriately represent the measurements at depth.

The MIP results show delineation of the groundwater chlorinated solvent concentratons to 5 µg/L except at MIP-33. At MIP 33 the probe detected ECD levels greater than 15,000,000 µV (the maximum level the MIP can quantify) while the bottom was only at 500,000 µV. The elevated levels at the bottom of MIP 33 may result from residual contamination in the equipment. This area is hatched on the cross-section.







Prepared for:

Prepared by:

AECOM

MIP Electron Capture Detector Results Cross-Section

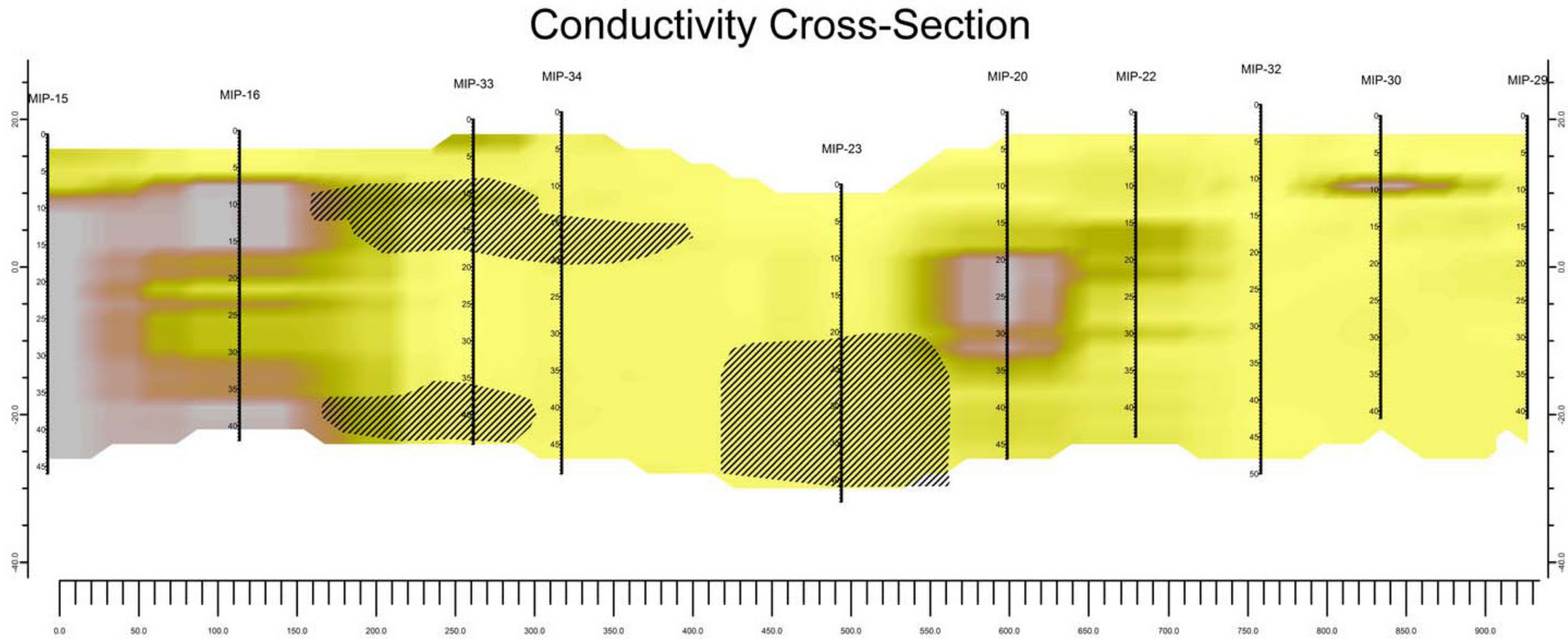
Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

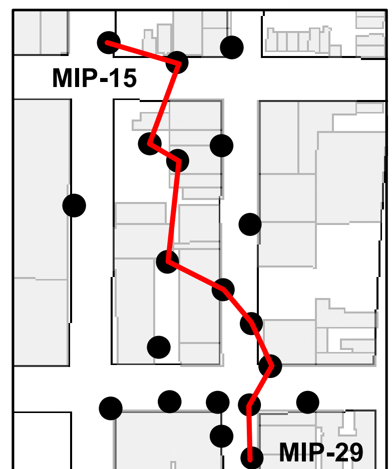
SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 162.5 325 Feet	5/29/2013	60237880	L:\work\101962\Working Draft\RI\Figures\F08 MIP X.mxd

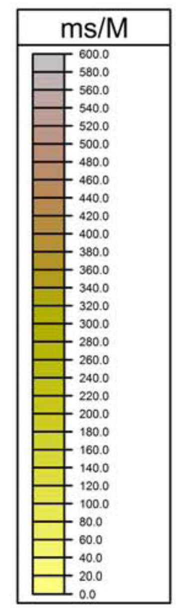
FIGURE:

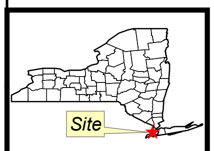
8

Conductivity Cross-Section









Prepared for:

Prepared by:

AECOM

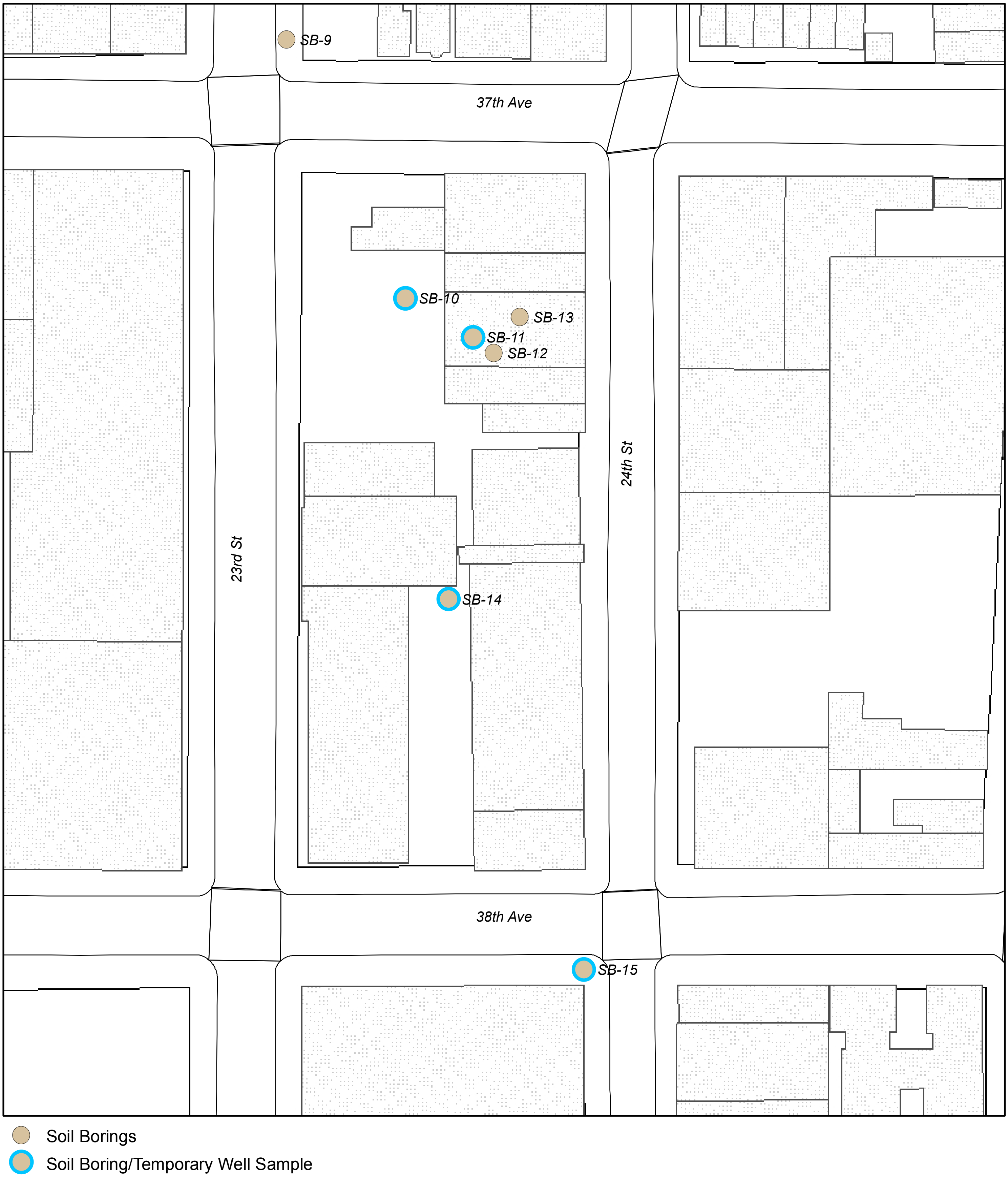
MIP Conductivity Results Cross-Section

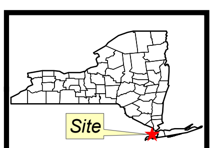
Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 162.5 325 Feet	11/15/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F09 MIP Xcond.mxd

FIGURE:

9





Prepared for:

Prepared by:

AECOM

Soil Boring and Temporary Well Locations

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
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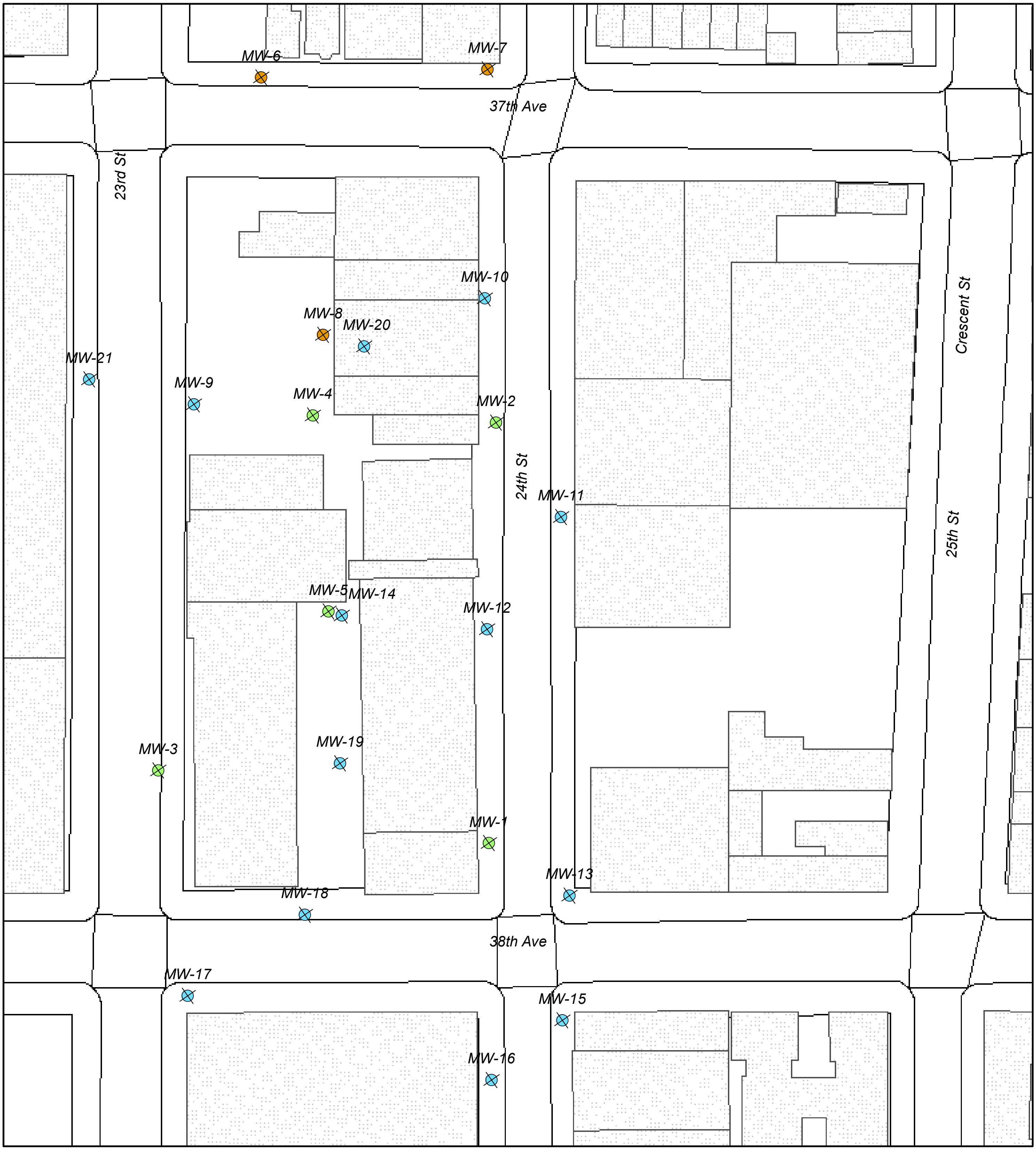
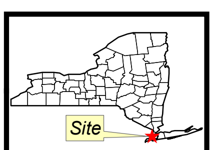
FIGURE:

10



Monitoring Well Installed for:
- Scalamandre Silks Site Investigation
- Remedial Investigation
- Site Characterization



Prepared for:

Prepared by:

AECOM

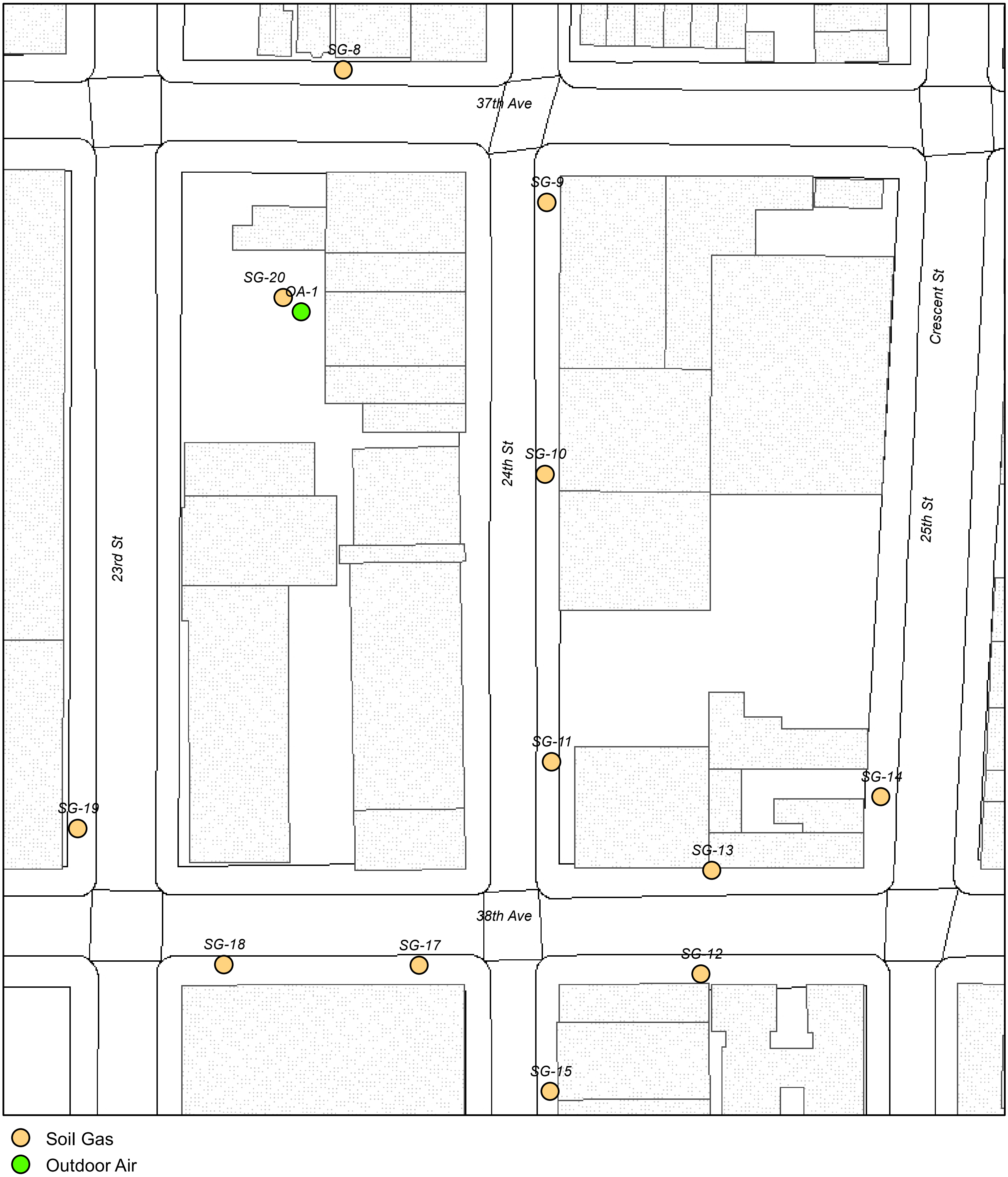
Monitoring Well Locations

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 42.5 85 Feet	11/14/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F11 MW Loc.mxd

FIGURE:

11



Prepared for:

Prepared by:

AECOM

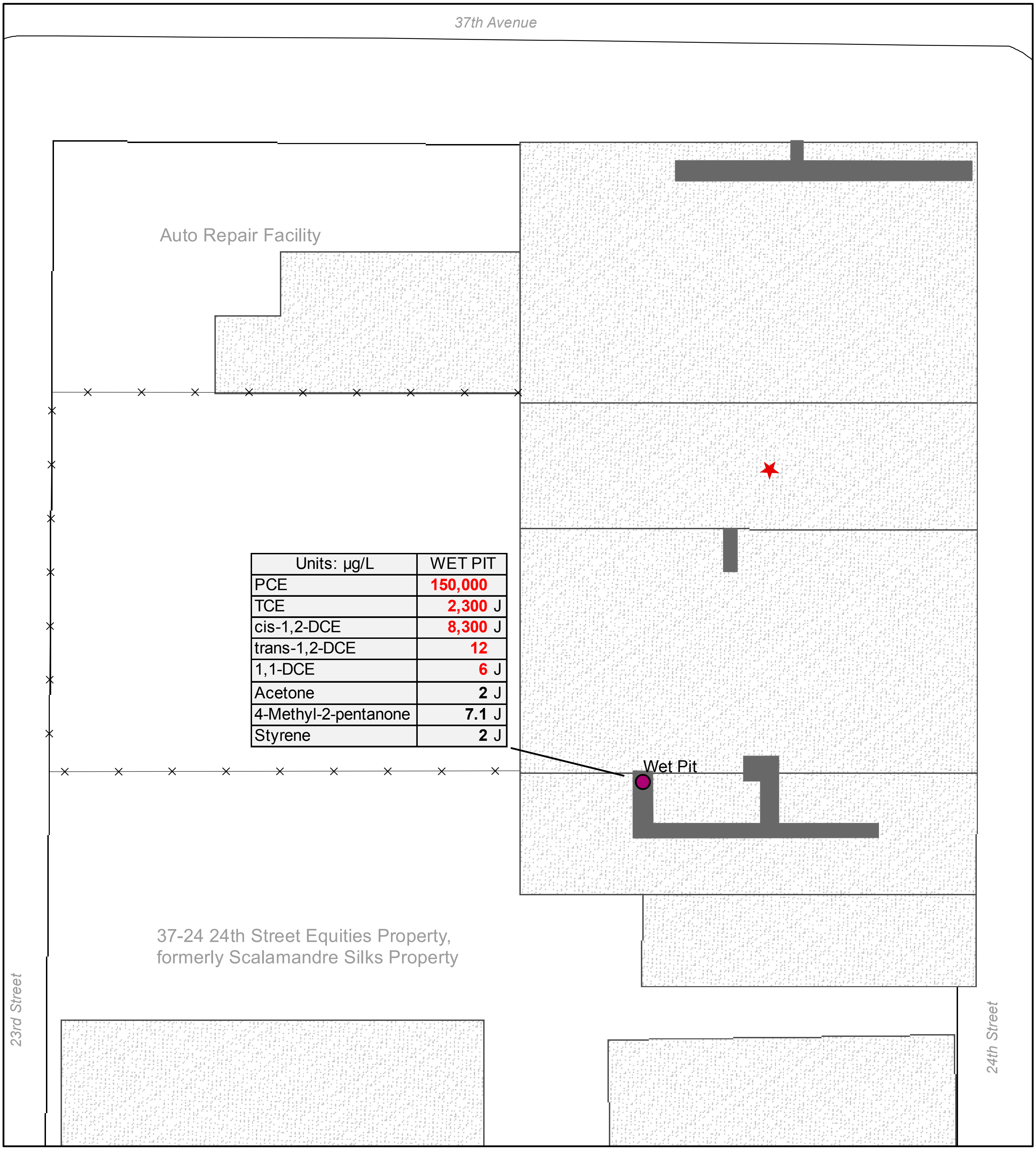
Soil Gas Sample Locations

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 42.5 85 Feet	11/15/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F12 SG Loc.mxd

FIGURE:

12



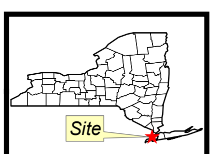
Units: µg/L	WET PIT
PCE	150,000
TCE	2,300 J
cis-1,2-DCE	8,300 J
trans-1,2-DCE	12
1,1-DCE	6 J
Acetone	2 J
4-Methyl-2-pentanone	7.1 J
Styrene	2 J

Wet Pit Sample
Site
Trench

PCE - Tetrachloroethene
TCE - Trichloroethene
DCE - Dichloroethene

J - Estimated

Sample results compared to NYSDEC Class GA criteria. The threshold is 5 µg/L for all parameters detected, except 50 µg/L for acetone and no threshold for 4-methyl-2 pentanone. Exceedances are in red.



Prepared for:

Prepared by:

AECOM

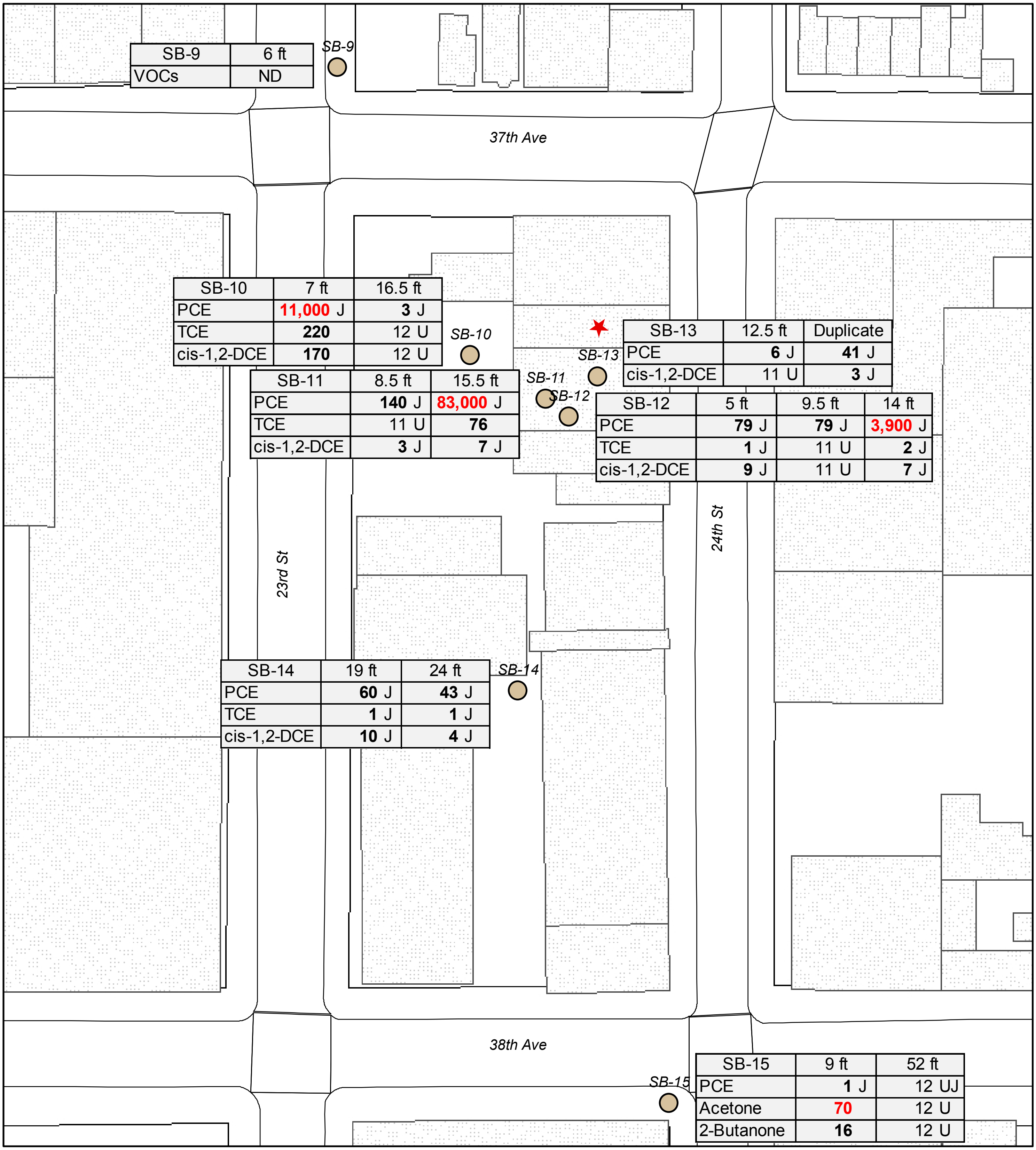
Facility Sample VOC Results

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 12.5 25 Feet	12/19/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F13 WP Res.mxd

FIGURE:

13



SB-9	6 ft
VOCs	ND

SB-10	7 ft	16.5 ft
PCE	**11,000** J	**3** J
TCE	**220**	12 U
cis-1,2-DCE	**170**	12 U

SB-13	12.5 ft	Duplicate
PCE	**6** J	**41** J
cis-1,2-DCE	11 U	**3** J

SB-11	8.5 ft	15.5 ft
PCE	**140** J	**83,000** J
TCE	11 U	**76**
cis-1,2-DCE	**3** J	**7** J

SB-12	5 ft	9.5 ft	14 ft
PCE	**79** J	**79** J	**3,900** J
TCE	**1** J	11 U	**2** J
cis-1,2-DCE	**9** J	11 U	**7** J

SB-14	19 ft	24 ft
PCE	**60** J	**43** J
TCE	**1** J	**1** J
cis-1,2-DCE	**10** J	**4** J

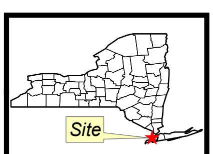
SB-15	9 ft	52 ft
PCE	**1** J	12 UJ
Acetone	**70**	12 U
2-Butanone	**16**	12 U

Soil Borings
Site

PCE - Tetrachloroethene
TCE - Trichloroethene
DCE - Dichloroethene
VC - Vinyl chloride

J - Estimated
U - Not Detected

Units: µg/kg
Sample results were compared to NYSDEC Part 375 Unrestricted Use criteria:
PCE - 1300 µg/kg, TCE - 470 µg/kg, cis-1,2-DCE - 250 µg/kg,
acetone - 50 µg/kg, and 2-butanone - 120 µg/kg.
Exceedances of the criteria are in red.



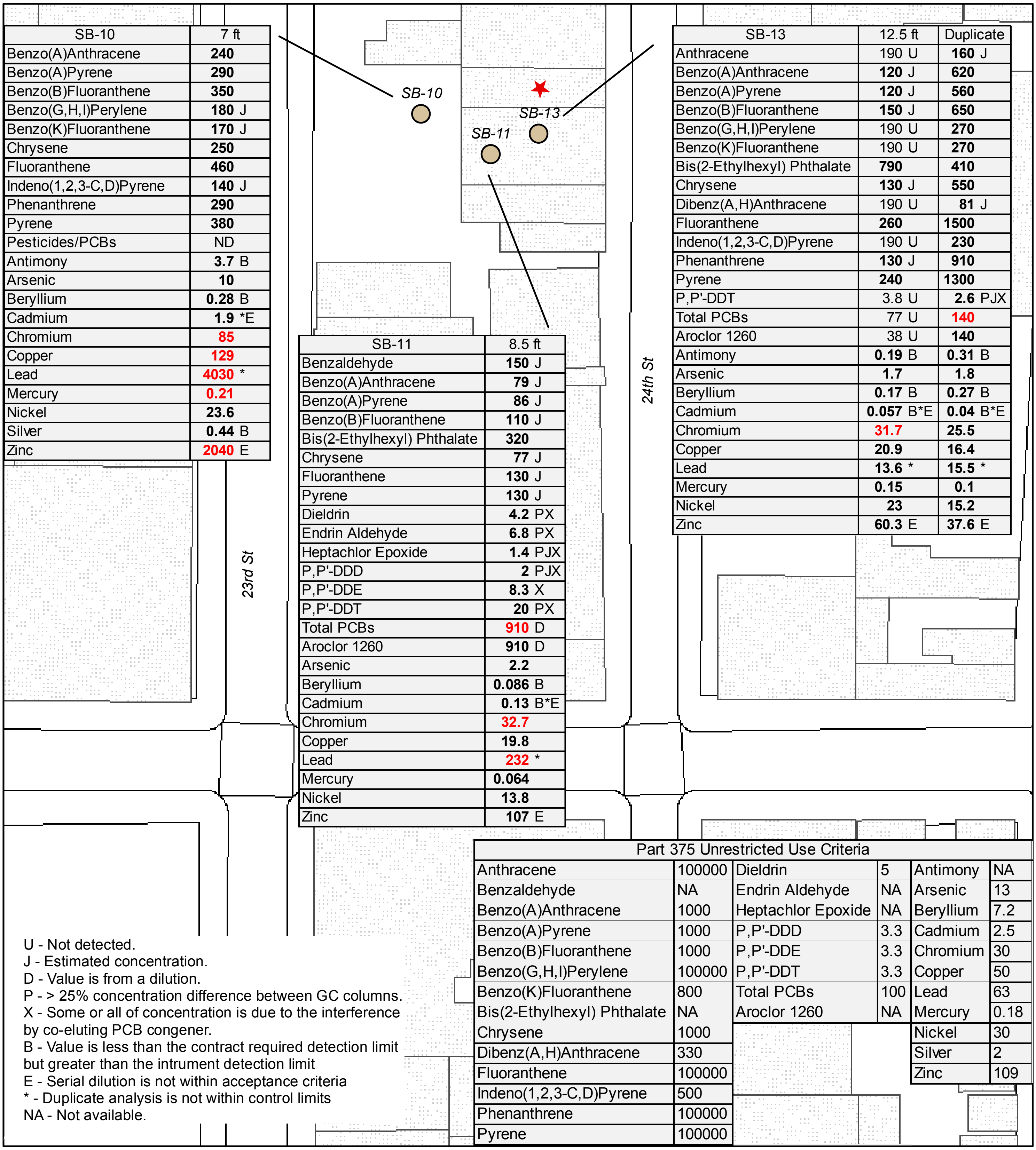
Prepared for:
Prepared by:
AECOM

Soil Boring VOC Results

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 42.5 85 Feet	12/19/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F14 SB Res V.mxd

FIGURE:
14



SB-10	7 ft
Benzo(A)Anthracene	**240**
Benzo(A)Pyrene	**290**
Benzo(B)Fluoranthene	**350**
Benzo(G,H,I)Perylene	**180** J
Benzo(K)Fluoranthene	**170** J
Chrysene	**250**
Fluoranthene	**460**
Indeno(1,2,3-C,D)Pyrene	**140** J
Phenanthrene	**290**
Pyrene	**380**
Pesticides/PCBs	ND
Antimony	**3.7** B
Arsenic	**10**
Beryllium	**0.28** B
Cadmium	**1.9** *E
Chromium	**85**
Copper	**129**
Lead	**4030** *
Mercury	**0.21**
Nickel	**23.6**
Silver	**0.44** B
Zinc	**2040** E

SB-13	12.5 ft	Duplicate
Anthracene	190 U	**160** J
Benzo(A)Anthracene	**120** J	**620**
Benzo(A)Pyrene	**120** J	**560**
Benzo(B)Fluoranthene	**150** J	**650**
Benzo(G,H,I)Perylene	190 U	**270**
Benzo(K)Fluoranthene	190 U	**270**
Bis(2-Ethylhexyl) Phthalate	**790**	**410**
Chrysene	**130** J	**550**
Dibenz(A,H)Anthracene	190 U	**81** J
Fluoranthene	**260**	**1500**
Indeno(1,2,3-C,D)Pyrene	190 U	**230**
Phenanthrene	**130** J	**910**
Pyrene	**240**	**1300**
P,P'-DDT	3.8 U	**2.6** PJX
Total PCBs	77 U	**140**
Aroclor 1260	38 U	**140**
Antimony	**0.19** B	**0.31** B
Arsenic	**1.7**	**1.8**
Beryllium	**0.17** B	**0.27** B
Cadmium	**0.057** B*E	**0.04** B*E
Chromium	**31.7**	**25.5**
Copper	**20.9**	**16.4**
Lead	**13.6** *	**15.5** *
Mercury	**0.15**	**0.1**
Nickel	**23**	**15.2**
Zinc	**60.3** E	**37.6** E

SB-11	8.5 ft
Benzaldehyde	**150** J
Benzo(A)Anthracene	**79** J
Benzo(A)Pyrene	**86** J
Benzo(B)Fluoranthene	**110** J
Bis(2-Ethylhexyl) Phthalate	**320**
Chrysene	**77** J
Fluoranthene	**130** J
Pyrene	**130** J
Dieldrin	**4.2** PX
Endrin Aldehyde	**6.8** PX
Heptachlor Epoxide	**1.4** PJX
P,P'-DDD	**2** PJX
P,P'-DDE	**8.3** X
P,P'-DDT	**20** PX
Total PCBs	**910** D
Aroclor 1260	**910** D
Arsenic	**2.2**
Beryllium	**0.086** B
Cadmium	**0.13** B*E
Chromium	**32.7**
Copper	**19.8**
Lead	**232** *
Mercury	**0.064**
Nickel	**13.8**
Zinc	**107** E

U - Not detected.
J - Estimated concentration.
D - Value is from a dilution.
P - > 25% concentration difference between GC columns.
X - Some or all of concentration is due to the interference by co-eluting PCB congener.
B - Value is less than the contract required detection limit but greater than the intrument detection limit
E - Serial dilution is not within acceptance criteria
* - Duplicate analysis is not within control limits
NA - Not available.

Part 375 Unrestricted Use Criteria					
Anthracene	100000	Dieldrin	5	Antimony	NA
Benzaldehyde	NA	Endrin Aldehyde	NA	Arsenic	13
Benzo(A)Anthracene	1000	Heptachlor Epoxide	NA	Beryllium	7.2
Benzo(A)Pyrene	1000	P,P'-DDD	3.3	Cadmium	2.5
Benzo(B)Fluoranthene	1000	P,P'-DDE	3.3	Chromium	30
Benzo(G,H,I)Perylene	100000	P,P'-DDT	3.3	Copper	50
Benzo(K)Fluoranthene	800	Total PCBs	100	Lead	63
Bis(2-Ethylhexyl) Phthalate	NA	Aroclor 1260	NA	Mercury	0.18
Chrysene	1000			Nickel	30
Dibenz(A,H)Anthracene	330			Silver	2
Fluoranthene	100000			Zinc	109
Indeno(1,2,3-C,D)Pyrene	500				
Phenanthrene	100000				
Pyrene	100000				

SoilBorings
Site

Units: µg/kg
Sample results were compared to NYSDEC Part 375 Unrestricted Use criteria. The criteria are listed above.
Exceedances of the criteria are in red.

Site

Prepared for:

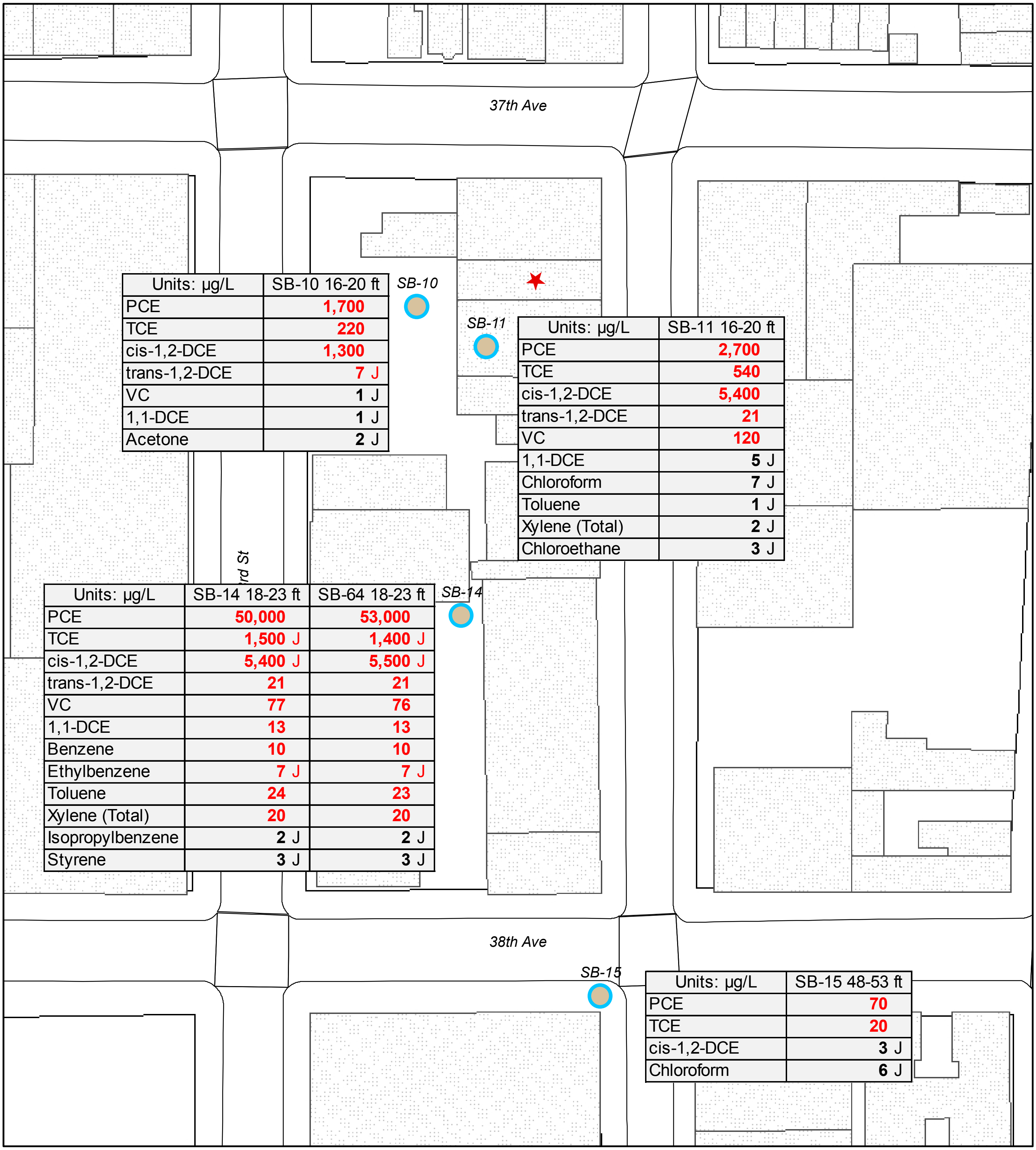
Prepared by:
AECOM

Soil Boring SVOC, Pesticide/PCBs, and Metals Results

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 42.5 85 Feet	11/14/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F15 SB Res O.mxd

FIGURE:
15



Units: µg/L	SB-10 16-20 ft
PCE	1,700
TCE	220
cis-1,2-DCE	1,300
trans-1,2-DCE	7 J
VC	1 J
1,1-DCE	1 J
Acetone	2 J

Units: µg/L	SB-11 16-20 ft
PCE	2,700
TCE	540
cis-1,2-DCE	5,400
trans-1,2-DCE	21
VC	120
1,1-DCE	5 J
Chloroform	7 J
Toluene	1 J
Xylene (Total)	2 J
Chloroethane	3 J

Units: µg/L	SB-14 18-23 ft	SB-64 18-23 ft
PCE	50,000	53,000
TCE	1,500 J	1,400 J
cis-1,2-DCE	5,400 J	5,500 J
trans-1,2-DCE	21	21
VC	77	76
1,1-DCE	13	13
Benzene	10	10
Ethylbenzene	7 J	7 J
Toluene	24	23
Xylene (Total)	20	20
Isopropylbenzene	2 J	2 J
Styrene	3 J	3 J

Units: µg/L	SB-15 48-53 ft
PCE	70
TCE	20
cis-1,2-DCE	3 J
Chloroform	6 J

Temporary Wells
Site

PCE - Tetrachloroethene
TCE - Trichloroethene
DCE - Dichloroethene
VC - Vinyl chloride

J - Estimated

Sampling results were compared to NYSDEC Class GA is 5 µg/L except for 50 µg/L for acetone, 7 µg/L for chloroform, 2 µg/L for vinyl chloride, and 1 µg/L for benzene. Exceedances of the thresholds are in red.

Site

Prepared for:

Prepared by:

AECOM

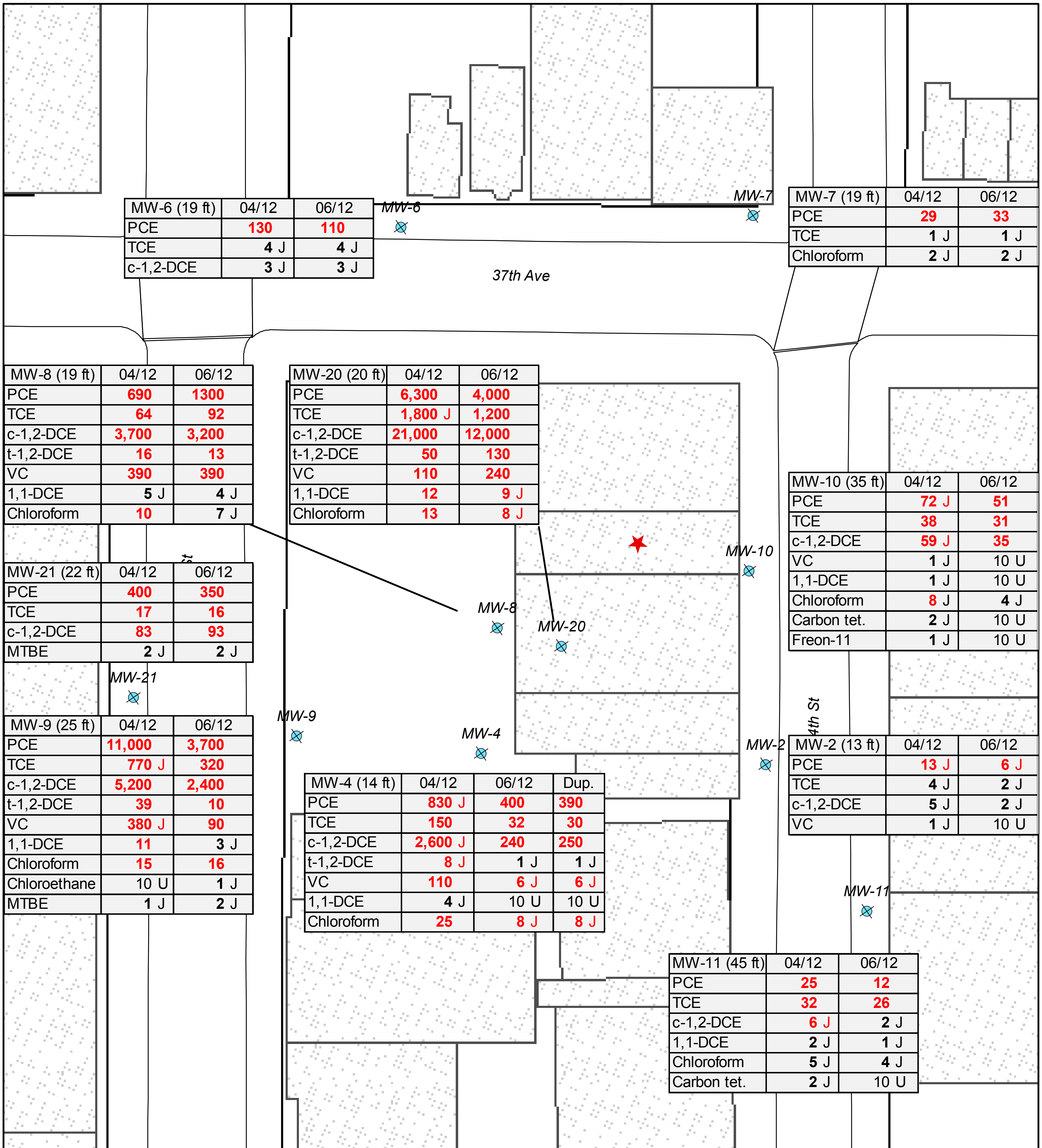
Temporary Well VOC Results

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 42.5 85 Feet	12/19/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F16 TWell Res.mxd

FIGURE:

16



MW-6 (19 ft)	04/12	06/12
PCE	130	110
TCE	4 J	4 J
c-1,2-DCE	3 J	3 J

MW-7 (19 ft)	04/12	06/12
PCE	29	33
TCE	1 J	1 J
Chloroform	2 J	2 J

MW-8 (19 ft)	04/12	06/12
PCE	690	1300
TCE	64	92
c-1,2-DCE	3,700	3,200
t-1,2-DCE	16	13
VC	390	390
1,1-DCE	5 J	4 J
Chloroform	10	7 J

MW-20 (20 ft)	04/12	06/12
PCE	6,300	4,000
TCE	1,800 J	1,200
c-1,2-DCE	21,000	12,000
t-1,2-DCE	50	130
VC	110	240
1,1-DCE	12	9 J
Chloroform	13	8 J

MW-10 (35 ft)	04/12	06/12
PCE	72 J	51
TCE	38	31
c-1,2-DCE	59 J	35
VC	1 J	10 U
1,1-DCE	1 J	10 U
Chloroform	8 J	4 J
Carbon tet.	2 J	10 U
Freon-11	1 J	10 U

MW-21 (22 ft)	04/12	06/12
PCE	400	350
TCE	17	16
c-1,2-DCE	83	93
MTBE	2 J	2 J

MW-9 (25 ft)	04/12	06/12
PCE	11,000	3,700
TCE	770 J	320
c-1,2-DCE	5,200	2,400
t-1,2-DCE	39	10
VC	380 J	90
1,1-DCE	11	3 J
Chloroform	15	16
Chloroethane	10 U	1 J
MTBE	1 J	2 J

MW-2 (13 ft)	04/12	06/12
PCE	13 J	6 J
TCE	4 J	2 J
c-1,2-DCE	5 J	2 J
VC	1 J	10 U

MW-4 (14 ft)	04/12	06/12	Dup.
PCE	830 J	400	390
TCE	150	32	30
c-1,2-DCE	2,600 J	240	250
t-1,2-DCE	8 J	1 J	1 J
VC	110	6 J	6 J
1,1-DCE	4 J	10 U	10 U
Chloroform	25	8 J	8 J

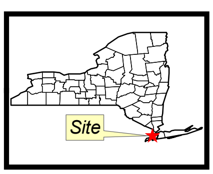
MW-11 (45 ft)	04/12	06/12
PCE	25	12
TCE	32	26
c-1,2-DCE	6 J	2 J
1,1-DCE	2 J	1 J
Chloroform	5 J	4 J
Carbon tet.	2 J	10 U

Monitoring Wells
Site

PCE - Tetrachloroethene
TCE - Trichloroethene
DCE - Dichloroethene
VC - Vinyl chloride
MTBE - Methyl tert-butyl ether

Tet. - Tetrachloride
J - Estimated
U - Not Detected

Units: µg/L
Sampling results were compared to NYSDEC Class GA is 5 µg/L except for 50 µg/L for acetone, 10 µg/L for MTBE, 7 µg/L for chloroform, 2 µg/L for vinyl chloride, 1 µg/L for benzene and no threshold for 1,2-dibromoethane. Exceedances of the thresholds are in red.
The approximate sample depth is shown in parentheses.



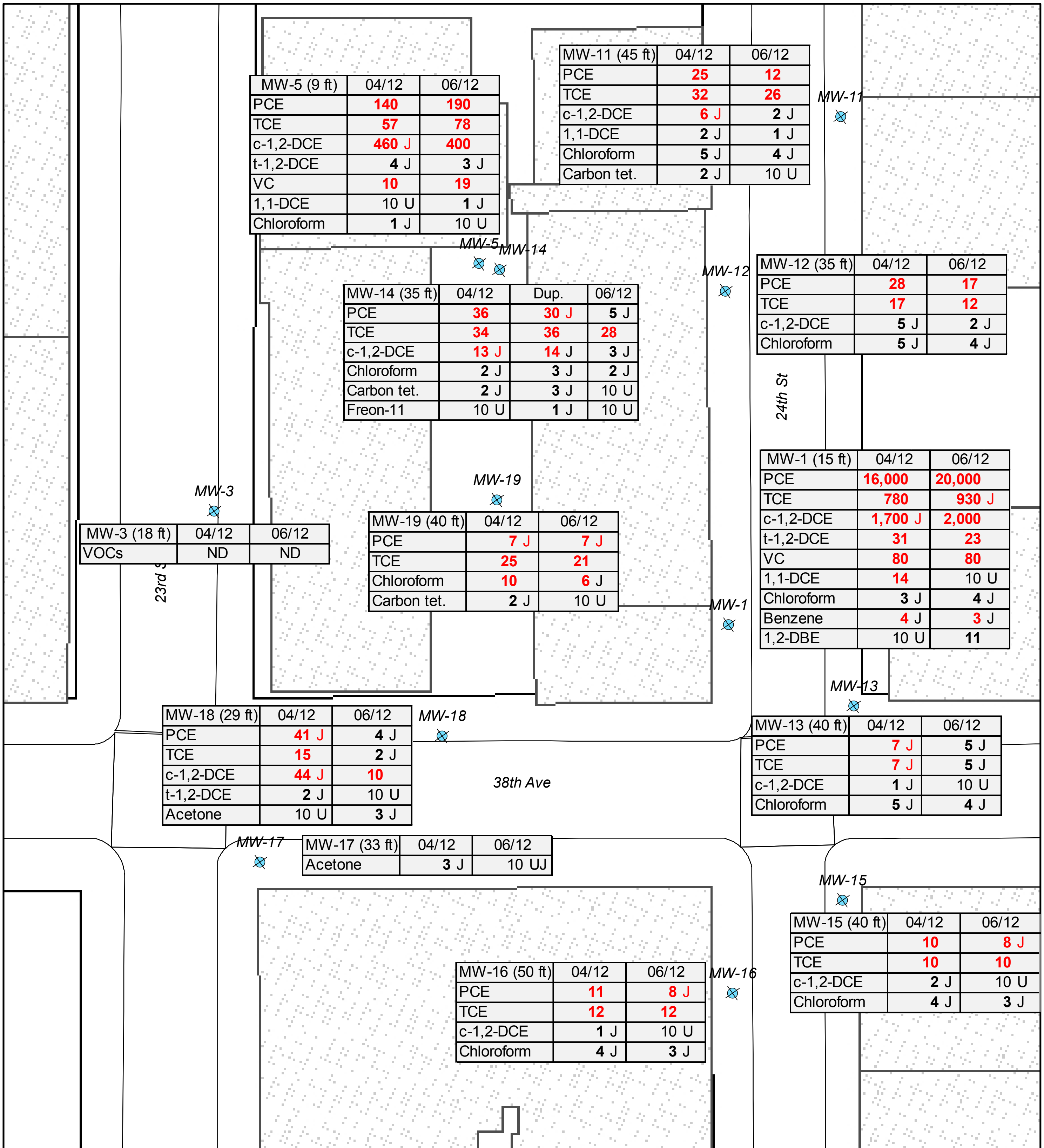
Prepared for:
Prepared by:
AECOM

Monitoring Well VOC Results Northern Portion of Study Area

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 27.5 55 Feet	5/6/2013	60237880	L:\work\101962\Working Draft\RI\Figures\F17 MW n.mxd

FIGURE:
17



MW-5 (9 ft)	04/12	06/12
PCE	**140**	**190**
TCE	**57**	**78**
c-1,2-DCE	**460 J**	**400**
t-1,2-DCE	**4** J	**3** J
VC	**10**	**19**
1,1-DCE	10 U	**1** J
Chloroform	**1** J	10 U

MW-11 (45 ft)	04/12	06/12
PCE	**25**	**12**
TCE	**32**	**26**
c-1,2-DCE	**6 J**	**2** J
1,1-DCE	**2** J	**1** J
Chloroform	**5** J	**4** J
Carbon tet.	**2** J	10 U

MW-12 (35 ft)	04/12	06/12
PCE	**28**	**17**
TCE	**17**	**12**
c-1,2-DCE	**5** J	**2** J
Chloroform	**5** J	**4** J

MW-14 (35 ft)	04/12	Dup.	06/12
PCE	**36**	**30 J**	**5** J
TCE	**34**	**36**	**28**
c-1,2-DCE	**13 J**	**14** J	**3** J
Chloroform	**2** J	**3** J	**2** J
Carbon tet.	**2** J	**3** J	10 U
Freon-11	10 U	**1** J	10 U

MW-1 (15 ft)	04/12	06/12
PCE	**16,000**	**20,000**
TCE	**780**	**930 J**
c-1,2-DCE	**1,700 J**	**2,000**
t-1,2-DCE	**31**	**23**
VC	**80**	**80**
1,1-DCE	**14**	10 U
Chloroform	**3** J	**4** J
Benzene	**4 J**	**3 J**
1,2-DBE	10 U	**11**

MW-3 (18 ft)	04/12	06/12
VOCs	ND	ND

MW-19 (40 ft)	04/12	06/12
PCE	**7 J**	**7 J**
TCE	**25**	**21**
Chloroform	**10**	**6** J
Carbon tet.	**2** J	10 U

MW-18 (29 ft)	04/12	06/12
PCE	**41 J**	**4** J
TCE	**15**	**2** J
c-1,2-DCE	**44 J**	**10**
t-1,2-DCE	**2** J	10 U
Acetone	10 U	**3** J

MW-13 (40 ft)	04/12	06/12
PCE	**7 J**	**5** J
TCE	**7 J**	**5** J
c-1,2-DCE	**1** J	10 U
Chloroform	**5** J	**4** J

MW-17 (33 ft)	04/12	06/12
Acetone	**3** J	10 UJ

MW-15 (40 ft)	04/12	06/12
PCE	**10**	**8 J**
TCE	**10**	**10**
c-1,2-DCE	**2** J	10 U
Chloroform	**4** J	**3** J

MW-16 (50 ft)	04/12	06/12
PCE	**11**	**8 J**
TCE	**12**	**12**
c-1,2-DCE	**1** J	10 U
Chloroform	**4** J	**3** J

Monitoring Wells

PCE - Tetrachloroethene
TCE - Trichloroethene
DCE - Dichloroethene
VC - Vinyl chloride

Tet. - Tetrachloride
J - Estimated
U - Not Detected

Units: µg/L
Sampling results were compared to NYSDEC Class GA is 5 µg/L except for 50 µg/L for acetone, 10 µg/L for MTBE, 7 µg/L for chloroform, 2 µg/L for vinyl chloride, 1 µg/L for benzene and no threshold for 1,2-dibromoethane. Exceedances of the thresholds are in red.
The approximate sample depth is shown in parentheses.

Site

Prepared for:

Prepared by: AECOM

Monitoring Well VOC Results Southern Portion of Study Area

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
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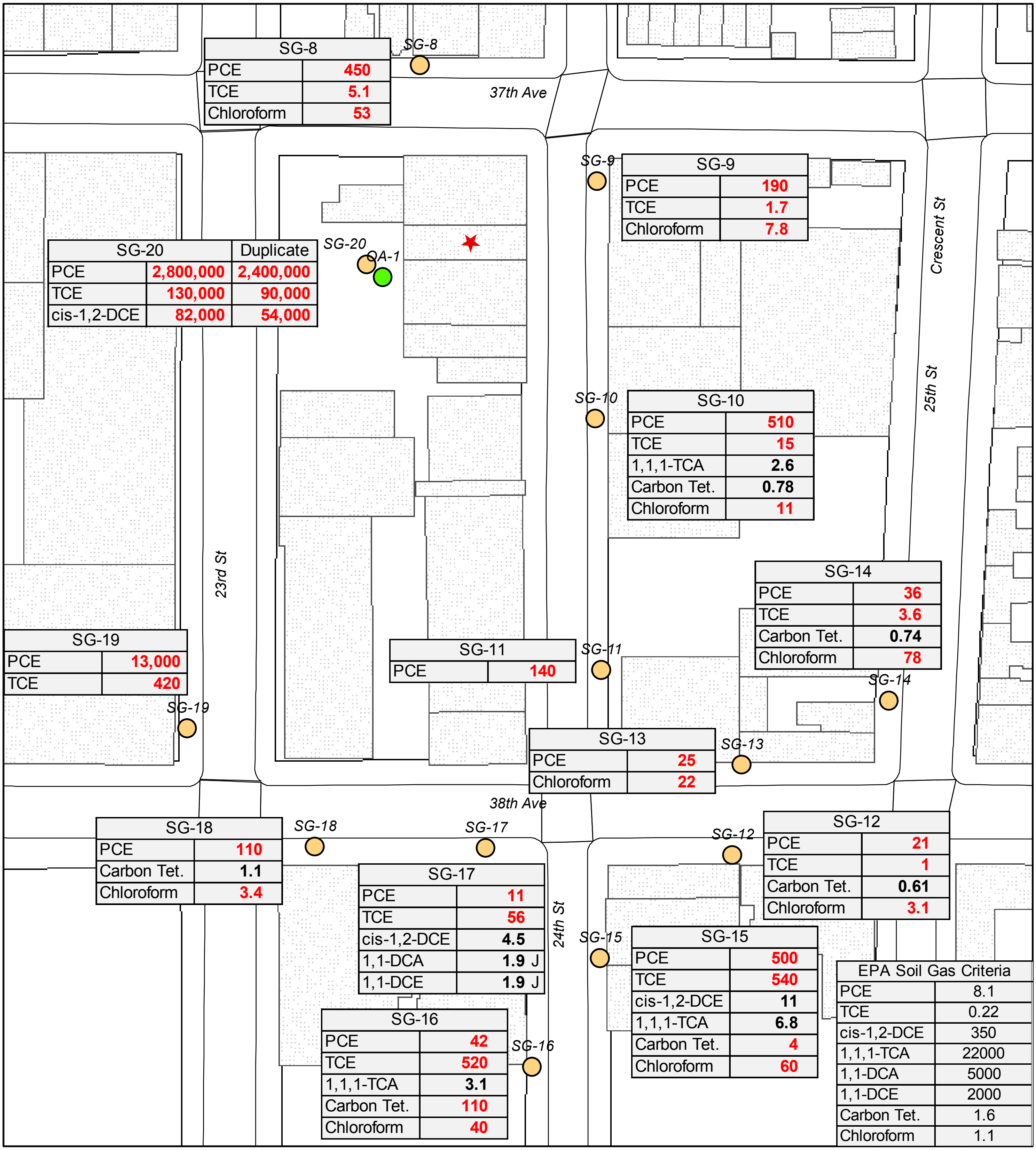
FIGURE: 18



Soil Gas
Outdoor Air
Site

PCE - Tetrachloroethene
TCE - Trichloroethene
DCE - Dichloroethene
TCE - Trichloroethane

Tet. - Tetrachloride
J - Estimated

Units: µg/m3
Sampling results were compared to EPA (2002) generic screening levels for shallow soil gas; risk 1E6. The thresholds are listed above.
Exceedances of the thresholds are in red.

Site

Prepared for:

Prepared by:
AECOM

Soil Gas PCE and Related Compounds, Carbon Tetrachloride, and Chloroform Results

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
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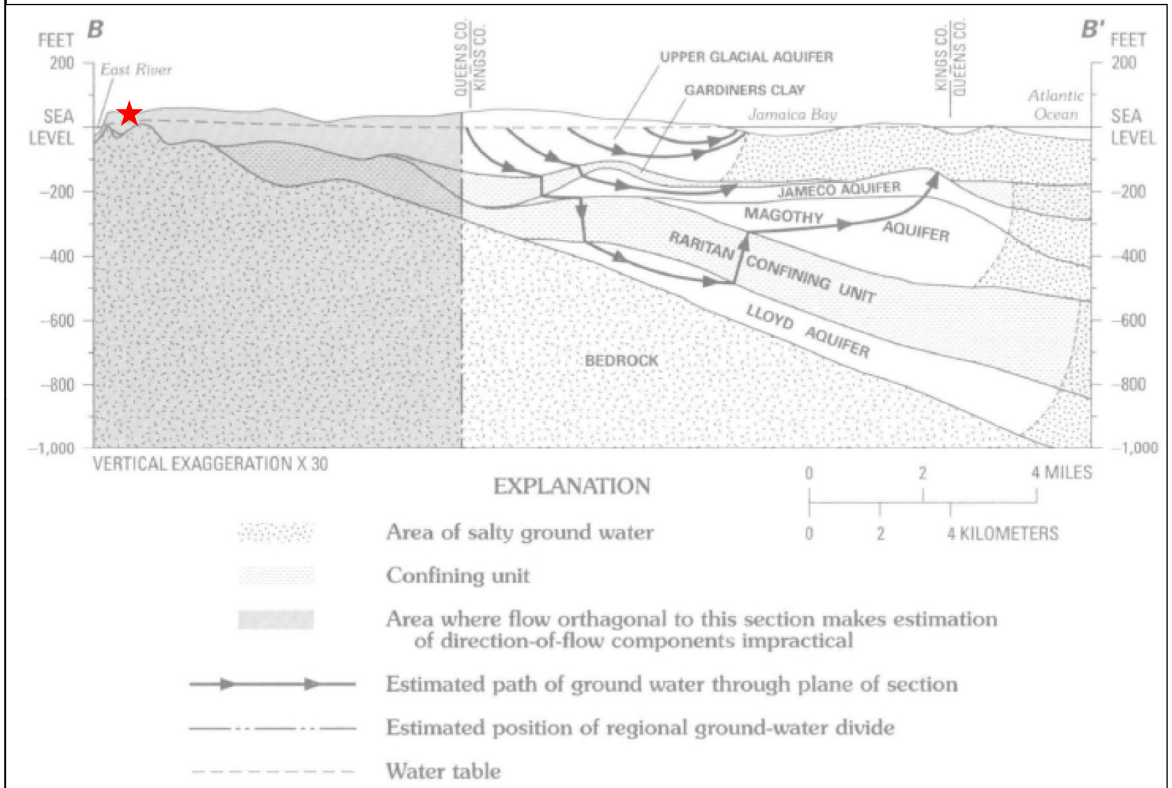
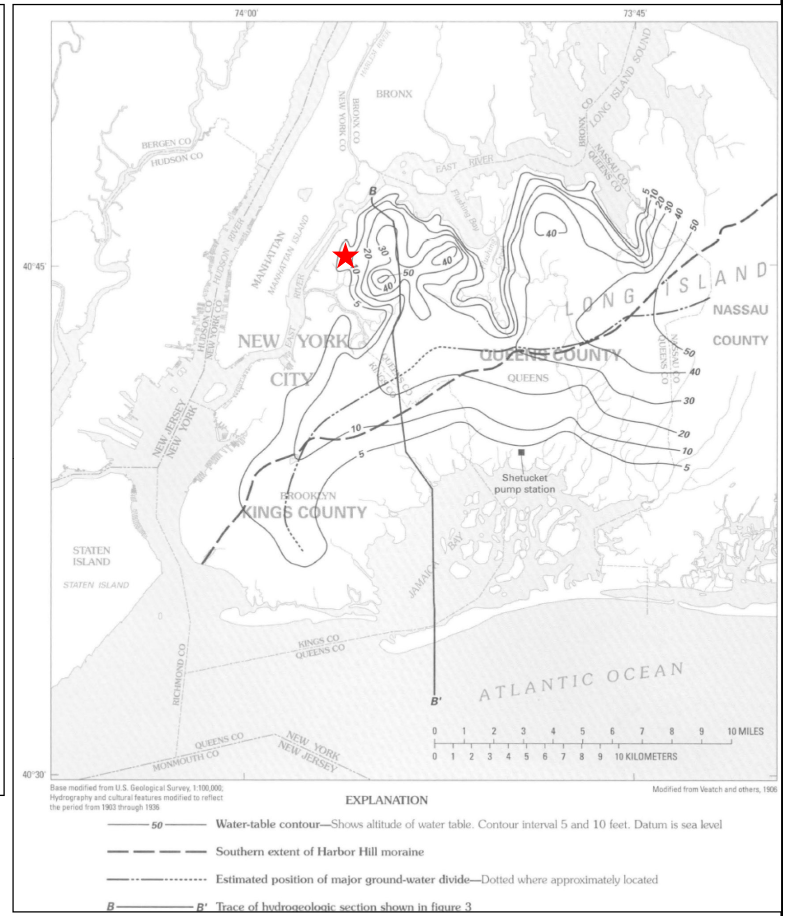
FIGURE:
19



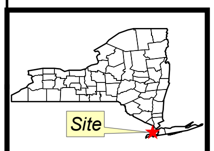
Stratigraphic Layers and Estimated Groundwater Vertical Flow Patterns

★ Approximate Site Location

From USGS (1999b).



Groundwater Horizontal Flow Patterns (1903)



Prepared for:

Prepared by:

AECOM

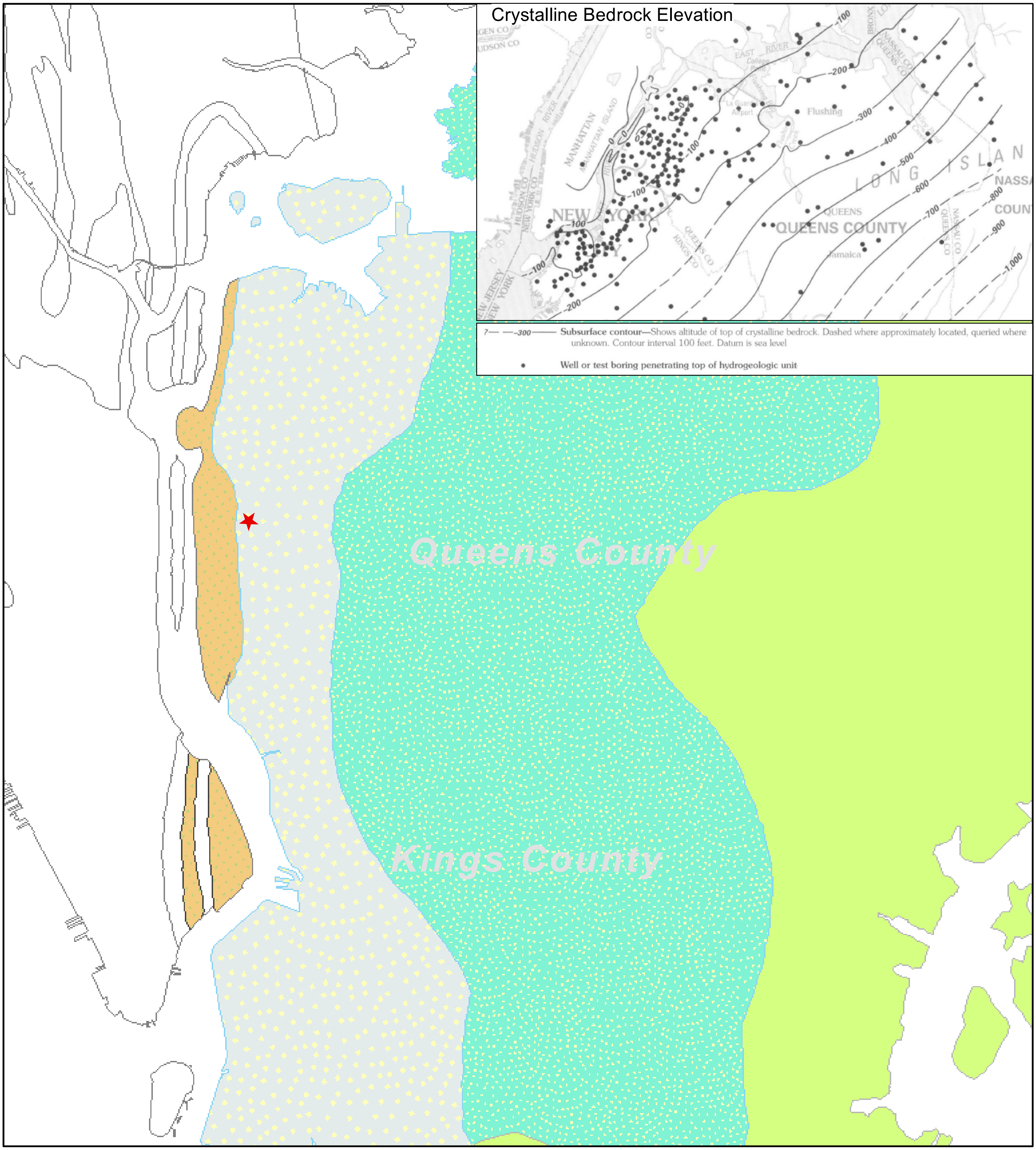
Subsurface Geology and Regional Flow Patterns

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 162.5 325 Feet	12/18/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F20 Geology.mxd

FIGURE:

20



Km
Kr
Ohr
Q
★ Site

From USGS (1970). Inset showing top of crystalline bedrock from USGS (1999b).
Q - Glacial and alluvial deposits
Ohr - Gneiss
Km - Monmouth, Matawan and Magothy Formation - silty clay, glauconitic sandy clay, sand, and gravel
Kr - Raritan Formation - clay, silty clay, sand, gravel

Site

Prepared for:

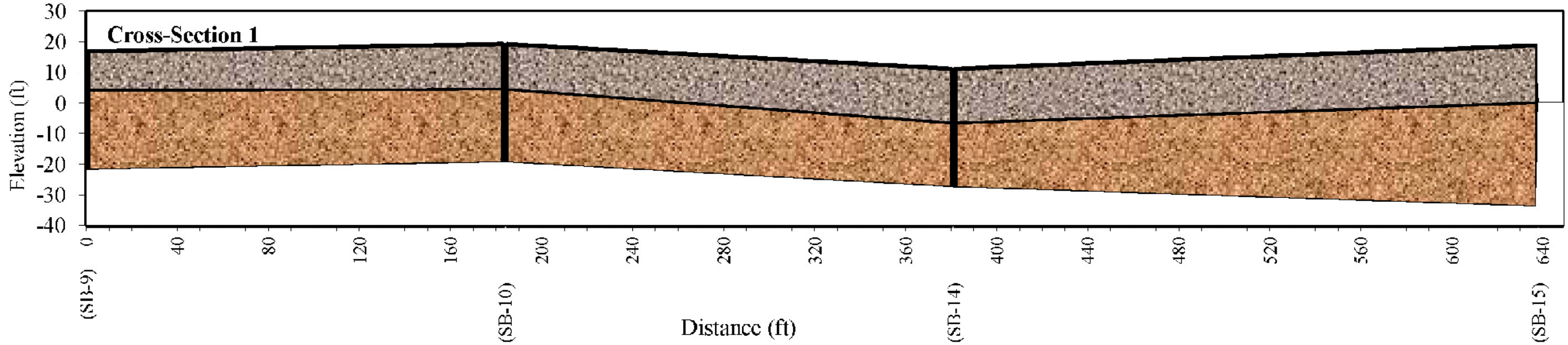
Prepared by: AECOM

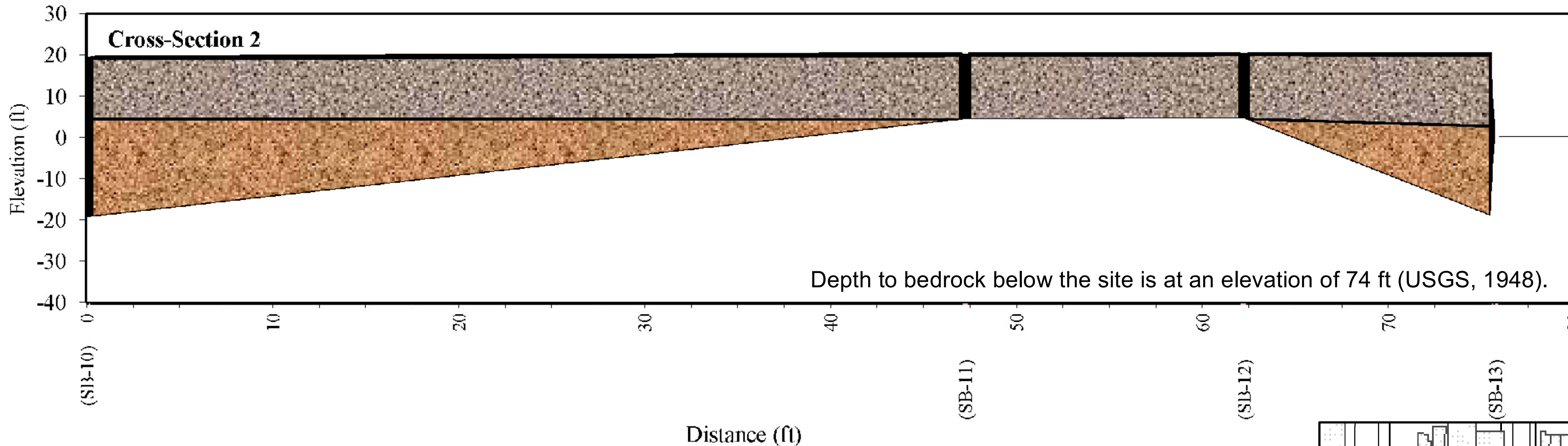
Bedrock in Study Area

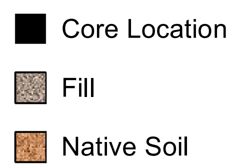
Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

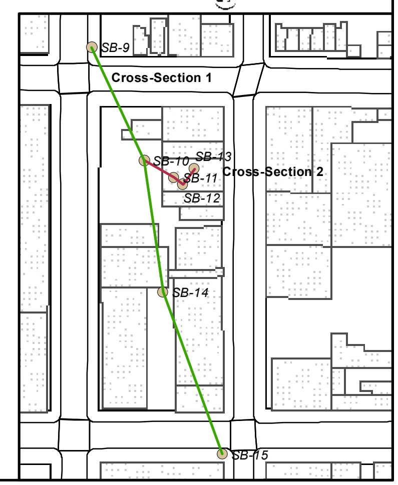
SCALE:	DATE:	JN:	PATH AND FILE NAME:
	12/11/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F21 Bedrock.mxd

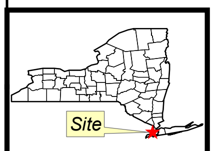
FIGURE: 21











Prepared for:

Prepared by:

AECOM

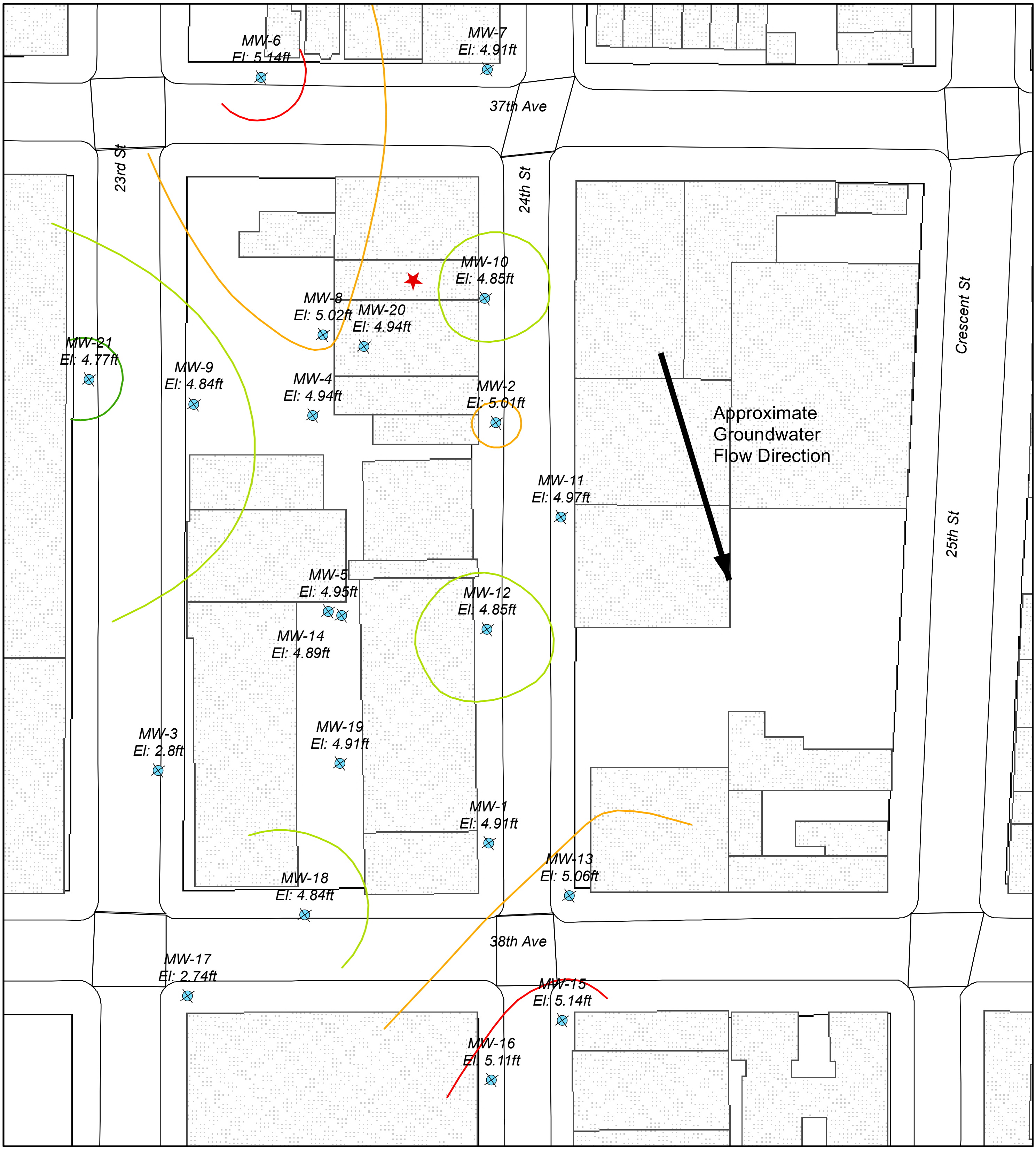
Soil Type Cross-Sections

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 162.5 325 Feet	12/11/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F22 XBorings.mxd

FIGURE:

22



Groundwater Elevations (ft)

- 4.8
- 4.9
- 5
- 5.1
- Approximate Flow Direction
- Monitoring Wells
- Site

Contours estimates by inverse distance weighting. MW-3 and MW-17 were excluded from contouring because these wells do not appear to be hydraulically connected to the remainder of wells in the study area.

Site

Prepared for:

Prepared by:

AECOM

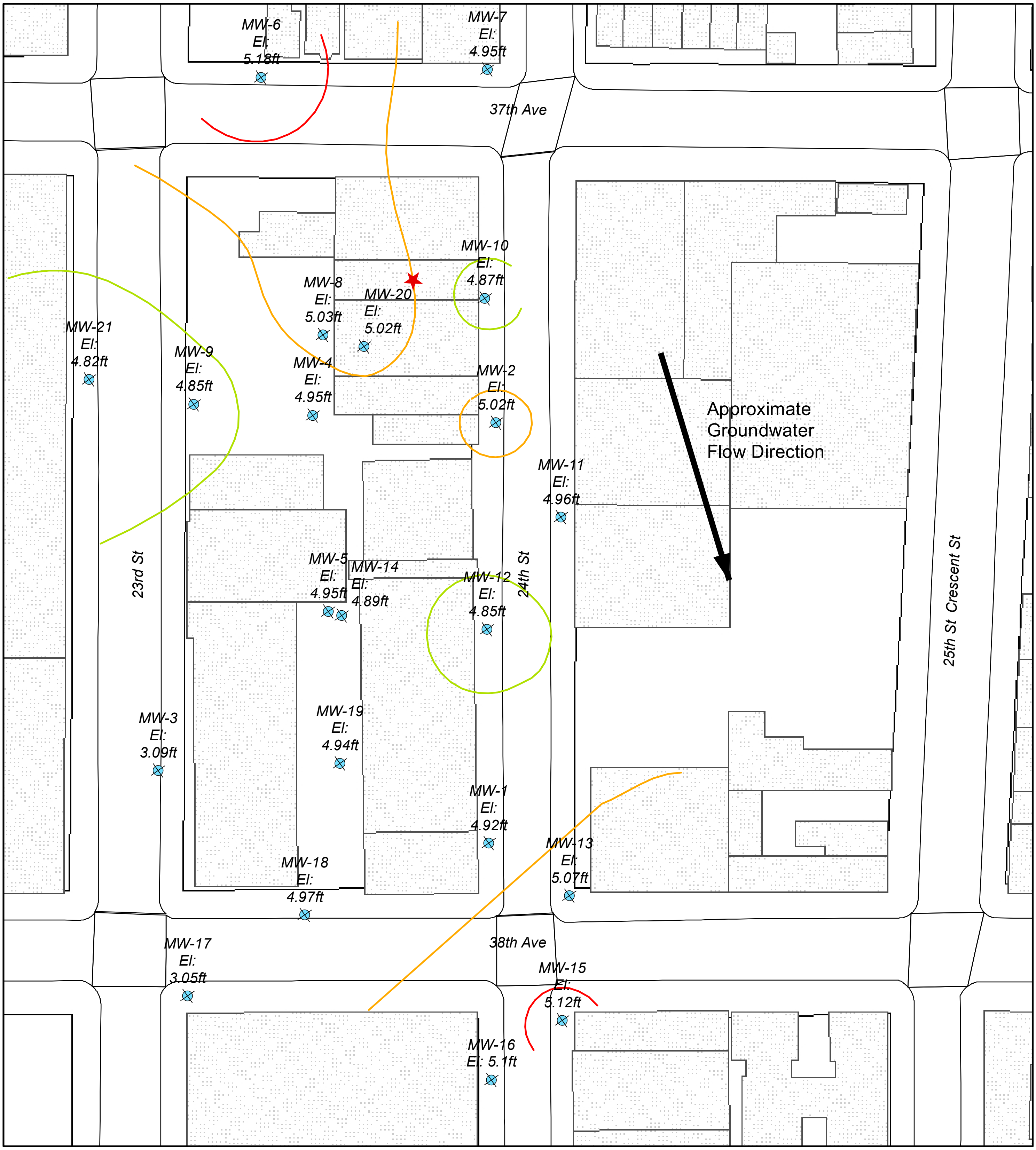
Groundwater Elevations April 2012

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 42.5 85 Feet	12/18/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F23 GW 1204.mxd

FIGURE:

23



Groundwater Elevations (ft)

- 4.8
- 4.9
- 5
- 5.1
- Monitoring Wells
- Site

Contours estimates by inverse distance weighting. MW-3 and MW-17 were excluded from contouring because these wells do not appear to be hydraullically connected to the remainder of wells in the study area.

Site

Prepared for:

Prepared by:

AECOM

Groundwater Elevations June 2012

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
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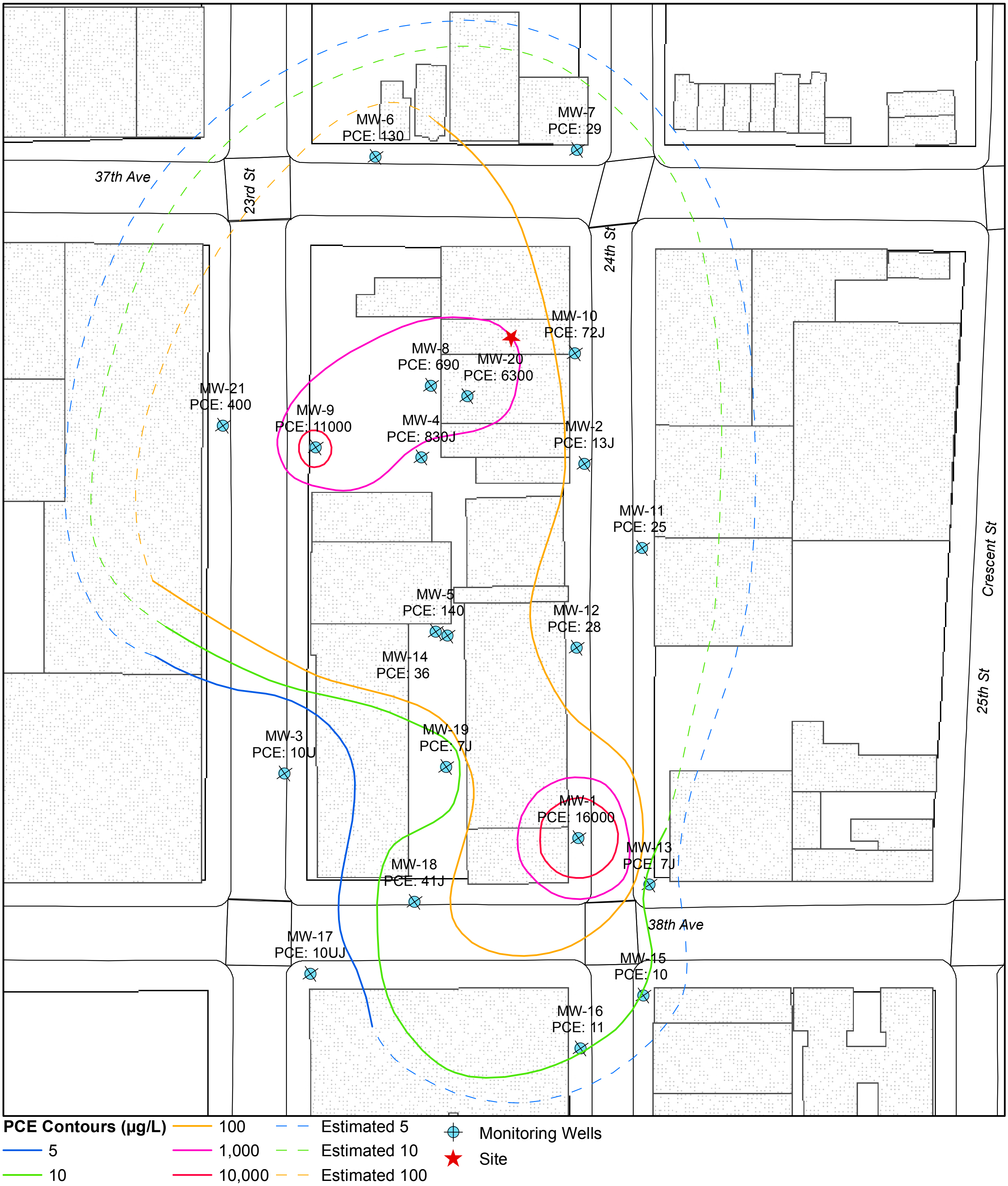
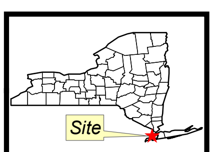
FIGURE:

24





Prepared for:

Prepared by:

AECOM

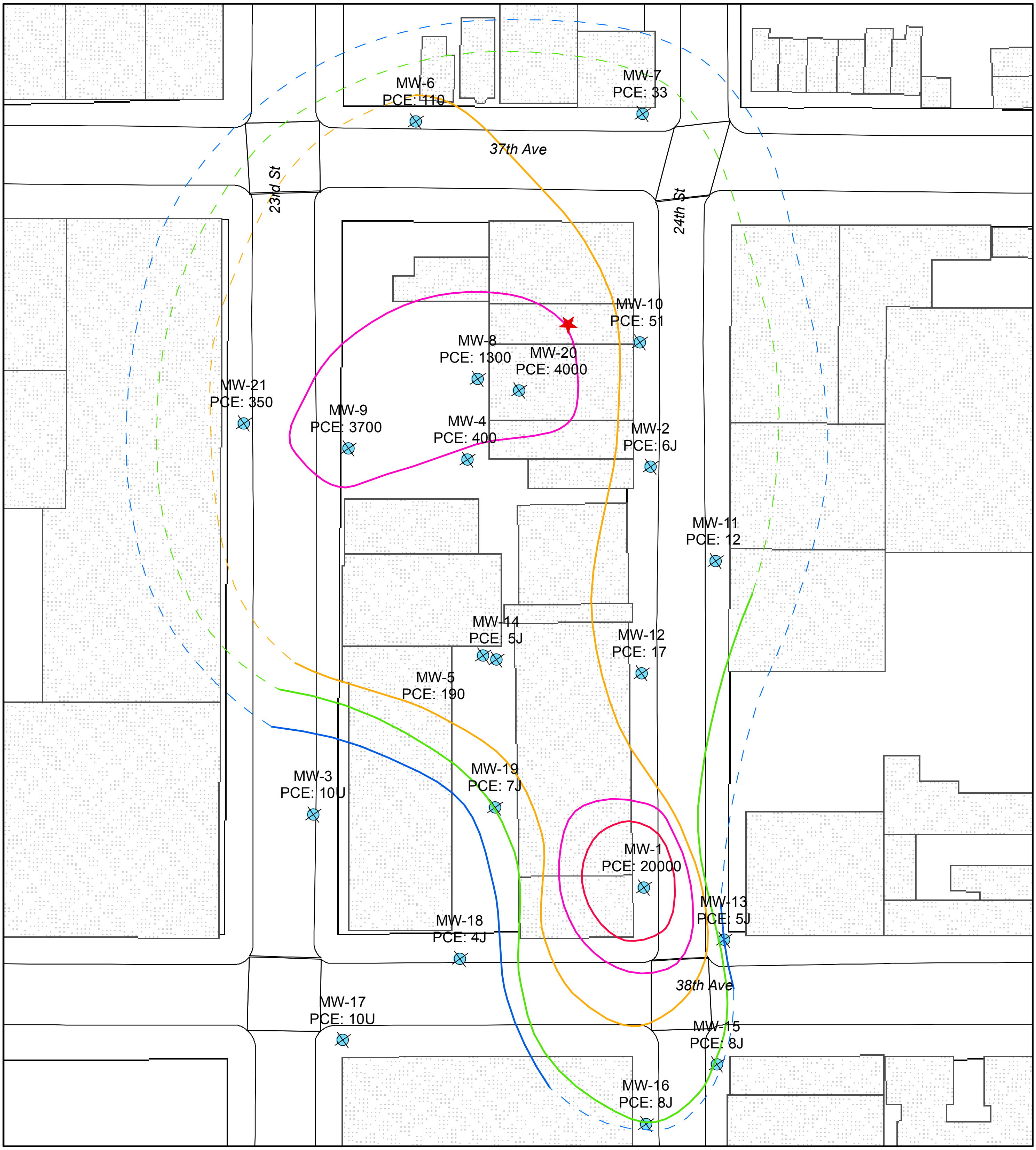
PCE Groundwater Contours April 2012

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 47.5 95 Feet	12/18/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F25 PCE GW04.mxd

FIGURE:

25



PCE Contours (µg/L

5	100	Estimated 5
10	1,000	Estimated 10
	10,000	Estimated 100

Monitoring Wells

Site

Site

Prepared for:

Prepared by:

AECOM

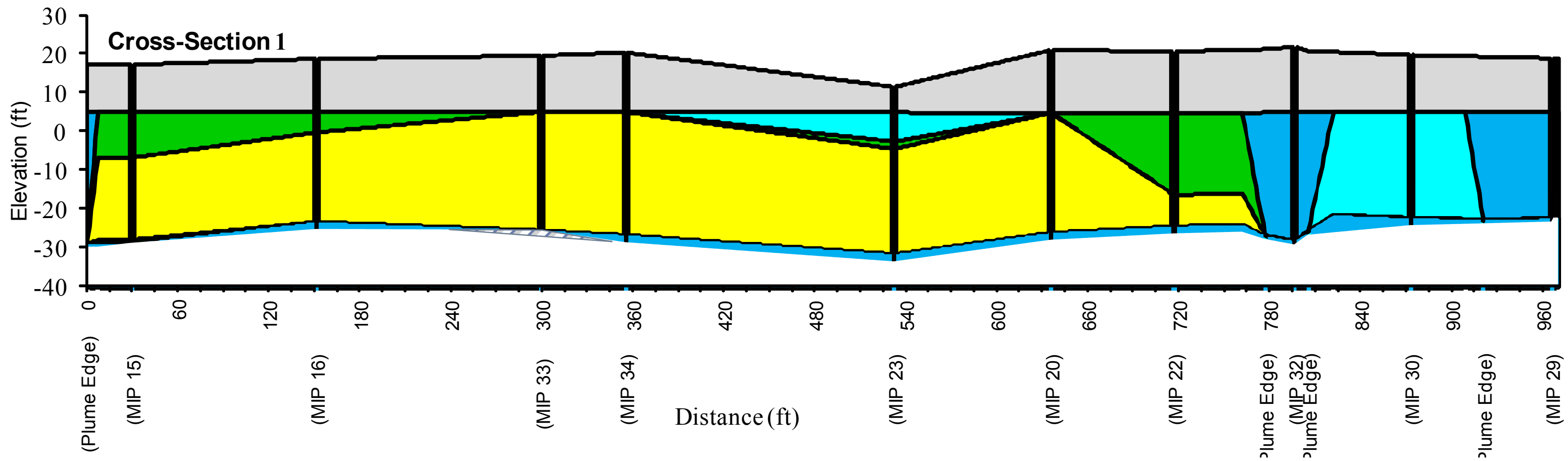
PCE Groundwater Contours June 2012

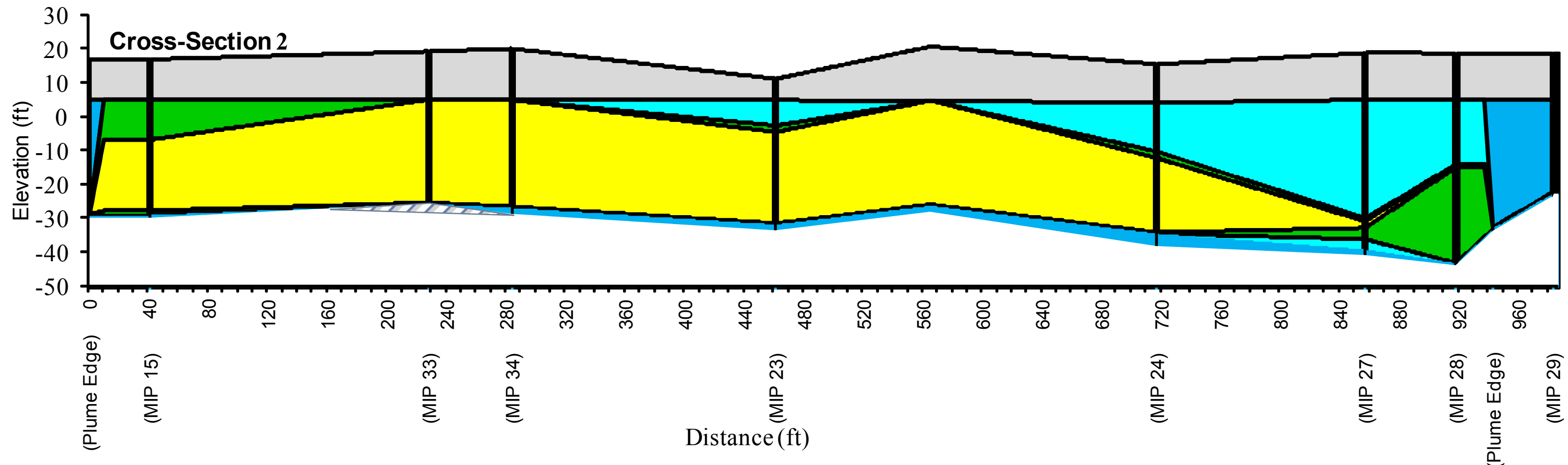
Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 42.5 85 Feet	12/18/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F26 PCE GW06.mxd

FIGURE:

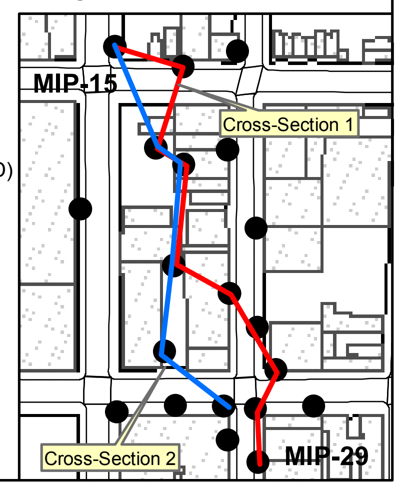
26

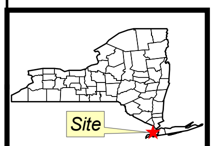




Note: The MIP results show delineation of the groundwater chlorinated solvent concentratons to 5 µg/L except at MIP-33. At MIP 33 the probe detected ECD levels greater than 15,000,000 µV (the maximum level the MIP can quantify) while the bottom was only at 500,000 µV. The elevated levels at the bottom of MIP 33 may result from residual contamination in the equipment.

Overburden
< 5 µg/L VOCs (<50,000 µV ECD)
Low end approx. 5 µg/L VOCs (50,000-100,000 µV ECD)
High end approx. 5 µg/L VOCs (100,000-150,000 µV ECD)
Above ECD range (>150,000 µV)
Delineation Uncertain (see note)





Prepared for:

Prepared by:

AECOM

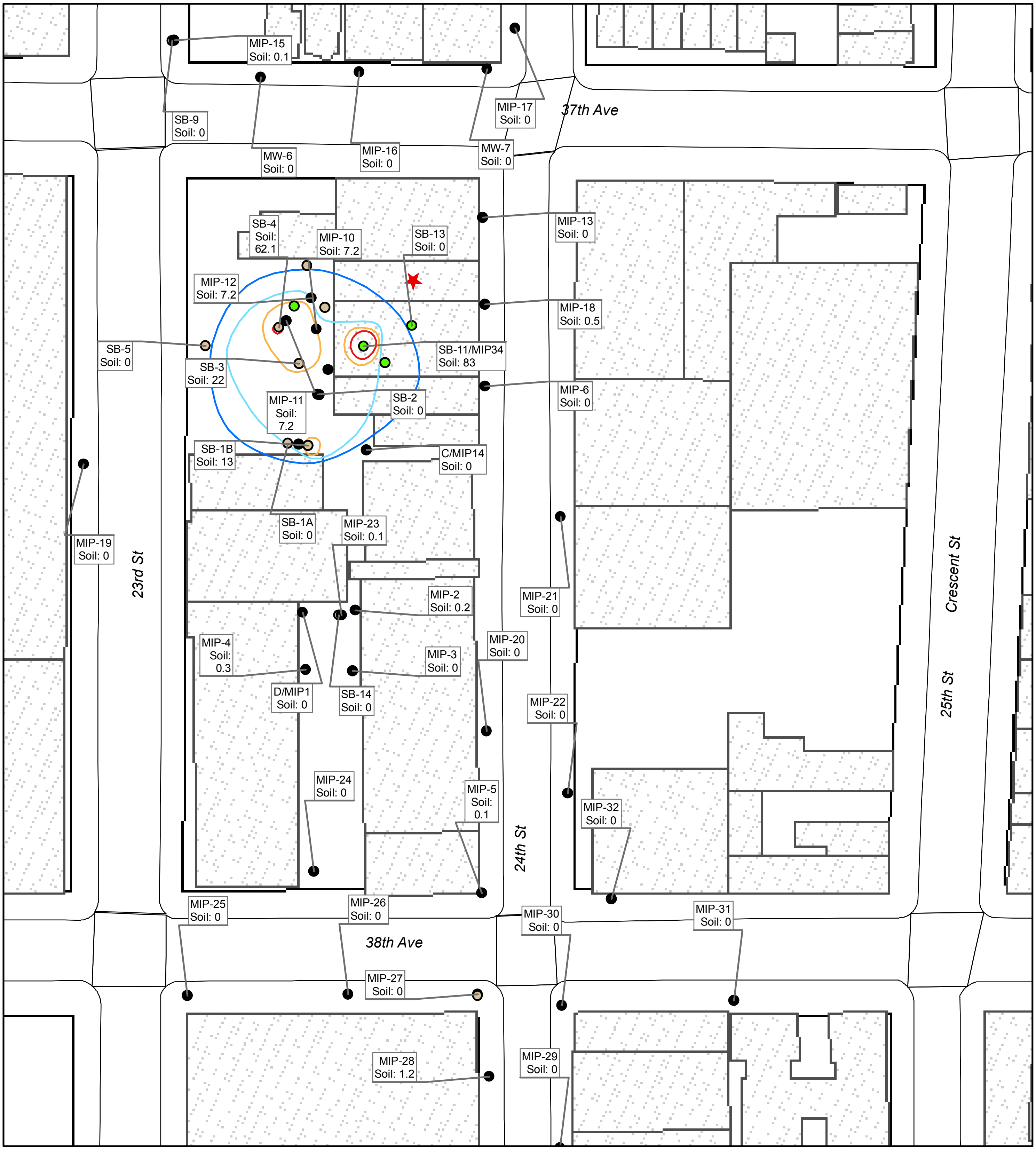
Chlorinated Solvent Groundwater Concentration Cross-Sections

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 162.5 325 Feet	6/19/2013	60237880	L:\work\101962\Working Draft\RI\Figures\F27 GW Vert2.mxd

FIGURE:

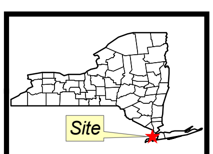
27



PCE Soil Concentration (mg/kg)

1.3
5
10
50
MIP
SB/MIP
SB
Site

The maximum soil concentration used for interpolation is shown. The values are either the result of soil laboratory analysis or are estimated from PID readings. The values are from measurements taken above groundwater. Units: mg/kg



Prepared for:

Prepared by:

AECOM

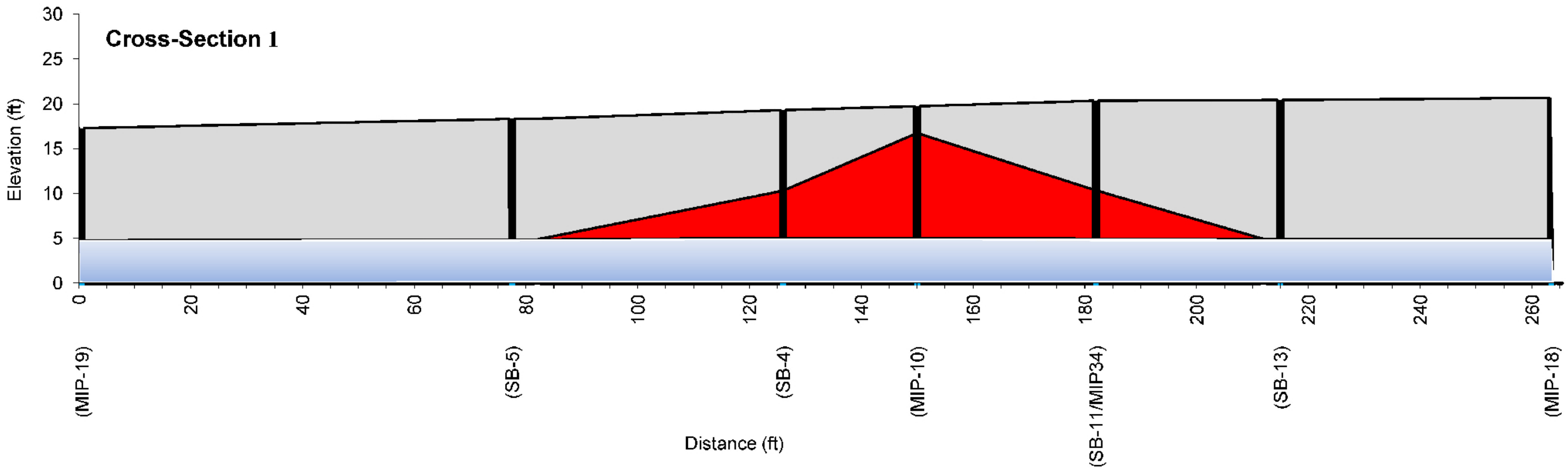
PCE Soil Vadose Zone Contours

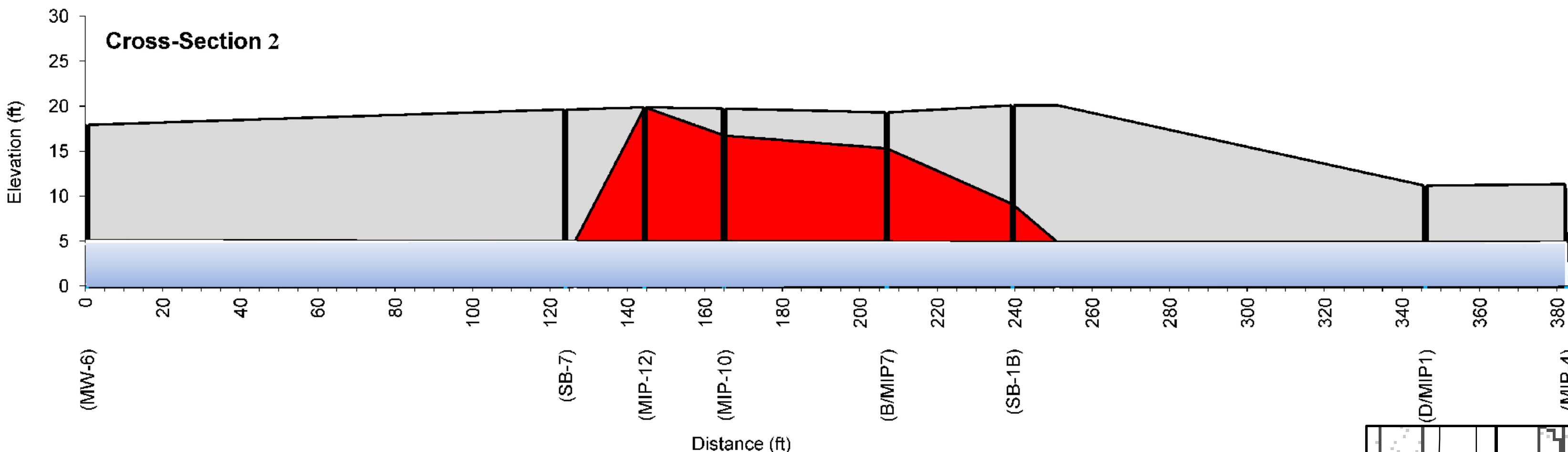
Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

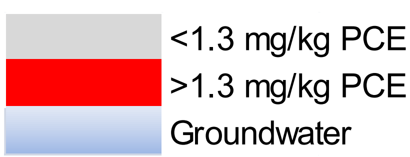
SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 42.5 85 Feet	6/19/2013	60237880	L:\work\101962\Working Draft\RI\Figures\F28 PCE Soil.mxd

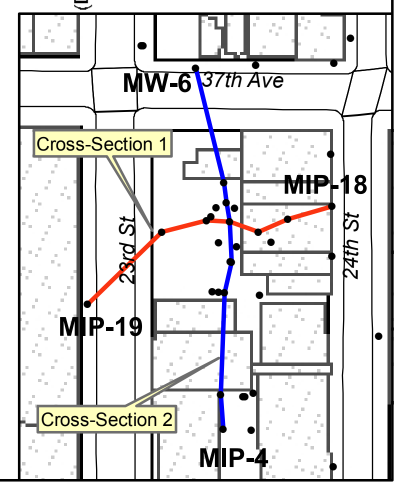
FIGURE:

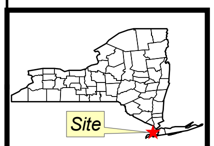
28











Prepared for:

Prepared by:

AECOM

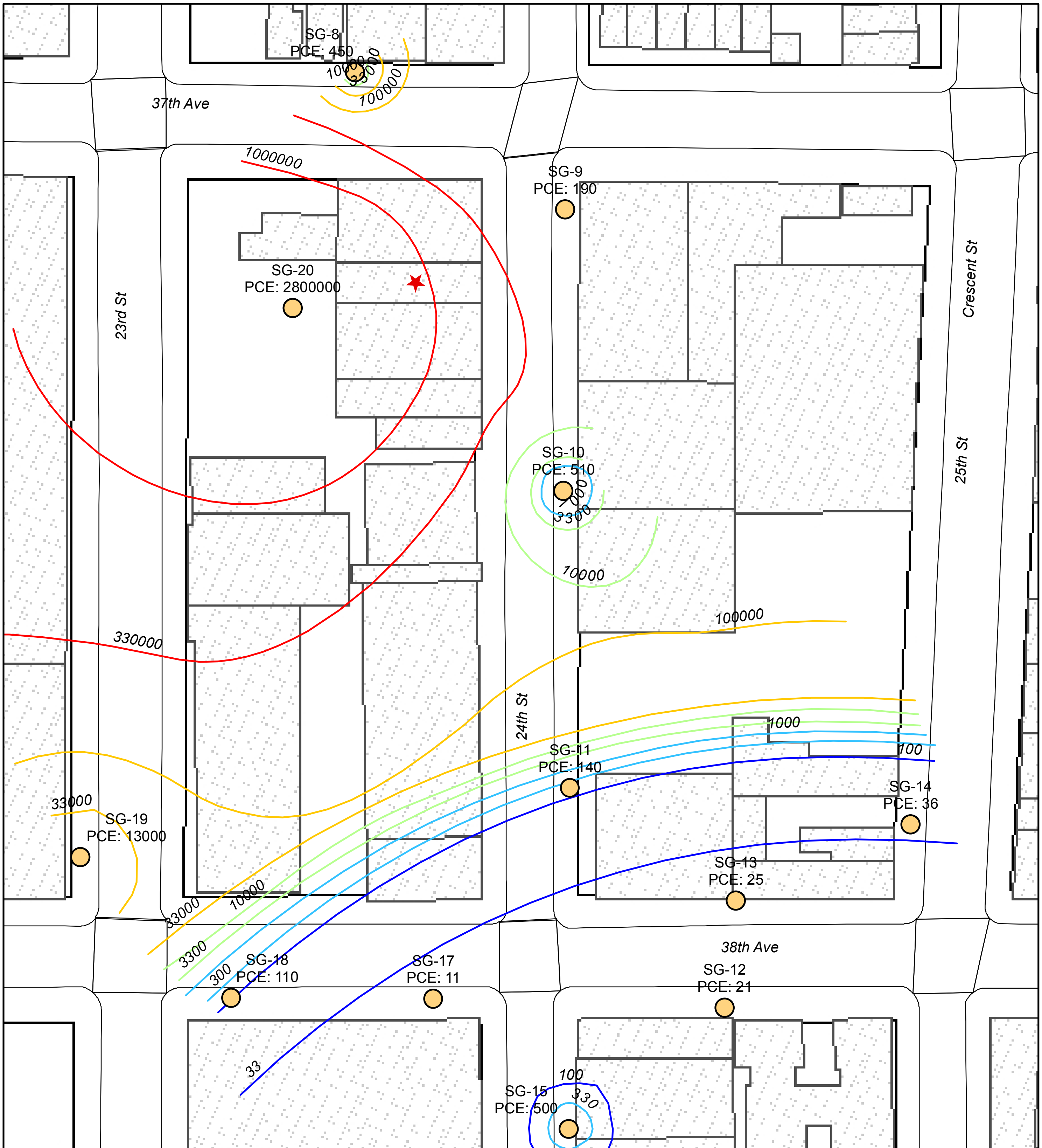
PCE Soil Vadose Zone Cross-Sections

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 100 200 Feet	6/19/2013	60237880	L:\work\101962\Working Draft\RI\Figures\F29 Soil Vert.mxd

FIGURE:

29

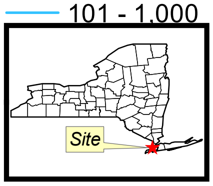


Soil Gas Location

PCE Conc.

- 33 - 100
- 101 - 1,000
- 1,001 - 10,000
- 10,001 - 100,000
- 100,001 - 1,000,000
- Site

Units: µg/m3



Prepared for:

Prepared by:

AECOM

PCE Soil Gas Contours

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 42.5 85 Feet	6/19/2013	60237880	L:\work\101962\Working Draft\RI\Figures\F30 PCE SG.mxd

FIGURE:

30

Appendix A

Phase I Environmental Site Assessment

Environment

Prepared for:
NYSDEC

Suite 300
New York, New York 10013

Submitted by:
AECOM
Chestnut Ridge, NY
AECOM Project
December 2012

Phase I Environmental Site Assessment for Jung Sun Laundry 37-10 24th Street, Long Island City, Queens, New York

Prepared By Kevin Seise – Project Scientist

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Executive Summary

This report presents the results of a Phase I Environmental Site Assessment (ESA) of the Jung Sung Laundry facility. The site is located at 37-10 24th Street, Long Island City, Queens, New York (Figure 1). Jung Sun Laundry has been in operation since the 1930s. From the late 1980s to the mid 1990s, the site was operated as a commercial dry cleaner. The site then transitioned from dry cleaning back to laundry service.

AECOM has conducted a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Standard E 1527-05 at 37-10 24th Street, Long Island City, Queens, New York. Mr. Kevin Seise of AECOM conducted a site visit on March 20, 2012. Any exceptions to, or deletions from, this practice are described in Section 1.3 of this report. This assessment revealed evidence of the following recognized environmental conditions (REC) in connection with the property:

- Subject Property: A review of the Sanborn Maps indicates that the subject property has historically been used as a laundry facility including dry cleaning operations since at least 1934. The potential for impacts from historic operations and residual contamination constitutes a REC. The historic use of laundry and dry cleaning chemicals could result in residual contamination and vapor intrusion concerns within the building.
- Subject Property: This property is currently the subject of a remedial investigation by the New York State Department of Environmental Conservation (NYSDEC) to assess the soil and groundwater contamination underneath the building. Investigative activities currently indicate that the Jung Sun facility is the source of local groundwater contamination.
- Subject Property: Numerous drums of laundry cleaning fluids were found scattered about the property inside and outside of the building. Some of the drums are open, some are unlabeled.
- Subject Property: Trenches and sumps are present within the building and the discharge points are not known.
- Subject Property: Stained concrete and asphalt was observed on the property. The staining was extensive and is not easily correlated to any given materials. Staining was observed in the previously mentioned sumps and trenches.
- Subject Property: A hydraulic trash compactor is located in the center of the yard area and appears to have leaked onto the subject property.
- Subject Property: An unexplained pile of crushed concrete is located adjacent to the trash compactor and may be the result of dumping on the property.
- Subject Property: A sump is located in one of the basements of the building and appears to be unlined with unidentified drainage pipes leading to it.
- Subject Property: An aboveground oil storage tank is located in the basement of the building and the contents of the tank could not be determined. The tank is encased in a masonry and concrete vault and could not be assessed for structural integrity or leak potential.
- Subject Property: Two sets of fill ports were observed in the sidewalk in front of the building indicating the presence of two additional tanks which were not observed. AECOM believes that the piping may have led to additional vaulted tanks in the basements.

- Subject Property: Wastewater at the property allegedly discharges to the city sewer system; however, a large sump was partially visible under a steel road plate in the southern end of the building. The sump was observed to contain several feet of water and AECOM suspects some of the buildings waste water may have been discharged to the sumps.
- Subject Property: The presence of broken fluorescent light bulbs and suspected PCB containing light ballasts in the basement is a REC.
- Surrounding Property Use: The properties to the south, east and west of the subject property have historically and continue to be used for a variety of industrial applications including automotive repair. The industrial use of the surrounding properties is a REC.
- Surrounding Property Use: The properties to the east of the subject property (by Hephaistos Building Supplies and the Victoria Laundromat Corporation) have been identified in multiple regulatory databases and are documented to have spills or other contamination present. The industrial use of the surrounding properties is a REC.

It is important to note that AECOM encountered data gaps with respect to the history of the subject property. Specifically, AECOM did not speak with the current owner or the past operators of the property during the investigation work because the site is no longer in operation.

1.0 Introduction

This report presents the results of a Phase I Environmental Site Assessment (ESA) of the Jung Sung Laundry facility. The site is located at 37-10 24th Street, Long Island City, Queens, New York (Figure 1). Jung Sun Laundry has been in operation since the 1930s. From the late 1980s to the mid 1990s, the site was operated as a commercial dry cleaner. The site then transitioned from dry cleaning back to laundry service.

A Phase I Environmental Site Assessment was performed by Aaron & Wright in September 2003 and was subsequently followed by a Phase 2 Limited Subsurface Investigation in October 2003 and a Phase 2 Limited Groundwater Investigation in December 2003 on the adjacent Scalamandre Silks property. During the Phase 2 Limited Subsurface Investigations, 5 borings were advanced to a depth of 10 feet, but no samples were collected because the PID readings were 0 ppm and there was no visible indication of contamination. A groundwater sample was collected from a temporary well. Trichloroethene (TCE) and tetrachloroethene (PCE) exceeded the New York State Department of Environmental Conservation (NYSDEC) groundwater quality standards of 5 µg/L with concentrations of 7.17 µg/L and 37.7 µg/L, respectively.

1.1 Scope of Work and Objectives

The Phase I ESA was conducted in accordance with the Standard for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM Standard) established by the ASTM (ASTM Designation E 1527-05), which meets the requirements of 40 CFR Part 312 and is intended to constitute *"all appropriate inquiry"* for purposes of the landowner liability protection.

The purpose of this Phase I ESA was to assess the environmental status of the subject property by identifying existing and potential recognized environmental conditions (RECs), which are defined by the ASTM as *"the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws."* According to ASTM, "[the] *term is not intended to include de minimis conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies."* This assessment is based on a review of existing conditions, reported pre-existing conditions, and observed operations at the subject site and adjacent properties.

In addition to the ASTM and United States Environmental Protection Agency (USEPA) standards, the intent of this assessment is to comply with the records search requirements outlined under NYSDEC DER-10 Appendix 3A.

1.2 Study Limitations

In the conduct of this due diligence investigation, AECOM attempted to independently assess the presence of such problems within the limits of the subject property. As with any due diligence evaluation, there is a certain degree of dependence upon oral information provided by facility or site representatives which is not readily verifiable through visual observations or supported by any available written documentation. AECOM shall not be held responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed by facility or site representatives at the time this assessment was performed. In addition, the findings in this report are subject to certain conditions and assumptions. The conditions and assumptions are noted in this report, and any party reviewing the findings of this report must carefully review and consider all such conditions and assumptions.

This report and all field data and notes were gathered and/or prepared by AECOM in accordance with generally accepted engineering and scientific practice in effect at the time of AECOM's assessment of the subject property. The statements, conclusions, and opinions contained in this report are only intended to give approximations of the environmental conditions at the subject property.

This report is prepared pursuant to an agreement between the client and AECOM and is for the exclusive use of the client. No other party is entitled to rely on the conclusions, observations, specifications, or data contained herein without first obtaining AECOM’s written consent and provided any such party signs an AECOM generated Reliance Letter. A third party’s signing of the AECOM Reliance Letter and AECOM’s written consent are conditions precedent to any additional use or reliance on this report.

The passage of time may result in changes in technology, economic conditions, site variations, or regulatory provisions which would render this report inaccurate. Reliance on this report after the date of issuance as an accurate representation of current site conditions shall be at the user’s sole risk.

1.3 Site-Specific Limitations

It should be noted that AECOM encountered material constraints in the performance of this Phase I ESA. Specifically, the following limitations were encountered:

- During the investigation of the property, the site owner was not available for interviews.
- Steel plates are present in various portions of the building and no access to the areas below the plates is possible without heavy equipment to move the plates.
- Trenches and drains are present within the building and no discharge point was identified.
- A large sump is present in the southern end of the facility and is filled with water. Due to the previously mentioned steel plates, the sump cannot be accessed for a detailed inspection and it is unknown if this sump is lined or serves as a discharge point for the other drains and trenches in the building
- The yard in the rear of the building is mostly filled with rolling carts, shipping containers, waste dumpsters, and other piles of debris. AECOM could not access all areas of the yard or check for stained surfaces.

1.4 Environmental Professional Statement

I declare that, to the best of my professional knowledge and belief, I meet the definition of an Environmental Professional as defined in §312.10 of 40 CFR Part 312, and I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Name: Kevin Seise Title: Project Scientist

Signature: Kevin Seise Date: 12/14/12

2.0 Site Description

2.1 Site Location and Description

On March 20, 2012 AECOM performed a visual inspection of the property located at 37-10 24th Street, Long Island City, Queens, New York. A site location map is provided as Figure 1.

The property located at 37-10 24th Street, Long Island City, New York (hereafter referred to as the 'subject property') consists of a one story brick building. The property is located on the southwest corner of the intersection of 24th Street and 37th Avenue. The subject property is surrounded by industrial buildings along the east, and south while the northern properties are a mix of commercial and residential properties. The western side of the property abuts several automotive repair and storage operations and included a yard for shipping and receiving laundry and supplies. This yard extended from the rear of the building to 23rd Street. Figure 2 provides a site plan depicting the location of the key features on the subject property along with the physical layout of the property. Representative photographs of the subject property are provided in Appendix A-1.

According to historical resources including Sanborn fire insurance maps, city directories, and interviews with the previous owner/occupant, the facility has operated as a commercial dry cleaner or laundry facility since its initial construction.

Land uses in the immediate vicinity of the subject property are as follows:

- North: The subject property is bordered by 37th Avenue, across which lies vacant buildings and residential properties.
- East: The subject property is bordered by Hephaistos Building Supplies and the Victoria Laundromat Corporation.
- South: The subject property is bordered by a mixed use commercial building.
- West: The subject property is bordered by Shah Jee Motors which is an automotive repair facility and KSW, Inc. which installs HVAC equipment.

2.2 Topography, Hydrology and Geology

According to the Environmental Data Resources (EDR) Geocheck® information (EDR report), the subject property is located at approximately 19 feet above mean sea level. According to the EDR report, the subject property is located in Queens County, NY and is not listed under FEMA (100 year or 500 year) Flood Zone or the National Wetland Inventory. According to the report, there are areas located within a 0.5-mile radius located within the 500-year flood zone. Also, information provided in the EDR report indicates that federally designated wetland areas are located within 1 mile of the subject property but not on the subject property.

According to soils information provided in the EDR report, the subject property area is underlain by soils classified as "*Urban Land*" with "variable" soil surface texture. The stratigraphic rock formation in the area is defined by "Mesozoic" era and "Cretaceous" system. The EDR report also includes soils information for other locations in the vicinity of the subject property; surface soils are identified as underlain primarily by silt loam, loamy sand, sandy loam, and fine sandy loam. Shallow soil is identified as sandy loam and deeper soils as un-weathered bedrock, very gravelly-loamy sand, stratified, and sandy loam.

Previous reports (Aaron & Wright for Scalamandre Silks) indicate that subsurface materials at the site consist of sand with some silt. Soil in the area is urban fill.

Based on groundwater elevation data recorded by Aaron & Wright measurements, the depth to groundwater was approximately 15 ft bgs in December 2003. Aaron & Wright reported that the groundwater flow direction is towards the south west, but there appears to be localized groundwater flow towards the south/southeast at the eastern side of the Scalamandre Silks property.

3.0 User-Provided Information

Section 6 of the ASTM Standard states that certain tasks, which will help to determine the possibility of RECs associated with the subject property, are generally conducted by the ESA report user. These tasks include reviewing title records for environmental liens or activity and land use limitations, any specialized knowledge (e.g., information about previous ownership or environmental litigation), experience related to RECs at the subject property, or significant reduction in the purchase price of the subject property.

3.1 Title Records/Environmental Liens

AECOM identified the deeds and liens against the subject property through Automated City Register Information System (ACRIS). There are deeds for the property (Block 366, Lots 18, 32, and 33) dated October 16, 2012 from seller Alexander Pabst, Esq., Referee and buyer New Generation Development, LLC. The previous owner, Feiyang Group, LLC, purchased the property on February 5, 2008.

3.2 Specialized Knowledge/Value Reduction Issues

The property is the subject of ongoing remedial investigations by AECOM on behalf of the NYSDEC. Extensive testing of soils, groundwater, and associated vapor intrusion hazards have occurred and are detailed later in this report. Based on the data and investigation activities, soil and groundwater contamination is present on the site.

3.3 Reason for Performing the Assessment

AECOM conducted the assessment to fulfill the Records Search Requirements of DER-10 Appendix 3A for the ongoing remedial investigation activities.

4.0 Site Reconnaissance

4.1 Methodology

AECOM's representative, Mr. Kevin Seise, conducted a site reconnaissance of accessible areas on the subject property on March 20, 2012. AECOM's objectives were to visually inspect the area for potential evidence of contamination and the presence of hazardous or regulated substances, and to assess the subject property's material environmental compliance via a review of available documents.

Previously AECOM had performed numerous investigative tasks (including soil vapor sampling, drilling, monitoring well installation, groundwater sampling, etc.) on and around the property at the request of the NYSDEC. During those investigative efforts, several site visits had occurred, however, no focus had been made on the environmental site assessment.

4.2 Subject Property Operations

An initial site visit was conducted on September 19, 2008 with representatives of NYSDEC and AECOM (Earth Tech at the time) present.

The owner of Jung Sun Laundry, Mr. Moy, identified the location of the former dry cleaning machine within the building. He stated that the solvent waste (PCE) was properly disposed off-site by Safety-Kleen. Jung Sun operated as a dry cleaner during the 1980s and 1990s.

The site is located at 37-10 24th Street, Long Island City, Queens, New York (Figure 1). Jung Sun Laundry has been in operation since the 1930s. From the late 1980s to the mid 1990s, the site was operated as a commercial dry cleaner. The site then transitioned from dry cleaning back to laundry service. Recently the site was vacated however, the cessation of operations has not been fully documented and attempts to reach the new owner have been unsuccessful.

Scalamandre Silks is adjacent to this site. Textile fabric manufacturing was performed on this property starting in 1936. Scalamandre Silks manufacturing facility has been in operation since the 1950s. The site manager at Scalamandre Silks, Mr. Long, provided a site visit throughout the facility. The building is currently rented to several other businesses. AECOM saw some wood working and artistic shops which might handle small quantities of hazardous materials on the Scalamandre Silks property.

Based on site use, it is likely that chemical dyes, paints, solvents and softening agents were used historically as part of day-to-day operations. The history of the subject property, including historical operations, is discussed in Section 5.1.

4.3 Oil and Hazardous Materials Storage and Use

Hazardous material usage as the site is known to have included tetrachloroethylene (PCE) and other dry cleaning fluids. The fluids were largely contained within a self-contained dry cleaning machine; however, at the time of the AECOM Phase I site visit, the dry cleaning machine was not present.

Numerous drums (some empty and some full) were found scattered throughout the property. Some of the drums were labeled, some were not. Drums of grease, hydrogen peroxide, CalSoft, Liquid Bulk Fabric Softener, Hypochlorite Solution (bleach), PX-70, and Bulk Liquid Alkali were found in various areas of the property. Unlabeled drums were found adjacent to a hydraulic trash compactor in the yard area with heavy staining and a greasy purple residue emanating from the bottom of the drums.

Numerous smaller containers of WD-40 and other household chemicals including one gallon cans of paint were scattered inside of the building.

4.4 Principal Waste Streams

At the time of the site inspection, the site was vacant and no representatives were available to discuss the operations including waste generation or disposal. Waste streams at the property appear to consist of spent PCE, wooden pallets, cardboard containers, and plastic wrap along with general trash. No discharge location for the waste water collection trenches was identified.

In September of 2008, AECOM met with Mr. Moy (then owner of the facility) during an initial site visit. Mr. Moy stated that spent PCE was properly disposed off-site by Safety-Kleen.

The solid waste disposal from the facility appears to have included the use of a hydraulic waste compactor in the yard area.

A pile of crushed concrete approximately 5 feet tall was observed piled next to the compactor. The concrete appears to have originated offsite, as no area onsite was found which appeared to have been demolished.

4.5 Utilities

The facility is heated with electric heaters mounted on the ceiling of the main floor. The building is cooled by opening windows. Con Ed provides electricity to the building. Water and sewer service is provided by the New York City Department of Environmental Protection.

4.6 Water and Wastewater

Water and sewer service is provided by the New York City Department of Environmental Protection. A running water line was observed in the northeast corner of the building. This water line was observed leaking and causing an icing condition on the sidewalk during previous investigative activities onsite and prompted AECOM to contact the New York Fire Department to enter the building and shut off the water service. Following the fire department shutting off the water valve, the leak continued to occur which indicates a previously undocumented water connection.

Wastewater is believed to have been discharged to the city sewer system. At the time of the site inspection, sumps and trenches in the building were found to contain water. A sump in the southern portion of the building contained several feet of water which would have been expected to drain to the sewer system. Several other sumps or drains were found in the trenches and one open sump was observed in the basement of the building. Two drain pipes were observed leading to the sump. The discharge point for all piping and sumps could not be verified.

4.7 Aboveground Storage Tanks (AST)

One 500 gallon fuel oil storage tank was observed in the central basement of the building. The tank is vaulted in the basement and is contained within a cinderblock and concrete vault.

4.8 Underground Storage Tanks (UST)

Historic Sanborn fire insurance maps revealed the presence of a gasoline tank inside the Jung Sun laundry facility. During the site visit, multiple fill ports were observed within the sidewalk in front of the building. AECOM found that the fill ports were routed towards the basements but were cut and partially capped. AECOM saw no evidence of current USTs at the facility and it appears that the maps refer to basement ASTs.

4.9 Polychlorinated Biphenyls (PCBs)

No oil filled transformers were observed at the subject property. Suspected PCB containing light ballasts were identified throughout the building. A hydraulic trash compactor is located in the yard area. Stained concrete and asphalt were observed in these areas and may be contaminated with hydraulic oils.

4.10 Surface Staining/Stressed Vegetation/Debris

Stained surfaces were observed throughout the building and the fenced yard area. Several areas of staining with residual slime were found on the property.

Large quantities of debris (laundry carts, pallets, empty drums, etc.) are present and visibility is severely limited by the debris.

No vegetation was observed since the property is fully paved or occupied by the building.

4.11 Adjacent Properties

The properties located adjacent to the subject property are identified in Section 2.1 of this report. During the site reconnaissance, AECOM visually inspected exterior areas of the properties that are located adjacent to the subject property and publicly accessible areas (e.g., public roadways, etc.), to the extent possible. The following environmental concerns or de minimis conditions were noted during this inspection:

Land uses in the immediate vicinity of the subject property are as follows:

- North: The subject property is bordered by 37th Avenue, across which lies vacant buildings and residential properties. Historic operations of the commercial buildings are not fully understood and could have included operations with might impact the subject property.
- East: The subject property is bordered by Hephaistos Building Supplies and the Victoria Laundromat Corporation.
- South: The subject property is bordered by a mixed use commercial building. The chemical usage and operations of the tenants is unknown.
- West: The subject property is bordered by Shah Jee Motors which is an automotive repair facility and KSW, Inc. which installs HVAC equipment. Vehicle maintenance activities could

have included undocumented releases which have the potential to impact the subject property.

5.0 Subject Facility and Surrounding Land Use History

Information pertaining to historical uses of the subject property and adjacent sites was obtained from various publicly available and readily reviewable sources including: discussions with a representative of the former property manager (Mr. Moy); review of local agency records; Sanborn Fire Insurance Maps (obtained from EDR); aerial photographs (obtained from EDR); historical topographic maps (obtained from EDR) and City Directory Abstract (obtained from EDR). Historical sources reviewed (as obtained from EDR) are included as Appendix A-2.

5.1 Sanborn Fire Insurance Maps

The Sanborn Fire Insurance Maps were originally created to assist insurance underwriters in understanding the potential fire risk of structures requiring insurance; however, they are also useful for determining the previous uses of a property.

The available years of map coverage for the subject property include 1996, 1995, 1994, 1993, 1992, 1991, 1990, 1989, 1988, 1986, 1985, 1980 , 1979 , 1977, 1970, 1950 , 1947, 1936, 1915, and 1898 .

The Sanborn Maps are attached in Appendix A-2. Interpretation of each of the Sanborn Fire Insurance Maps for the subject property is described in below.

5.1.1 1898 Sanborn Map

The 1898 Sanborn Map depicts the subject property as undeveloped land in a largely undeveloped residential neighborhood. In 1898, the street names were identified as William Street (now 24th Street) and Webster Avenue (now 37th Avenue).

5.1.2 1915 Sanborn Map

The 1915 map shows the property as undeveloped land and the properties in the immediate vicinity of the property are similarly undeveloped. A few residential properties have been developed to the east and south of the property. A wheel wright is located in the center of the block while a lumber yard was constructed one block east of the property.

5.1.3 1936 Sanborn Map

The 1936 map shows that the subject property has been developed with a wet-wash laundry facility and a private garage. A gasoline tank is located in the western end of the interior of the garage building. A live poultry market is located in one of the buildings on the southern end of the subject property. The street names have been converted to the modern numerical scheme.

A large facility identified as “Ginzkey Manufacturers” and shown as a rug storage warehouse and compound is present immediately south of the Jung Sung property in the location of the current multitenant building. The map does not provide much decipherable information, however, a transformer vault is identified on the northern end of the building.

A filling station was located to the northwest of the subject property on the site of the current Shah Jee auto facility. This filling station is shown as having two gasoline tanks. The American Motion Picture Machinery Works was located to the southwest of the subject property and included a gasoline tank. An auto repair and painting facility was located to the north across 37th Avenue along with a bake shop which had a fuel oil tank. A machine shop and iron work was also located to the north and west on 23rd Street.

The properties to the east have been developed with a large garage and a steel shelving manufacturer and a private garage with two gas tanks. The lumber yard previously noted has been removed. A rug cleaning operation has been added one block east of the subject property. The remainder of the map shows an increase in residential properties in the area.

5.1.4 1947 Sanborn Map

The 1947 map shows no major changes to the subject property. The surrounding properties to the north and south have minimal changes with the exception of the addition of a Waterproofing manufacturer to the southwest and the addition of an auto repair facility to the filling station previously observed to the northwest.

A metal truck body manufacturer has been added to the property immediately east of the property. A machine shop and auto repair facility are also present one block east of the subject property while the remainder of the neighborhood remains largely unchanged since the 1936 map.

5.1.5 1950 Sanborn Map

The 1950 map shows no changes on the subject property itself, with the possible exception of a repair shop and Contractor's Yard which appears to occupy the shipping and receiving yard of the laundry facility. This parcel is part of the Jung Sun operation and may be a leased space.

A fabric and painting facility was added to the southwest corner of the block with the subject property. Several garage and metal working shops are located to the north. No major changes were noted elsewhere in the neighborhood.

5.1.6 1970 Sanborn Map

The laundry facility appears to have expanded to the north and now includes auto repair capabilities (presumably for delivery vehicles) in one of the garage bays of the building. A large building was added immediately northeast across 24th Street in the location of the current building supply facility.

A bowling alley was added to the east of the property along with a film processing and warehouse operation.

Public School Number No 112 (Dutch Kills School) was added to the northeast of the property along Crescent Street. No additional significant changes were observed on the surrounding properties.

5.1.7 1977-1996 Sanborn Map

No significant changes were made to the subject or surrounding properties.

5.2 Historical Aerial Photographs

To meet prior use requirements of ASTM E 1527-05, historical aerial photographs, including the oldest available photograph (see Appendix A-2), AECOM relied on the historical aerial photographs provided by EDR. The available years of aerial photographic coverage for the subject property include 1966, 1975, 1984, and 1994. Based on the review of the aerial photographs, the subject property has been developed since at least 1966. The interpretation of each aerial photographic history of the subject property is described in the following section.

5.2.1 1966 Aerial Photograph

The subject property is visible in the current configuration. The property appears to be fully operational and the neighborhood is well established as a mix of residential and commercial properties. Due to the quality of the image, no specific details are visible on the property.

5.2.2 1975 Aerial Photographs

In 1975, the facility appears to be fully operational and shipping and receiving operations are visible on the west side of the building in the location which the Sanborn maps refer to as a Contractor's yard. Several large trucks or shipping containers are visible on this property.

5.2.3 1984 Aerial Photographs

No significant changes are visible on or around the subject property.

5.2.4 1994 Aerial Photograph

The subject property appears unchanged since the 1975 aerial photograph.

5.3 Historical Topographical Maps

To meet prior use requirements of ASTM E 1527-05, AECOM relied on the historical topographical maps (see Appendix A-2) provided by EDR. The available years of topographic map coverage include 1897, 1947, 1966, 1979, and 1995. The interpretation of each topographic map of the subject property is described in the following section.

5.3.1 1897 Topographical Map

The map scale does not allow for detailed analysis of the property, however, the area appears to be sparsely developed. The area of the subject property appears to be vacant land while several large commercial or industrial buildings are shown. The topography and inferred groundwater flow is sloping to the south and east towards tributaries of the East River.

5.3.2 1947 Topographical Map

The topographical map shows the subject property is occupied by a large building. Railroad tracks are visible to the south and southeast. The surrounding neighborhood appears to be fully developed with a mix of residential and commercial buildings.

5.3.3 1966, 1979, and 1995 Topographical Map

No significant changes since 1947 map were noticed on the topographical map.

5.4 EDR City Directory Abstract

EDR City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a subject property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at five year intervals. This report compiles information gathered in this review by geocoding the latitude and longitude of property identified.

Year	Uses	Source
2005	Ung Sun Laundry Corp 3 S D Moy & Sons O	Hill-Donnelly Information Services
2000	Jung Sun Wet Wash D Moy & Sons Lip	Cole Information Services
1996	No Record	NYNEX
1991	Jung Sun Wet Wash Inc	NYNEX
1983	Jung Sun Wet Wash Inc	New York Telephone
1976	Jung Sun Wet Wash Inc	New York Telephone
1970	Jung Sun Wet Wash Inc	New York Telephone
1967	Jung Sun Wet Wash Inc	New York Telephone
1962	Jung Sun Wet Wash Inc	New York Telephone
1950	No Records	New York Telephone
1945	Jung Sun Wet Wash Inc	New York Telephone
1939	Jung Sun Wet Wash Inc	New York Telephone
1934	Philip Yea Jung Sun Wet Wash Co Eng Sing Jung Sun Wet Wash Co Jung Sun Wet Wash Co	R. L. Polk & Co.
1922	No Records	The Metropolitan Directory Co.

The abstract shows that, from 1934 through at least 2005, the subject property has been used as a laundry facility. The facility operated as Jung Sun Wet Wash from 1934 through 2000. No information is provided for the use of the subject property before 1934.

6.0 Oil and Hazardous Material Spills/Releases

6.1 Facility Documentation

AECOM was provided with the following documents regarding previous studies of the property. Since this is an ongoing NYSDEC investigation, additional reports are being generated as work progresses.

Aaron & Wright completed a Phase 1 Environmental Site Assessment in September 2003, a Phase 2 Limited Subsurface Investigation in October 2003 and a Phase 2 Limited Groundwater Investigation in December 2003 on the adjacent Scalamandre Silks property. During the Phase 2 Limited Subsurface Investigations, 5 borings were advanced to a depth of 10 feet, but no samples were collected because the PID readings were 0 ppm and there was no visible indication of contamination. A groundwater sample was collected from a temporary well. The TCE and PCE exceeded the NYSDEC groundwater quality standards of 5 µg/L with concentrations of 7.17 µg/L and 37.7 µg/L, respectively. During the Phase 2 Limited Groundwater Investigation, 5 permanent monitoring wells were installed. Samples from these wells exceeded the NYSDEC groundwater quality standards for TCE, PCE or vinyl chloride. The highest levels were detected in the monitoring well adjacent to the Jung Sun Laundry (MW-4).

AECOM (at the time known as Earth Tech) conducted Phase 1 of a site characterization in July 2008 to facilitate the NYSDEC in determining if the site should be added to the NYS Registry of Inactive Hazardous Waste Sites or nominated to the NPL.

The July 2008 site characterization resulted in the following conclusions:

- The presence of PCE and TCE, was confirmed in the groundwater under the Jung Sun and Scalamandre Silks property. The presence of PCE was confirmed in the subsurface soil (Area B on Scalamandre Silks property, located adjacent to the Jung Sun Property). The concentration of PCE and other chlorinated solvents observed in the groundwater is greatest in MW-4, located immediately to the west of the Jung Sun facility and near the location of the dry cleaning operation.
- Groundwater flow in the shallow zone appears to be to the south-southeast across the site (A&W, 2003), although the extremely minimal gradient makes determination of the groundwater flow direction difficult. The data indicate that the dissolved plume observed on the south side of the site is not present north of the site. This suggests that the site is a probable source of the observed contamination.
- There is some upgradient or cross-gradient contamination in the shallow groundwater; suggesting a possible additional upgradient source if the presumed flow direction is correct. Alternatively, this relatively low level of contamination may result from dispersion of the contaminant plume identified on the Jung Sun Property.
- Based on the distribution and concentration of contaminants observed in the soil and groundwater, it is considered possible that there may be an additional source area near the area of a tank-like geophysical anomaly (near TEMIP 8 and MW-4).
-

- Impacts to human health from airborne contamination should be evaluated since receptors are present at the operating facilities on the block. No public water wells were identified within a mile of the site indicating there is no significant threat to human health from ingestion of the groundwater.
- Off –site migration of the groundwater contamination is possible because PCE contamination in the downgradient MW-1 was observed in the 2003 and January 2008 sampling events at levels exceeding the Class GA criteria.
- Ecological impacts from the elevated groundwater concentrations are not considered significant because of the urban setting and a lack of a direct pathway.

The second phase of the site characterization was performed in March of 2010. Based on the results of the field investigations, AECOM concluded that:

- The groundwater, soil and soil gas results confirm the presence of chlorinated volatile organic compounds (TCE, PCE, VC and cis-1,2-DCE) in all matrices at the site (Jung Sun) and in the vicinity of the site.
- The groundwater flow in the shallow zone appears to be relatively flat across the site and the extremely minimal gradient makes determination of the groundwater flow direction difficult. The data of previous site investigation February 2008 and February 2009 of site investigation indicate that the dissolved plume has migrated towards south-southeast to the site at MW-1 and MW-5.
- In Phase 2, a decrease in groundwater contamination concentrations was observed for MW-4 and an increase in groundwater contamination was observed in the downgradient wells MW-1 and MW-5 compared to Phase 1. This indicates the migration of the plume from the site towards south-southeast, and a potential vertical migration of the plume.
- There is some upgradient or cross-gradient contamination in the shallow groundwater; suggesting a possible additional upgradient source, if the presumed flow direction is correct. Alternatively, this relatively low level of contamination may result from dispersion of the contaminant plume identified on the Jung Sun Property.
- PCE was detected in groundwater above the NYSDEC class GA criteria in six of the eight monitoring wells.
- PCE was detected in soil above NYS DEC Part 375 unrestricted use soil cleanup goals on Jung Sun property and Scalamandre Silks property adjacent to Jung Sun. At location SB-1B within the Scalamandre property PCE was detected at 12.0 ft bgs, which is believed to be migrated from contaminated groundwater during seasonal fluctuation (No PID readings were recorded from the surface to 11.00 ft bgs.)
- PCE and TCE were detected at elevated concentrations in soil gas samples; future soil vapor investigation is warranted.
- Ecological impacts from the elevated groundwater concentrations are not considered significant because of the urban setting and a lack of a direct pathway.
- Test pit excavation at the suspected anomalies presented at Scalamandre Silks property adjacent to Jung Sun property identified a reinforced concrete pad.

Based on the two phases of site investigation data (2008 and 2009), listed the site as class 2. Jung Sun is a probable source of the PCE in groundwater because:

- The laundry used solvents during 1980s and 1990s as part of their commercial dry cleaning business as stated by the former owner, Mr. Moy, during the site visit in September 2007.
- Jung Sun is listed in the EDR report as a generator of F002 wastes.
- The adjacent facility, Scalamandre Silks is listed in the EDR Report as a generator of F003 ignitable wastes, but not solvents. No tanks were identified on the Scalamandre Silks property.
- Although the water table is generally flat, it appears there is a slight gradient to the southeast from a high on the Jung Sun property which may result in solvents historically discharged from the Jung Sun property pooling in the groundwater adjacent to the Scalamandre Silks Building.
- Groundwater and soil samples from the Jung Sun property exceed the applicable NYSDEC criteria for PCE and TCE.

6.2 Federal, State, and Local Government Agencies

Section 8.2.2 of the ASTM standard specifies that local, and/or additional state or tribal environmental records sources shall be reviewed to enhance and supplement the ASTM-required federal and state records reviewed and discussed in Section 6.3 of this report.

AECOM reviewed internet based databases from NYSDEC and USEPA for information about the subject property to obtain information related to spills/releases of oil or hazardous materials and other significant incidents.

AECOM is currently working with the NYSDEC to perform remedial investigations of the property.

6.3 Environmental Database Review

EDR provided regulatory information for the subject property, and surrounding properties in its Radius Map with Geocheck® database report. The database report is included as Appendix A-2.

6.3.1 Subject Property

The subject property was listed in the NY Spills, RCRA-SQG, FINDS, Manifest, SHWS, Drycleaners, ERNS, NYSpills, NY Hist Spills, and E-Designations databases. The facility appears under multiple names in the databases including “Oil in Well”, Jung Sun Laundry Plume, Jung Sun Laundry Corp. Jung Sun Laundry Corp, 37-10 24th Street, and Lot 15, Tax block 367. All of these names are tied to the same address for the property and reflect variations in the data entry of each database.

The property is listed as a dry cleaner with historic spills and was deemed a New York State Hazardous Waste Site and classified as a site with “significant threat to the public health or environment – action required”. The property is listed by the NYSDEC as being inactive in December 2006. Following subsequent investigations performed by NYSDEC and AECOM the site was placed on the state hazardous waste site registry as a Class 2 Inactive Hazardous Waste Disposal Site. Chlorinated solvents and daughter compounds persist in the soil and groundwater. Historic spills have resulted in contamination on the property.

6.3.2 Surrounding Properties and Additional ASTM Listings

The following table lists the number of sites by database within the prescribed search radius appearing in the EDR report.

Database Reviewed	Minimum Search Area	Number of Sites Within Area
Federal CERCLIS No Further Remedial Action Planned (CERC-NFRAP) Site List	0.5 Mile Radius	0
Federal RCRA CORRACTS Facilities List	1 Mile Radius	1
Federal RCRA Generators List – SQG	0.25 Mile Radius	5
Federal RCRA Generators List – CESQG	0.25 Mile Radius	5
State and Tribal Equivalent CERCLIS - State Hazardous Waste Sites (SHWS)	1 Mile Radius	5
State and Tribal Leaking Storage Tanks (LTANKS)	0.5 Mile Radius	65
State and Tribal Storage Tanks (TANKS)	0.25 Mile Radius	0
Historical – State and Tribal Leaking Storage Tanks (HIST LTANKS)	0.5 Mile Radius	55
State and Tribal Registered Storage Tanks List – Underground Storage Tanks (UST)	0.25 Mile Radius	22
Major Oil Storage Facilities Database (MOSF UST)	0.5 Mile Radius	2
Major Oil Storage Facilities AST Database (MOSF AST)	0.5 Mile Radius	2
Major Oil Storage Facilities Database (MOSF)	0.5 Mile Radius	1
State and Tribal Solid Waste Landfills (SWF/LF))	0.5 Mile Radius	3
State and Tribal Registered Storage Tanks List – Aboveground Storage Tank (AST)	0.25 Mile Radius	38
State and Tribal Voluntary Cleanup Sites – Voluntary Cleanup Agreements (VCP)	0.5 Mile Radius	1
Local Lists of Landfill/Solid Waste Disposal Sites (SWRCY)	0.5 Mile Radius	0
Local Lists of Hazardous Waste/Contaminated Sites (DEL SHWS)	1 Mile Radius	1
Local Lists of Registered Storage Tanks (HIST UST)	0.25 Mile Radius	20
Records of Emergency Release Reports (NY Spills)	0.125 Mile Radius	9
Records of Emergency Release Reports (NY Hist Spills)	0.125 Mile Radius	8
RCRA – Non-Generator	0.25 Mile Radius	22
Formerly Used Defense Sites Properties (FUDS)	1 Mile Radius	0
Manifest (MANIFEST)	0.25 Mile Radius	38
Dry Cleaners (DRYCLEANERS)	0.25 Mile Radius	1
E DESIGNATION	0.125 Mile Radius	34
Manufactured Gas Plants (MGPs)	1 Mile Radius	0

An evaluation of sites identified within the prescribed search area is presented below.

6.3.2.1 **Federal Databases**

Federal CERCLIS No Further Remedial Action Planned (CERC-NFRAP) Site List

CERC-NFRAP sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National

Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

CORRACTS

CORRACTS is a list of handlers with RCRA Corrective Action Activity. The subject property address is not listed in the CORRACTS database. The EDR report identified one CORRACTS within a 0.5-1 mile radius of the subject property.

Federal RCRA Generators List – SQG

RCRAInfo is the USEPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, indicates that there are five RCRA-SQG sites within approximately 0.25 miles of the subject property.

Four of the five RCRA –SQG properties are located at lower elevations from the subject property and therefore, are not likely to have impacted the subject property. The fifth site is identified as Enterprise Cleaners located 0.24 miles to the south east of the site. Due to the distance and location of the facility, it is unlikely to have an impact on the subject property.

Federal RCRA Generators List – CESQG

RCRA conditionally exempt small quantity generators (CESQGs) generate less than 100 kilogram (kg) of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-CESQG list, as provided by EDR has revealed that there are five RCRA-CESQG site within approximately 0.25 miles of the property.

Three of the five facilities are located at lower elevations and are not expected to have an impact on the facility. Of the two remaining facilities, the Kerns Manufacturing Corp. located on 29th Street is cross referenced in the FINDS and Manifest databases and is shown has having been a large quantity generator in the mid 1980's. The site is listed as having generated large quantities of chlorinated solvents and heavy metals. Kerns Manufacturing Corp. is located southeast of the site. Elevated groundwater concentrations do not appear to be entering the study area from this direction. The other site (BELCO EQUIPMENT CORP) located at 38-01 29th Street is listed as having generated flammable wastes. No violations are identified for the facility.

6.3.2.2 State/Tribal Databases

Solid Waste Facilities / Landfill Sites (SWF/LF)

The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state.

A review of the SWF/LF list, as provided by EDR, has revealed that there are three SWF/LF sites within approximately 0.25-0.5 mile radius of the subject property. These sites are located to the west and northwest of the subject property and are described as being at lower elevations than the subject property. Based on the downgradient nature of these properties, they are not expected to negatively impact the subject property.

State Hazardous Waste Sites (SHWS)

The SHWS records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the NYSDEC's Inactive Hazardous Waste Disposal Sites in New York State.

The EDR database report shows a total of five SHWS facilities were identified within one mile of the subject property. Four of the properties are located south or east of the property and are shown at higher elevations than the Jung Sun property; however, due to the distance from the property and the apparent side gradient location of these properties, it is unlikely that cross contamination is occurring.

The fifth site listed is as being at a lower elevation and is not expected to have an impact on the subject property.

State and Tribal Leaking Storage Tanks (LTANKS)

The LTANKS records contain an inventory of reported leaking storage tank incidents reported from April 1, 1986 through the most recent update. They can be either leaking underground storage tanks or leaking aboveground storage tanks. The causes of the incidents are tank test failures, tank failures, or tank overfills.

A review of the LTANKS list, as provided by EDR has revealed that there are 65 LTANKS sites within approximately 0.5 miles of the subject property. Of the 65 sites, 32 are listed at higher elevations than the subject property. The database report shows that the 32 higher elevation LTANKS cases have been closed.

The remaining sites are listed at lower elevations than the subject property and are not likely to have an impact on the site.

State and Tribal Registered Storage Tanks List – Underground Storage Tanks (UST)

The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of RCRA. The data come from the NYSDEC's Petroleum Bulk Storage (PBS) Database.

A review of the UST list, as provided by EDR has revealed that there are 22 UST sites within approximately 0.25 miles of the subject property. Of the 22 sites, 12 are listed as being at higher elevations than the subject property. Of the 12 properties, Tri Star Lumber Corp and Hephaistos Building Supplies are located directly across the street from the subject property. The facilities are listed as having petroleum storage tanks, but no violations are listed and as such, the facilities are unlikely to have impacted the property.

State and Tribal Registered Storage Tanks List – Aboveground Storage Tank (AST)

The Aboveground Storage Tank database contains registered ASTs. The data come from the NYSDEC's Petroleum Bulk Storage (PBS) Database.

A review of the AST list has revealed that there are 38 AST sites within approximately 0.25 miles of the subject property. No leaks, releases or violations are reported for these sites, and therefore it is unlikely that there are any environmental impacts to the subject property from these sites.

6.3.2.3 **Local Databases**

Local Lists of Landfill/Solid WASTE Disposal Sites (SWRCY)

This database deals with Registered Recycling Facility List from the NYSDEC.

A review of the SWRCY list, as provided by EDR, has revealed no SWRCY sites within approximately 0.5 miles of the subject property.

Local Lists of Registered Storage Tanks (HIST UST)

The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the NYSDEC's Petroleum Bulk Storage (PBS) Database

A review of the HIST UST list, as provided by EDR, revealed that there are 20 HIST UST sites within approximately 0.25 miles of the subject property. Based on the information that no spills have been reported from these sites, any environmental impact from these sites is unlikely.

Records of Emergency Release Reports (NY Spills)

Data collected in the NY Spills, as reported to NYSDEC, is required by one or more of the following: Article 12 of the Navigation Law, 6 NYCRR Section 613.8 (from PBS regulations), or 6 NYCRR Section 595.2 (from CBS regulations). It includes spills active as of April 1, 1986, as well as spills occurring since this date.

A review of the NY Spills list has revealed that there are 9 NY Spills sites within approximately 0.125 miles of the subject property. Of the 9 sites, 8 sites are also listed under the NY Historical Spills database. Considering the nature of contaminant leaked, quantities and that the sites were closed, it is unlikely that there were any environmental impacts to the subject property.

RCRA – Non-Generator (RCRA-NonGen)

RCRA-NonGen is USEPA's comprehensive information system, providing access to data supporting RCRA (1976) and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Non-Generators do not presently generate hazardous waste.

A review of the RCRA-NonGen list, as provided by EDR has revealed that there are 22 RCRA-NonGen sites within approximately 0.25 miles of the subject property. Of the 19 sites, 16 are listed in multiple databases. No spills or releases are reported for any of the sites. It is unlikely that these sites have impacted the subject property.

MANIFEST

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

A review of the MANIFEST list, as provided by EDR has revealed that there are 37 MANIFEST sites within approximately 0.25 miles of the subject property. No spills or releases are reported for any of the sites. It is unlikely that these sites have impacted the subject property.

DRYCLEANERS

This listing provides all registered dry-cleaning facilities around the subject property.

A review of the DRYCLEANERS list has revealed that there is one drycleaner site within approximately 0.25 miles of the subject property. No spills were reported for this facility; however, multiple violations were identified. The nature of the violations appears to be administrative and the facility is located approximately ¼ mile away from the site, therefore, it is unlikely that the facility would have impacted the subject property.

It must be noted that the DRYCLEANERS list does not indicate the subject property or the other facilities listed in the other databases as being cleaners.

Manufactured Gas Plants (MGP)

The EDR Proprietary MGP database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. MGP sites were operated in the United States from the 1800s to 1950s to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste.

A review of the MGP list, as provided by EDR, has revealed that there are no MGP sites within approximately 1 mile of the subject property.

7.0 Interviews

7.1 Interviews with Current Owner

Per ASTM E 1527-05, interviews with past and present owners, operators, and occupants of the subject property, who are likely to have material information regarding the potential for contamination at the subject property shall be conducted, to the extent that they can be identified and that the information likely to be obtained is not duplicative of information already obtained from other sources. AECOM has attempted to interview property owners and operators for the subject property, however, prior to the start of the Phase I ESA effort, the owner disappeared and no formal interview has been conducted. Additional information obtained during the interview process (e.g., information on site history and operations) has been incorporated, as appropriate, in Sections 4.0 and 5.0.

7.2 Interviews with Past Owners, Operators, and Occupants

AECOM was unable to contact the current and former property owner(s) and operator(s) for the purpose of this assessment.

7.3 Interviews with Government Agencies

Contact with local and federal government agencies were conducted in conjunction with the review of regulatory records. Information obtained through these interviews is discussed in Section 6.2.

8.0 Findings and Conclusions

AECOM performed a Phase I ESA of the property located at 37-10 24th Street, Long Island City, Queens, New York (subject property), in conformance with the scope and limitations of ASTM Standard E 1527-05. No physical environmental sampling was performed as part of this Phase I ESA. Any exceptions to, or deletions from, this practice are described in Section 1.1 of this report.

In accordance with the ASTM Standard, potential findings can include RECs, historic recognized environmental conditions (HRECs), and de minimis conditions. RECs are conditions where the data collected indicates that there is or has been a release or that there is a potential for a release of hazardous substances or petroleum products into the structures at the subject site, or into the ground, groundwater or surface water of the subject site. HRECs are generally conditions that in the past have been remediated to the satisfaction of the responsible regulatory agency. De minimis conditions are those situations that do not present a material risk of harm to public health or the environment and generally would not be subject to enforcement action if brought to the attention of the appropriate governmental agencies.

8.1 RECs

AECOM has performed a Phase I ESA in conformance with the scope and limitations of ASTM Standard E 1527-05 of 37-10 24th Street, Long Island City, Queens, New York. Any exceptions to, or deletions from, this practice are described in Section 1.3 of this report. This assessment has revealed no evidence of RECs in connection with the property except for the following:

- Subject Property: A review of the Sanborn Maps indicates that the subject property has historically been used as a laundry facility including dry cleaning operations since at least 1934. The potential for impacts from historic operations and residual contamination constitutes a REC. The historic use of laundry and dry cleaning chemicals could result in residual contamination and vapor intrusion concerns within the building.
- Subject Property: This property is currently the subject of an remedial investigation by the NYSDEC to assess the soil and groundwater contamination underneath the building. Investigative activities currently indicate that the Jung Sun facility is the source of local groundwater contamination.
- Subject Property: Numerous drums of laundry cleaning fluids were found scattered about the property inside and outside of the building. Some of the drums are open, some are unlabeled.
- Subject Property: Trenches and sumps are present within the building and the discharge points are not known.
- Subject Property: Stained concrete and asphalt was observed on the property. The staining was extensive and is not easily correlated to any given materials. Staining was observed in the previously mentioned sumps and trenches.
- Subject Property: A hydraulic trash compactor is located in the center of the yard area and appears to have leaked onto the subject property.

- Subject Property: An unexplained pile of crushed concrete is located adjacent to the trash compactor and may be the result of dumping on the property.
- Subject Property: A sump is located in one of the basements of the building and appears to be unlined with unidentified drainage pipes leading to it.
- Subject Property: An aboveground oil storage tank is located in the basement of the building and the contents of the tank could not be determined. The tank is encased in a masonry and concrete vault and could not be assessed for structural integrity or leak potential.
- Subject Property: Two sets of fill ports were observed in the sidewalk in front of the building indicating the presence of two additional tanks which were not observed. AECOM believes that the piping may have led to additional vaulted tanks in the basements.
- Subject Property: Wastewater at the property allegedly discharges to the city sewer system; however, a large sump was partially visible under a steel road plate in the southern end of the building. The sump was observed to contain several feet of water and AECOM suspects some of the buildings waste water may have been discharged to the sumps.
- Subject Property: The presence of broken fluorescent light bulbs and suspected PCB containing light ballasts in the basement is a REC.
- Surrounding Property Use: The properties to the south, east and west of the subject property have historically and continue to be used for a variety of industrial applications including automotive repair. The industrial use of the surrounding properties is a REC.
- Surrounding Property Use: The properties to the east of the subject property have been identified in multiple regulatory databases and are documented to have spills or other contamination present. The industrial use of the surrounding properties is a REC.

8.2 HRECs

Based on the results of the ESA, the following HRECs were identified with respect to the subject property.

- Subject Property: A review of the Sanborn Maps indicates that the subject property has historically been used as a laundry facility. The potential for impacts from historic operations and residual contamination constitutes a HREC.

8.3 De minimis

No de minimis conditions were identified with respect to the subject property.

8.4 Data Failures/Data Gaps

Per the ASTM Standard, historical research is complete when either: 1) the objectives in Sections 8.3.1 through 8.3.2.2 of the Standard are achieved; or 2) data failure is encountered. The following data failures/gaps were encountered or identified with respect to the subject property:

- AECOM could not speak with the current owners of the building.
- At the time of the site inspection, much of the ground surface was obscured by garbage, piles of concrete, rolling carts, and steel road plates, and as such, the ground surface could not be thoroughly reviewed.

9.0 References and Contacts

9.1 Persons Interviewed

AECOMs sole interview was a casual conversation with Mr. Moy who previously owned the property. At the time, AECOM was not performing a Phase I and did not ask specifically relevant questions.

9.2 Reports and Documents

Environmental Data Resources, Inc., (EDR), Aerial Photos Decade Package, prepared for Jung Sun Laundry Plume 37-10 24th Street Long Island City, NY dated April 4, 2008 Inquiry Number: 2187109.5. Report prepared by Environmental Data Resources, 440 Wheelers Farms Road, Milford, Connecticut 06460, (800) 353-0050.

EDR, City Directory Abstract, prepared for prepared for Jung Sun Laundry Plume 37-10 24th Street Long Island City, NY dated April 4, 2008 Inquiry Number: 2187109.5. Report prepared by Environmental Data Resources, 440 Wheelers Farms Road, Milford, Connecticut 06460, (800) 353-0050.

EDR, Historical Topographic Map Report, prepared for prepared for Jung Sun Laundry Plume 37-10 24th Street Long Island City, NY dated April 4, 2008 Inquiry Number: 2187109.5. Report prepared by Environmental Data Resources, 440 Wheelers Farms Road, Milford, Connecticut 06460, (800) 353-0050.

EDR, Certified Sanborn Map Report, prepared for prepared for Jung Sun Laundry Plume 37-10 24th Street Long Island City, NY dated April 4, 2008 Inquiry Number: 2187109.5. Report prepared by Environmental Data Resources, 440 Wheelers Farms Road, Milford, Connecticut 06460, (800) 353-0050.

EDR, Radius Map with GeoCheck®, prepared for prepared for Jung Sun Laundry 37-10 24th Street Long Island City, NY dated February 22, 2012. Inquiry Number: 3263651.1s. Report prepared by Environmental Data Resources, 440 Wheelers Farms Road, Milford, Connecticut 06460, (800) 353-0050.

Aaron & Wright Technical Services Inc., 2003. Phase II Limited Subsurface Investigation of Scalamandre Silks, Inc. October.

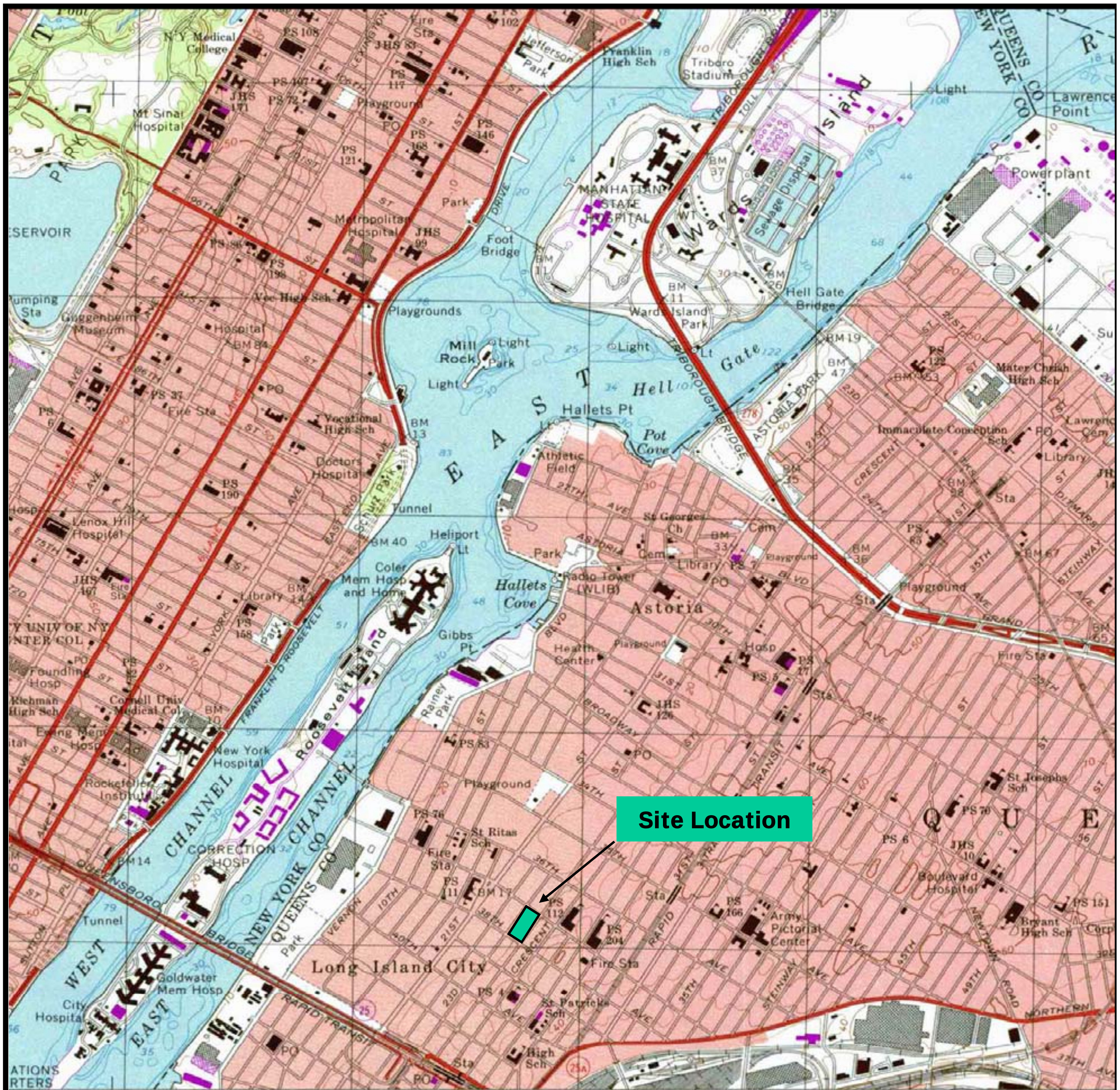
Aaron & Wright Technical Services Inc., 2003. Limited Groundwater Investigation of Scalamandre Silks, Inc. December.

Earth Tech, Inc. 2008. Phase 1 Data Summary Report Jung Sun Laundry Plume Site Number: 241102. Prepared for New York State Department of Environmental Conservation. July.

Earth Tech, Inc. 2010. Phase 2 Data Summary Report Jung Sun Laundry Plume Site Number: 241102. Prepared for New York State Department of Environmental Conservation.

U.S. Environmental Protection Agency Enforcement and Compliance History Online (ECHO) database, http://www.epa.gov/echo/.

U.S. Department of Labor Occupational Safety and Health Administration Standard Industrial Classification (SIC) System Search, http://www.osha.gov/pls/imis/sicsearch.html?p_sic=&p_search=sheet+metal.



MN GN

12° / 213 MILS

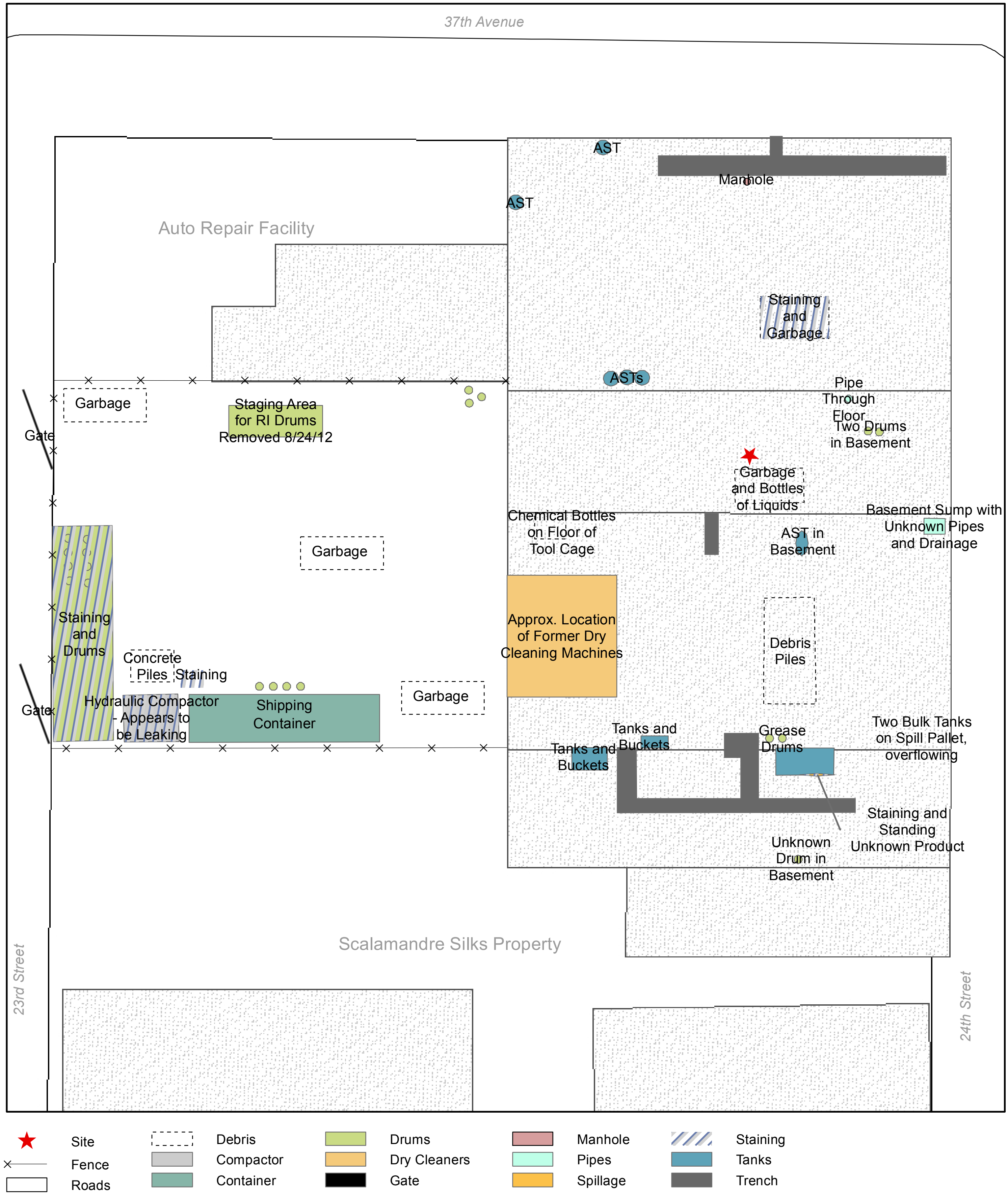
0° 42' / 12 MILS

UTM GRID & 1979 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

USGS Central Park (NY) Quadrangle

U.S.G.S. 1:24 000 SCALE TOPOGRAPHIC MAP

AECOM	PROJECT: **JUNG SUN LAUNDRY PLUME** 37-10 24th Street. Long Island City, New York	SITE LOCATION MAP Project No: 60237880 Figure No: 1



Site

Prepared for:

Prepared by: AECOM

Facility Layout

Jung Sun Laundry Plume Site (Site No. 241102), 37-10 24th Street, Long Island City, NY 11101

SCALE:	DATE:	JN:	PATH AND FILE NAME:
0 12.5 25 Feet	11/14/2012	60237880	L:\work\101962\Working Draft\RI\Figures\F02 Layout.mxd

FIGURE:

2

Appendix A-1

Site Photographs

Subject Property

Interior of northern portion of building

Interior of central portion of building

Interior of southern portion of building.

Interior of northern basement with drum and garbage on floor.

Cut piping believed to be former AST/UST fill piping.

	Vaulted AST in central basement. Note dearation tank in foreground on left side and piping leading to the sump just off camera on the bottom right corner.
	Sump in central basement with various pipes discharging to it and no known discharge point.
	Alternate view of sump in central basement with drain pipes and a drum on the right side.

	Southern basement interior.
	Open top drum with unknown contents in the southern basement.
	Overview of the yard portion of the subject property with the two shipping containers, hydraulic compactor and pile of concrete rubble.

	Heavy staining and residual slime associated with drums next to the shipping containers.
	Interior of shipping containers.
	Drums mixed with linen carts in the yard area.

	Typical trenches with sumps, staining, and standing water throughout the facility.
	Typical building interior with containers of paints and other materials scattered with general garbage.
	Cans and bottles of paint, lubricants, and other maintenance chemicals in the maintenance cage of the building.

	View of grease drums (left) and road plates at the entrance to the southern portion. The gap in the road plates is the location of a sump pit which is full of water.
	Stained trenches and road plates in the southern portion of the building.
	Steel road plates over sump.

Garbage filled trenches and drains inside of the building.

Overflowing chemical storage tanks on an overflowing spill containment pallet. Note the staining in front of the pallet.

Drums of grease and unknown liquids in the yard portion of the property.

Appendix A-2

EDR Reports on CD

Appendix A-3

Qualifications of Environmental Professional

Kevin D. Seise
Project Manager

Education

BS, Environmental Science, Richard Stockton College of New Jersey, 1996

Years of Experience

With AECOM: 9

With Other Firms: 6

Training and Certifications

40-hour HAZWOPER Training

Aerial Lift (Man-lift) Operation Training

Asbestos Worker Medical Exam

Audiogram Medical Review

Boater Safety

Confined Space - Attendant

Confined Space - Entrant

Confined Space - Entry Supervisor

Defensive Driving Awareness Training

DOT Level 1 Shipper/(TDG) Canada

DOT Medical Monitoring

Employee Substance Abuse Training

Fall Protection Awareness Training

First Aid

First Aid/CPR

General Excavation Safety

Hazard Communication (US)/WHMIS (Canada)

HAZWOPER 40-Hour Training

HAZWOPER 8-Hour Refresher Training

HAZWOPER 8-Hour Supervisor Training

HAZWOPER Medical Exam

Hearing Protection

Lead Worker Exam - Blood Pb and ZPP

Office Ergonomics

Project Management - Basic

Reasonable Suspicion - Alcohol and Substance Abuse

Respirator Fit Test

Respirator Medical Clearance

Respiratory Protection

Mr. Seise is experienced in the design, implementation, and management of environmental assessments and remediation projects. He has performed environmental due diligence assessments of power plants including coal, natural gas, oil, and hydroelectric generating facilities in support of investment opportunities, facility decommissioning for power plants, pharmaceutical plants, and other industrial facilities.

Mr. Seise has conducted environmental assessments; hazardous material inventories; groundwater monitoring; soil sampling; monitoring well installation; soil vapor intrusion testing; Phase I environmental site assessments; asbestos, lead, and microbial investigations; and emergency response activities for various government clients. He also is the Chestnut Ridge, New York environmental health and safety (EH&S) coordinator.

Project Experience

Other Category

New York City Department of Environmental Protection, Croton Falls Reservoir Environmental Health and Safety Management, Croton Falls, New York. Environmental health and safety manager for the ongoing reconstruction efforts at the Croton Falls Dam and Diverting Dam reconstruction projects. Duties include inspection and monitoring of oil and other hazardous materials in use by the contractor and regulatory compliance for drinking water, watershed, and pollutant discharges related to operations in and around the reservoirs, oversight of the removal of sediments and hazardous materials from legacy operations, and general safety oversight of contractors operations. [07/01/2009-12/31/2012]

New Jersey Department of Transportation, Landfill Monitoring, Trenton, New Jersey. Field team leader for the quarterly inspection and monitoring of post closure conditions at the Duck Island Landfill. Duties include coordination, training, H&S management of field crews sampling wells on the landfill, along streams, and along highways and railroad tracks. [07/01/2006-12/31/2012]

Orange & Rockland Utilities Company, Former US Bus Company Hazardous Materials Survey, Suffern, New York. Project manager for an asbestos, lead, and hazardous materials survey for a predemolition inspection of a former bus maintenance garage. [12/01/2008-06/01/2009]

US Postal Service, Emergency Lead-Based Paint Abatement, Newark, New Jersey. Project manager for monitoring the abatement of lead-based paint from Judge Hayden's chambers in the Newark main post office. Managed response to an emergency request following the discovery of damaged lead-based paint above a drop ceiling in the judge's chambers. The emergency cleanup was performed within hours of the request. [02/01/2009-06/30/2009]

US Postal Service, Asbestos and Lead-Base Paint Testing, Elizabeth, New Jersey. Project manager for testing of for lead-based paint and asbestos in damaged areas of the lobby of an historic post office. [03/01/2009-06/30/2009]

US Postal Service, Main Post Office Emergency Lead Abatement Oversight, Newark, New Jersey. Project manager for monitoring the emergency removal of damaged and flaking lead-based paint, including industrial hygiene monitoring of airborne lead dust concentrations and settled lead dust following abatement. [01/01/2009-12/31/2009]

US Postal Service, Dominic V. Daniels Processing and Distribution Center Asbestos Abatement Monitoring, Kearny, New Jersey. Project manager for monitoring the removal of approximately 600 square feet of asbestos-containing floor tiles. Managing air monitoring during removal and post-abatement clearance air samples. [01/01/2009-02/28/2009]

New York State Department of Environmental Conservation, COSCO Manufacturing Site Soil Vapor Intrusion and Groundwater Sampling, Spring Valley, New York. Project manager for a soil vapor intrusion study and indoor air

RMD X-ray Fluorescence Analyzer Manufacturers Training

Safety Orientation

Scaffolding Training

Trench/Excavation Safety

quality survey of properties down-gradient of a NYSDEC state Superfund site. Managing sampling of on-site wells to determine if remaining groundwater conditions are adversely impacting the occupants of residences above the plume. [10/01/2008-10/01/2009]

Civic Builders, Petroleum Odor Analysis, Bronx, New York. Project manager for response to complaints of petroleum odors in soils at a new school construction site. Managing screening of soils with a PID to delineate the extent of contamination, collection of soil samples for laboratory analysis, and direction and consulting services on the methods for disposing of the soil. [09/01/2008-12/31/2008]

Civic Builders, New Heights School Asbestos Specifications, Harlem, New York. Project manager for preparation of asbestos abatement design specifications for roofing materials at a charter school, which currently occupies a small portion of the building but is planning to expand. The increased occupancy requires additional air conditioning units on the roof, which must penetrate the asbestos-containing roofing materials. [09/01/2008-12/31/2008]

Confidential Client, Cogeneration Plant Due Diligence, Michigan. Project manager for environmental due diligence to support the potential acquisition of a 1240 MW gas-fired cogeneration plant. Managing review of environmental permits and assessment of the power plant to maintain permit compliance within the client's derived efficiency and financial models. Managing review of water and air permitting along with a general environmental assessment of the plant and the legacy infrastructure related to a nuclear power plant at the site. [06/01/2008-12/31/2008]

New York City School Construction Authority, New Heights Academy Lead Paint Operation and Maintenance Plan, New York, New York. Project manager, as a subconsultant,for preparation of a lead-based paint O&M plan for a newly renovated charter school. [08/01/2008-09/30/2008]

Gramercy Group, Inc., Van Nest Underground Storage Tank Sampling, Bronx, New York. Project manager for monitoring the removal of three USTs discovered during demolition and performing the required post-excavation soil sampling. Managing preparation of an underground storage tank closure report for removal of the three tanks. [06/01/2008-10/31/2008]

US Postal Service, Main Post Office Lead Removal Specifications, Newark, New Jersey. Project manager for preparation of design specifications for removal of lead-based paint from all five floors of the building and allowing for continued occupancy during the abatement process. [09/01/2008-12/31/2008]

US Postal Service, Main Post Office Floor Tiles, Staten Island, New York. Project manager for monitoring during abatement of approximately 20 square feet of asbestos-containing floor tiles, air monitoring during removal of the floor tiles, and post-abatement clearance air sampling. [05/01/2008-09/30/2008]

St. Patrick's Parish, Middle School Asbestos Remediation and Oversight, Chatham, New Jersey. Project manager for preparation of asbestos abatement design specifications and plans, assisting with selection of an abatement contractor, oversight during abatement of the sewage-contaminated carpeting and underlying asbestos floor tiles, and asbestos air monitoring during the entire project. [06/01/2008-12/31/2008]

St. Patrick's Parish, Roof Asbestos Testing, Chatham, New Jersey. Project manager for asbestos testing of a school roof prior to planned roof replacement. [05/01/2008-06/30/2008]

Civic Builders, New Heights Building Renovation Environmental Advice, New York, New York. Project manager for assistance with environmental-related issues during renovation of a multi-use building into a charter school. Managing consultation on lead-based paint, asbestos-containing materials, fuel oil storage tanks, and vapor intrusion hazards. [04/01/2008-12/31/2008]

New York State Department of Environmental Conservation, Farmingdale Cleaners Site Sampling, Farmingdale, New York. Project manager for installation of 11 multi-channel well sampling units in 11 new monitoring well locations down-gradient of a former dry cleaning facility and two rounds of sampling to monitor the existing PCE plume and its migratory pathways. [03/01/2008-12/31/2009]

Northeast Energy Alliance, LLC, Power Plant Due Diligence, Northeastern US. Project manager for assistance during the purchase and sale period of an asset acquisition. Managing environmental due diligence, document review, and analysis of emissions performance and other regulator compliance issues that might impact investors. [01/01/2008-12/31/2008]

Longview Power Plant and Coal Mine, Due Diligence, Bloomfield, West Virginia. Project manager for environmental due diligence to support refinancing of a 600 MW coal fired power generation plant. Managing an assessment of the attached, yet independent, coal mine to assess the mine's capacity to maintain supply for the power plant and operate within the parameters of various operating permits. [06/01/2008-12/31/2008]

Sigma Energy Solutions, Brandywine Cogeneration Facility Due Diligence, Brandywine, Maryland. Project manager for assistance with due diligence efforts to identify environmental liabilities and performance-limiting factors related to environmental constraints. [10/01/2007-06/01/2008]

ITT Corporation, Clifton Memorial Park Restoration, Clifton, New Jersey. Project manager for review of existing city storm sewer conditions and design of a stormwater treatment system with a centrifugal debris separator and an outfall netting system. Managing planting of 60 trees around the city park and an additional 800 irises around the pond in the center of the park as part of a natural resource restoration project required by an agreement between the client and the NJDEP. [09/01/2007-09/01/2008]

Civic Builders, Asbestos Abatement Oversight, Brooklyn, New York. Project manager for asbestos abatement monitoring during asbestos removal prior to demolition of half of the structure and renovation of the remainder of the structure into a new charter school for the city of New York. [11/01/2007-02/01/2008]

Civic Builders, Asbestos and Lead-Based Paint Inspection, Bronx, New York. Project manager for asbestos and lead-based paint inspection, abatement design, and contractor oversight for a 120,000-square-foot school building prior to demolition. [04/01/2007-12/31/2008]

US Postal Service, Trenton Processing and Distribution Center AST Removal, Hamilton Township, New Jersey. Project manager for preparation of specifications and plans for demolition of an aboveground fuel oil storage tank and the associated concrete pad. Managing assistance with selecting a demolition contractor and coordinating contractor activities and facility needs. [04/01/2008-12/31/2008]

US Postal Service, Roof Asbestos Abatement Oversight, Lakehurst, New Jersey. Project manager for abatement of approximately 80 square feet of asbestos-containing roofing material from the front awning of the Lakehurst main post office. Managing collect of clearance air samples during and after abatement. [11/01/2007-12/31/2008]

US Postal Service, Newark Main Post Office Paint Chip Sampling and Abatement Oversight, Newark, New Jersey. Project manager for collecting paint chip samples and testing paint for lead content, preparation of a remediation work plan, and monitoring of lead-based paint removal. [07/01/2007-12/31/2008]

US Postal Service, Main Post Office Emergency Response, Orange, New Jersey. Project manager for response to an emergency following a partial ceiling collapse. Managed collection of samples of the fallen ceiling materials, analysis for asbestos and lead content, and preparation of a report of the findings. The emergency response was completed within two hours of the initial phone call request. [07/01/2007-12/31/2007]

US Postal Service, Industrial Hygiene Services, Multiple Sites, New Jersey and New York. Project manager, inspector, and project monitor involved in inspection, abatement design, and abatement oversight for asbestos, lead based paint removal projects, and industrial hygiene services in postal services facilities throughout New York and New Jersey. [01/01/1997-12/31/2011]

New Jersey School Construction Corporation, Asbestos Inspection, Abatement Design, Cost Estimating, and Abatement Oversight, Jersey City, New Jersey. Task manager for asbestos inspection, abatement design, abatement cost estimating, and abatement oversight for seven properties, which included a historic railroad station, historic bank building, and a mix of residential and commercial properties. [10/01/2006-12/31/2007]

Civic Builders, Asbestos and Lead Inspection, Abatement Design, Remedial Cost Estimating, and Abatement Oversight, Bronx, New York. Project manager for asbestos and lead inspection, abatement design, abatement cost estimating, and abatement oversight and for an 120,000-square-foot former arsenal facility to convert the building into a new school. [02/01/2007-12/31/2007]

Civic Builders, Asbestos and Lead Inspection and Abatement, Brooklyn, New York. Project manager for asbestos and lead inspection, abatement design, abatement cost estimating, and abatement oversight for an 80,000-square-foot former dairy processing facility to convert the building into a new school. [02/01/2007-12/31/2007]

Confidential Electronics Company, Paint Sludge Contamination Investigation, Mahwah, New Jersey. Project manager for review of existing environmental reports and guidance on future investigations of paint sludge contamination on the property and neighboring properties. Working with regulators in New York and New Jersey and overseeing the former property owner's consultant and contractors to protect the interests of the client during the investigation period. [11/01/2006-12/31/2007]

New York City School Construction Authority, Little Neck Parkway Phase I Environmental Site Assessment, Little Neck, New York. Project manager for a Phase I ESA and preparing a scope of work for an indoor air quality investigation. Following the Phase I and scope of work, served as project manager for the sampling and reporting of indoor air quality survey. [07/01/2006-12/31/2007]

New York City School Construction Authority, Phase I Environmental Site Assessment, Elmhurst, New York. Project manager for a Phase I ESA update and preparation of a scope of work for Phase II site investigation. Following the Phase I and scope of work, served as project manager for the sampling and reporting of indoor air quality survey. [07/01/2006-12/31/2007]

New York City School Construction Authority, AAFE Site Phase I Environmental Site Assessment, Flushing, New York. Project manager for a Phase I ESA update and preparation of a scope of work for a Phase II site investigation if needed. [06/01/2006-12/31/2011]

US Postal Service, Asbestos and Lead Inspections and Abatement, Multiple Sites, New Jersey and New York. Project manager, inspector, and project monitor involved in inspection, abatement design, and abatement oversight for asbestos and lead based paint removal projects in postal services facilities throughout New York and New Jersey. [01/01/1997-12/31/2011]

US Postal Service, Mold Assessment and Abatement, Multiple Sites, New Jersey and New York. Environmental scientist involved in mold sampling, analysis and reporting following significant water intrusion during an extended precipitation event. Conducted indoor air quality sampling using spore traps and surface sampling using microbial swabs and biotapes. [01/01/1997-12/31/2011]

Massachusetts Department of Corrections, Prison Hazardous Materials Abatement, Massachusetts. Provided field inspection, remedial design, and remedial oversight for asbestos and hazardous material abatement at multiple prisons. [Prior to AECOM] [01/01/2000-12/31/2002]

New Jersey School Construction Corporation, Property Acquisition, Northern New Jersey. Conducted site feasibility studies in connection with the planned acquisition of commercial-industrial sites for future development as schools. Prepared environmental screening report and Phase I environmental site assessment reports and prepared specifications for remedial design. [Prior to AECOM] [01/01/2004-12/31/2005]

Philadelphia Gas Works, Underground Storage Tank Compliance, Pennsylvania. Provided underground storage tank compliance and monthly lead detection checks. [Prior to AECOM] [01/01/2003-12/31/2004]

Jersey City Public Schools, Underground Storage Tank Compliance, Jersey City, New Jersey. Provided underground storage tank compliance and monthly lead detection checks. [Prior to AECOM] [01/01/2004-12/31/2005]

University of Massachusetts, Compliance Audit, Dartmouth, Massachusetts. Conducted a facilities compliance audit for the campus. [Prior to AECOM]

Ashland Landfill, Closure Assistance, Ashland, Massachusetts. Assisted with landfill closure and monitoring. [Prior to AECOM]

Medfield State Hospital, Underground Storage Tank Closure and Spill Prevention Control and Countermeasure Training, Medfield, Massachusetts. Provided UST abandonment oversight monitoring for the closure of 30,000 gallon #6 fuel oil storage tank and provided training to facility personnel to comply with the requirements of the SPCC plan. [Prior to AECOM]

Cambridge Police Department, Firing Range Decontamination, Cambridge, Massachusetts. Inspected, designed, and provided project management for the decontamination and dismantling of the firing range on the fifth floor of the occupied police headquarters building. [Prior to AECOM]

Industrial Hygiene Assessment, Industrial Hygiene Hazard Assessment, NAS Lakehurst, New Jersey. Performed industrial hygiene hazard assessment for guano in support of hangar modifications. [Prior to AECOM]

Merck Pharmaceutical, Asbestos and Lead Abatement, Barceloneta, Puerto Rico. Inspected for asbestos and lead-based paint. Provided filed management services for the abatement and demolition of a factory. [01/01/1999-12/31/1999]

Railroad Power Plant, Asbestos and Lead Abatement, Cumberland, Maryland. Inspected for asbestos and lead-based paint. Provided filed management services for the abatement and demolition of a two boiler power plant. [01/01/1999-12/31/1999]

Chemical Manufacturer, RCRA Closure, Guayanilla, Puerto Rico. Provided on-site management for the removal of mercury-contaminated soils. [01/01/1998-12/31/1999]

Auto Manufacturer, Asbestos Inspection, Toledo, Ohio. Performed an asbestos inspection of a 6.7-million-square-foot automotive assembly plant, including a 6-story power plant. [01/01/1999-12/31/1999]

Giant Foods, Tank Management, Landover, Maryland. Oversaw the lining of four underground storage tanks and the implementation of spill prevention control and countermeasures modifications. [01/01/1998-12/31/1998]

Phillips Petroleum, Extraction Systems, Carteret, New Jersey. Assisted in the installation of multiple-phase extraction systems, including pilot studies and system installation. [01/01/1998-12/31/1999]

US Navy, Naval Reserve Center Soil and Groundwater Cleanup, Binghamton, New York. Provided on-site management for the cleanup of petroleum-contaminated soils and the treatment of contaminated groundwater. [01/01/1998-12/31/1999]

New York City Board of Education, Asbestos Services, New York, New York. Provided asbestos services, including preparing AHERA management plans, conducting asbestos and lead inspections, and providing asbestos oversight. [Prior to AECOM] [01/01/1997-12/31/1998]

Massachusetts Highway Department, Property Acquisition, Multiple Sites, Massachusetts. Conducted property assessments for environmental due diligence and site feasibility studies and prepared specifications for remedial design for property acquisitions to facilitate roadway expansions. [01/01/2000-12/31/2003]

City of Philadelphia, Property Acquisition, Multiple Sites, Pennsylvania. Conducted property assessments for environmental due diligence including Phase I and Phase II assessments and asbestos inspections to assist in city wide redevelopment efforts. [01/01/2003-12/31/2005]

Housing Authority of Perth Amboy, Former Middlesex County Vocational Technical School Property Acquisition, New Jersey. Conducted Phase I environmental assessment, Phase II environmental assessment for environmental due diligence and site feasibility studies and prepared specifications for remedial design. [01/01/2004-12/31/2005]

Appendix B

Field Forms

DIRECT PUSH BORING LOG

Boring No.: SB-9

PROJECT: Jung Sun			PAGE 1 OF 2
PROJECT No.: 6E+07		CONTRACTOR: Zebra	DATE: 3/20/12
LOCATION: Long Island City		DRILLERS NAME: Evan	AECOM REP.: Celeste Foster

WATER LEVELS			
DATE	TIME	DEPTH	DESIGNATION OF DRILL RIG: Geoprobe 7720DT
			SIZE AND TYPE OF EQUIPMENT: 5 ft macrocore samplers, acetate liners
3/20/12	13:50	15 ft	REFERENCE ELEVATION: 17.13 ft; DEPTH OF BOREHOLE: 39 ft
			THICKNESS OF OVERBURDEN: NA; DISPOSITION OF BOREHOLE: abandoned

LABORATORY ANALYSES:

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
0–5				0 - 5' Hand Cleared
5–10	S1 13:35	39/60	0.0 1.3 7.8 0.0	0 - 1" Ash 1 - 5" Concrete 5 - 10" Dark brown medium dand, stained, dry, no odor 10" - 11" Concrete 11" - 39" Brown medium sand, some fine sand dry, no odor Sample S1-9-6 collected at 14:05 at 6 - 6.5'
10–15	S2 13:40	22/60	0.0 0.0 0.0	0 - 7" Asphalt 7 - 10" Brown medium sand, some fine sand, dry, no odor 10 -13" Asphalt 13 - 22" Brown medium sand, some fine sand, dry, no odor
15–20	S3 13:50	29/60	0.0 0.0 0.0 0.0	0 - 29" Brown medium sand, trace coarse sand, wet, no odor

AECOM

DIRECT PUSH BORING LOG

Boring No.: SB-9

PROJECT: Jung Sun

PROJECT No.: 60237880

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
20	S4 14:05	52/60	0.0	0 - 50" Brown, medium sand, trace coarse sand, wet, no odor,
			0.0	no staining
21			0.0	50 - 52" Brown medium sand, trace fine sand, wet, no odor
			0.0	
22			0.0	
			0.0	
23			0.0	
			0.0	
24			0.0	
			0.0	
25	S5 14:25	60/60	0.0	0 - 20" Brown medium sand, some coarse sand, wet, no odor
26			0.0	20 - 60" Brown medium sand, some fine sand, wet, no odor
			0.0	
27			0.0	
			0.0	
28			0.0	
			0.0	
29			0.0	
			0.0	
			0.0	
30	S6 14:45	54/60	0.0	0 - 24" Brown medium sand, some coarse sand, wet, no odor
31			0.0	24 - 36" Brown medium sand, trace coarse sand, wet, no odor
			0.0	36 - 54" Brown medium sand, some fine sand
32			0.0	
			0.0	
33			0.0	
			0.0	
34			0.0	
			0.0	
35	S7 15:10	44/48	0.0	0 - 24" Brown medium sand, trace, coarse, wet, no odor
36			0.0	24 - 26" Brown coarse sand, some fine sand, no odor, wet
			0.0	26 - 44" Brown medium sand, no odor, wet
37			0.0	
			0.0	
38			0.0	
			0.0	
39				Refusal at 39'
40				

AECOM

DIRECT PUSH BORING LOG

Boring No.: SB-14

PROJECT:	Jung Sun		PAGE 1 OF 2
PROJECT No.:	60237880	CONTRACTOR: Zebra	DATE: 3/16/12
LOCATION:	Long Island City	DRILLERS NAME: Evan M.	AECOM REP.: Brian Cacciopoli

WATER LEVELS			
			DESIGNATION OF DRILL RIG: Geoprobe 7720DT
DATE	TIME	DEPTH	SIZE AND TYPE OF EQUIPMENT: 5 ft macrocore samplers, acetate liners
			REFERENCE ELEVATION: 11.4 ft — DEPTH OF BOREHOLE: 39 ft
			THICKNESS OF OVERBURDEN: NA — DISPOSITION OF BOREHOLE: abandoned

LABORATORY ANALYSES:

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
0		30/60		Gray/Black coarse sand, no odor, moist
5		34/60	0.6	
6				Brown coarse sand, trace gravels, <2cm, subangular
10		47/60	0.4	Dark brown sandy gravel, some silts, 1-2cm, angular, saturated, no odor
11				Brown gravelly (1-2cm, subrounded) coarse sand, no odor, wet
14.5			1.2	
15		47/60		
15.5			3.1	
17.5			8.4	
18				Brown fine sand, some silt, slight odor, moist Sample SB-14-19-20 collected at 09:00 from 19 - 20'
19.5			11.6	
20				

AECOM

DIRECT PUSH BORING LOG

Boring No.: SB-14

PROJECT: Jung Sun

PROJECT No.: 60237880

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
20	09:00	52/60	0.8	Brown coarse sand with gravel, angular grains up to 4cm, no odor
21			2.5	
22				
23			12.5	Brown medium sand with gravel ~5-10mm rounded, slight odor saturated
24			33.2	Sample SB-14-24-25 collected at 09:10 from 24 - 25'
25			45.0	
		54/60	1.2	Brown very coarse sand with gravel ~5-10mm rounded, saturated
26				
27			4.2	
28			8.2	
29				Brown clayey silt, slightly compactable, plastic, slight chemical odor
30	09:18		5.5	
		60/60		Brown coarse sand with gravel
31			13.0	
32			5.4	
			3.4	Brown clayey silt
33				Gravel 2cm, sub-rounded, saturated with coarse sand
34				Brown coarse sand with angular gravel, no odor, saturated
35			10.1	Brown/grey clay some silt, plastic, compactable
		48/60	1.5	Brown coarse sand with gravel
36				Brown clay with silt, no odor, not compactable, not plastic
37				
38			2.5	Brown clay with trace silt, slightly plastic, no odor
39	09:35			
				Refusal at 39' bgs
40				

AECOM

DIRECT PUSH BORING LOG

Boring No.: SB-15

PROJECT:	Jung Sun		PAGE 1 OF 3
PROJECT No.:	60237880	CONTRACTOR: Zebra	DATE: 3/16/12
LOCATION:	Long Island City	DRILLERS NAME: Evan M.	AECOM REP.: Brian Cacciopoli

WATER LEVELS			
			DESIGNATION OF DRILL RIG: Geoprobe 7720DT
DATE	TIME	DEPTH	SIZE AND TYPE OF EQUIPMENT: 5 ft macrocore samplers, acetate liners
			REFERENCE ELEVATION: 19.09 ft — DEPTH OF BOREHOLE: 53 ft
			THICKNESS OF OVERBURDEN: NA — DISPOSITION OF BOREHOLE: abandoned

LABORATORY ANALYSES:

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
0			0.7	Brown clay, some silt, not plastic: not compactible moist, some slight staining
1				
2			7.5	
3				
4	11:25	60/60		Gray silt, some clay, black staining (6-8'), no odor, moist
5			13.0	
6			14.5	
7				
8				
9			15.9	Sample SB-15-9-10 collected at 11:35 from 9 - 10'
10		42/60	4.7	
11				Green/grey clay no odor, plastic, compactible, moist
12			4.0	
13				
14			5.7	Black silt with some clay, no odor, moist
15		60/60		
16			78.6	Grey clay with some silt, no odor, not plastic/compactible Sample SB-15-16-17 collected at 11:50 from 16 - 17'
17				Grey silt with some clay, no odor
18				
19				Red/Brown fine sand, no odor, saturated
20				

DIRECT PUSH BORING LOG Boring No.: **SB-15**

PROJECT:	Jung Sun	
PROJECT No.:	60237880	PAGE 2 OF 3

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
20	11:55	60/60	12.5	Brown/red fine sand, no visible staining
21				
22				
23				
24				
25		60/60		
26				
27				
28				
29				
30		60/60		
31				
32				
33				
34				Brown silt and sand, no odor
35		60/60		Brown fine sand, no odor
36				
37				
38				
39				
40				

DIRECT PUSH BORING LOG

Boring No.: SB-15

PROJECT:	Jung Sun			
PROJECT No.:	60237880			PAGE 3 OF 3

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
40	12:30	60/60	0.0	Brown fine sand, no odor, no staining
41				
42				
43				
44				
45		60/60	0.0	
46				Brown silt and sand, no odor, no staining
47				
48				Sample SB-15-48-53 collected at 14:45 from 48 - 53'
49				
50		36/60	0.0	Brown fine sand, no odor, no staining Sample SB-15-50 collected at 14:20 from 50 - 50.5'
51				
52				Brown silt and sand, no odor Sample SB-15-52-53 collected at 13:10 from 52 - 53'
53				Refusal at 53' bgs
54				
55				
56				
57				
58				
59				
60				

DIRECT PUSH BORING LOG

Boring No.: SB-10

PROJECT:	Jung Sun		PAGE 1 OF 2
PROJECT No.:	60237880	CONTRACTOR: Zebra	DATE: 3/15/12
LOCATION:	Long Island City	DRILLERS NAME: Evan M.	AECOM REP.: Celeste Foster

WATER LEVELS			
			DESIGNATION OF DRILL RIG: Geoprobe 7720DT
DATE	TIME	DEPTH	SIZE AND TYPE OF EQUIPMENT: 5 ft macrocore samplers, acetate liners
3/15/12	15:40	15 ft	REFERENCE ELEVATION: 19.52 ft — DEPTH OF BOREHOLE: 39 ft
			THICKNESS OF OVERBURDEN: NA — DISPOSITION OF BOREHOLE: abandoned

LABORATORY ANALYSES:

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
0–5	S1 15:00	46/60	83.7 250.4 207.9 97.8 42.4 61.8 74.2	0 - 46" Fill, clay brick pieces, cement pieces, asphalt stained sections (appears to be from asphalt) throughout, some medium brown sand mixed in dry, chemical odor
5–10	S2 15:10	43/60	116.9 59.1 55.4 445.5 50.2 319.3 191.5	0 - 11" Fill, clay brick pieces, cement pieces, asphalt stained sections (appears to be from asphalt) throughout, some medium brown sand mixed in, dry, chemical odor 11 - 22" Brown medium sands, dry, chemical odor 22 - 25" Brick & concrete chips, dry, chemical odor 25 - 35" Brown medium sands, some fines, asphalt staining, dry, chemical od 35 - 43" Black fill, concrete, stained, asphalt, dry, chemical odor Groundwater sample SB-10-7.0 collected at 16:16 from 7'
10–15	S3 15:22	23/60	27.9 57.1 8.5 2.7	0 - 23" Black fill, concrete, stained, asphalt, dry
15–20	S4 15:40	34/60	5.0 18.6 4.3 9.4 8.7	0 - 34" Brown, medium sand, trace fines, trace coarse sand, silver mica flecks, wet, no odor Groundwater sample SB-10-16-20 collected at 17:30 from 16 ft SB-10-16.5 collected at 16:30 from 16.5-17'

AECOM

DIRECT PUSH BORING LOG

Boring No.: SB-10

PROJECT: Jung Sun

PROJECT No.: 60237880

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
20	S5 15:50	36/60	43.3 5.2 2.5 0.3 0.0	0 - 36" Brown medium sands, some fine sands silver mica flecks, wet, no odor
21				
22				
23				
24				
25	S6 16:00	60/60	9.1 14.3 13.7 4.2 0.0 0.0 0.0 0.0 0.0 0.0	0 - 60" Brown medium sands, some fine sands silver mica flecks, wet, no odor
26				
27				
28				
29				
30	S7 16:10	60/60	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0 - 60" Brown medium sands, some fine sands silver mica flecks, wet, no odor
31				
32				
33				
34				
35	S8 16:20	48/48	0.0 0.0 0.2 0.0 0.0 0.0 0.0 0.0	0 - 48" Brown medium sands, some fine sands silver mica flecks, wet, no odor
36				
37				
38				
39				Refusal at 39'
40				

DIRECT PUSH BORING LOG

Boring No.: SB-11

PROJECT:	Jung Sun		PAGE 1 OF 1
PROJECT No.:	60237880	CONTRACTOR: Zebra	DATE: 3/15/12
LOCATION:	Long Island City	DRILLERS NAME: Evan M.	AECOM REP.:

WATER LEVELS			
			DESIGNATION OF DRILL RIG: Geoprobe 7720DT
DATE	TIME	DEPTH	SIZE AND TYPE OF EQUIPMENT: 5 ft macrocore samplers, acetate liners
3/15/12	11:00	~14-15 ft	REFERENCE ELEVATION: 20.34 ft DEPTH OF BOREHOLE: 16 ft
			THICKNESS OF OVERBURDEN: NA DISPOSITION OF BOREHOLE: abandoned

LABORATORY ANALYSES:

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
0-4	S1 10:42	29/48	53.5 50.9 35.0 77.5	Concrete top 6" 6 - 29" Brown medium sand, some fine sand, fill & black staining throughout, dry, no odor
4-8	S2 10:42	28/48	92.9 65.1 105.9 51.4 34.8	0 - 28" Brown medium sands, trace fines less fill than above, most of fill is confined to 11" no odor, dry
8-12	S3 10:52	31/48	183.9 49.5 75.5 68.0 42.2	Brown medium sands, trace fines, with some fill Sample SB-11-8.5 collected at 10:52 from 8.5 - 9'
12-16	S4 11:00	24/48	111.1 96.3 1000	0 - 15" Brown medium sands, trace fines, with some fill 15 - 15.75" silica, mica shale, shiny flakey with black flecks 15.75 - 24" Brown medium sands, trace fines, with some fill, wet at 14-15 ft Sample SB-11-15.5 collected at 11:30 from 13.5 - 14' (mica section)
16-20				End of Boring at 16' GW sample SB-11-16-20 collected at 11:55 from 16 - 20'

AECOM

DIRECT PUSH BORING LOG

Boring No.: SB-12

PROJECT:	Jung Sun		PAGE 1 OF 1
PROJECT No.:	60237880	CONTRACTOR: Zebra	DATE: 3/15/12
LOCATION:	Long Island City	DRILLERS NAME: Evan M.	AECOM REP.: Celeste Foster

WATER LEVELS			
DATE	TIME	DEPTH	DESIGNATION OF DRILL RIG: Geoprobe 7720DT
			SIZE AND TYPE OF EQUIPMENT: 5 ft macrocore samplers, acetate liners
3/15/12	10:30	16 ft	REFERENCE ELEVATION: 20.47 ft; DEPTH OF BOREHOLE: 16 ft
			THICKNESS OF OVERBURDEN: NA; DISPOSITION OF BOREHOLE: abandoned

LABORATORY ANALYSES:

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
0–4				0 - 5' Hand cleared
4–8	S1 10:00	24/48	4.9 25.0 46.2 33.8	0 - 24" Medium brown sands with fill and asphalt throughout dry, no odor SB-12-5.0 collected at 12:10 from 5 - 5.5 ft
8–12	S2 10:10	34/48	44.4 60.0 125.0 69.0	0 - 34" Medium brown sands with fill and asphalt throughout dry, no odor Sample SB-12-9.5 collected at 12:05 from 9.5 - 10 ft
12–16	S3 10:20	24/48	58.3 119.5 157.4 20.9	0 - 24" Medium brown sands with fill and asphalt throughout dry, no odor, wet 22-24" Sample SB-12-14 collected at 10:30 from 14 - 14.5 ft
16–20				Refusal at 16'

DIRECT PUSH BORING LOG

Boring No.: SB-13

PROJECT:	Jung Sun				PAGE 1 OF 2
PROJECT No.:	60237880		CONTRACTOR: Zebra		DATE: 3/15/12
LOCATION:	Long Island City		DRILLERS NAME: Evan M.		AECOM REP.: Celeste Foster
WATER LEVELS			DESIGNATION OF DRILL RIG: Geoprobe 7720DT		
DATE	TIME	DEPTH	SIZE AND TYPE OF EQUIPMENT: 5 ft macrocore samplers, acetate liners		
3/15/12	13:20	~13-14ft	REFERENCE ELEVATION: 20.41 ft	DEPTH OF BOREHOLE: 40 ft	
			THICKNESS OF OVERBURDEN: NA	DISPOSITION OF BOREHOLE: abandoned	

LABORATORY ANALYSES:

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
0-5				0 - 5' Hand cleared
5-8	S1 13:00	25/36	4.5 5.9 8.0 1.6	0 - 23" Fill, medium brown sand, some fine sands some shale (mica) in sections throughout dry, no odor 23-25" Mica
8-12	S2 13:05	24/48	6.0 4.0 4.2 11.2	0 - 24" Fill throughout, medium brown sand, some fine sands, some shale (mica) in sections, some brick pieces dry, no odor
12-16	S3 13:10	31/48	22.7 9.3 7.2 6.4	0 - 10" Fill throughout, medium brown sand, some fine sands, some shale (mica) in sections, some brick pieces, dry, no odor 10 - 31" brown and gray fine sand, trace medium, no odor, wet Sample SB-13-12.5 and duplicate SB-63 collected at 13:15 & 13:17 from 12.5 ft
16-20	S4 13:15	32/48	23.2 11.6 4.5 6.4 43.0	Petroleum odor 0 - 4" Brown fine sands, trace medium at 6" brick pieces 8 - 21" Black stained medium sand, some coarse sand 21 - 32" Brown medium sand, some fine sands

AECOM

DIRECT PUSH BORING LOG

Boring No.: SB-13

PROJECT: Jung Sun

PROJECT No.: 60237880

Depth (ft)	Sample Number & Time	Rec. (feet)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
20–24	S5 13:30	41/48	14.0 33.8 16.9 12.0 13.4 26.3	0 - 36" Black medium sand, some coarse wet, slight petroleum odor 36 - 41" Brown, medium sand, trace fine sand
24–28	S6 13:45	11/48	0.5	0 - 11" Medium, brown sand, some fine trace mica flecks wet, no odor
28–32	S7 14:05	25/48	0.5 0.3 0.6 0.2	Medium, brown sand, some fine trace mica flecks, wet, no odor
32–36	S8 14:25	33/48	0.3 0.1 0.1 0.0	Medium, brown sand, some fine trace mica flecks, wet, no odor
36–40	S9 14:40			No soil recovered End of boring

AECOM

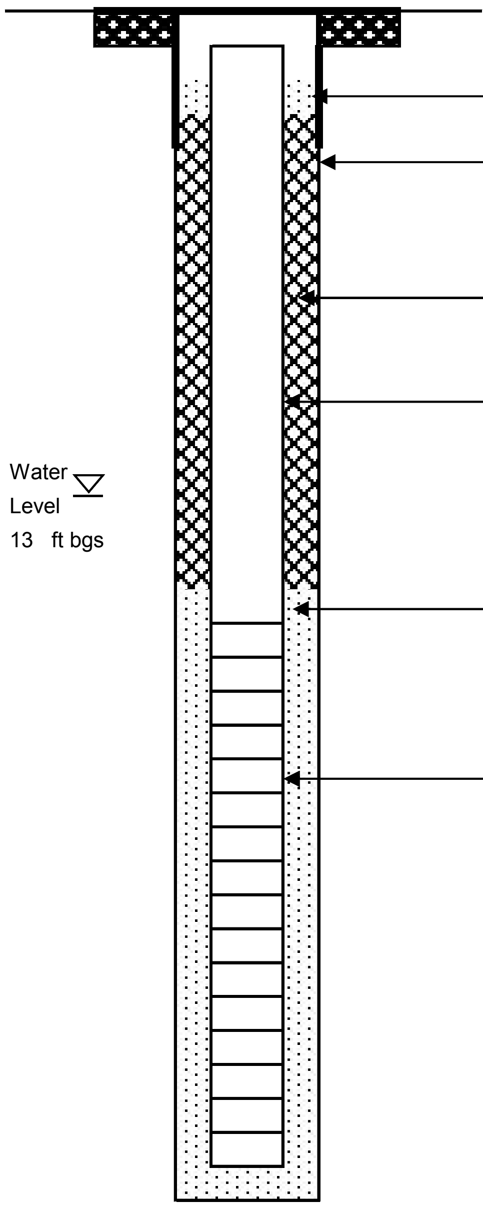
MONITORING WELL CONSTRUCTION LOG

Well No. MW-9

Project: Jung Sun	Location: Long Island City, NY	
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/09/2012	Oversight: Brian Cacciopoli, YEC	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.

Locking protective flushmount with concrete pad



Ground Surface 0.0 ft

Sand from 1.2 ft to 0.70 ft

Borehole diameter 3.25 inches

Bentonite from 14.0 ft to 1.2 ft

Riser Pipe from 30.0 ft to 0.5 ft

Water Level 13 ft bgs

Filter pack from 30.0 ft to 14.0 ft

Sand Size 0

Well screen from 30.0 ft to 15.0 ft

Diameter 2 inches

Slot size 10 inches

Type PVC

Bottom Cap at 30.0 ft

Bottom of Borehole at 30.0 ft

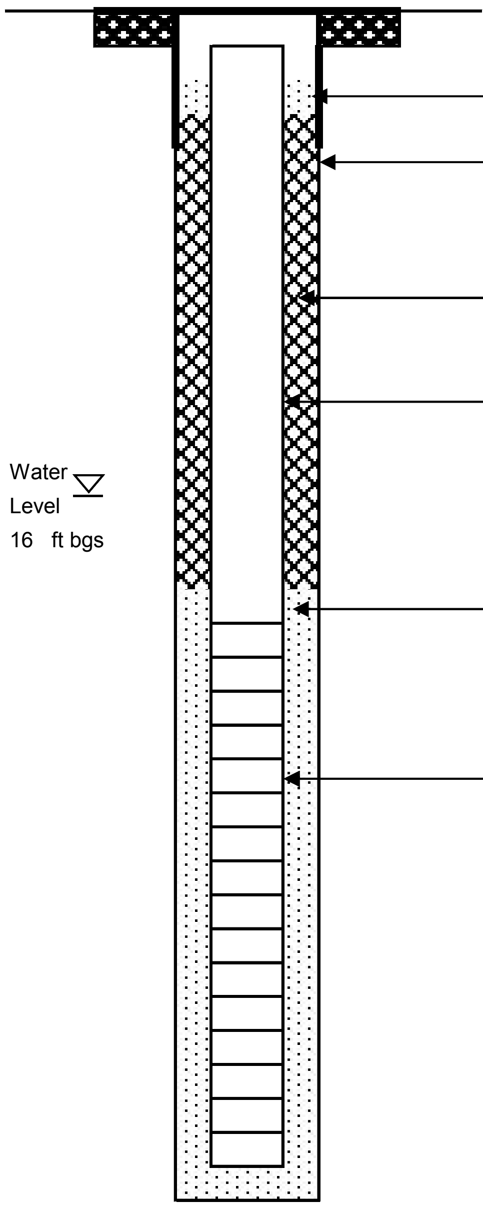
Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

MONITORING WELL CONSTRUCTION LOG — Well No. MW-10

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/08/2012	Oversight: Celeste Foster, AECOM	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.



Locking protective flushmount with concrete pad

Ground Surface 0.0 ft

Sand from 1.2 ft to 0.70 ft

Borehole diameter 3.25 inches

Bentonite from 29.0 ft to 1.2 ft

Riser Pipe from 40.0 ft to 0.5 ft

Filter pack from 40.0 ft to 29.0 ft

Sand Size 0

Well screen from 40.0 ft to 30.0 ft

Diameter 2 inches

Slot size 10 inches

Type PVC

Bottom Cap at 40.0 ft

Bottom of Borehole at 40.0 ft

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

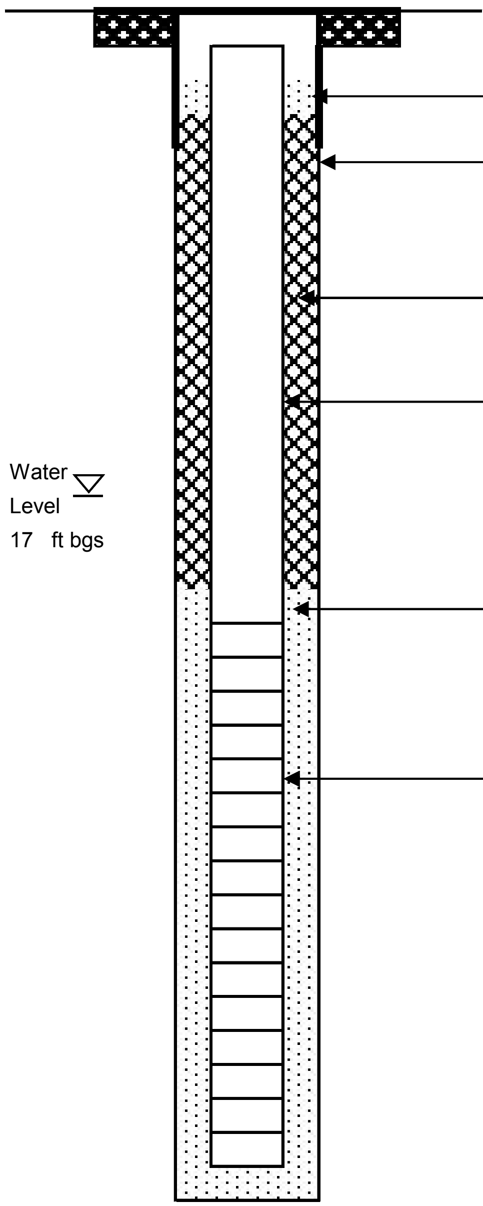
AECOM

MONITORING WELL CONSTRUCTION LOG

Well No. MW-11

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/12/2012	Oversight: Celeste Foster, AECOM	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.



Water Level 17 ft bgs

Locking protective flushmount with concrete pad

Ground Surface 0.0 ft

Sand from 1.2 ft to 0.70 ft

Borehole diameter 3.25 inches

Bentonite from 39.0 ft to 1.2 ft

Riser Pipe from 50.0 ft to 0.5 ft

Filter pack from 50.0 ft to 39.0 ft

Sand Size 0

Well screen from 50.0 ft to 40.0 ft

Diameter 2 inches

Slot size 10 inches

Type PVC

Bottom Cap at 50.0 ft

Bottom of Borehole at 50.0 ft

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

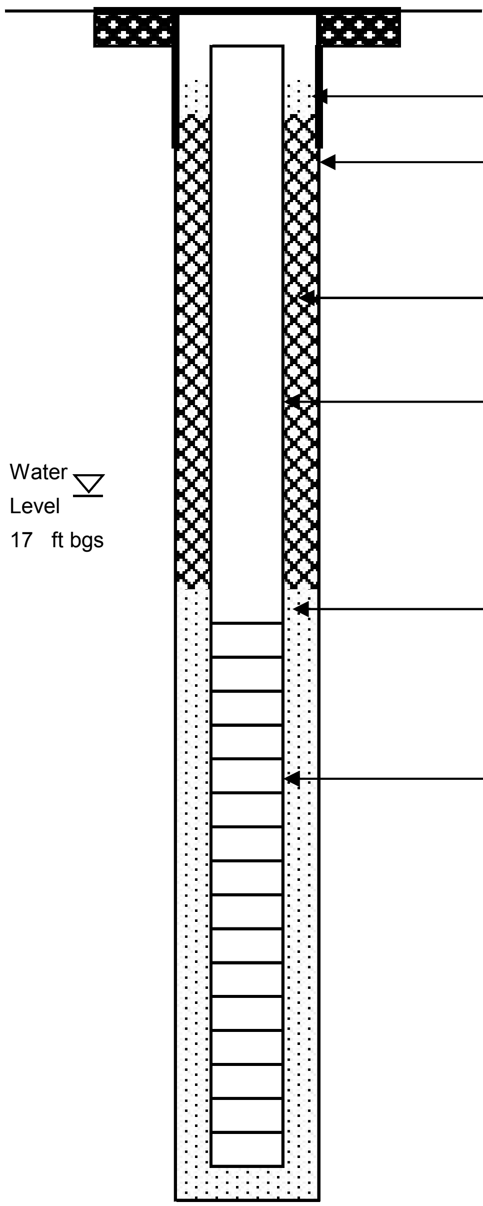
(NOT TO SCALE)

MONITORING WELL CONSTRUCTION LOG **Well No. MW-12**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/12/2012	Oversight: Celeste Foster, AECOM	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.

Locking protective flushmount with concrete pad



Ground Surface 0.0 ft

Sand from 1.2 ft to 0.70 ft

Borehole diameter 3.25 inches

Bentonite from 29.0 ft to 1.2 ft

Riser Pipe from 40.0 ft to 0.5 ft

Filter pack from 40.0 ft to 29.0 ft

Sand Size 0

Well screen from 40.0 ft to 30.0 ft

Diameter 2 inches
Slot size 10 inches
Type PVC

Bottom Cap at 40.0 ft

Bottom of Borehole at 40.0 ft

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

AECOM

MONITORING WELL CONSTRUCTION LOG

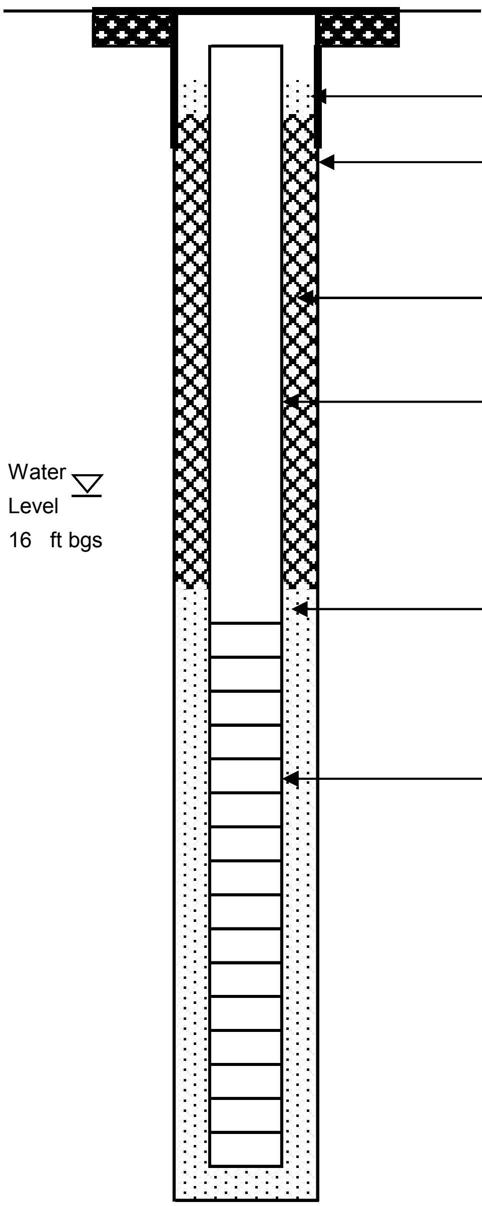
Well No. MW-13

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/12/2012	Oversight: Celeste Foster, AECOM	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.

Locking protective flushmount with concrete pad

Ground Surface 0.0 ft



Sand from 1.2 ft to 0.70 ft

Borehole diameter 3.25 inches

Bentonite from 34.0 ft to 1.2 ft

Riser Pipe from 45.0 ft to 0.5 ft

Filter pack from 45.0 ft to 34.0 ft

Sand Size 0

Well screen from 45.0 ft to 35.0 ft

Diameter 2 inches

Slot size 10 inches

Type PVC

Bottom Cap at 45.0 ft

Bottom of Borehole at 45.0 ft

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

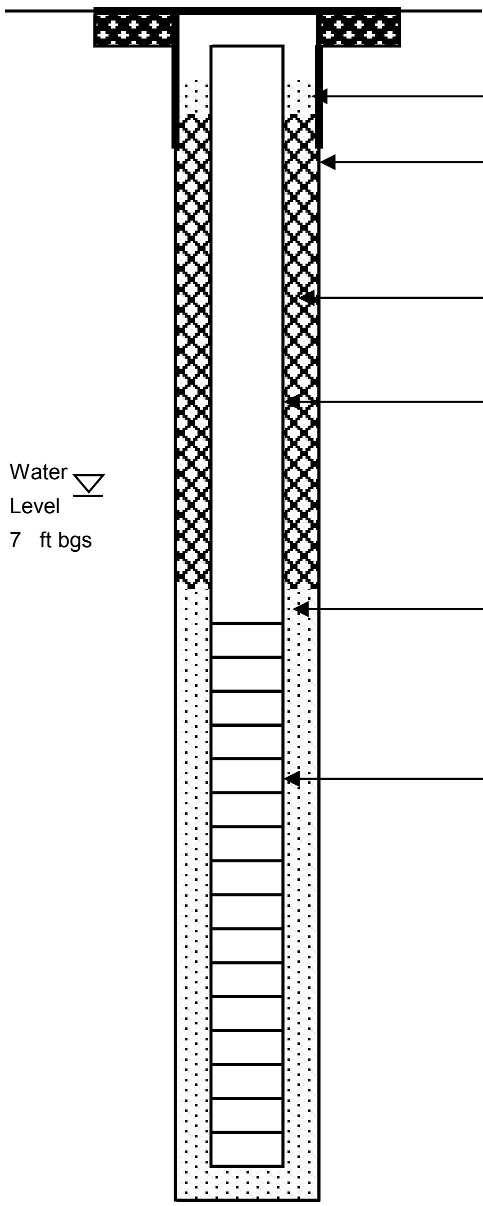
AECOM

MONITORING WELL CONSTRUCTION LOG

Well No. MW-14

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/09/2012	Oversight: Brian Cacciopoli, YEC	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.



Locking protective flushmount with concrete pad

Ground Surface 0.0 ft

Sand from 1.2 ft to 0.70 ft

Borehole diameter 3.25 inches

Bentonite from 29.0 ft to 1.2 ft

Riser Pipe from 40.0 ft to 0.5 ft

Filter pack from 40.0 ft to 29.0 ft

Sand Size 0

Well screen from 40.0 ft to 30.0 ft

Diameter 2 inches

Slot size 10 inches

Type PVC

Bottom Cap at 40.0 ft

Bottom of Borehole at 40.0 ft

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

AECOM

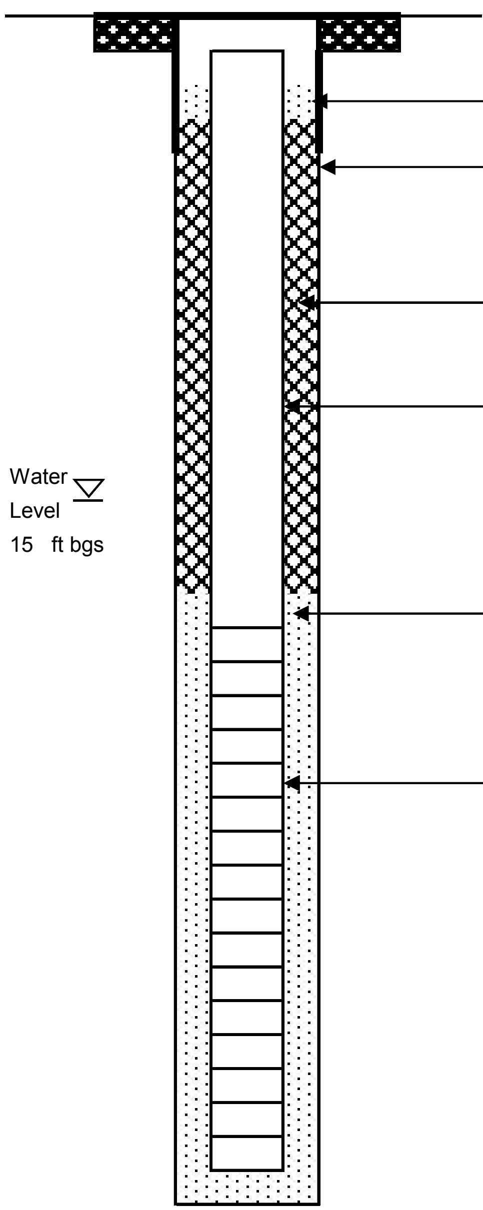
MONITORING WELL CONSTRUCTION LOG

Well No. MW-15

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/13/2012	Oversight: Celeste Foster, AECOM	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.

Locking protective flushmount with concrete pad



Ground Surface 0.0 ft

Sand from 1.2 ft to 0.70 ft

Borehole diameter 3.25 inches

Bentonite from 34.0 ft to 1.2 ft

Riser Pipe from 45.0 ft to 0.5 ft

Filter pack from 45.0 ft to 34.0 ft

Sand Size 0

Well screen from 45.0 ft to 35.0 ft

Diameter 2 inches

Slot size 10 inches

Type PVC

Bottom Cap at 45.0 ft

Bottom of Borehole at 45.0 ft

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

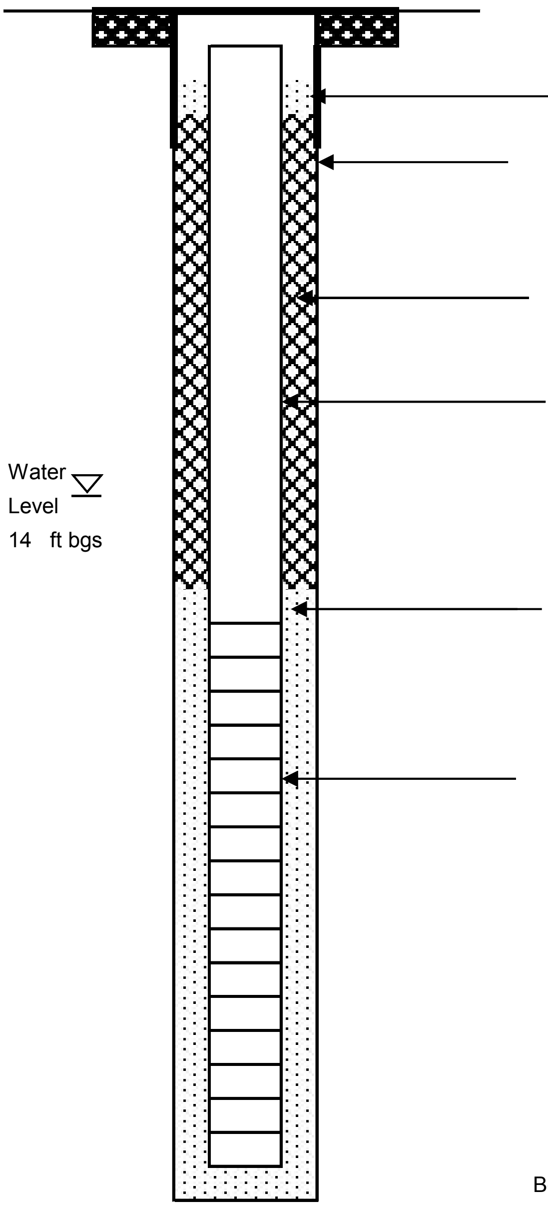
MONITORING WELL CONSTRUCTION LOG **Well No. MW-16**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/19/2012	Oversight: Celeste Foster, AECOM	

NOTE: Well installed using 2 inch geoprobe rods and 1 inch ID prepack wells. No room for tremie grout.

Locking protective flushmount with concrete pad

Ground Surface 0.0 ft



Sand from 1.2 ft to 0.70 ft

Borehole diameter 2.00 inches

Bentonite from 44.0 ft to 1.2 ft

Riser Pipe from 55.0 ft to 0.5 ft

Water Level 14 ft bgs

Filter pack from 55.0 ft to 44.0 ft

Sand Size 0

Well screen from 55.0 ft to 45.0 ft

Diameter 1 inches

Slot size 10 inches

Type PVC

Bottom Cap at 55.0 ft

Bottom of Borehole at 55.0 ft

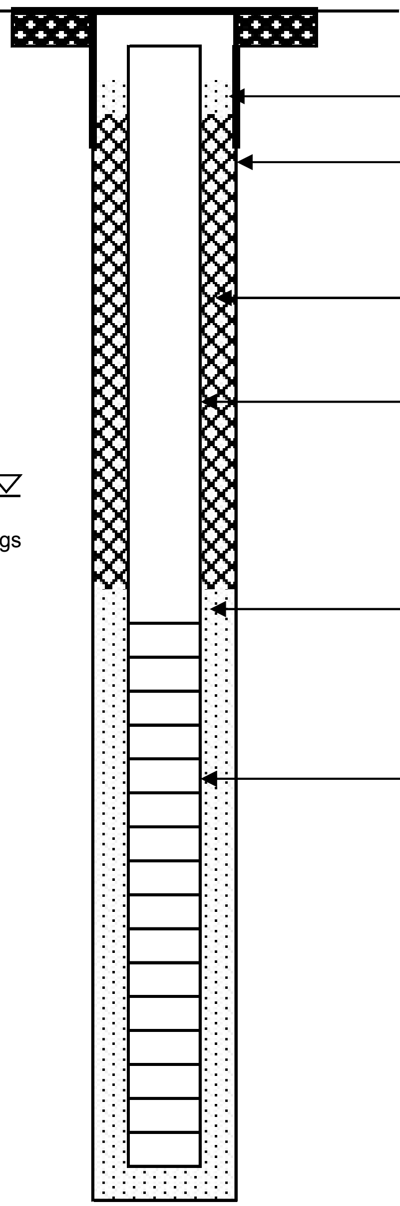
Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

MONITORING WELL CONSTRUCTION LOG **Well No. MW-17**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/08/2012	Oversight: Celeste Foster, AECOM	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.



Locking protective flushmount with concrete pad

Ground Surface	0.0 ft		
Sand from	1.2 ft	to	0.70 ft
Borehole diameter	3.25 inches		
Bentonite from	22.0 ft	to	1.2 ft
Riser Pipe from	38.0 ft	to	0.5 ft
Filter pack from	38.0 ft	to	22.0 ft
Sand Size	0		
Well screen from	38.0 ft	to	23.0 ft
Diameter	2 inches		
Slot size	10 inches		
Type	PVC		
Bottom Cap at	38.0 ft		
Bottom of Borehole at	38.0 ft		

Water Level 12 ft bgs

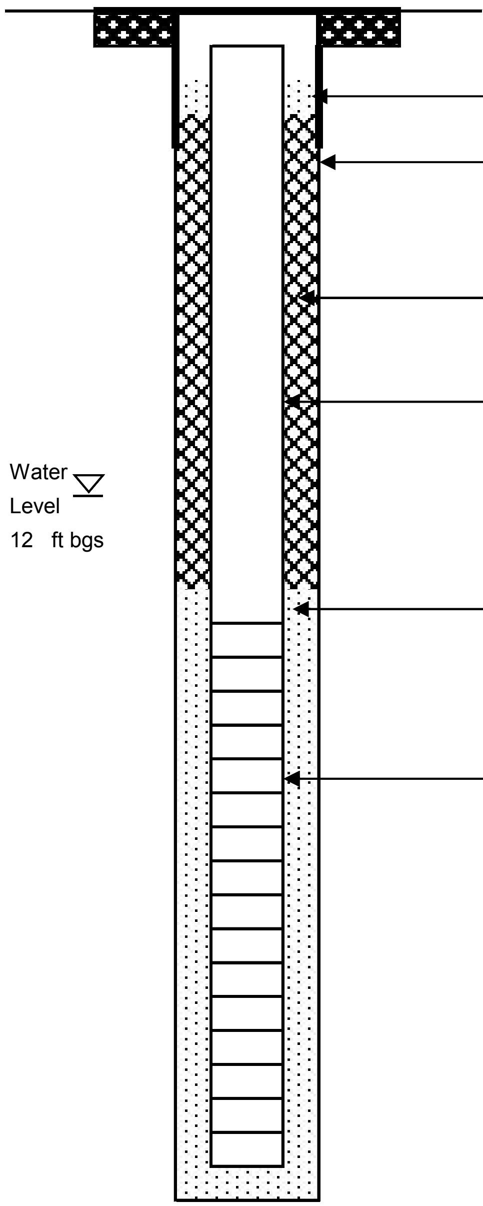
Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

MONITORING WELL CONSTRUCTION LOG **Well No. MW-18**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/13/2012	Oversight: Celeste Foster, AECOM	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.



Locking protective flushmount with concrete pad

Ground Surface 0.0 ft

Sand from 1.2 ft to 0.70 ft

Borehole diameter 3.25 inches

Bentonite from 23.0 ft to 1.2 ft

Riser Pipe from 34.0 ft to 0.5 ft

Filter pack from 34.0 ft to 23.0 ft

Sand Size 0

Well screen from 34.0 ft to 24.0 ft

Diameter 2 inches

Slot size 10 inches

Type PVC

Bottom Cap at 34.0 ft

Bottom of Borehole at 34.0 ft

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

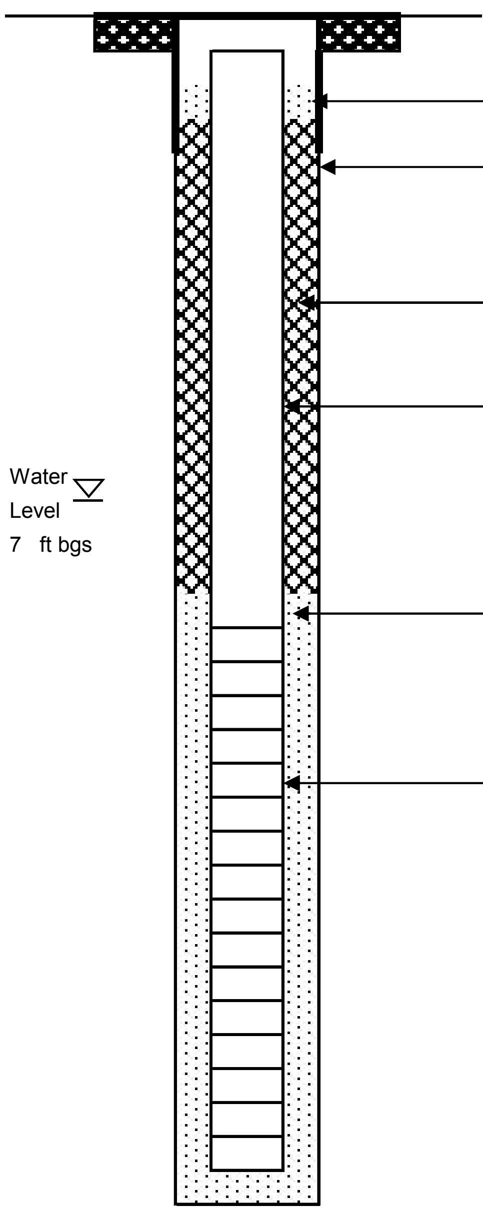
(NOT TO SCALE)

MONITORING WELL CONSTRUCTION LOG **Well No. MW-19**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/09/2012	Oversight: Brian Cacciopoli, YEC	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.

Locking protective flushmount with concrete pad



Water Level 7 ft bgs

Ground Surface	0.0 ft		
Sand from	1.2 ft	to	0.70 ft
Borehole diameter	3.25 inches		
Bentonite from	28.5 ft	to	1.2 ft
Riser Pipe from	44.5 ft	to	0.5 ft
Filter pack from	44.5 ft	to	28.5 ft
Sand Size	0		
Well screen from	44.5 ft	to	29.5 ft
Diameter	2 inches		
Slot size	10 inches		
Type	PVC		
Bottom Cap at	44.5 ft		
Bottom of Borehole at	44.5 ft		

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

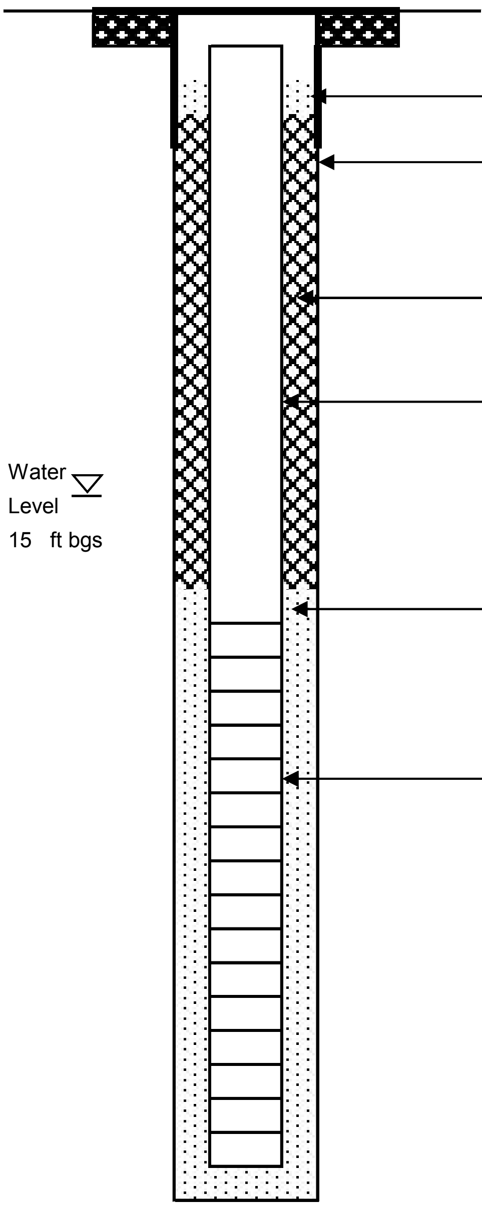
MONITORING WELL CONSTRUCTION LOG **Well No. MW-20**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/13/2012	Oversight: Celeste Foster, AECOM	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.

Locking protective flushmount with concrete pad

Ground Surface 0.0 ft



Water Level 15 ft bgs

Sand from 1.2 ft to 0.70 ft

Borehole diameter 3.25 inches

Bentonite from 14.0 ft to 1.2 ft

Riser Pipe from 25.0 ft to 0.5 ft

Filter pack from 25.0 ft to 14.0 ft

Sand Size 0

Well screen from 25.0 ft to 15.0 ft

Diameter 2 inches

Slot size 10 inches

Type PVC

Bottom Cap at 25.0 ft

Bottom of Borehole at 25.0 ft

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

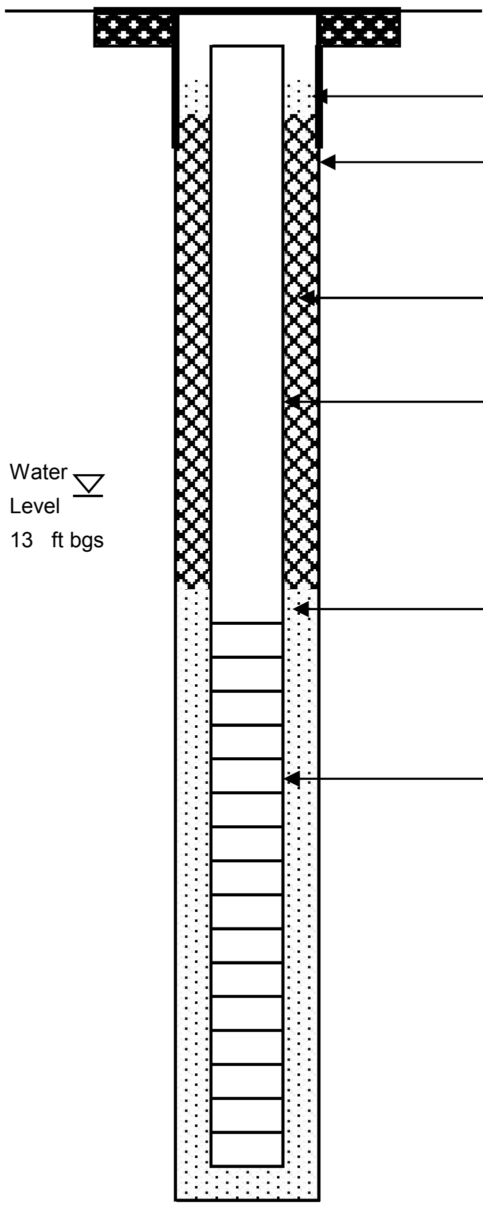
AECOM

MONITORING WELL CONSTRUCTION LOG

Well No. MW-21

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60237880	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: 03/14/2012	Oversight: Brian Cacciopoli, YEC	

NOTE: Well installed using 3.25 OD geoprobe rods and 2 inch ID prepack wells. No room for tremie grout.



Locking protective flushmount with concrete pad

Ground Surface 0.0 ft

Sand from 1.2 ft to 0.70 ft

Borehole diameter 3.25 inches

Bentonite from 16.0 ft to 1.2 ft

Riser Pipe from 27.0 ft to 0.5 ft

Filter pack from 27.0 ft to 16.0 ft

Sand Size 0

Well screen from 27.0 ft to 17.0 ft

Diameter 2 inches
Slot size 10 inches
Type PVC

Bottom Cap at 27.0 ft

Bottom of Borehole at 27.0 ft

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

AECOM

WELL NO. **MW-9**

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/21/2012		5. DATE WELL COMPLETED 3/21/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Brian Cacciopoli		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 2.9 gallons WELL TD: 30.37 ft PUMP INTAKE: 25.4 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	REMARKS
10:10	12.81								Static water level
10:35		0.75							Pump on
10:45		0.7						1045	
10:50		0.5						270	
10:55		0.5						74.1	
11:00		0.5						7.65	Pump off
11:05	12.84								

Pump Type: Hurricane

AECOM

WELL NO. MW-10

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/21/2012		5. DATE WELL COMPLETED 3/21/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Evan Moraitis/Steve.		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 4.2 gallons WELL TD: 40.79 ft PUMP INTAKE: 35.8 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	REMARKS
9:48	15.34	0.5						120	Static water level, Pump on
9:52		0.5						45	
10:10		0.5						0.0	Pump off

Pump Type: Hurricane

AECOM

WELL NO. MW-11

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/21/2012		5. DATE WELL COMPLETED 3/21/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Evan Moraitis/Brian Cacciopoli		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 4.1 gallons WELL TD: 41.75 ft PUMP INTAKE: 36.8 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	REMARKS
10:30	16.39	0.75						290	Static water level, Pump on
10:45		0.75						3.1	
11:00		0.75						1.3	Pump off

Pump Type: Hurricane

AECOM

WELL NO. MW-12

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/21/2012		5. DATE WELL COMPLETED 3/21/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Evan Moraitis/Steven		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 4 gallons WELL TD: 40.41 ft PUMP INTAKE: 35.4 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS						REMARKS
			Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	
11:20	16.16	0.75						1000	Static water level, Pump on
11:33		0.75						200	
11:46		0.75						0	Pump off

Pump Type: Hurricane

AECOM

WELL NO. MW-13

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/21/2012		5. DATE WELL COMPLETED 3/21/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Evan Moraitis/Steve.		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 4.9 gallons WELL TD: 45.44 ft PUMP INTAKE: 40.4 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS						REMARKS
			Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	
12:15	15.14	0.7						--	Static water level, Pump on
12:37		0.7						85	
13:00		0.5						230	
13:15		0.5						8.3	Pump off

Pump Type: Hurricane

WELL NO. MW-14

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/21/2012		5. DATE WELL COMPLETED 3/21/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Brian Cacciopoli		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 5.5 gallons WELL TD: 40.31 ft PUMP INTAKE: 35.3 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	REMARKS
11:25	6.32								Static water level; Pump on
11:45		0.7						252	
11:55								129	
12:05								--	
12:15								65.0	
12:25								104.5	
12:30	6.34							42.9	Pump off

Pump Type: Hurricane

AECOM

WELL NO. **MW-15**

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/22/2012		5. DATE WELL COMPLETED 3/22/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Brian Cacciopoli		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 5.1 gallons WELL TD: 45.41 ft PUMP INTAKE: 40.4 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	REMARKS
8:30	13.88							600	Static water level
8:47		0.9						400	Pump on
9:05		0.9						15	Pump off

Pump Type: Hurricane

AECOM

WELL NO. MW-16

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/22/2012		5. DATE WELL COMPLETED 3/22/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Brian Cacciopoli		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 1.7 gallons WELL TD: 55.29 ft PUMP INTAKE: 50.3 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	REMARKS
9:20	13.52								Static water level
9:23		0.17							Pump on
9:30		0.17						8.4	
9:45		0.17						150	
9:55		0.17						180	
10:05		0.17						39	Pump off

Pump Type: Hurricane

WELL NO. MW-17

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/21/2012		5. DATE WELL COMPLETED 3/21/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Evan Moraitis/Steve.		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 4.4 gallons WELL TD: 38.7 ft PUMP INTAKE: 33.7 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	REMARKS
14:05	11.6	1.0						13	Static water level
14:22		1.0						50	Pump on
14:33		1.0						200	
14:45		1.0						0	Pump off

Pump Type: Hurricane

AECOM

WELL NO. MW-18

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/22/2012		5. DATE WELL COMPLETED 3/22/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Brian Cacciopoli		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 3.7 gallons WELL TD: 33.86 ft PUMP INTAKE: 28.9 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	REMARKS
10:20	11.44								Static water level
10:25		0.13							Pump on
10:35		0.13						20	
10:39		0.13							Well nearly dry; Pump off
10:42		0.13							Pump on
10:45		0.13							Cloudy; Pump off to recharge
10:55								600	
13:20	22.35	0.09							Pump on
13:30		0.09						400	
13:40		0.09						--	
14:00		0.09							Pump off: dry

Pump Type: Hurricane

AECOM

WELL NO. MW-19

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/21/2012		5. DATE WELL COMPLETED 3/21/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Brian Cacciopoli		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 6.1 gallons WELL TD: 44.29 ft PUMP INTAKE: 39.3 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	REMARKS
12:50	6.63								Static water level
13:05		0.25							Pump on
13:20		0.25							
13:35		0.75						257	
13:45		0.9						55.7	
13:55		1.0						26.5	Pump off

Pump Type: Hurricane

AECOM

WELL NO. **MW-20**

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/22/2012		5. DATE WELL COMPLETED 3/22/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Brian Cacciopoli		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 1.7 gallons WELL TD: 25.36 ft PUMP INTAKE: 20.4 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	REMARKS
12:15	15.03								Static water level
12:20		0.36							Pump on
12:30		0.36						330	
12:40		0.36						70	
12:50		0.36						23	

Pump Type: Hurricane

AECOM

WELL NO. **MW-21**

WELL DEVELOPMENT FORM	PROJECT Jung Sun	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
1. LOCATION Long Island City, NY	4. DATE WELL STARTED 3/21/2012		5. DATE WELL COMPLETED 3/21/2012
2. CLIENT NYSDEC	6. NAME OF INSPECTOR Celeste Foster		
3. DRILLING COMPANY Zebra			

ONE WELL VOLUME : 2.3 gallons WELL TD: 26 ft PUMP INTAKE: 21 ft

Time	Depth to Water (ft)	Purge Rate (gal/min)	FIELD MEASUREMENTS Temp. (C)	Conduct. (ms/cm)	DO (mg/L)	pH	ORP	Turbidity (ntu)	REMARKS
9:04	12.2								Static water level
9:05		0.5							Pump on
9:08		0.5						1000	
9:16		0.5						330	
9:18		0.5						90	
9:21		0.5						90	
9:27		0.5						70	
9:32		0.5						9.30	Pump off

Pump Type: Hurricane

AECOM

WELL NO. MW-01

WELL SAMPLING FORM	PROJECT Jung Sun Laundry Plume Site	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
LOCATION Long Island City, NY		DATE WELL STARTED 04/09/12	DATE WELL COMPLETED 04/09/12
CLIENT NYSDEC		NAME OF INSPECTOR Celeste Foster	
DRILLING COMPANY Zebra			

ONE WELL VOLUME : 0.8 gallons WELL TD: 20 ft PUMP INTAKE DEPTH: 15 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS						REMARKS
			Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	
16:45	14.95								Static water level
16:51		200							Pump on
16:57	14.95	200	14.4	1.47	8.77	7.09	1.74	103.0	
17:15	14.95	200	13.4	1.50	8.43	6.94	169	17.4	
17:25	14.96	200	13.4	1.50	8.56	6.92	167	13.7	
17:30									Sample MW-1
17:42	14.98								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-02

WELL SAMPLING FORM	PROJECT Jung Sun Laundry Plume Site	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
LOCATION Long Island City, NY		DATE WELL STARTED 04/09/12	DATE WELL COMPLETED 04/09/12
CLIENT NYSDEC		NAME OF INSPECTOR Celeste Foster	
DRILLING COMPANY Zebra			

ONE WELL VOLUME : 0.4 gallons WELL TD: 18.34 ft PUMP INTAKE DEPTH: 13.3 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
13:40	15.98								Static water level
13:55		200							Pump on
14:05	15.98	200	17.07	532	332	6.36	71	7500	
14:25	15.98	200	17.02	18.9	3.14	6.46	-5	7500	
14:35	15.98	200	16.82	4.94	2.86	6.51	-24	200	
14:50	15.98	200	16.56	3.35	2.61	6.58	-42	150	
15:00	15.45	200	16.6	0.34	4.75	8.00	-110	19.2	
15:15	15.97	250	16.4	0.33	4.63	7.92	-109	19.40	
15:30	15.98	250	16.3	0.33	4.35	7.85	-106	20.30	
15:40	15.98	250	16.4	0.33	4.3	7.88	-110	18.10	
15:45	15.98								Sample MW-2

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-03

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF SHEETS 1
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/11/12	DATE WELL COMPLETED: 04/11/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Cacciopoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 1.9 gallons WELL TD: 24.19 ft PUMP INTAKE DEPTH: 19.2 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
8:02	12.25								Static water level
8:05		225							Pump on
8:10	12.25	225	10.23	2.08	3.07	6.72	1	50.2	
8:20	12.25	225	9.13	2.21	3.89	6.746	-12	38.4	
8:30	12.25	225	8.45	2.26	4.28	6.77	-17	39.7	
8:40	12.25	225	7.81	2.32	4.92	6.79	-21	34.5	
8:50	12.25	225	7.74	2.34	5.02	6.80	-26	34.2	
9:00	12.25								Sample MW-3

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

WELL NO. MW-04

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/10/12	DATE WELL COMPLETED: 04/10/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 0.8 gallons WELL TD: 19.18 ft PUMP INTAKE DEPTH: 14.2 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
14:00	14.50								Static water level
14:05		200							Pump on
14:15	14.50	200	12.2	0.338	1.58	7.57	148	833	
14:30	14.50	200	13.7	0.327	1.14	7.65	135	287	
14:45	14.50	200	14.3	0.318	1.01	7.63	126	201.0	
15:00	14.50	200	13.0	0.326	1.40	7.56	126	103.0	
15:15	14.50	200	12.7	0.329	1.43	7.55	127	81.7	
15.25	14.50	200	12.3	0.331	1.57	7.54	127	69.1	
15:40	14.50	200	12.1	0.333	1.78	7.48	132	39.4	
15:50	14.50	200	12.1	0.333	1.82	7.55	127	35.9	
16:00	14.50	200	12.7	0.329	1.83	7.76	114	33.5	
16:05									Sample MW-4
	14.47								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs and MNA parameters

AECOM

WELL NO. MW-05

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/10/12	DATE WELL COMPLETED: 04/10/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Jennifer Becker	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 1.5 gallons   WELL TD: 15.15 ft   PUMP INTAKE DEPTH: 10.2 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
11:30	5.98								Static water level
11:32									Pump on
11:37	5.99	130	15.2	0.66	8.53	7.77	131	999.0	
11:47	5.98	130	15.3	0.65	5.49	7.63	131	293.0	
11:57	5.98	130	15.1	0.65	5.38	7.65	127	174.0	
12:07	5.98	160	14.8	0.65	5.24	7.71	121	136.0	
12:17	5.98	160	15.0	0.65	5.08	7.7	120	111.0	
12:27	5.98	160	15.1	0.65	5.00	7.72	118	94.7	
12:37	5.98	160	15.1	0.65	4.97	7.74	116	84.5	
12:47	5.98	160	14.9	0.65	4.93	7.74	115	69.5	
12:57	5.98	160	15.1	0.65	4.68	7.74	113	64.3	
13:07	5.98	160	15.4	0.65	4.67	7.75	113	56.0	
13:17	5.98	160	15.6	0.65	4.67	7.76	112	52.9	
13:27	5.98	160	15.2	0.65	4.70	7.78	112	47.1	
13:30	5.98								Sample MW-05

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-06

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF SHEETS 1
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/11/12	DATE WELL COMPLETED: 04/11/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 1.8 gallons WELL TD: 23.55 ft PUMP INTAKE DEPTH: 18.6 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
8:56	12.57								Static water level
8:57		200							Pump on
9:12	12.60	200	8.8	1.55	1.44	6.98	207	122	
9:27	12.57	200	9.8	1.49	1.26	6.93	173	46.6	
9:42	12.57	200	10.1	1.50	1.11	6.88	150	30.9	
9:47	12.57	200	10.3	1.49	1.08	6.87	143	24.7	
9:52	12.57	200	10.3	1.49	1.09	6.86	140	25.8	
9:57	12.57	200	10.4	1.49	1.07	6.86	139	24.3	
10:00									Sample MW-6
10:15	12.57								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-07

WELL SAMPLING FORM	PROJECT Jung Sun Laundry Plume Site	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
LOCATION Long Island City, NY		DATE WELL STARTED 04/11/12	DATE WELL COMPLETED 04/11/12
CLIENT NYSDEC		NAME OF INSPECTOR Jennifer Becker	
DRILLING COMPANY Zebra			

ONE WELL VOLUME : 1.4 gallons WELL TD: 23.6 ft PUMP INTAKE DEPTH: 18.6 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
8:20	14.85								Static water level
8:25	14.85								Pump on
8:30	14.85	150	14.2	1.4	10.48	7.64	108	256.0	
8:40	14.85	170	14.6	1.5	9.67	7.72	107	205.0	
8:50	14.85	170	14.6	1.5	10.02	7.73	110	174.0	
9:00	14.85	170	14.5	1.5	10.35	7.73	114	125.0	
9:10	14.85	170	14.6	1.5	10.56	7.73	116	99.5	
9:20	14.85	170	14.5	1.5	10.61	7.73	118	68.9	
9:30	14.85	170	14.5	1.5	10.74	7.73	119	59.2	
9:40	14.85	170	14.7	1.5	10.78	7.73	119	47.6	
9:43									Sample time
9:48	14.84								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-08

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF SHEETS 1
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/11/12	DATE WELL COMPLETED: 04/11/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Jennifer Becker	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 1.4 gallons WELL TD: 23.21 ft PUMP INTAKE DEPTH: 18.2 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
10:53	14.53								Static water level
10:56	14.53								Pump on
11:00	14.53	170	10.0	0.647	2.92	7.07	142	395.0	
11:10	14.53	170	10.8	0.605	4.31	7.09	138	228.0	
11:20	14.53	170	11.2	0.582	4.88	7.13	139	102.0	
11:30	14.53	170	11.6	0.570	5.23	7.17	141	60.9	
11:40	14.53	170	12.1	0.562	5.08	7.22	136	49.6	
11:43	14.53								Sample MW-8
11:46									

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-10

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF SHEETS 1
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/09/12	DATE WELL COMPLETED: 04/09/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 4.1 gallons WELL TD: 40.7 ft PUMP INTAKE DEPTH: 35.7 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
12:47	15.40								Static water level
12:53		210							Pump on
13:15	15.42	210	17.5	1.09	1.47	7.46	-72	127.0	
13:30	15.44	210	18.1	1.06	0.57	7.48	-59	72.0	
13:45	15.46	210	18.9	1.05	0.48	7.44	-44	71.5	
14:00	15.41	200	18.5	1.07	0.47	7.4	-26	43.6	
14:10	15.43	200	18.8	1.07	0.49	7.41	-28	42.6	
14:20	15.42	200	19.3	1.06	0.46	7.39	-34	42.5	
14:30									Sample MW-10
15:00	15.45								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-11

WELL SAMPLING FORM	PROJECT Jung Sun Laundry Plume Site	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
LOCATION Long Island City, NY		DATE WELL STARTED 04/09/12	DATE WELL COMPLETED 04/09/12
CLIENT NYSDEC		NAME OF INSPECTOR Brian Cacciopoli	
DRILLING COMPANY Zebra			

ONE WELL VOLUME : 5.5 gallons WELL TD: 49.97 ft PUMP INTAKE DEPTH: 45 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS						REMARKS
			Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	
12:05	16.41								Static water level
12:10									Pump on
12:20	16.89	230	16.2	1.4	6.87	7.99	-133	999.0	
12:30	16.84	210	16.4	1.4	6.13	7.96	-148	676.0	
12:40	16.69	160	16.7	1.4	6.06	7.94	-148	534.0	
12:50	16.77	200	16.7	1.4	5.78	7.92	-146	418.0	
13:00	16.8	210	16.8	1.3	5.74	7.89	-135	412.0	
13:10	16.80	210	16.5	1.3	5.42	7.85	-136	425.0	
13:20	16.9	320	16.7	1.4	5.24	7.81	-133	321.0	
13:30	16.85	260	17.0	1.3	4.9	7.82	-141	278.0	
13:40	16.85	250	16.8	1.3	5.04	7.77	-138	259.0	
13:50	16.86	250	16.8	1.3	4.9	7.73	-136	391.0	
14:00	16.85	250	17.0	1.3	4.81	7.71	-135	380.0	
14:10	16.85	250	17.1	1.3	4.75	7.71	-143	406.0	
14:15	16.75								Sample MW-11

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-12

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/19/12	DATE WELL COMPLETED: 04/19/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Cacciopoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 3.9 gallons WELL TD: 40.35 ft PUMP INTAKE DEPTH: 35.4 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
16:40	16.17								Static water level
16:42		260							Pump on
16:50	16.19	260	18.2	1.2	7.72	7.75	83	999.0	
17:00	16.18	260	18.1	1.2	7.91	7.84	80	386.0	
17:10	16.18	260	18.2	1.2	7.85	7.88	81	192.0	
17:20	16.19	260	18.2	1.2	7.77	7.88	83	124.0	
17:35	16.18	260	18.1	1.2	7.83	7.91	87	76.2	
17:50	16.19	260	18.1	1.2	7.7	7.92	88	67.8	
18:00	16.19	260	18.1	1.2	7.61	7.92	90	63.1	
18:10	16.19	260	18.1	1.2	7.4	7.92	90	67.6	
18:25	16.19	260	17.8	1.2	7.11	7.89	92	67.2	
18:35	16.18	260	18.0	1.2	6.92	7.92	89	85.8	
18:45	16.19	260	18.0	1.2	6.80	7.92	89	81.4	
18:50	16.17								Sample MW-12

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

WELL NO. MW-13

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/09/12	DATE WELL COMPLETED: 04/09/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 4.9 gallons WELL TD: 45.39 ft PUMP INTAKE DEPTH: 40.4 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
17:20	15.29								Static water level
17:27		200							Pump on
17:45	15.39	200	13.2	1.34	8.19	7.15	192	470	
18:00	15.39	200	12.4	1.36	8.31	7.19	190	293	
18:15	15.35	200	12.4	1.37	8.48	7.19	190	168	
18:30	15.35	200	12.6	1.36	8.48	7.23	190	144	
18:45	15.35	200	12.7	1.34	8.37	7.24	189	100	
18:55	15.35	200	12.6	1.35	8.46	7.28	188	48.3	
19:00	15.29								Sample MW-13

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-14

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/10/12	DATE WELL COMPLETED: 04/10/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Cacciopoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 5.5 gallons   WELL TD: 40.34 ft   PUMP INTAKE DEPTH: 35.3 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
10:50	6.36								Static water level
10:55	6.36	200							Pump on
11:15	6.37	200	16.8	0.129	0.00	5.90	41	72	
11:30	6.37	200	16.8	0.128	0.00	5.99	34	19	
11:40	6.38	200	16	0.342	10.89	6.06	32	11	
11:50	6.37	200	16.6	0.133	6.03	6.05	32	13	
12:00	6.37	200	16.3	0.127	0.00	6.05	33	17	
12:10	6.37	200	16.4	0.126	0.00	6.02	33	19.00	
12:20	6.37								Sample MW-14
12:25									Duplicate MW-64

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs and MNA parameters

AECOM

WELL NO. MW-15

WELL SAMPLING FORM	PROJECT Jung Sun Laundry Plume Site	PROJECT No. 60237880	SHEET 1 OF 1 SHEETS
LOCATION Long Island City, NY		DATE WELL STARTED 04/10/12	DATE WELL COMPLETED 04/10/12
CLIENT NYSDEC		NAME OF INSPECTOR Brian Cacciapoli	
DRILLING COMPANY Zebra			

ONE WELL VOLUME : 5.1 gallons WELL TD: 45.35 ft PUMP INTAKE DEPTH: 40.4 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
7:35	13.96								Static water level
7:37		250							Pump on
7:55	13.24	250	9.9	1.93	11.60	7.29	68	883.0	
8:10	13.96	250	10.2	1.91	10.36	7.27	73	161.0	
8:25	13.96	250	10.2	1.94	9.72	7.27	73	76.9	
8:40	13.95	250	10.2	1.95	9.43	7.27	69	65.1	
8:50	13.95	250	10.2	1.95	9.34	7.29	65	55.1	
9:05	13.96	250	10.3	1.96	9.33	7.31	64	49.5	
9:15	13.96	250	10.4	1.96	9.20	7.32	64	41.0	
9:20	13.96								Sample MW-15

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-16

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/10/12	DATE WELL COMPLETED: 04/10/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Jennifer Becker	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 1.7 gallons WELL TD: 55.01 ft PUMP INTAKE DEPTH: 50 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
	13.61								Static water level
8:11	13.61								Pump on
8:28	13.61	250	16.0	1.5	16.67	7.93	73	999.0	
8:38	13.61	50	15.8	1.7	16.41	7.93	96	999.0	
8:48	13.61	50	16.0	1.8	16.08	7.92	97	999.0	
8:58	13.61	40	16.4	1.7	16.20	7.94	99	999.0	
9:08	13.61	50	17.8	1.7	15.91	7.96	105	999.0	
9:18	13.61	50	18.0	1.8	15.93	7.97	105	999.0	
9:28	13.61	50	17.8	1.8	16.33	7.99	97	999.0	
9:38	13.61	50	17.5	1.8	15.86	8.03	67	999.0	
9:48	13.61	50	17.7	1.8	14.64	8.02	64	690.0	
9:58	13.61	50	17.8	1.7	13.12	8.00	64	598.0	
10:08	13.61	50	18.3	1.7	12.57	8.01	65	437.0	
10:18	13.61	50	18.5	1.8	12.22	8.02	67	365.0	
10:28	13.61	50	19.2	1.8	12.22	8.04	70	675.0	
10:32	13.61								Sample MW-16

Pump Type: 1" Geotech bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-17

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/10/12	DATE WELL COMPLETED: 04/10/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Cacciopoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 4.4 gallons **WELL TD:** 38.60 ft **PUMP INTAKE DEPTH:** 33.6 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
15:00	11.55								Static water level
15:05		220							Pump on
15:10	11.55	220	16.2	5.00	6.26	8.23	-137	271.0	
15:20	11.55	220	16.3	4.30	6.93	8.06	-125	135.0	
15:30	11.57	220	16.3	3.60	6.96	8.00	-107	124.0	
15:40	11.56	220	16.3	2.80	6.97	8.00	-96	87.8	
15:50	11.55	220	16.5	2.40	6.92	8.01	-94	66.0	
16:00	11.55	220	16.5	2.40	7.03	8.02	-91	68.8	
16:10	11.55	220	16.3	2.00	6.96	8.02	-90	60.4	
16:20	11.55	220	16.4	1.90	6.94	8.02	-90	48.7	
16:25	11.55								Sample MW-17

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-18

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/10/12	DATE WELL COMPLETED: 04/10/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Jennifer Becker	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 3.7 gallons WELL TD: 33.87 ft PUMP INTAKE DEPTH: 28.9 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
13:40	11.09								Static water level
13:42									Pump on
14:00	11.56	50	10.93	1.50	4.91	7.47	219	54.8	
14:10	11.86	50	10.35	1.52	3.72	7.49	188	37.7	
14:20	12.5	30	10.27	1.53	3.01	7.51	170	38.1	
14:30	12.79	10	10.33	1.57	3.01	7.49	169	40.4	
14:40	12.87	10	10.48	1.53	3.28	7.47	177	42.7	
14:50	12.90	10	10.36	1.53	3.59	7.51	179	45.5	
15:00	12.92	5	10.28	1.57	3.44	7.51	184	43.3	
15:10	12.96	5	10.09	1.57	3.52	7.52	192	45.0	
15:12									Sample MW-18
15:18	12.02								

Pump Type: 1" Geotech bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-19

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF SHEETS 1
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/10/12	DATE WELL COMPLETED: 04/10/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 6.1 gallons WELL TD: 44.2 ft PUMP INTAKE DEPTH: 39.2 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS						REMARKS
			Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	
9:05	6.67								Static water level
9:10		200							Pump on
9:25	6.35	200	16.02	7100	0.00	7.29	218	7500	
9:40	6.35	200	15.89	99.9	0.00	7.28	229	0.0	
9:55	6.35	200	9.4	1.27	16.86	7.59	137	215	
10:05	6.35	200	9.9	1.25	16.16	7.56	142	170	
10:20	6.35	200	10.5	1.22	13.97	7.55	149	127	
10:35	6.35	200	11.5	1.18	13.31	7.63	150	85.9	
10:50	6.35	200	11.9	1.17	12.74	7.59	145	46.3	
11:15	6.35	200	12.1	1.16	11.31	7.53	139	25.8	
11:20	6.35	200	12.1	1.16	11.16	7.54	138	26.0	
11:25	6.35	200	12.2	1.16	10.93	7.53	136	23.1	
11:30									Sample MW-19
11:45	6.67								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs and MNA parameters

AECOM

WELL NO. MW-20

WELL SAMPLING FORM	PROJECT Jung Sun Laundry Plume Site	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
LOCATION Long Island City, NY		DATE WELL STARTED 04/11/12	DATE WELL COMPLETED 04/11/12
CLIENT NYSDEC		NAME OF INSPECTOR Celeste Foster	
DRILLING COMPANY Zebra			

ONE WELL VOLUME : 1.7 gallons WELL TD: 25.4 ft PUMP INTAKE DEPTH: 20.4 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
11:15	15.09								Static water level
11:20		240							Pump on
11:30	15.09	240	16.0	0.79	6.61	7.76	-14	264.0	
11:40	15.09	240	16.3	0.79	6.99	7.78	2	72.7	
11:50	15.09	240	16.3	0.79	7.28	7.77	15	44.4	
12:00	15.09	240	16.3	0.78	6.43	7.73	37	20.7	
12:10	15.09	240	16.3	0.78	6.40	7.73	38	20.4	
12:20	15.10	240	16.3	0.78	6.25	7.73	41	19.5	
12:40									Sample MW-20

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs and MNA parameters

AECOM

WELL NO. MW-21

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 04/11/12	DATE WELL COMPLETED: 04/11/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Cacciopoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 2.5 gallons WELL TD: 27.47 ft PUMP INTAKE DEPTH: 22.5 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
9:55	12.25								Static water level
10:05									Pump on
10:15	12.25	210	8.59	1.63	2.99	7.33	156	0.0	
10:25	12.25	210	7.60	1.68	2.65	7.33	132	38.6	
10:35	12.25	210	7.00	1.71	2.53	7.34	125	13.0	
10:45	12.25	210	6.67	1.73	6.44	7.39	115	0.0	
10:55	12.25	210	6.73	1.74	6.66	7.46	115	0.0	
11:05	12.25	210	6.55	1.75	6.57	7.56	108	0.0	
11:10	12.25								Sample MW-21

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-01

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/11/12	DATE WELL COMPLETED: 06/11/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 0.9 gallons WELL TD: 20.4 ft PUMP INTAKE DEPTH: 15.4 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS						REMARKS
			Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	
17:12	15.02								Static water level
17:35									Pump on
17:45	15.05	400	18.29	1.24	1.58	7.20	39	323	
17:55	15.05	400	18.19	1.23	1.27	7.20	46	57.3	
18:05	15.05	225	18.36	1.23	1.25	7.22	51	11.1	
18:15	15.05	225	18.28	1.24	1.28	7.19	57	0.0	
18:25	15.02								Sample MW-1

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-02

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF SHEETS 1
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/11/12	DATE WELL COMPLETED: 06/11/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 0.4 gallons WELL TD: 18.34 ft PUMP INTAKE DEPTH: 13.3 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
11:50	15.95								Static water level
14:33									Pump on
14:40	15.98	200	19.14	0.653	5.01	6.86	-59	45.7	
14:50	16.00	200	18.55	0.597	1.85	7.02	-90	7.8	
15:00	16.00	200	18.45	0.584	1.63	7.03	-96	5.0	
15:10	15.99	200	18.40	0.577	1.48	7.03	-102	5.0	
15:20	15.99	200	18.34	0.566	1.31	7.06	-107	2.5	
15:30	15.99	200	18.25	0.555	1.21	7.05	-109	2.10	
15:40	15.99	200	18.22	0.552	1.13	7.07	-109	1.80	
15:45									Sample MW-2
16:00	15.98								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-03

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF SHEETS 1
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/13/12	DATE WELL COMPLETED: 06/13/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Cacciopoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 2 gallons WELL TD: 24.2 ft PUMP INTAKE DEPTH: 19.2 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
7:44	11.77								Static water level
7:45		345							Pump on
7:55	11.77	345	18.35	1.78	2.60	6.80	-89	103	
8:05	11.77	345	18.32	1.79	1.61	6.73	-95	14.0	
8:15	11.77	345	18.34	1.80	1.37	6.73	-101	0.0	
8:30	11.77	345	18.33	1.81	1.47	6.74	-107	0.0	
8:40	11.77	345	18.34	1.80	1.38	6.73	-110	0.0	
8:45	11.77								Sample MW-3

Field measurements: Temp., Conduct., DO, pH, ORP, Turbidity.

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-04

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF SHEETS 1
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/13/12	DATE WELL COMPLETED: 06/13/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Cacciopoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 0.8 gallons WELL TD: 19.2 ft PUMP INTAKE DEPTH: 14.2 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
10:07	14.37								Static water level
10:15		225							Pump on
10:25	14.37	225	16.98	0.317	6.37	7.71	32	362	
10:35	14.37	225	16.86	0.316	2.87	7.70	32	269	
10:45	14.37	225	16.68	0.318	2.64	7.71	26	138	
10:55	14.37	225	16.55	0.32	2.62	7.76	26	114	
11:05	14.37	225	16.58	0.326	2.77	7.73	25	71.3	
11:15	14.37	225	16.54	0.328	2.85	7.72	28	58.5	
11:25	14.37	225	16.52	0.327	2.70	7.76	29	34.4	
11:35									Sample MW-04
11:40	14.37								Duplicate MW-54

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs and MNA parameters

AECOM

WELL NO. MW-05

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/12/12	DATE WELL COMPLETED: 06/12/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Caccioppoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 1.5 gallons WELL TD: 15.2 ft PUMP INTAKE DEPTH: 10.2 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
14:52	6.01								Static water level
15:55									Pump on
15:05	6.01	180	18.71	1.22	0.73	7.25	115	112	
15:15	6.01	180	19.94	0.663	0.62	7.30	96	56.3	
15:25	6.01	200	19.70	0.328	0.47	7.28	86	26.4	
15:50	6.01	200	19.49	0.650	0.51	7.15	72	14.0	
16:00	6.01	200	19.52	0.647	0.5	7.15	72	12.9	
16:10	6.01	200	19.52	0.645	0.51	7.15	71	10.5	
16:15	6.01								Sample MW-5

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-06

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF SHEETS 1
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/13/12	DATE WELL COMPLETED: 06/13/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 1.8 gallons WELL TD: 23.55 ft PUMP INTAKE DEPTH: 18.6 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
8:30	12.45								Static water level
8:47	12.47	200	19.11	1.36	2.80	7.02	154	266	Pump on
9:10	12.47	200	18.55	1.34	2.28	7.04	129	78.5	
9:20	12.47	200	18.49	1.33	2.05	7.03	130	34.2	
9:30	12.47	200	18.46	1.33	1.98	7.03	130	35.7	
9:40	12.47	200	18.45	1.32	1.43	7.04	123	26.0	
9:50	12.47	200	18.41	1.32	1.19	7.07	119	19.5	
10:00	12.47	200	18.53	1.32	1.05	7.08	110	14.2	
10:10	12.47	200	18.58	1.32	1.00	7.07	106	12.7	
10:20	12.47	200	18.45	1.32	0.90	7.08	102	9.1	
10:25	12.47	200	18.48	1.32	0.84	7.07	98	8.30	
10:40	12.47	200	18.44	1.31	0.79	7.07	99	7.20	
10:42									Sample MW-6
10:46	12.47								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-07

WELL SAMPLING FORM	PROJECT Jung Sun Laundry Plume Site	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
LOCATION Long Island City, NY		DATE WELL STARTED 06/13/12	DATE WELL COMPLETED 06/13/12
CLIENT NYSDEC		NAME OF INSPECTOR Dan Robinson	
DRILLING COMPANY Zebra			

ONE WELL VOLUME : 1.4 gallons WELL TD: 23.6 ft PUMP INTAKE DEPTH: 18.6 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
8:10	14.8								Static water level
8:25	14.84	200	17.43	1.45	3.99	3.95	202	143	Pump on
8:40	14.75	200	17.38	1.37	3.93	6.94	201	131	
8:50	14.81	200	17.35	1.37	3.83	6.93	198	87.2	
9:00	14.8	200	17.34	1.37	3.84	6.93	194	62	
9:10	14.8	200	17.37	1.37	3.72	6.92	192	47.7	
9:20	14.8	200	17.43	1.37	3.69	6.92	190	33.4	
9:20	14.80	200							Sample MW-7

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs and MNA parameters

AECOM

WELL NO. MW-08

WELL SAMPLING FORM	PROJECT Jung Sun Laundry Plume Site	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
LOCATION Long Island City, NY		DATE WELL STARTED 06/13/12	DATE WELL COMPLETED 06/13/12
CLIENT NYSDEC		NAME OF INSPECTOR Dan Robinson	
DRILLING COMPANY Zebra			

ONE WELL VOLUME : 1.4 gallons WELL TD: 23.21 ft PUMP INTAKE DEPTH: 18.2 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
11:00	14.5								Static water level
11:05	14.52	350							Pump on
11:10	14.52	250	18.76	0.48	1.21	6.80	121	94.5	
11:20	14.52	250	18.44	0.48	0.66	6.77	121	15.4	
11:30	14.51	250	18.39	0.49	0.57	6.77	135	5.7	
11:40	14.51	250	18.40	0.49	0.55	6.77	138	4.1	
11:50	14.51	250	18.40	0.49	0.53	6.78	136	2.9	
11:50	14.50								Sample MW-8

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-09

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/13/12	DATE WELL COMPLETED: 06/13/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Caccioppoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 2.9 gallons WELL TD: 30.2 ft PUMP INTAKE DEPTH: 25.2 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
12:32	12.49								Static water level
12:35		250							Pump on
12:45	12.49	250	18.94	1.01	3.23	7.35	85	788	
12:55	12.49	250	18.42	0.927	3.56	7.40	69	166	
13:05	12.49	250	18.39	0.859	4.42	7.39	71	87.8	
13:15	12.49	250	18.58	0.844	4.45	7.41	66	43.6	
13:25	12.49	250	18.61	0.826	4.77	7.45	67	12.8	
13:30	12.49								Sample MW-9

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-10

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF SHEETS 1
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/11/12	DATE WELL COMPLETED: 06/11/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Caccioppoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 4.1 gallons WELL TD: 40.49 ft PUMP INTAKE DEPTH: 35.5 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
11:47	15.37								Static water level
14:02									Pump on
14:10	15.42	200	22.30	0.987	1.54	7.16	185	304	
14:20	15.43	200	21.23	1.04	1.52	7.27	110	123	
14:30	15.42	200	21.17	1.06	1.23	7.27	113	75.4	
14:40	15.42	200	20.78	1.07	0.98	7.26	113	55.6	
14:50	15.44	200	20.70	10.8	0.90	7.26	110	48.5	
15:00	15.43	200	20.59	1.07	0.84	7.26	112	34.70	
15:10	15.45	200	20.50	1.08	0.78	7.26	108	28.50	
15:20	15.44	200	20.47	1.09	0.74	7.26	107	26.10	
15:25									Sample MW-10
15:30	15.37								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

WELL NO. MW-11

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/11/12	DATE WELL COMPLETED: 06/11/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 5.5 gallons WELL TD: 49.97 ft PUMP INTAKE DEPTH: 45 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS						REMARKS
			Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	
11:52	16.44								Static water level
16:37									Pump on
16:50	16.88	225	18.46	1.36	0.74	7.35	-84	989	
17:00	16.88	225	18.14	1.37	0.65	7.35	-84	569	
17:10	16.88	205	18.00	1.37	0.58	7.34	-84	414	
17:20	16.87	205	17.96	1.37	0.53	7.34	-80	234	
17:30	16.88	205	17.83	1.37	0.50	7.35	-79	168	
17:40	16.85	200	18.20	1.37	0.51	7.35	-73	127	
17:50	16.85	200	18.07	1.37	0.53	7.35	-74	112	
18:00	16.85	200	18.05	1.37	0.54	7.36	-76	942	
18:10	16.85	200	18.01	1.37	0.50	7.36	-77	89.3	
18:20	16.85	200	17.97	1.37	0.46	7.36	-77	68.1	
18:30	16.85	200	17.96	1.37	0.45	7.35	-75	56.9	
18:37	16.85	200	17.97	1.37	0.42	7.35	-75	52.8	
18:40									Sample MW-11
18:45	16.66								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-12

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/11/12	DATE WELL COMPLETED: 06/11/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Caccioppoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 3.9 gallons   WELL TD: 40.35 ft   PUMP INTAKE DEPTH: 35.4 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
12:11	16.21								Static water level
16:07									Pump on
16:17									Air bubbles/flow inconsistent
16:40									Refit pump w/tubing
16:50	16.21	175	20.92	1.18	5.07	7.34	172	517	
17:00	16.22	250	19.65	1.18	4.20	7.32	176	251	
17:10	16.21	250	19.38	1.19	3.22	7.24	183	178	
17:20	16.21	250	19.39	1.19	2.90	7.22	175	141	
17:30	16.21	250	19.37	1.19	2.76	7.22	178	141	
17:40	16.21	250	19.37	1.19	2.59	7.22	181	152	
17:50	16.22	250	19.32	1.18	2.37	7.21	184	161	
18:00	16.22	250	19.22	1.18	2.36	7.20	171	150	
18:10	16.21	250	19.23	1.18	2.33	7.19	173	135	
18:20	16.21	250	19.2	1.18	1.92	7.18	177	119	
18:30	16.21	250	19.19	1.19	1.61	7.18	181	103	
18:40	16.21	250	19.18	1.19	1.51	7.17	182	94.8	
18:45									Sample MW-12
18:50	16.21								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-13

WELL SAMPLING FORM	PROJECT Jung Sun Laundry Plume Site	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
LOCATION Long Island City, NY		DATE WELL STARTED 06/12/12	DATE WELL COMPLETED 06/12/12
CLIENT NYSDEC		NAME OF INSPECTOR Dan Robinson	
DRILLING COMPANY Zebra			

ONE WELL VOLUME : 4.9 gallons WELL TD: 45.39 ft PUMP INTAKE DEPTH: 40.4 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
8:25	15.21								Static water level
8:35									Pump on
8:37	15.34	200	18.25	1.11	5.67	7.76	129	0	
9:15	15.25	50	21.01	1.14	4.91	7.59	136	616	
9:25	15.24	75	21.26	1.15	4.71	7.59	135	598	
9:35	15.22	75	21.80	1.16	4.89	7.58	133	543	
9:45	15.23	200	18.50	1.13	6.93	7.61	133	606	
9:55	15.22	200	18.25	1.12	7.3	7.50	158	530	
10:05	15.22	200	18.19	1.11	7.61	7.58	131	464	
10:15	15.22	200	18.28	1.10	7.5	7.58	132	442	
10:25	15.22	200	18.30	1.10	7.75	7.58	131	394	
10:31	15.22	200	18.27	1.10	7.76	7.62	127	371	
10:45	15.22	200	18.41	1.10	7.8	7.63	123	345	
10:55	15.22	200	18.41	1.10	7.72	7.50	130	327	
11:05	15.22	200	18.38	1.10	7.79	7.62	122	294	
11:15	15.22	200	18.26	1.10	7.79	7.54	122	269	
11:20	15.21								Sample MW-13

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-14

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/12/12	DATE WELL COMPLETED: 06/12/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 5.5 gallons WELL TD: 40.3 ft PUMP INTAKE DEPTH: 35.3 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
13:15	6.34								Static water level
13:20									Pump on
13:25	6.34	200	18.74	1.18	0.85	7.27	148	1000	
13:40	6.34	200	18.75	1.18	0.86	7.27	148	1000	
13:50	6.34	200	18.69	1.17	0.74	7.26	143	614	
14:10	6.34	200	18.72	1.15	1.10	7.25	125	409	
14:20	6.34	200	18.74	1.15	1.01	7.25	124	368	
14:30	6.34	200	18.68	1.15	0.79	7.25	123	341	
14:40	6.34	200	18.69	1.16	0.67	7.24	121	229	
14:50	6.34	200	18.70	1.18	0.61	7.25	170	177	
15:15	6.34	200	18.73	1.23	0.50	7.26	114	86.4	
15:20	6.34	200	18.73	1.24	0.46	7.29	112	74.1	
15:25									Sample MW-14
16:00	6.34								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs and MNA parameters

AECOM

WELL NO. MW-15

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF SHEETS 1
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/12/12	DATE WELL COMPLETED: 06/12/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Brian Caccioppoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 5.1 gallons WELL TD: 45.35 ft PUMP INTAKE DEPTH: 40.4 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (μs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
7:57	13.98								Static water level
8:02									Pump on
8:15	13.99	225	18.23	1.86	5.53	7.27	107	108	
8:25	13.99	225	18.24	1.86	5.24	7.26	109	96.9	
8:35	13.99	225	18.26	1.86	5.17	7.27	109	90.3	
8:45	13.98	225	18.25	1.85	5.11	7.28	107	89.7	
9:05	13.99	225	18.26	1.83	4.99	7.32	109	71.7	
9:15	13.99	225	18.33	1.83	4.95	7.31	109	68.1	
9:25	13.99	225	18.27	1.83	4.90	7.31	109	65.3	
9:45	13.99	225	18.31	1.83	4.88	7.31	106	48.7	
9:50	13.98								Sample MW-15

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-16

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/12/12	DATE WELL COMPLETED: 06/12/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster/Brian Caccioppoli	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 1.7 gallons WELL TD: 55 ft PUMP INTAKE DEPTH: 50 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
7:30	13.60								Static water level
7:40	13.60								Pump on
8:00	13.60	120	19.90	1.50	6.10	7.22	105	293	
8:20	13.60	120	19.21	1.51	4.16	7.20	126	106	
8:30	13.60	120	19.19	1.51	3.95	7.21	130	74.4	
8:40	13.60	120	19.19	1.54	4.10	7.21	131	46.3	
8:45	13.60	120	19.17	1.54	4.17	7.22	130	44.3	
8:50	13.60								Sample MW-16

Pump Type: 1" Geotech bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-17

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/12/12	DATE WELL COMPLETED: 06/12/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Dan Robinson	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 4.5 gallons   WELL TD: 38.6 ft   PUMP INTAKE DEPTH: 33.6 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
12:11	11.24								Static water level
12:15									Pump on
12:15	11.28	200	18.99	5.36	2.96	6.81	-113	133	
12:25	11.27	200	18.37	5.51	2.10	6.82	127	112	
12:35	11.26	200	18.26	4.37	1.45	6.87	-133	121	
12:45	11.25	200	18.05	2.41	3.20	7.02	-146	76.9	
12:55	11.25	200	18.07	2.03	1.49	7.07	-142	58.7	
13:05	11.25	200	17.93	1.86	1.48	7.09	-141	53.2	
13:15	11.25	200	17.93	1.75	1.48	7.09	-143	34.7	
13:25	11.25	200	17.91	1.67	1.75	7.11	-143	27.4	
13:35	11.25	200	17.84	1.63	1.50	7.08	-143	25.5	
13:45	11.25	200	17.80	1.61	1.42	7.08	-143	25.3	
14:00	11.25								Sample MW-17

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-18

WELL SAMPLING FORM	PROJECT Jung Sun Laundry Plume Site	PROJECT No. 60237880	SHEET 1 OF SHEETS 1
LOCATION Long Island City, NY		DATE WELL STARTED 06/12/12	DATE WELL COMPLETED 06/12/12
CLIENT NYSDEC		NAME OF INSPECTOR Brian Caccioppoli	
DRILLING COMPANY Zebra			

ONE WELL VOLUME : -1.9 gallons   WELL TD: 33.9   PUMP INTAKE DEPTH: -5 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
11:00	11.88								Static water level
11:05									Pump on
11:15	12.30	50	21.57	1.11	2.39	7.69	38	85.9	
11:30	12.45	50	22.26	1.11	1.73	7.58	32	55.4	
11:45	12.60	50	22.71	1.11	1.58	7.58	39	20.0	
11:55	12.60	25	23.08	1.11	1.63	7.59	42	23.5	
12:15	12.60	25	23.39	1.11	1.35	7.59	51	17.9	
12:40	12.60	25	22.97	1.11	1.54	7.59	54	22.8	
13:00	12.60	25	22.24	1.13	1.62	7.58	54	32.8	
13:05									Sample MW-18
13:30	12.60								

Pump Type: 1" Geotech bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-19

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/12/12	DATE WELL COMPLETED: 06/12/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 3.8 gallons WELL TD: 30.2 ft PUMP INTAKE DEPTH: 25.2 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
9:30	6.63								Static water level
9:35									Pump on
9:50	6.65	200	18.96	1.04	3.52	7.33	156	825	
10:10	6.65	200	18.48	1.05	3.13	7.32	154	721	
10:20	6.65	200	18.37	1.07	3.55	7.32	156	341	
10:30	6.65	200	18.32	1.07	3.51	7.31	156	312	
10:40	6.65	200	18.35	1.07	3.27	7.32	157	225	
10:45	6.65	200	18.76	1.05	3.24	7.31	153	150	
10:50	6.65	200	18.77	1.06	3.13	7.31	159	117	
11:00	6.65	200	18.73	1.06	3.14	7.32	159	102	
11:10	6.65	200	18.69	1.06	3.14	7.32	159	81.6	
11:20	6.65	200	18.62	1.06	3.10	7.32	161	60.7	
11:30	6.65	200	18.60	1.06	3.09	7.32	161	52.7	
11:35									Sample MW-19
11:55	6.65								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs and MNA parameters

AECOM

WELL NO. MW-20

WELL SAMPLING FORM	PROJECT: Jung Sun Laundry Plume Site	PROJECT No.: 60237880	SHEET 1 OF 1 SHEETS
LOCATION: Long Island City, NY		DATE WELL STARTED: 06/13/12	DATE WELL COMPLETED: 06/13/12
CLIENT: NYSDEC		NAME OF INSPECTOR: Celeste Foster	
DRILLING COMPANY: Zebra			

ONE WELL VOLUME : 1.8 gallons WELL TD: 25.4 ft PUMP INTAKE DEPTH: 20.4 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
11:20	14.50								Static water level
11:23									Pump on
11:40	14.50	200	17.90	0.750	7.67	7.31	-87	5.6	
12:10	14.49	200	17.72	0.751	5.16	7.24	-73	1.4	
12:20	14.49	200	17.75	0.750	4.67	7.22	-73	0.9	
12:30	14.49	200	17.70	0.748	4.32	7.22	-75	0.9	
12:40	14.49	200	17.67	0.743	3.67	7.18	-84	0.7	
12:50	14.49	200	17.51	0.744	3.00	7.17	-88	0.7	
13:00	14.49	200	17.63	0.743	2.32	7.20	-94	0.5	
13:20									Sample MW-20
	14.50								

Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

AECOM

WELL NO. MW-21

WELL SAMPLING FORM	PROJECT Jung Sun Laundry Plume Site	PROJECT No. 60237880	SHEET 1 OF 1 SHEETS
LOCATION Long Island City, NY		DATE WELL STARTED 06/12/12	DATE WELL COMPLETED 06/12/12
CLIENT NYSDEC		NAME OF INSPECTOR Dan Robinson	
DRILLING COMPANY Zebra			

ONE WELL VOLUME : 2.5 gallons WELL TD: 27.47 ft PUMP INTAKE DEPTH: 22.5 ft

Time	Depth to Water (ft)	Purge Rate (mL/min)	FIELD MEASUREMENTS Temp. (°C)	Conduct. (µs/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (ntu)	REMARKS
14:47	12.15								Static water level
14:47									Pump on
14:50	12.20	250	17.72	1.22	1.83	7.34	-13	155.0	
15:00	12.20	250	17.68	1.21	1.81	7.36	-11	76.9	
15:10	12.00	250	17.72	1.21	1.51	7.35	-8	40.2	
15:20	12.16	250	17.64	1.21	1.37	7.34	-7	30.9	
15:30	12.16	250	17.65	1.21	1.34	7.34	-8	16.6	
15:40	12.16	250	17.66	1.22	1.38	7.32	-6	10.9	
15:50	12.16	250	17.67	1.21	1.39	7.32	-6	5.2	
16:00	12.16	250	17.67	1.22	1.36	7.31	-9	0.9	
16:05									Sample MW-21
16:30	12.15								

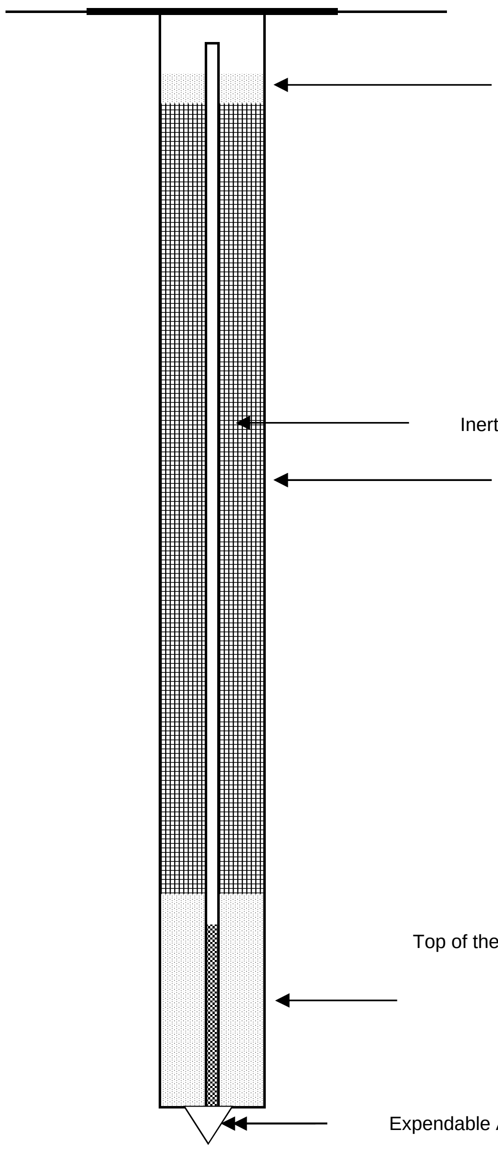
Pump Type: 2" QED bladder pump

Analytical Parameters: VOCs

SOIL VAPOR CONSTRUCTION LOG **Boring No. SG-8**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 7, 2012	Oversight: Celeste Foster, AECOM	

Flush permanent stainless steel cap



Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼” ID x 6” Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

Expendable Anchor Point Connected to Implant with an O-ring

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

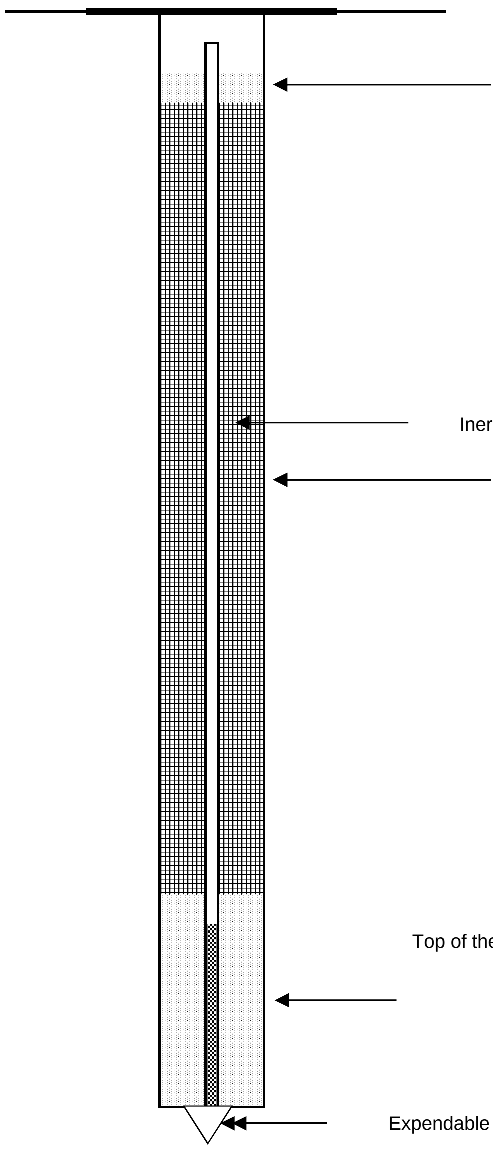
AECOM

SOIL VAPOR CONSTRUCTION LOG

Boring No. SG-9

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 7, 2012	Oversight: Celeste Foster, AECOM	

Flush permanent stainless steel cap



Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼" ID x 6" Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

Expendable Anchor Point Connected to Implant with an O-ring

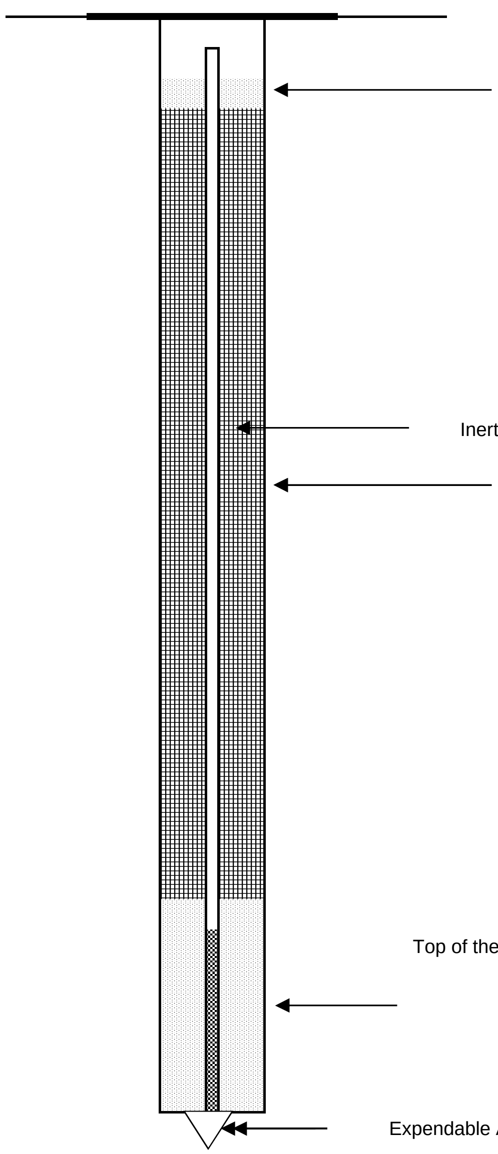
Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

SOIL VAPOR CONSTRUCTION LOG

Boring No. SG-10

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 7, 2012	Oversight: Celeste Foster, AECOM	



Flush permanent stainless steel cap

Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼" ID x 6" Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

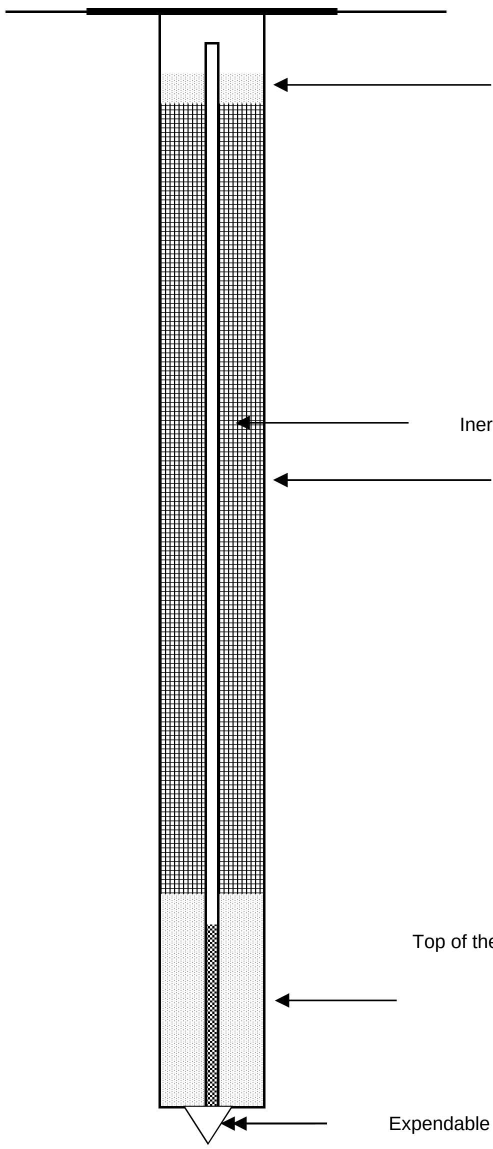
Expendable Anchor Point Connected to Implant with an O-ring

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

SOIL VAPOR CONSTRUCTION LOG **Boring No. SG-11**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 7, 2012	Oversight: Celeste Foster, AECOM	



Flush permanent stainless steel cap

Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼" ID x 6" Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

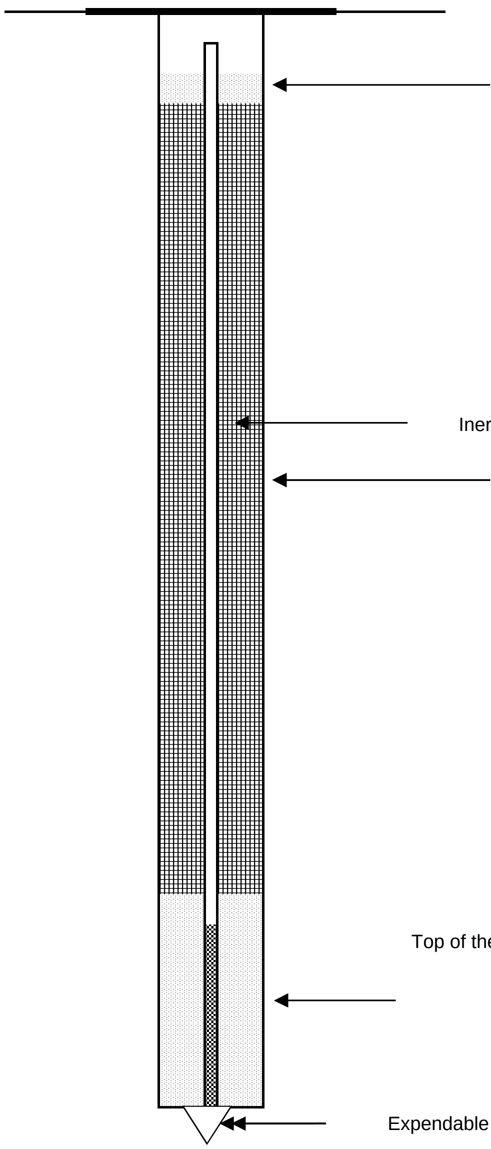
Expendable Anchor Point Connected to Implant with an O-ring

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

SOIL VAPOR CONSTRUCTION LOG **Boring No. SG-12**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 19, 2012	Oversight: Celeste Foster, AECOM	



Flush permanent stainless steel cap

Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼" ID x 6" Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

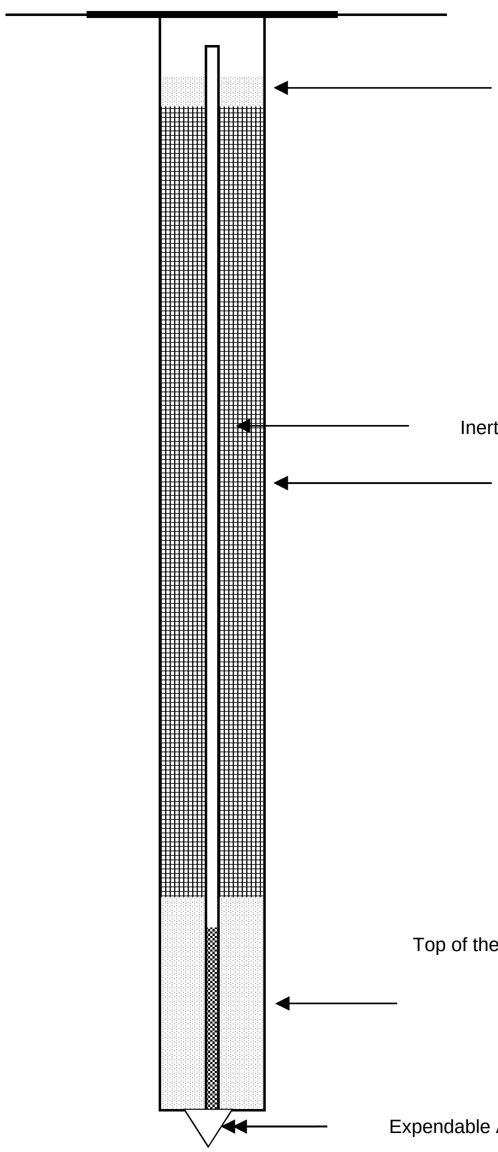
Expendable Anchor Point Connected to Implant with an O-ring

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

SOIL VAPOR CONSTRUCTION LOG **Boring No. SG-13**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 19, 2012	Oversight: Celeste Foster, AECOM	



Flush permanent stainless steel cap

Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼" ID x 6" Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

Expendable Anchor Point Connected to Implant with an O-ring

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

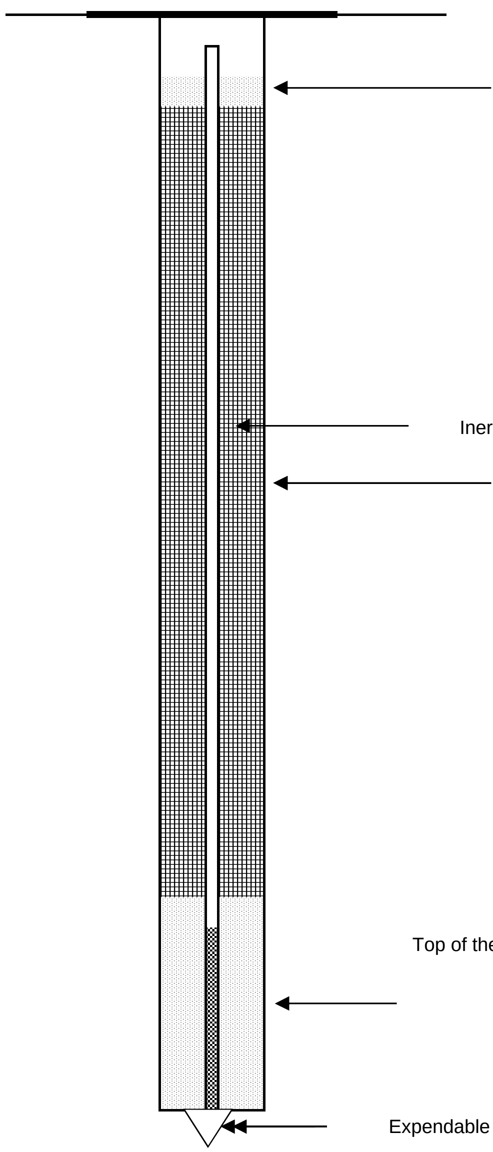
(NOT TO SCALE)

SOIL VAPOR CONSTRUCTION LOG **Boring No. SG-14**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 20, 2012	Oversight: Celeste Foster, AECOM	

Flush permanent stainless steel cap

Ground Surface 0.0 ft



Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼” ID x 6” Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

Expendable Anchor Point Connected to Implant with an O-ring

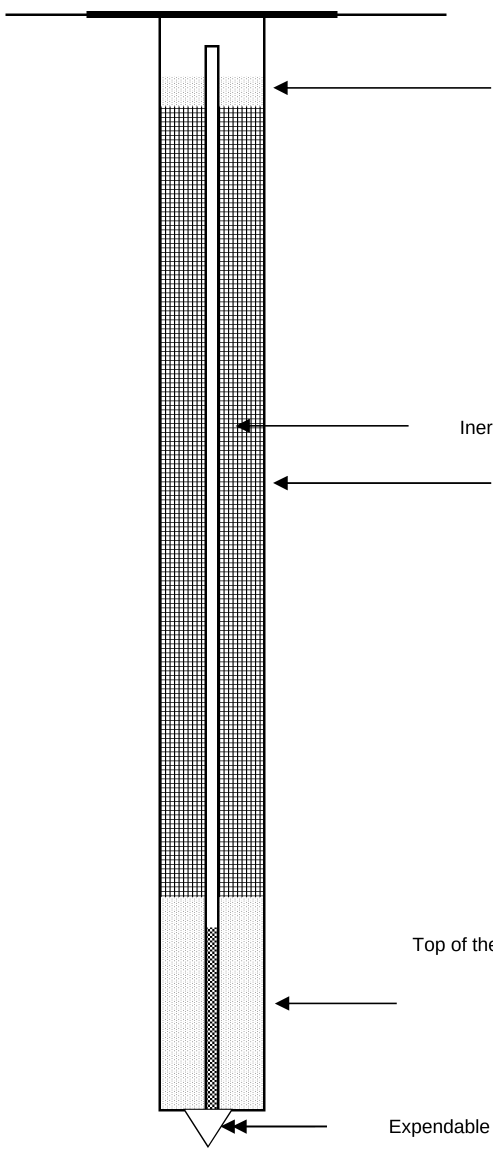
Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

SOIL VAPOR CONSTRUCTION LOG **Boring No. SG-15**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 20, 2012	Oversight: Celeste Foster, AECOM	

Flush permanent stainless steel cap



Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼" ID x 6" Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

Expendable Anchor Point Connected to Implant with an O-ring

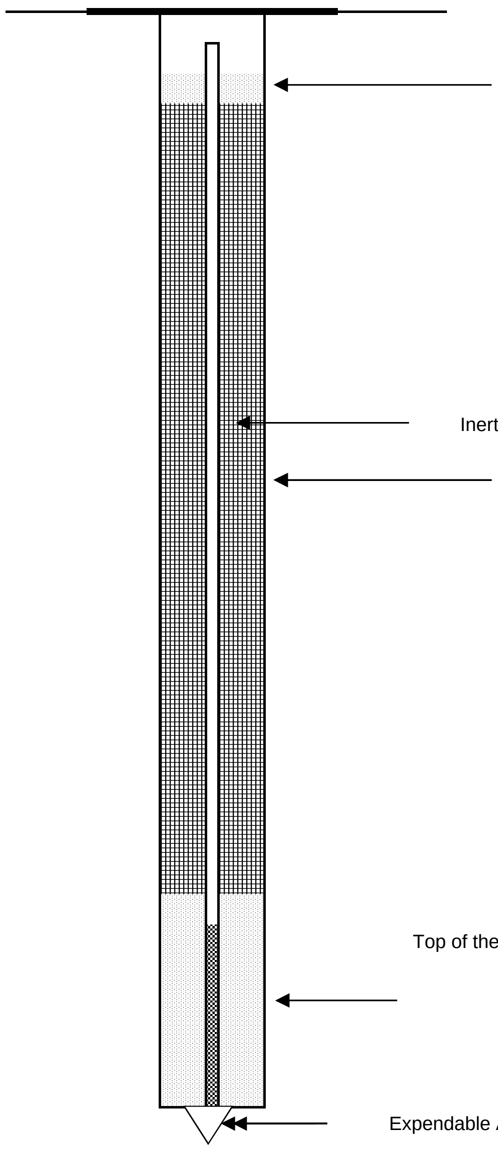
Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

SOIL VAPOR CONSTRUCTION LOG **Boring No. SG-16**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 19, 2012	Oversight: Celeste Foster, AECOM	

Flush permanent stainless steel cap



Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼” ID x 6” Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

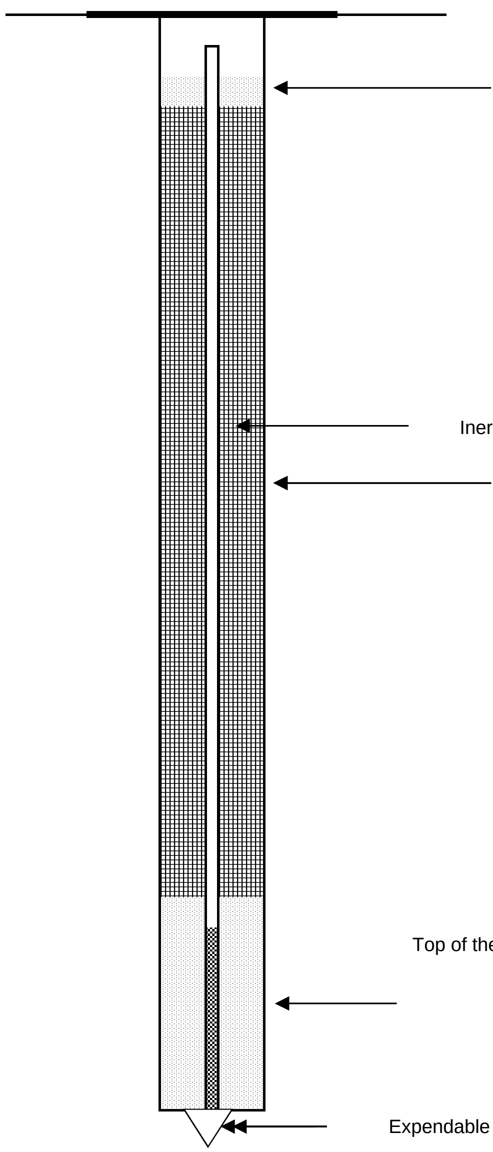
Expendable Anchor Point Connected to Implant with an O-ring

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

SOIL VAPOR CONSTRUCTION LOG **Boring No. SG-17**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 7, 2012	Oversight: Celeste Foster, AECOM	



Flush permanent stainless steel cap

Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼" ID x 6" Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

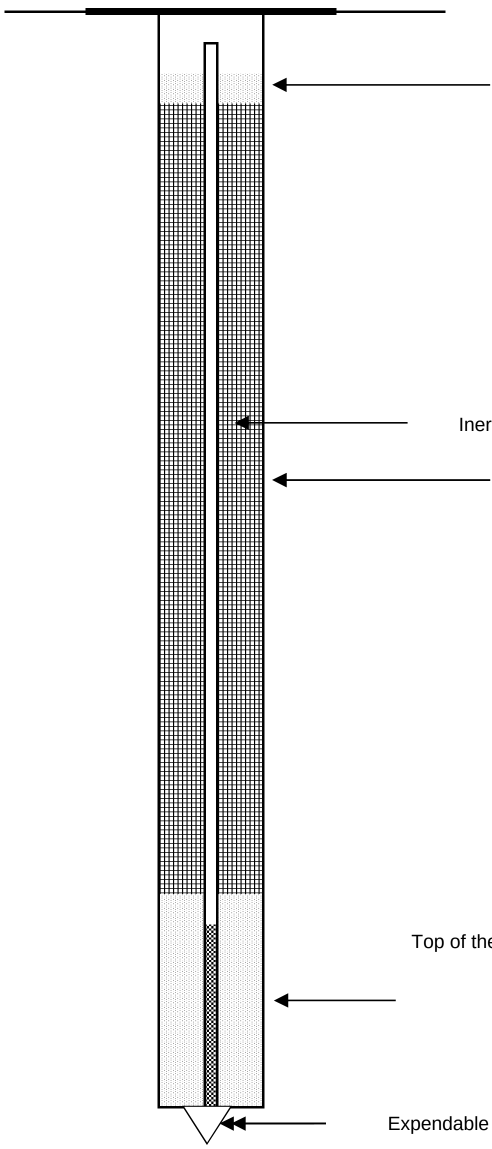
Expendable Anchor Point Connected to Implant with an O-ring

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

SOIL VAPOR CONSTRUCTION LOG **Boring No. SG-18**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 7, 2012	Oversight: Celeste Foster, AECOM	



Flush permanent stainless steel cap

Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼" ID x 6" Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

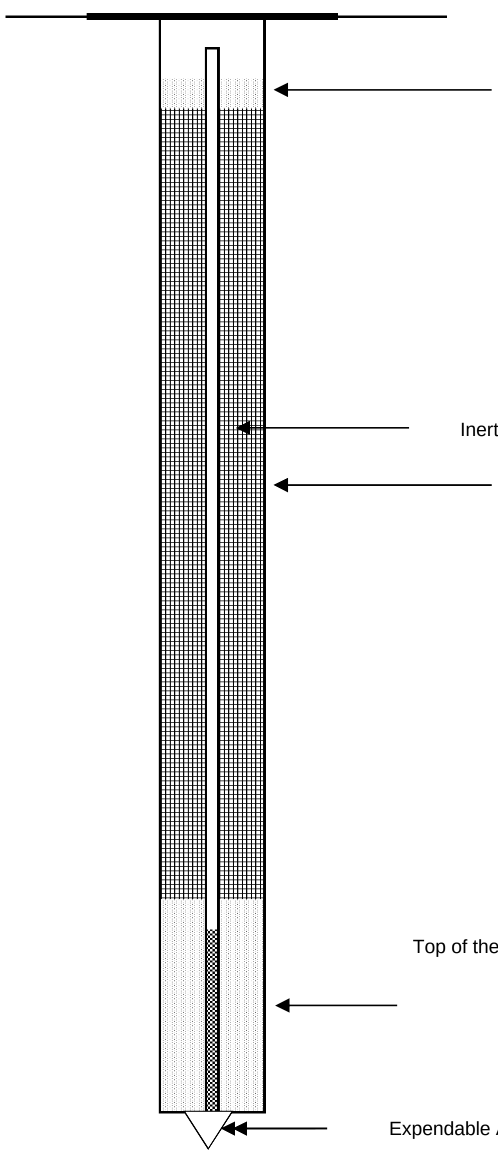
Expendable Anchor Point Connected to Implant with an O-ring

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

SOIL VAPOR CONSTRUCTION LOG **Boring No. SG-19**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 7, 2012	Oversight: Celeste Foster, AECOM	



Flush permanent stainless steel cap

Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼" ID x 6" Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

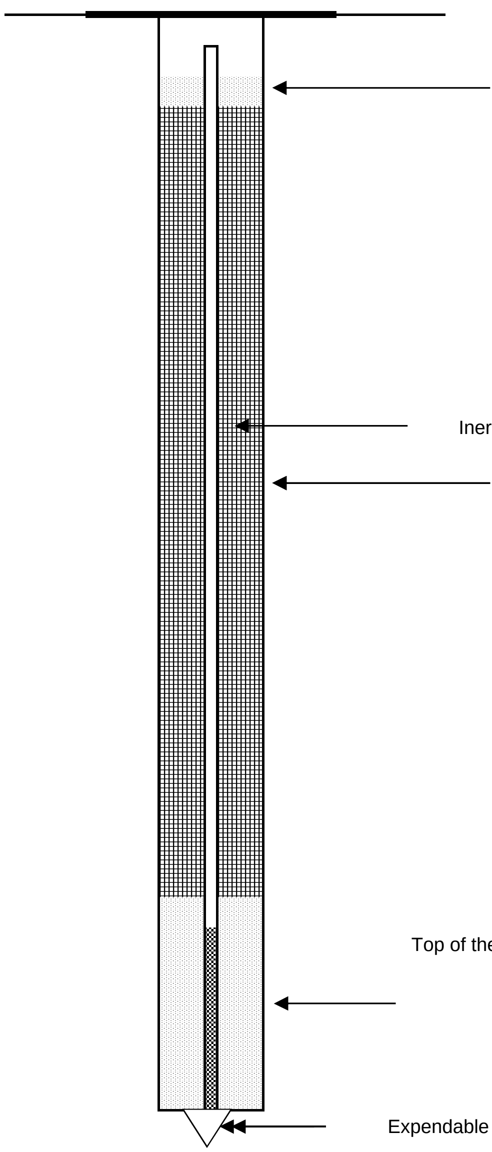
Expendable Anchor Point Connected to Implant with an O-ring

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

SOIL VAPOR CONSTRUCTION LOG **Boring No. SG-20**

Project: Jung Sun	Location: Long Island City, NY	Page 1 of 1
AECOM Project No.: 60188614	Subcontractor: Zebra	
Surface Elevation: NA	Driller: Evan Moraitis	
Date of Construction: March 7, 2012	Oversight: Celeste Foster, AECOM	



Flush permanent stainless steel cap

Ground Surface 0.0 ft

Sand 0.75 ft to 0.50 ft bgs

Surface Seal Material benonite

Inert Sampling Tube Material 1/4" ID Teflon lined Poly

Bentonite Seal 7.5 ft to 0.75 ft bgs

Top of the ¼" ID x 6" Long Stainless Steel Screen 7.5 ft bgs

Porous Backfill Material sand

Porous Backfill Material -8.0 ft to 7.0 ft bgs

Bottom of Borehole at -8.0 ft bgs

Expendable Anchor Point Connected to Implant with an O-ring

Note: All measurements based on ground surface at 0.0 feet. (+) above grade. (-) below grade.

(NOT TO SCALE)

Summa Canister Sampling Field Data Sheet

Site: Jung Sun (60237880)
Samplers: Celeste Foster, Brian Caccioppoli, Dan Robinson
Date: 3/23/2011

Sample#	SG-8	SG-9	SG-10	SG-11	SG-12
Summa Canister ID	6664	6598	0040	7468	1319N
Flow Controler ID	K514	K385	K258	K499	K523
Additional Tubing Added How much (ft)?	3 ft	2 ft	2 ft	2 ft	2 ft
Purge Time (Start)	10:30	10:58	11:15	11:40	13:30
Purge Time (Stop)	10:35	11:03	11:20	11:45	13:35
Total Purge Time (min)	5	5	5	5	5
Purge Volume (L)	1	1	1	1	1
Purge PID (ppm)	0.2 - 0.4	0	0	0	0
Pressure Gauge - Before Sampling (" Hg)	-30	-30	-30	-30	-30
Sample Time (Start)	10:55	11:05	11:27	11:47	13:36
Sample Time (Stop)	12:55	13:07	13:31	13:48	15:36
Sample Time (hr:min)	2:00	2:02	2:04	2:01	2:00
Pressure Gauge - After Sampling (" Hg)	-7	-7	-7	-6	-7
Background PID (ppm)	0.0	0.0	0.0	0.0	0.0
Sample Volume	6	6	6	6	6
Canitster Pressure Went to Ambient Pressure?	No	No	No	No	No
Tracer Gas Results	0.0ppm/24.3%	0.0ppm/35.0%	0.0ppm/18.9%	0.0ppm/25.2%	0.0/36.3%
General Comments					

Summa Canister Sampling Field Data Sheet

Site: Jung Sun (60237880)
Samplers: Celeste Foster, Brian Caccioppoli, Dan Robinson
Date: 3/23/2011

Sample#	SG-13	SG-14	SG-15	SG-16	SG-17
Summa Canister ID	93168	6642	12446	7481	11207
Flow Controler ID	K364	K243	K458	K428	K502
Additional Tubing Added How much (ft)?	2 ft	2 ft	2 ft	2 ft	2 ft
Purge Time (Start)	12:40	11:09	13:46	14:08	14:35
Purge Time (Stop)	12:54	11:14	13:51	14:13	14:40
Total Purge Time (min)	5	5	5	5	5
Purge Volume (L)	1	1	1	1	1
Purge PID (ppm)	0	0	0	0	0
Pressure Gauge - Before Sampling (" Hg)	-30	-30	-29	-30	-30
Sample Time (Start)	12:51	13:15	13:53	14:14	14:41
Sample Time (Stop)	14:54	15:15	15:53	16:21	16:40
Sample Time (hr:min)	2:03	2:00	2:00	2:07	1:59
Pressure Gauge - After Sampling (" Hg)	-8	-6	-7	-7	-6
Background PID (ppm)	0.0	0.0	0.0	0.0	0.0
Sample Volume	6	6	6	6	6
Canitster Pressure Went to Ambient Pressure?	No	No	No	No	No
Tracer Gas Results	25ppm/19.8%	0.0ppm/23.4%	0.0ppm/38.6%	0.0ppm/25.6%	0.0/15.8%
General Comments					

Summa Canister Sampling Field Data Sheet

Site: Jung Sun (60237880)

Samplers: Celeste Foster, Brian Caccioppoli, Dan Robinson

Date: 3/23/2011

Sample#	SG-18	SG-19	SG-20	SG-70	OA1
Summa Canister ID	4339	1008N	7490	93177	7501
Flow Controler ID	K275	K453	K517	K113	K240
Additional Tubing Added How much (ft)?	2 ft	2 ft	2 ft	2 ft	NA
Purge Time (Start)	14:55	16:30	16:20	16:20	NA
Purge Time (Stop)	15:00	16:35	16:25	16:25	NA
Total Purge Time (min)	5	5	5	5	NA
Purge Volume (L)	1		1	1	NA
Purge PID (ppm)	0	9.3	253	253	NA
Pressure Gauge - Before Sampling (" Hg)	-30	-30	-30	-30	-30
Sample Time (Start)	15:15	16:40	16:26	16:27	16:35
Sample Time (Stop)	17:26	18:37	18:27	18:25	18:19
Sample Time (hr:min)	2:11	1:57	2:01	1:58	1:44
Pressure Gauge - After Sampling (" Hg)	-7	-2	-7	-7	-6
Background PID (ppm)	0.0	0.0	0.0	0.0	0.0
Sample Volume	6	6	6	6	6
Canitster Pressure Went to Ambient Pressure?	No	No	No	No	No
Tracer Gas Results	0.0ppm/22.5%	0.0ppm/20.4%	0.0ppm/22.8%	0.0ppm/22.8%	NA
General Comments	SG-70 is a duplicate of SG-20				

Summa Canister Sampling Field Data Sheet

Site: Jung Sun (60237880)

Samplers: Celeste Foster (AECOM), Dan Robinson (YEC)

Date: 3/19 - 3/20/12

Sample#	B02-IA1	B02-IA51	B02-SS1	B02-OA1	
Summa Canister ID	A281	93245	12455	12880	
Flow Controler ID	K289	K383	K279	K401	
Additional Tubing Added How much (ft)?	NA	NA	3 ft	3 ft	
Purge Time (Start)	NA	NA	10:00	NA	
Purge Time (Stop)	NA	NA	10:05	NA	
Total Purge Time (min)	NA	NA	5	NA	
Purge Volume (L)	NA	NA	1	NA	
Purge PID (ppm)	NA	NA	0	NA	
Pressure Gauge - Before Sampling (" Hg)	-30	-30	-30	-30	
Sample Time (Start)	11:52	11:53	11:54	12:02	
Sample Time (Stop)	11:07	11:08	11:06	13:40	
Total Sample Time (min)	1395	1395	1392	1538	
Pressure Gauge - After Sampling (" Hg)	-1.5	-5	-3.5	-10	
Background PID (ppm)	0	0	0	0	
Sample Volume	6	6	6	6	
Canitster Pressure Went to Ambient Pressure?	No	No	No	No	
Tracer Gas Results	0ppm/40.9%	NA	NA	NA	
Weather 24 hours before and during sampling	No	No	No	Yes	
General Comments					

Summa Canister Sampling Field Data Sheet

Site: Jung Sun (60237880)

Samplers: Celeste Foster (AECOM) Dan Robinson (YEC)

Date: 3/19 - 3/20/12

Sample#	B03-SS1	B03-IA1			
Summa Canister ID	1405	93038			
Flow Controler ID	K370	K237			
Additional Tubing Added How much (ft)?	3 ft	NA			
Purge Time (Start)	13:48	NA			
Purge Time (Stop)	13:53	NA			
Total Purge Time (min)	5	NA			
Purge Volume (L)	1	NA			
Purge PID (ppm)	1.00	NA			
Pressure Gauge - Before Sampling (" Hg)	-30	-30			
Sample Time (Start)	14:27	14:32			
Sample Time (Stop)	13:30	13:33			
Total Sample Time (min)	1383	1381			
Pressure Gauge - After Sampling (" Hg)	-4	-7			
Background PID (ppm)	0	0			
Sample Volume	6	6			
Canitster Pressure Went to Ambient Pressure?	No	No			
Tracer Gas Results	0 ppm/16.6%	NA			
Weather 24 hours before and during sampling	No	No			
General Comments					

Summa Canister Sampling Field Data Sheet

Site: Jung Sun (60237880)

Samplers: Celeste Foster, Kevin Seise (AECOM)

Date: 3/20 - 3/21/12

Sample#	B04-SS1	B04-IA1	B04-SS2	B04-IA2	B04-OA2
Summa Canister ID	1287N	93239	02306	S-1493	93244
Flow Controler ID	K394	K174	K0986	K331	K355
Additional Tubing Added How much (ft)?	3 ft	3 ft	3 ft	3 ft	NA
Purge Time (Start)	11:10	NA	11:20	NA	NA
Purge Time (Stop)	11:15	NA	11:25	NA	NA
Total Purge Time (min)	5	NA	5	NA	NA
Purge Volume (L)	1	NA	1	NA	NA
Purge PID (ppm)	0.00	NA	0	NA	NA
Pressure Gauge - Before Sampling (" Hg)	-30	-30	-30	-30	-30
Sample Time (Start)	11:36	11:35	11:33	11:34	15:00
Sample Time (Stop)	11:15	11:16	11:19	11:20	13:30
Total Sample Time (min)	1419	1421	1426	1426	1230
Pressure Gauge - After Sampling (" Hg)	-7	-6	-7	-5	-0.5
Background PID (ppm)	5.6	5.6	0.7	0.7	0
Sample Volume	6	6	6	6	6
Canitster Pressure Went to Ambient Pressure?	No	No	No	No	No
Tracer Gas Results	0 ppm/11.7%	NA	NA	NA	NA
Weather 24 hours before and during sampling	No	No	No	No	No
General Comments					

Summa Canister Sampling Field Data Sheet

Site: Jung Sun (60237880)
Samplers: Rita Papagian (AECOM), Jen Becker (YEC)
Date: 3/27 - 3/28/13

	Structure B15				Structure B12	
Sample#	B04-SS3	B04-IA3	B04-IA33	B04-OA3	B04-IA4	B04-SS4
Summa Canister ID	2508	4725	2917	3127	2553	3156
Flow Controler ID	2939	5078	4272	3508	3296	4720
Additional Tubing Added How much (ft)?	3 ft	0	0	0	0	3 ft
Purge Time (Start)	11:10	NA	NA	NA	NA	NA
Purge Time (Stop)	11:15	NA	NA	NA	NA	NA
Total Purge Time (min)	5	NA	NA	NA	NA	NA
Purge Volume (L)	1	NA	NA	NA	NA	NA
Purge PID (ppm)	0.00	NA	NA	NA	NA	NA
Pressure Gauge - Before Sampling (" Hg)	-30	-30	-28	-30	-30	-30
Sample Time (Start)	1127	1129	1128	1234	1332	1330
Sample Time (Stop)	0946	0947	0948	1215	1310	1225
Total Sample Time (min)	1339	1338	1340	1421	1418	1375
Pressure Gauge - After Sampling (" Hg)	-2	-4	-5	-9	-15	-5
Background PID (ppm)	0	0	0	0	0	0
Sample Volume	6	6	6	6	6	6
Canitster Pressure Went to Ambient Pressure?	No	No	No	No	No	No
Tracer Gas Results	0 ppm	NA	NA	NA	NA	0 ppm
General Comments						

Indoor Air Sampling

To avoid potential interferences and dilution effects, occupants should make a reasonable effort to avoid the following for 24 hours prior to and during sampling:

a. opening any windows, fireplace dampers, openings or vents;
b. operating ventilation fans unless special arrangements are made;
c. smoking in the building;
d. painting;
e. using a wood stove, fireplace or other auxiliary heating equipment (e.g., kerosene heater);
f. operating or storing automobile in an attached garage;
g. allowing containers of gasoline or oil to remain within the house or garage area, except for fuel oil tanks;
h. cleaning, waxing or polishing furniture, floors or other woodwork with petroleum- or oil-based products;
i. using air fresheners, scented candles or odor eliminators;
j. engaging in any hobbies that use materials containing volatile chemicals;
k. using cosmetics including hairspray, nail polish, nail polish removers, perfume/cologne, etc.;
l. lawn mowing, paving with asphalt, or snow blowing;
m. applying pesticides;
n. using building repair or maintenance products, such as caulk or roofing tar; and
o. bringing freshly dry-cleaned clothing or furnishings into the building.

Appendix C

MIP Results

AECOM
MIP Site Delineation Survey
Jung Sun Laundry Plume
37-10 24th Street
Long Island City, Queens, NY

LEGEND

ECD = Electron Capture Detector
PID = Photo Ionization Dectector
FID = Flame Ionization Detector
ECD/PID/FID Units = Micro Volts (uV)
Cond Units = Millisiemens/Meter (mS/M)
Distance units = Feet (ft)
Depth Units = Feet (ft)

ZEBRA Environmental - Subsurface Sampling, Injections and Data Collection for Environmental Professionals Since 1992.

AECOM
MIP Site Delineation Survey
Jung Sun Laundry Plume
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Long Island City, Queens, NY

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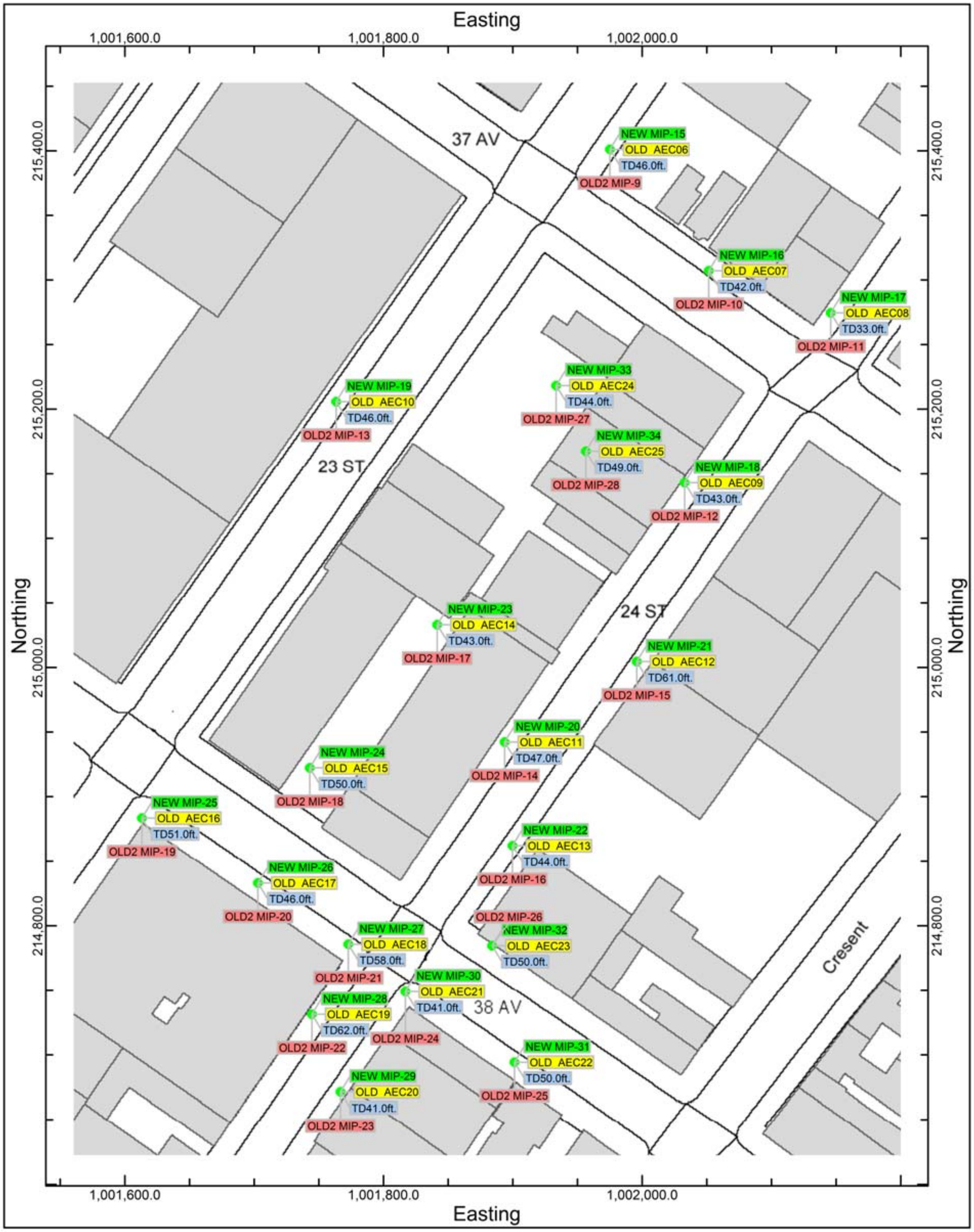

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MIP Site Delineation Survey
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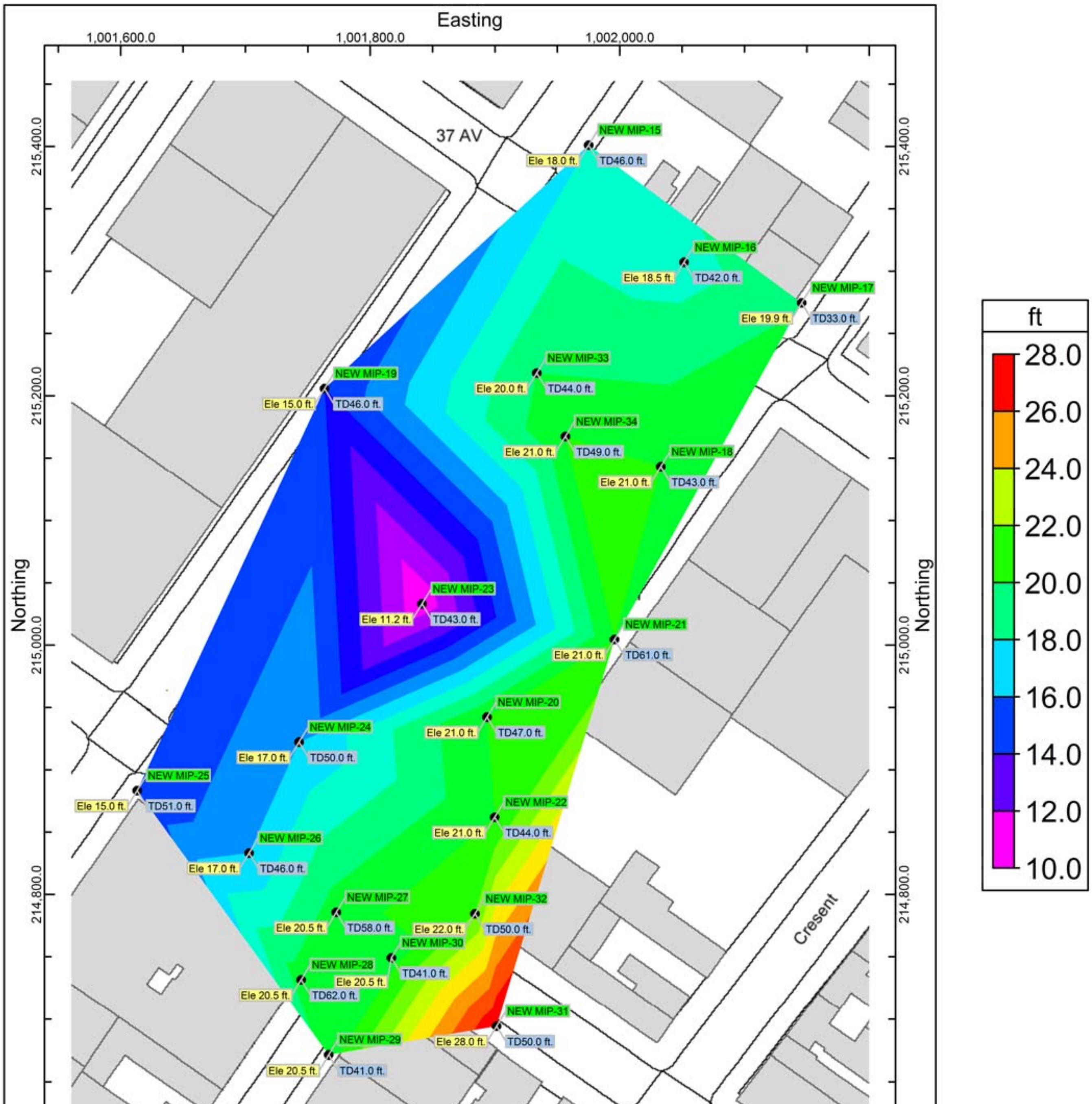

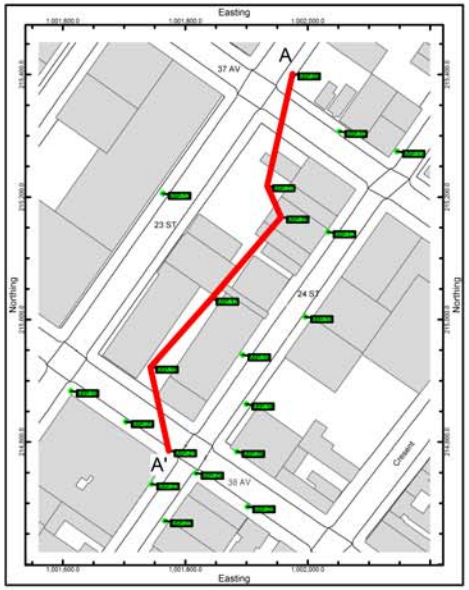

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MIP Site Delineation Survey
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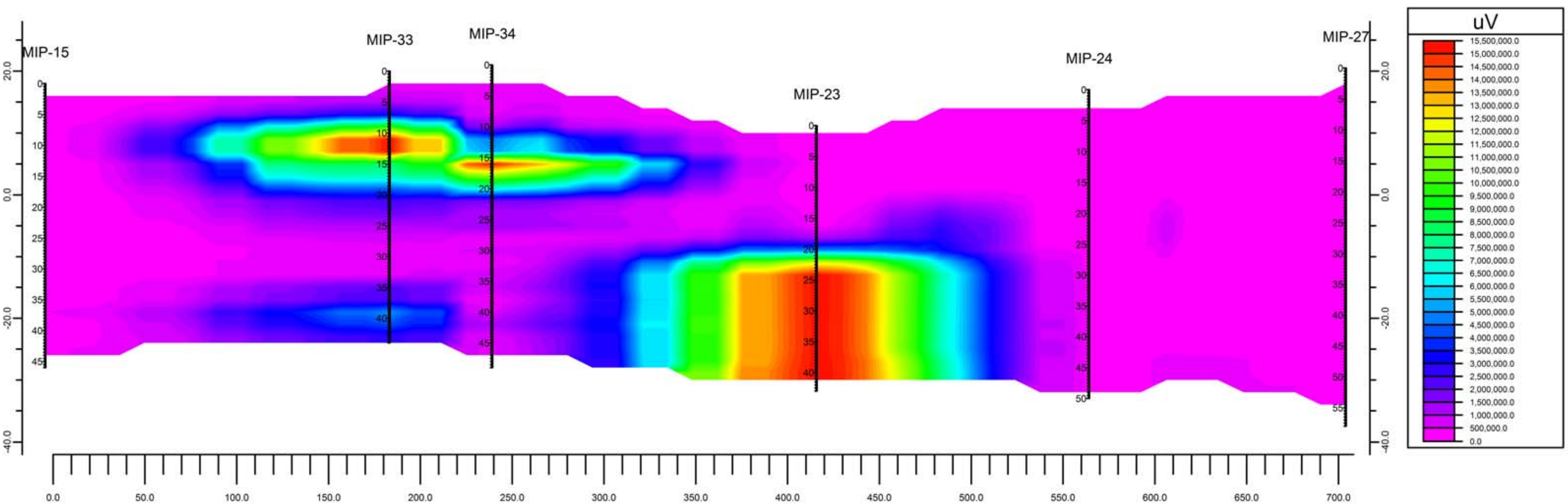
Depth Units = Feet (ft)

ZEBRA

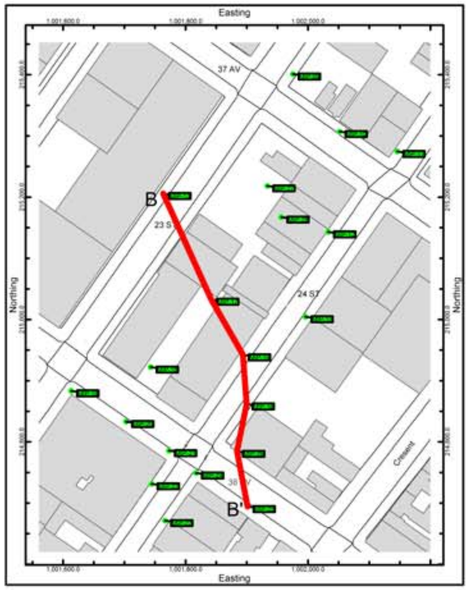
A

ECD Cross-Section A-A'

A'



ZEBRA Environmental - Subsurface Sampling, Injections and Data Collection for Environmental Professionals Since 1992.



AECOM
MIP Site Delineation Survey
Jung Sun Laundry Plume
37-10 24th Street
Long Island City, Queens, NY

LEGEND

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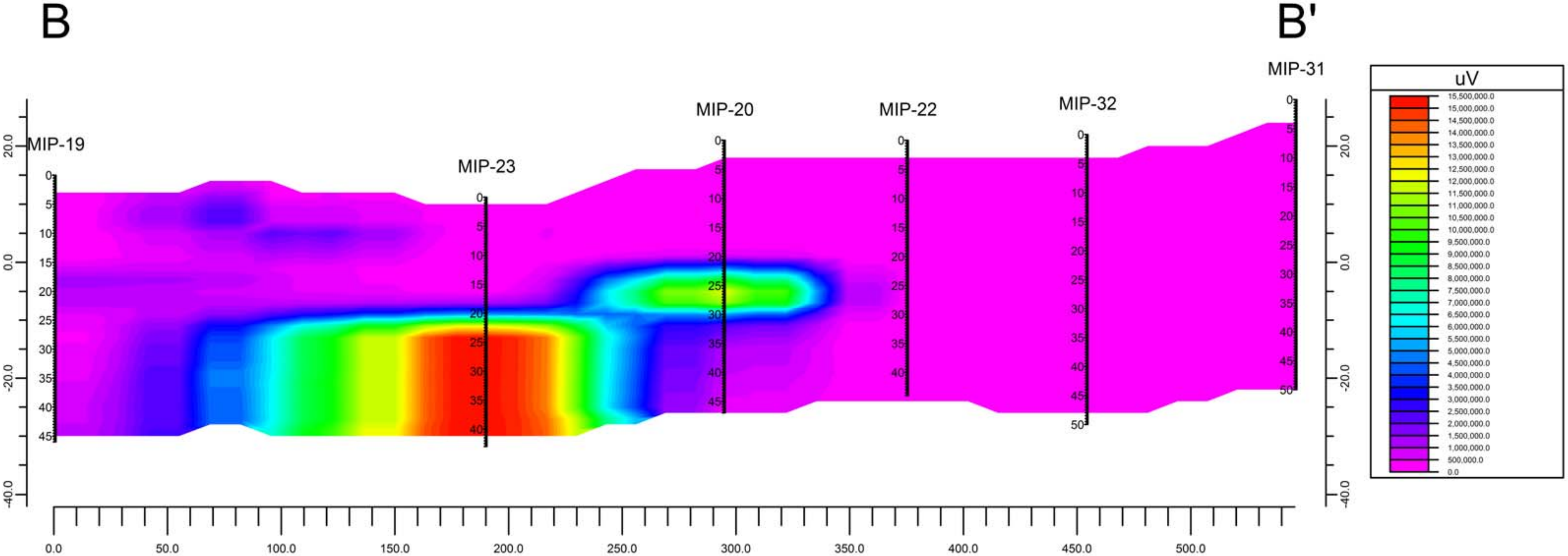
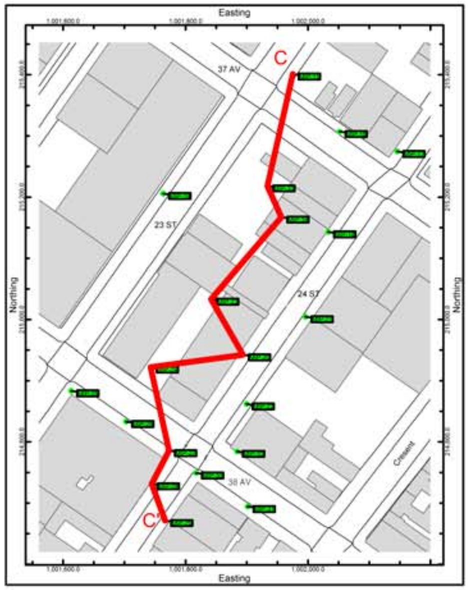
PID = Photo Ionization Dectector
FID = Flame Ionization Detector
ECD/PID/FID Units = Micro Volts (uV)
Cond Units = Millisiemens/Meter (mS/M)
Distance units = Feet (ft)
Depth Units = Feet (ft)

ECD Cross-Section B-B'



ZEBRA Environmental - Subsurface Sampling, Injections and Data Collection for Environmental Professionals Since 1992.



AECOM
MIP Site Delineation Survey
Jung Sun Laundry Plume
37-10 24th Street
Long Island City, Queens, NY

LEGEND

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FID = Flame Ionization Detector
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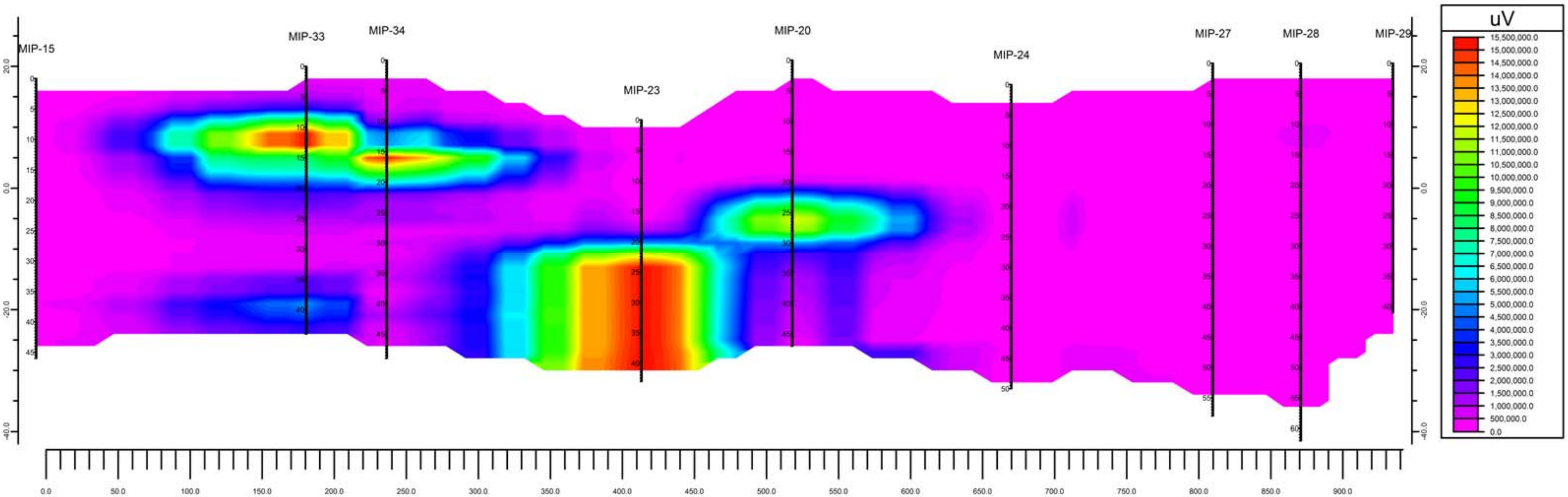
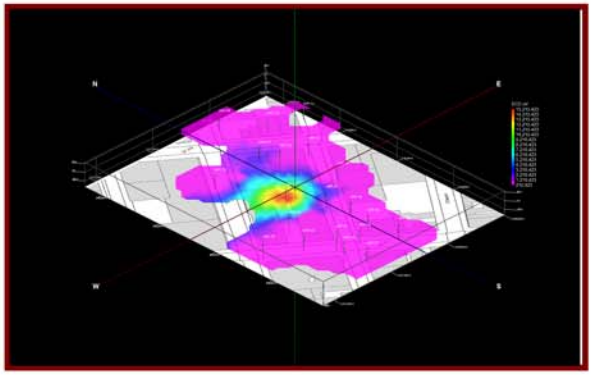
Cond Units = Millisiemens/Meter (mS/M)
Distance units = Feet (ft)
Depth Units = Feet (ft)

ECD Cross-Section C-C'

C C'



ZEBRA Environmental - Subsurface Sampling, Injections and Data Collection for Environmental Professionals Since 1992.



AECOM
MIP Site Delineation Survey
Jung Sun Laundry Plume
37-10 24th Street
Long Island City, Queens, NY

ECD

SOLID MODEL 500,000 uV
SOUTH WESTERN VIEW

LEGEND

ECD = Electron Capture Detector
PID = Photo Ionization Dectector
FID = Flame Ionization Detector
ECD/PID/FID Units = Micro Volts (uV)
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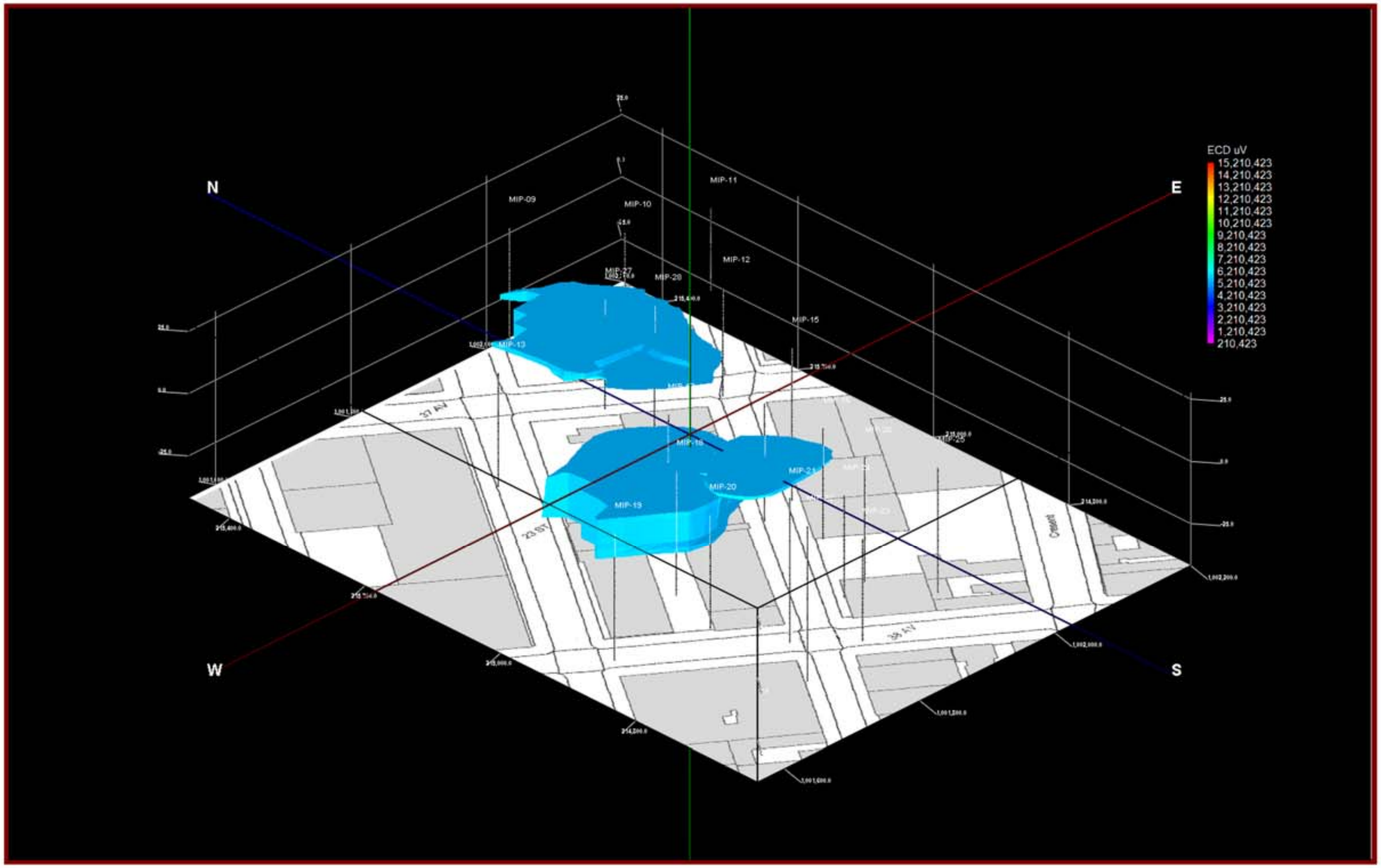
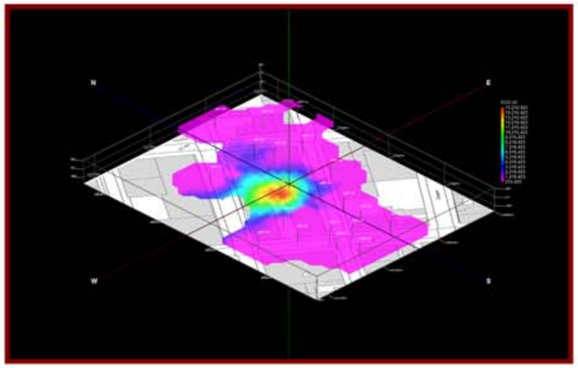
Distance units = Feet (ft)
Depth Units = Feet (ft)



ZEBRA Environmental - Subsurface Sampling, Injections and Data Collection for Environmental Professionals Since 1992.



AECOM
MIP Site Delineation Survey
Jung Sun Laundry Plume
37-10 24th Street
Long Island City, Queens, NY

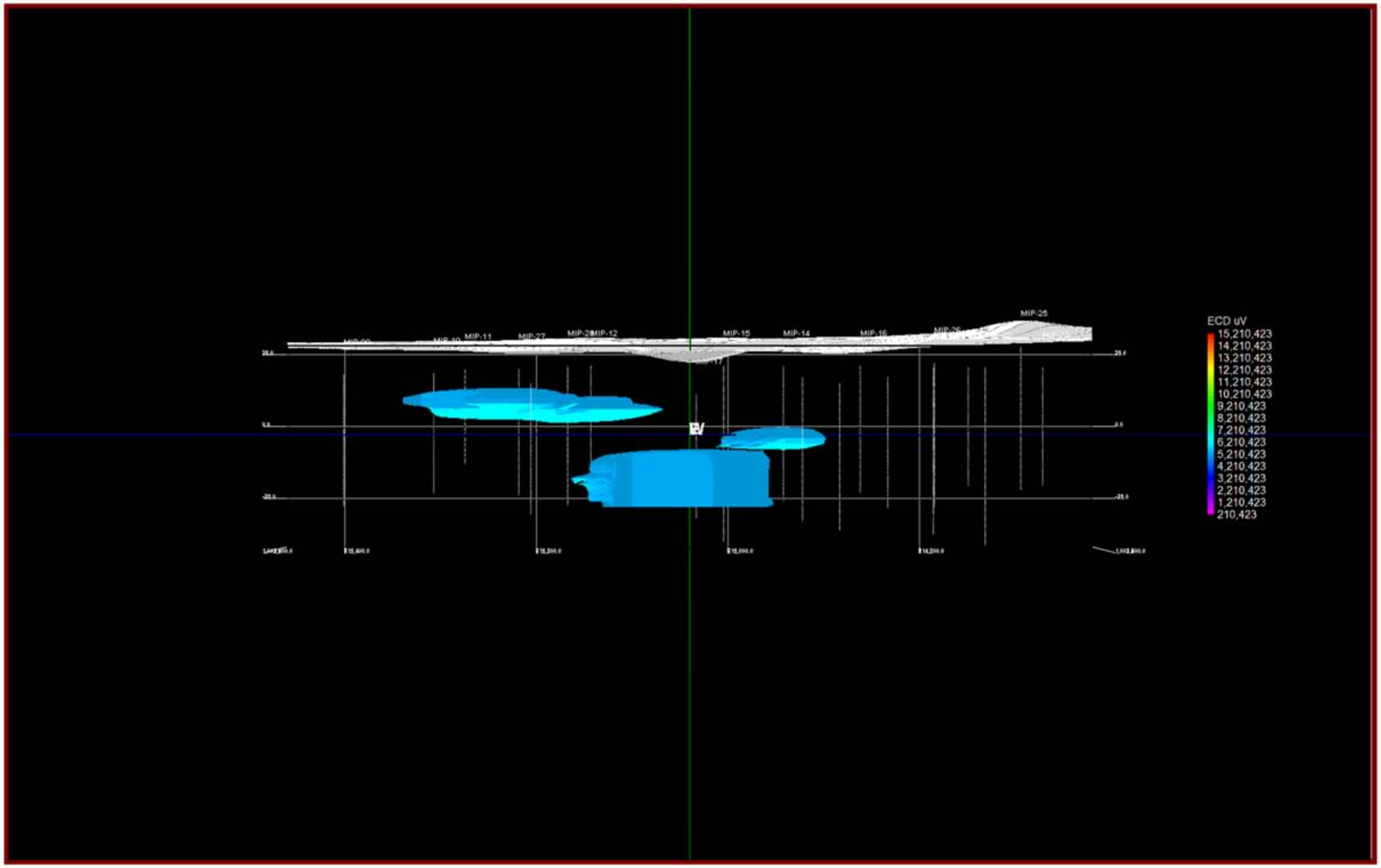
ECD

SOLID MODEL 500,000 uV
SOUTH WESTERN VIEW

LEGEND

ECD = Electron Capture Detector
PID = Photo Ionization Dectector
FID = Flame Ionization Detector
ECD/PID/FID Units = Micro Volts (uV)
Cond Units = Millisiemens/Meter (mS/M)
Distance units = Feet (ft)
Depth Units = Feet (ft)

ZEBRA



ZEBRA Environmental - Subsurface Sampling, Injections and Data Collection for Environmental Professionals Since 1992.

AECOM
MIP Site Delineation Survey
Jung Sun Laundry Plume
37-10 24th Street
Long Island City, Queens, NY

LEGEND

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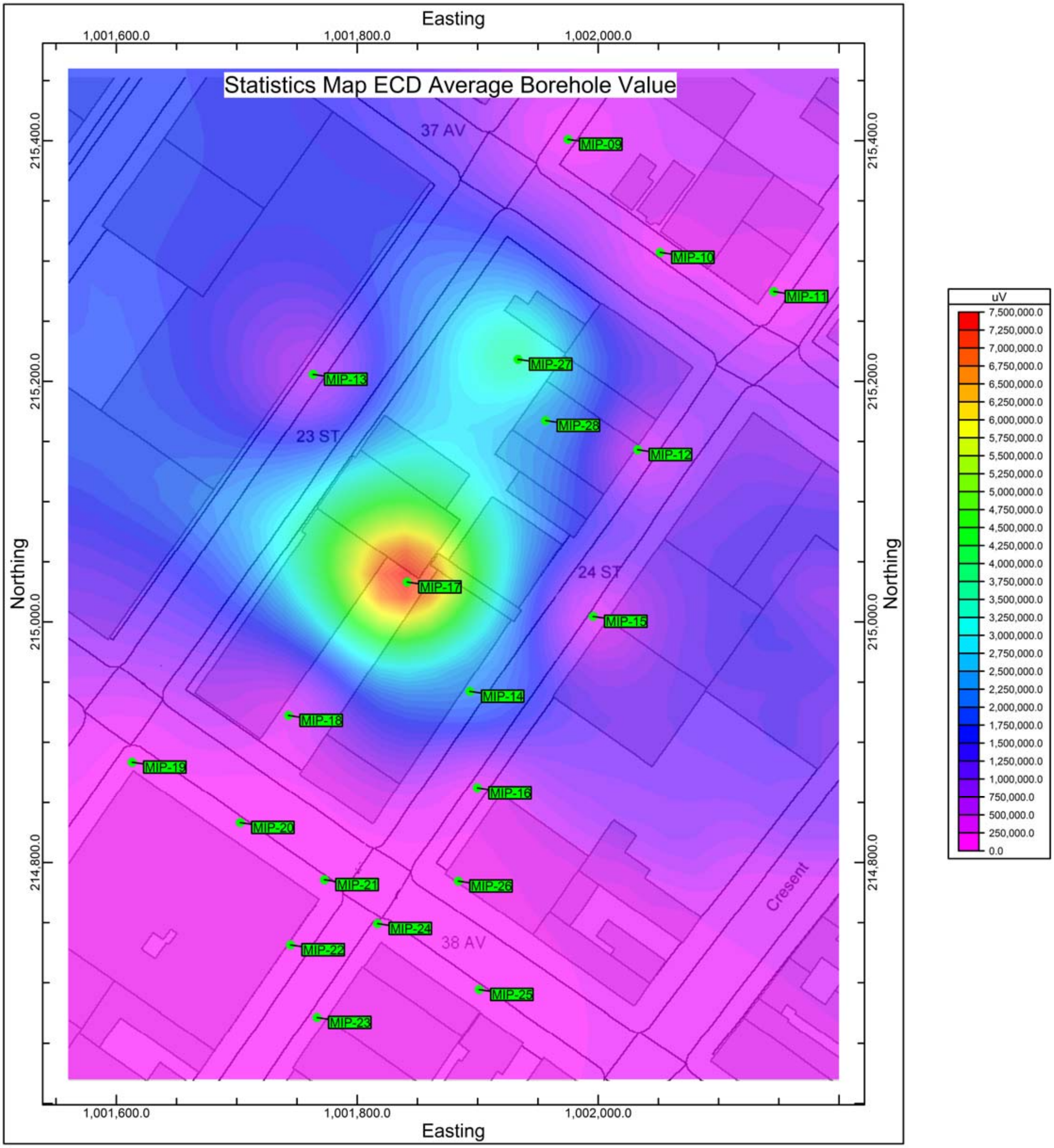

AECOM
MIP Site Delineation Survey
Jung Sun Laundry Plume
37-10 24th Street
Long Island City, Queens, NY

LEGEND

ECD = Electron Capture Detector
PID = Photo Ionization Dectector
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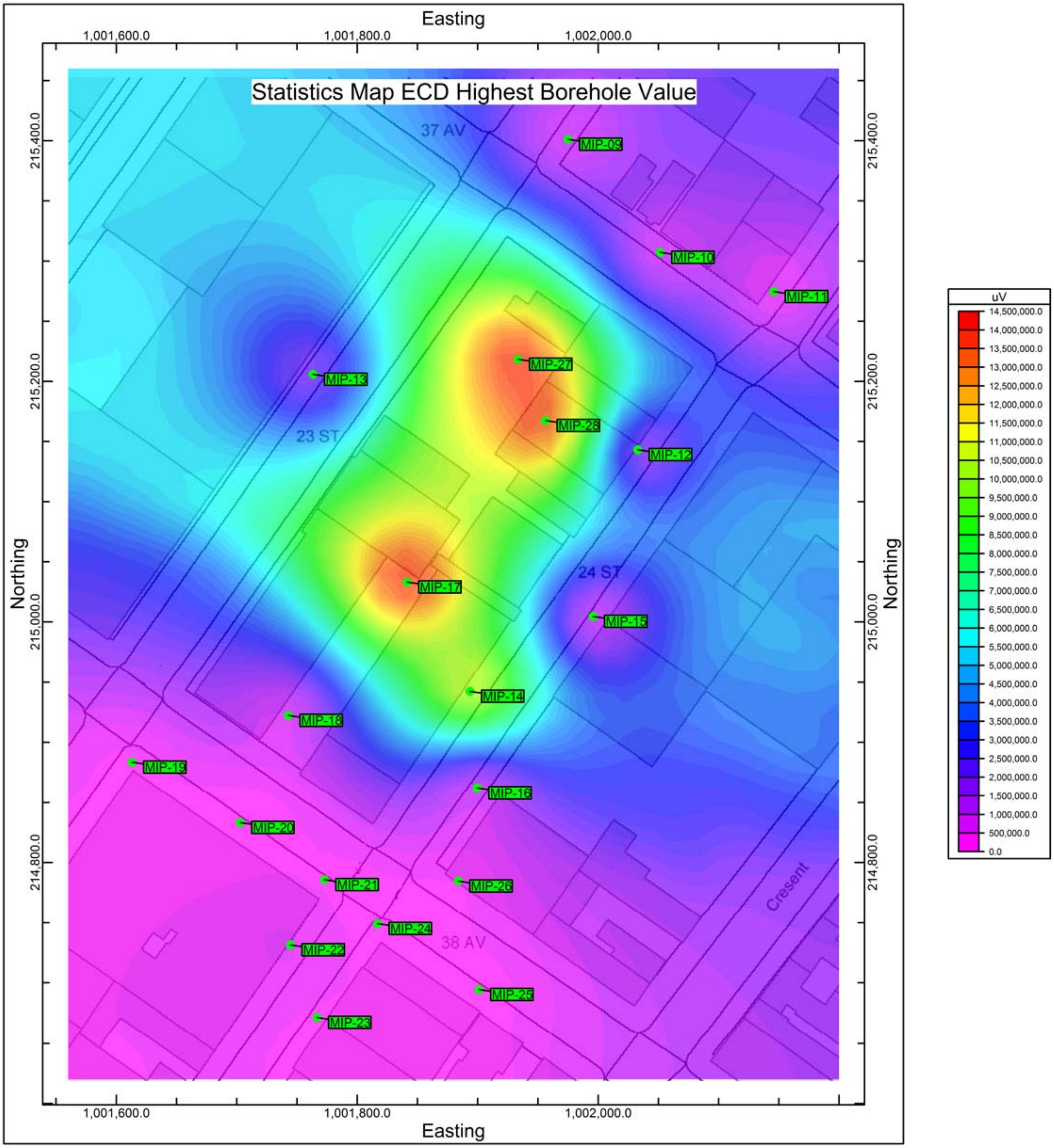
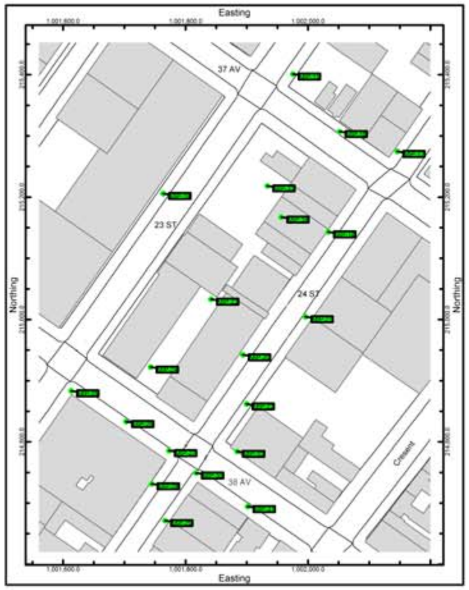
Depth Units = Feet (ft)



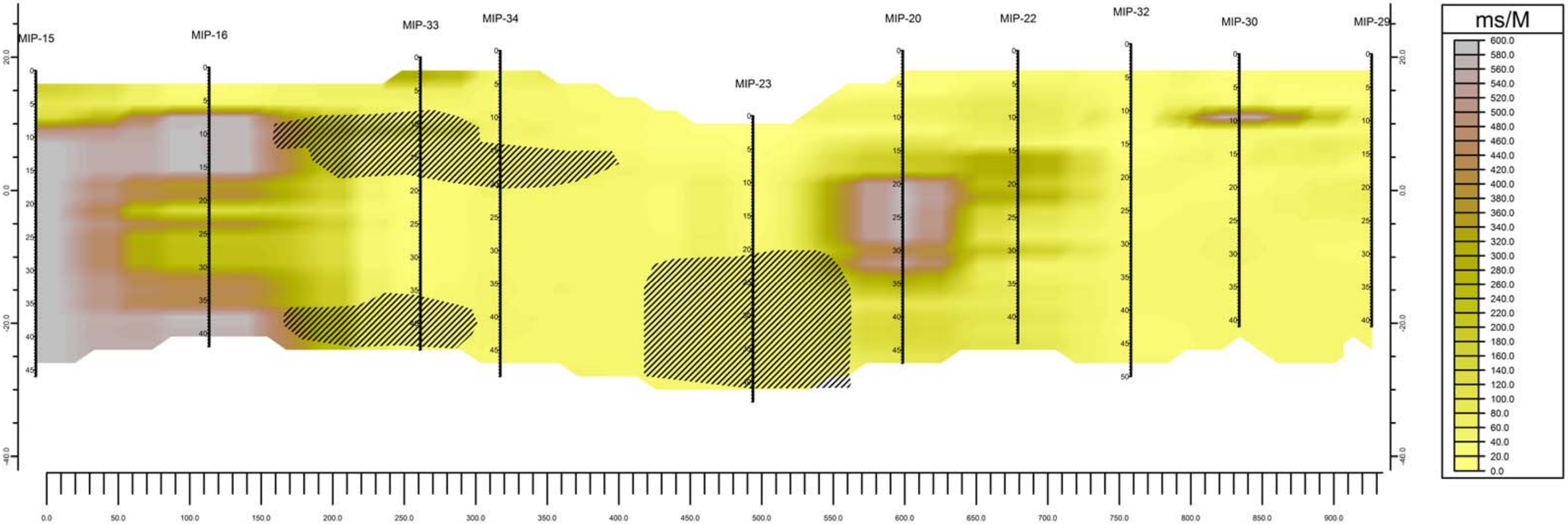


AECOM
MIP Site Delineation Survey
Jung Sun Laundry Plume
37-10 24th Street
Long Island City, Queens, NY

LEGEND

ECD = Electron Capture Detector
PID = Photo Ionization Dectector
FID = Flame Ionization Detector
ECD/PID/FID Units = Micro Volts (uV)
Cond Units = Millisiemens/Meter (mS/M)
Distance units = Feet (ft)
Depth Units = Feet (ft)

Conductivity Cross-Section



ZEBRA Environmental - Subsurface Sampling, Injections and Data Collection for Environmental Professionals Since 1992.

ZEBRA MIP Field Book

AECOM	Jung Sun Cleaners - LIC				
Number of Days MIP	7	1		2	
John Diamond	DS20130				
DEPTH for DAY		**42**		**155**	
DATE		2/27/2012	2/28/2012	2/28/2012	2/28/2012
New Point Name					
Number of locations	20	AEC18	AEC20	AEC21	AEC22
MIP Unit - Mule		Mule	Mule	Mule	Mule
Probe TD	961	42	48	61	46
Total Depth	961.25				
Response Test Result		Good	Good	Good	Good
ECD MAX		785,104	12,561,660	212,454	252,747
FID MAX		126,984	152,625	125,763	310,134
PID MAX		12,210	151,404	162,393	156,288
PID Lamp Percentage		50	50	50	50
Mass Flow		40	40	40	40
		Location Notes	**Location Notes**	**Location Notes**	**Location Notes**

ZEBRA MIP Field Book

AECOM	Jung Sun Cleaners - LIC						
Number of Days MIP	7		3			4	
John Diamond	DS20130						
DEPTH for DAY			**147**			**163**	
DATE		2/29/2012	2/29/2012	2/29/2012	3/1/2012	3/1/2012	3/1/2012
New Point Name							
Number of locations	20	AEC26	AEC31	AEC32	AEC27	AEC28	AEC30
MIP Unit - Mule		Mule	Mule	Mule	Mule	Mule	Mule
Probe TD	961	46	51	51	59	62	43
Total Depth	961.25						
Response Test Result		Good	Good	Good	Good	Good	Good
ECD MAX		130,647	137,973	126,984	223,443	735,043	133,089
FID MAX		1,115,995	122,100	123,321	1,117,216	1,114,774	112,332
PID MAX		185,592	191,694	17,094	166,056	170,940	156,288
PID Lamp Percentage		50	50	50	50	50	50
Mass Flow		40	40	40	40	40	40
		Location Notes	**Location Notes**	**Location Notes**	**Location Notes**	**Location Notes**	**Location Notes**

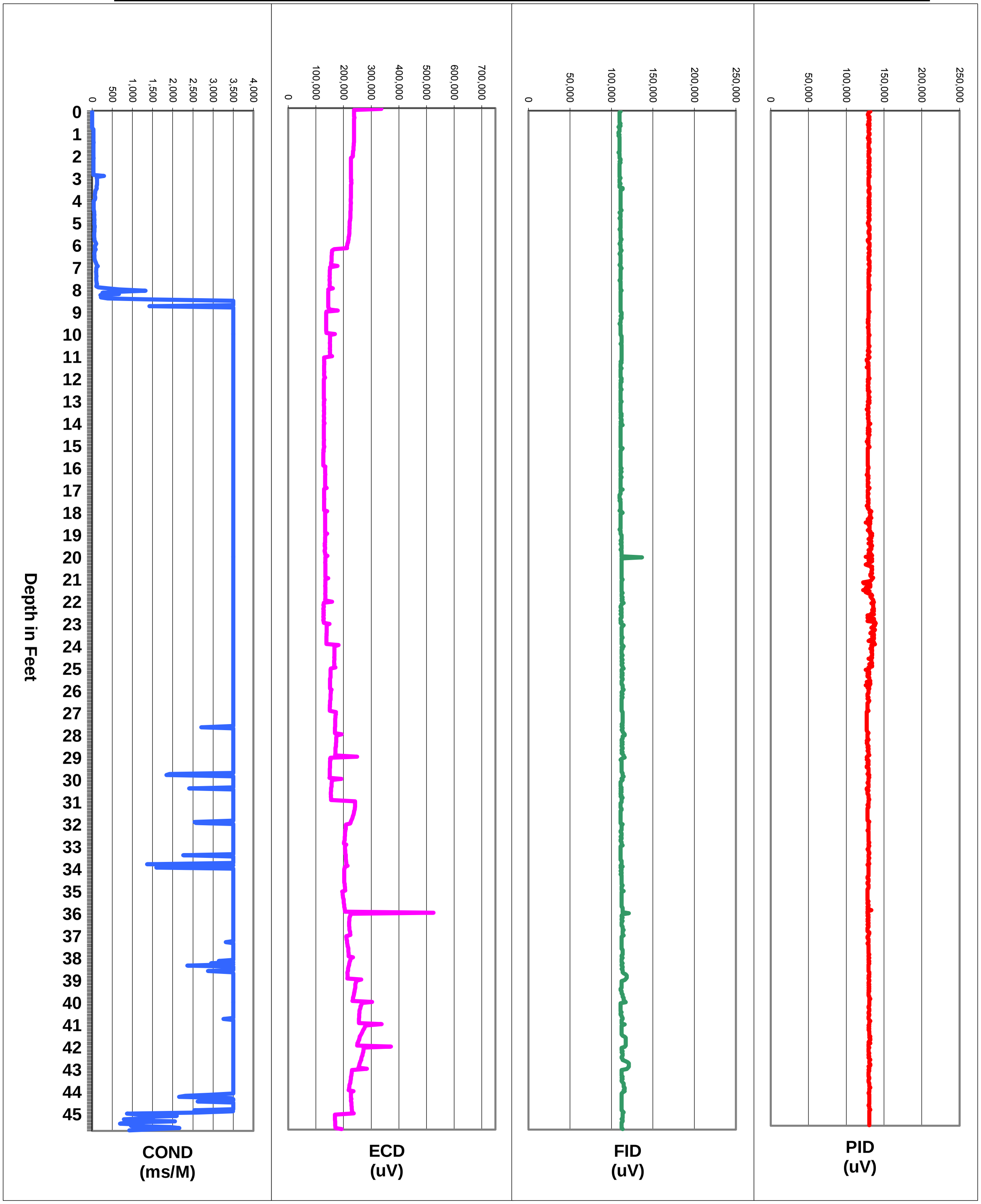
ZEBRA MIP Field Book

AECOM	Jung Sun Cleaners - LIC						
Number of Days MIP	7		5			6	
John Diamond	DS20130						
DEPTH for DAY			147			123	
DATE		3/2/2012	3/2/2012	3/2/2012	3/5/2012	3/5/2012	3/5/2012
New Point Name							
Number of locations	20	AEC23	AEC24	AEC25	AEC15	AEC16	AEC17
MIP Unit - Mule		Mule	Mule	Mule	Mule	Mule	Mule
Probe TD	961	44	53	50	46	43	34
Total Depth	961.25						
Response Test Result		Good	Good	Good	Good	Good	Good
ECD MAX		15,355,311	249,084	186,813	525,031	343,101	317,460
FID MAX		135,531	1,115,995	1,117,216	136,752	122,100	150,183
PID MAX		179,043	175,824	151,404	139,194	120,879	129,426
PID Lamp Percentage		50	50	50	50	50	50
Mass Flow		40	40	40	40	40	40
		Location Notes	Location Notes	Location Notes	Location Notes	Location Notes	Location Notes

ZEBRA MIP Field Book

AECOM	**Jung Sun Cleaners - LIC**				
Number of Days MIP	**7**	7			
John Diamond	**DS20130**				
DEPTH for DAY		**183**			
DATE		3/6/2012	3/6/2012	3/6/2012	3/6/2012
New Point Name					
Number of locations	**20**	AEC19	AEC29	AEC33	AEC34
MIP Unit - Mule		Mule	Mule	Mule	Mule
Probe TD	**961**	48	42	45	48
Total Depth	**961.25**				
Response Test Result		Good	Good	Good	Good
ECD MAX		1,631,258	246,642	15,374,847	15,355,311
FID MAX		152,625	1,119,658	137,973	147,741
PID MAX		18,315	18,315	18,315	17,094
PID Lamp Percentage		50	50	50	50
Mass Flow		40	40	40	40
		Location Notes	**Location Notes**	**Location Notes**	**Location Notes**

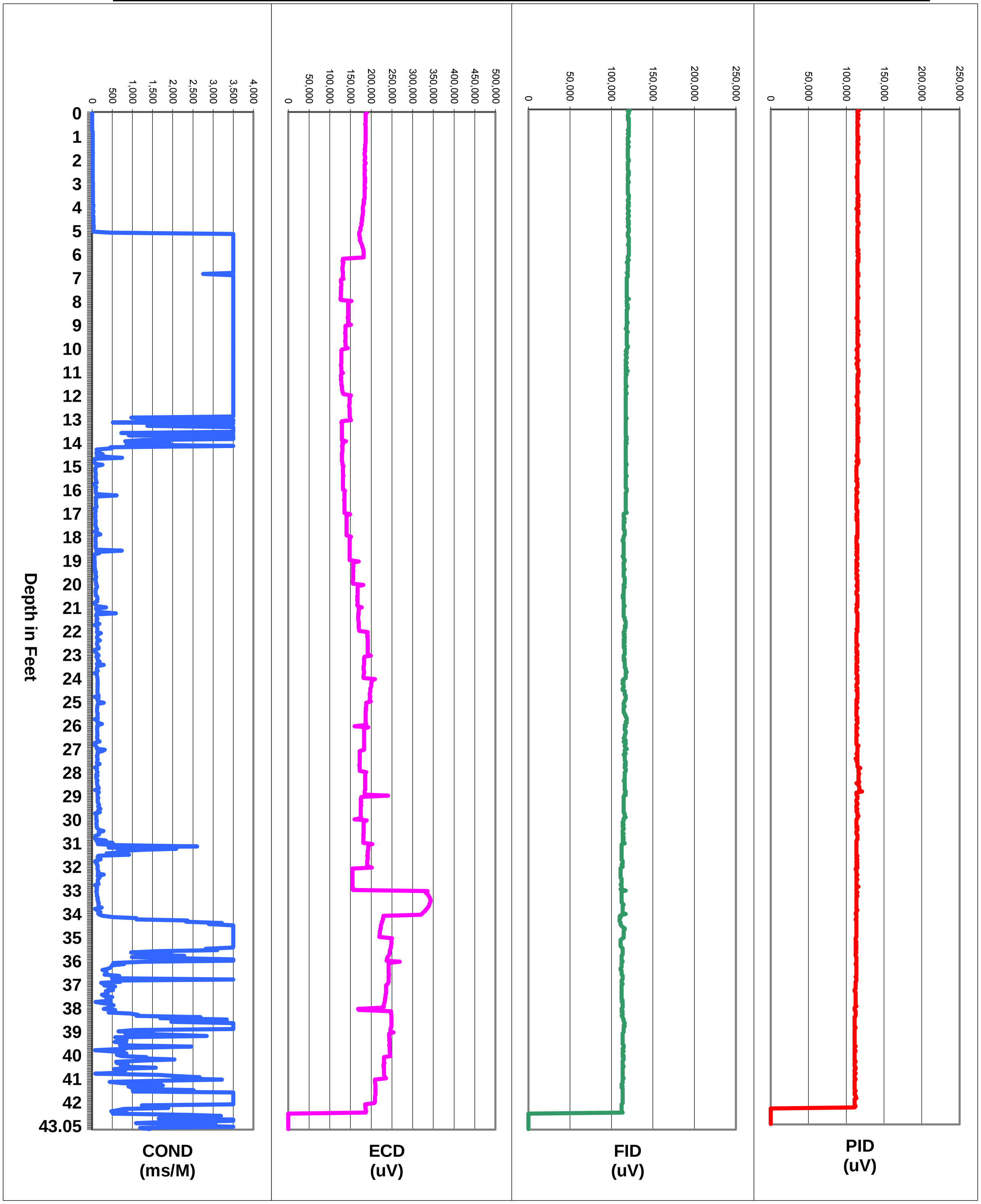
ZEBRA EC/MIP Summary Log, Point AEC15

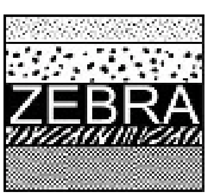


for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/5/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 9 of 0

ZEBRA EC/MIP Summary Log, Point AEC16

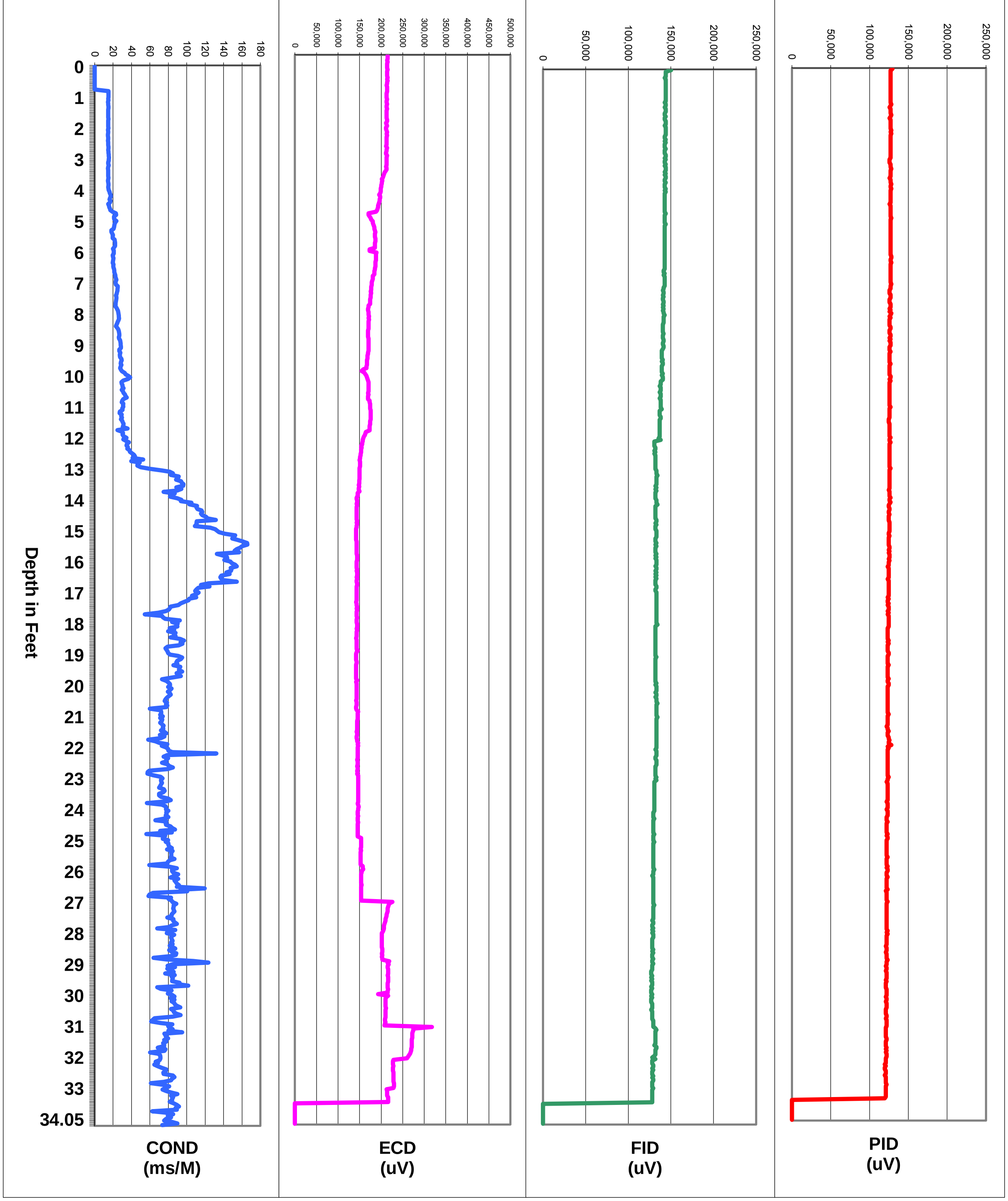


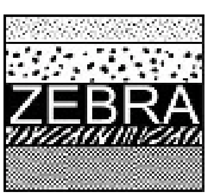


for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/5/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 10 of 0

ZEBRA EC/MIP Summary Log, Point AEC17

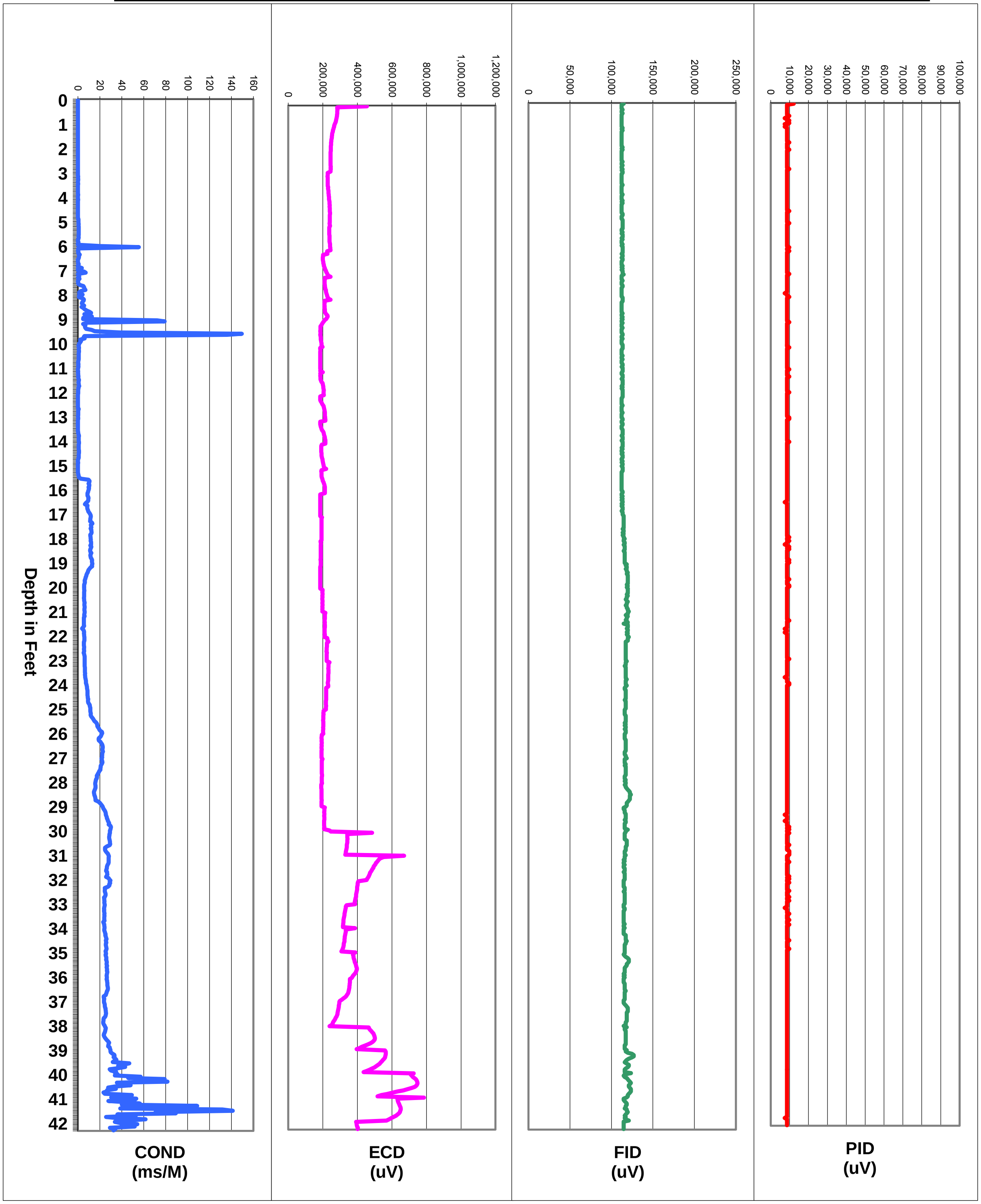




for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/5/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 11 of 0

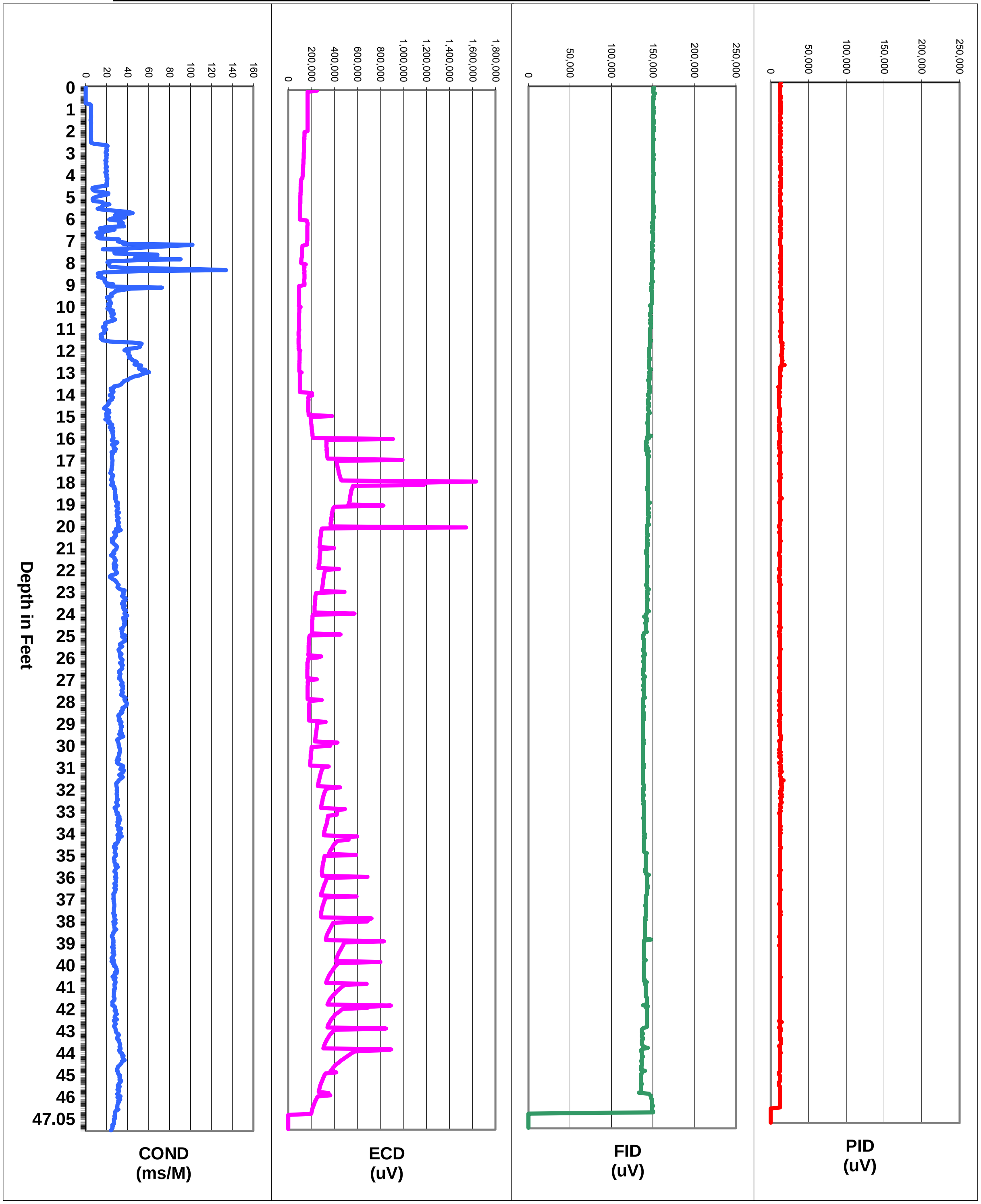
ZEBRA EC/MIP Summary Log, Point AEC18



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 2/27/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 51 of 0

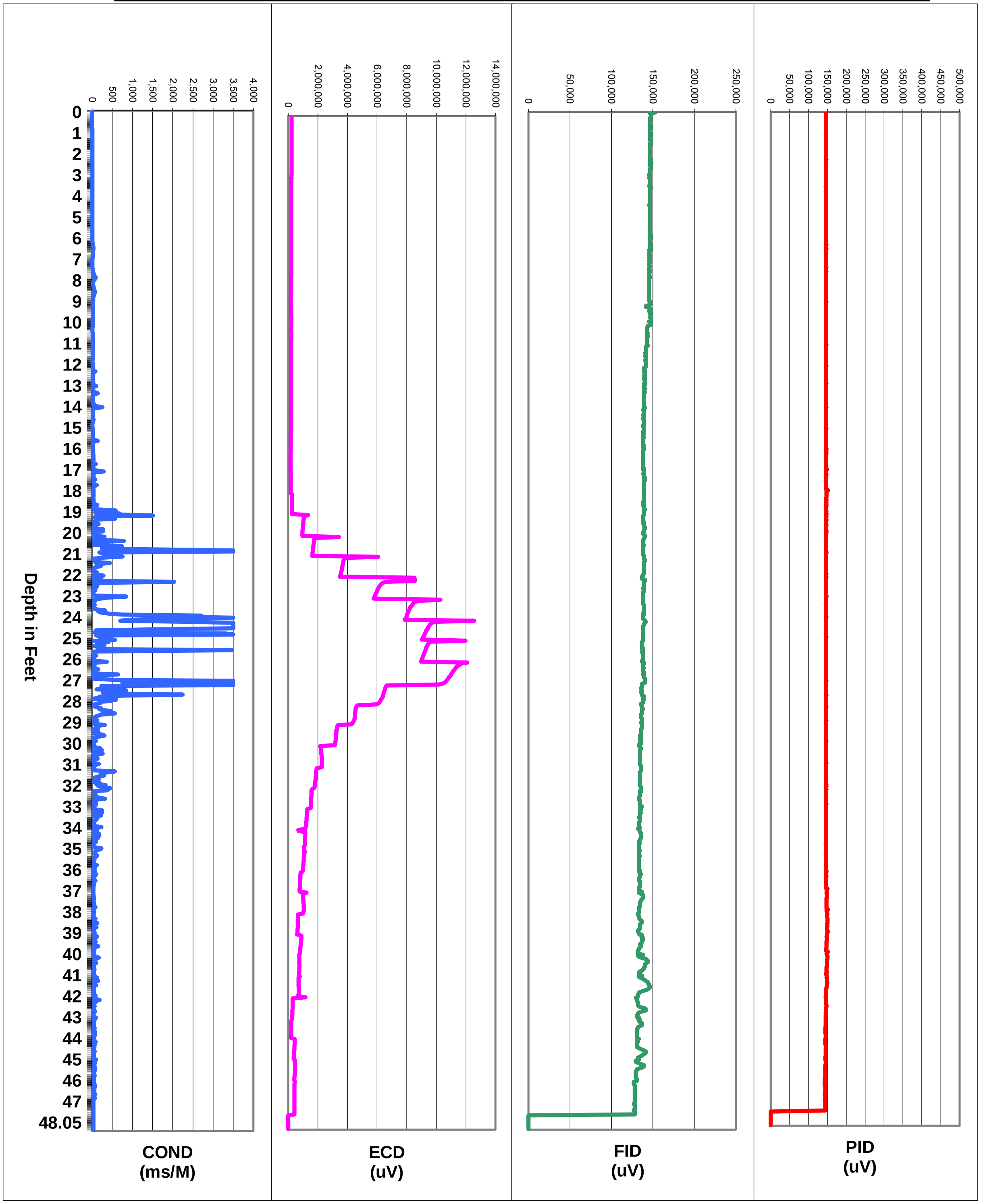
ZEBRA EC/MIP Summary Log, Point AEC19



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/6/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 13 of 0

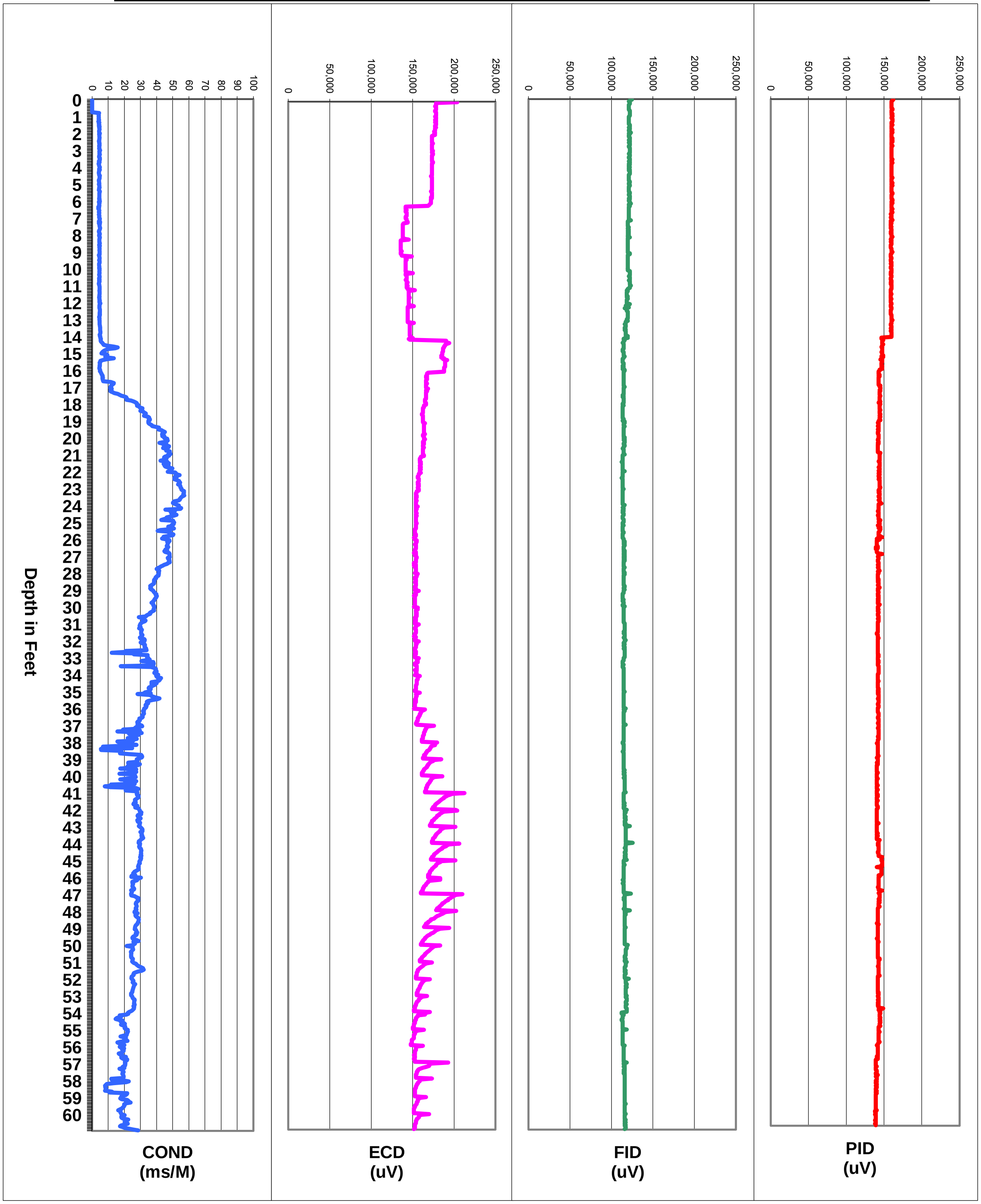
ZEBRA EC/MIP Summary Log, Point AEC20



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 2/28/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 14 of 0

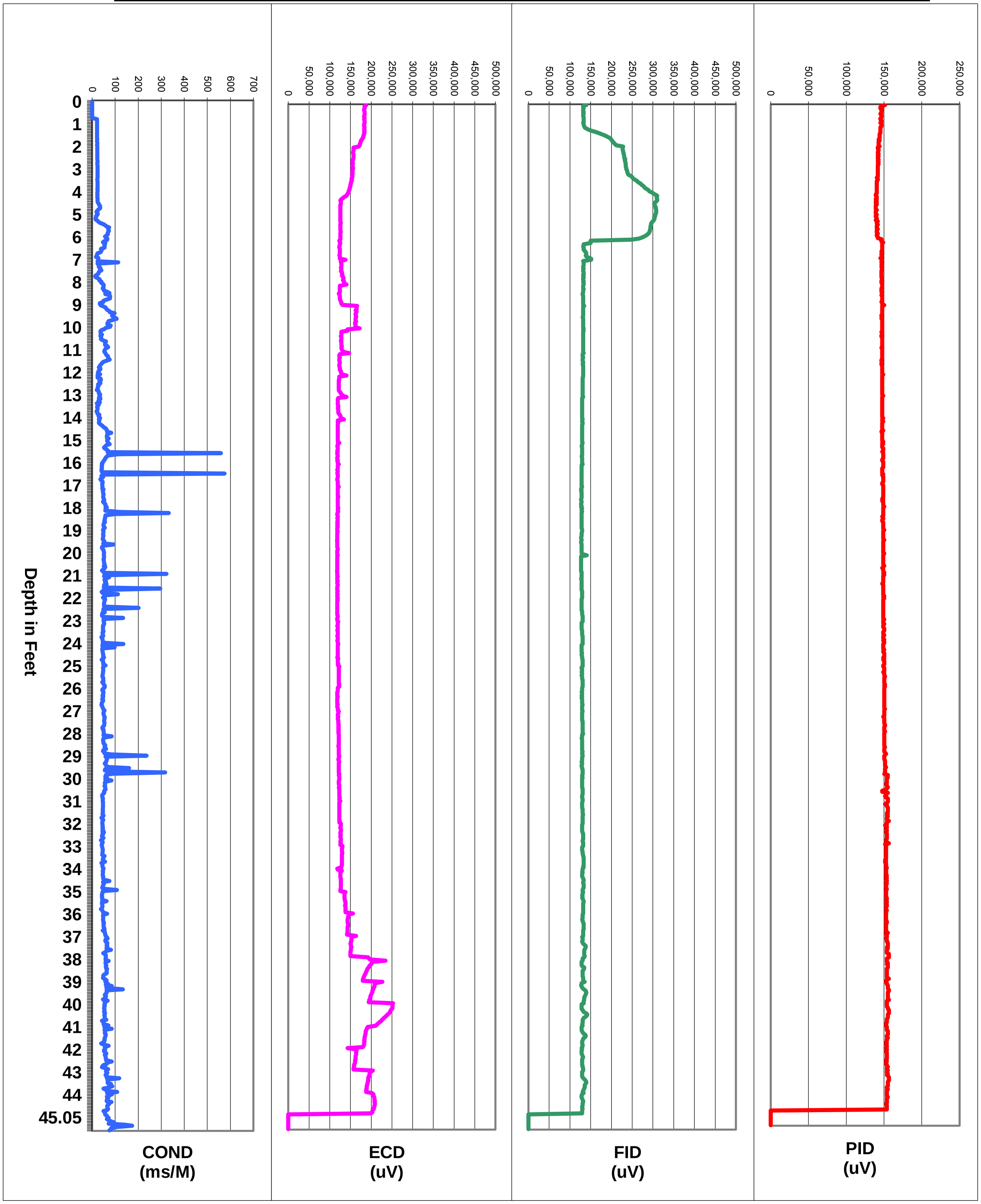
ZEBRA EC/MIP Summary Log, Point AEC21



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 2/28/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 15 of 0

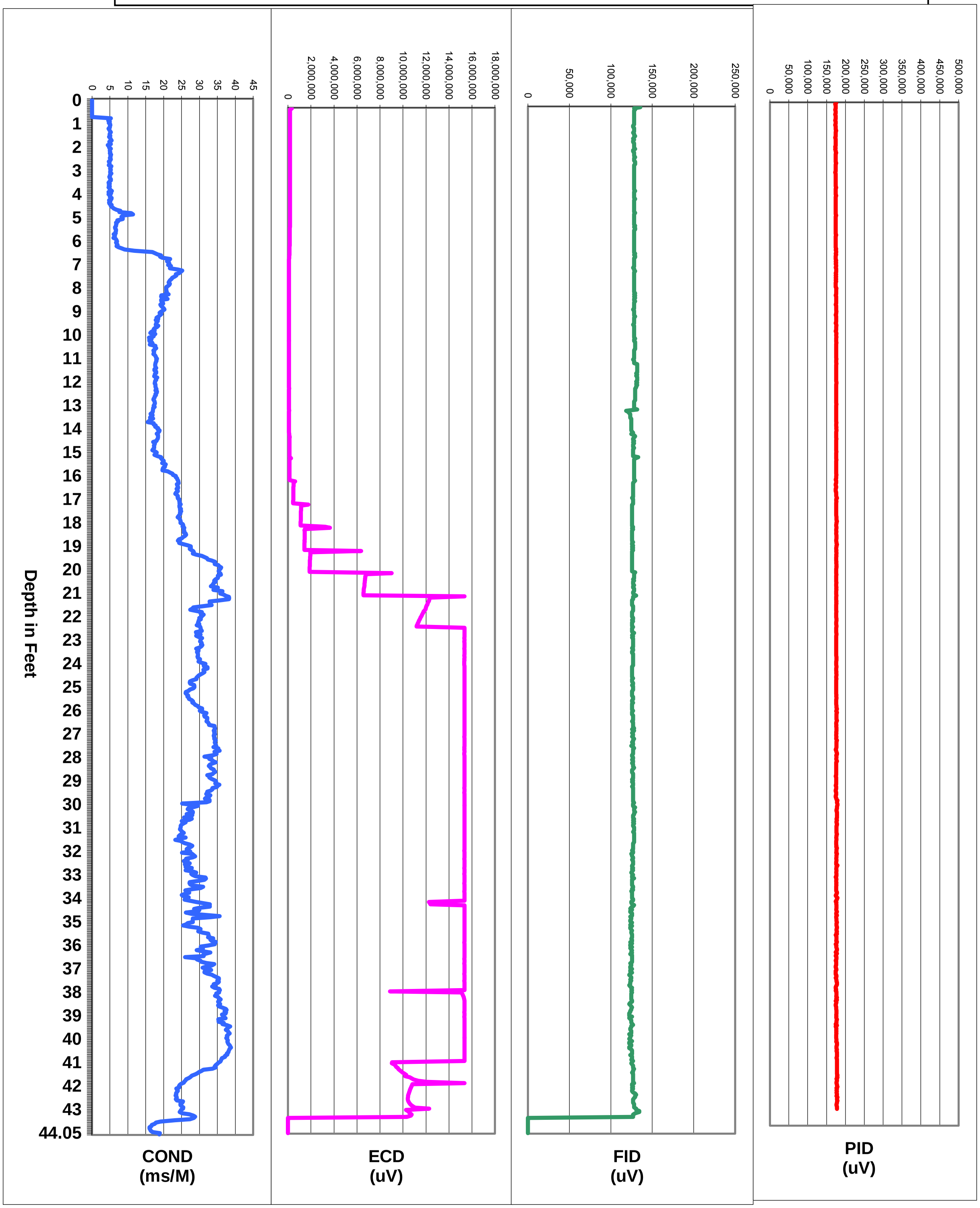
ZEBRA EC/MIP Summary Log, Point AEC22



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 2/28/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 16 of 0

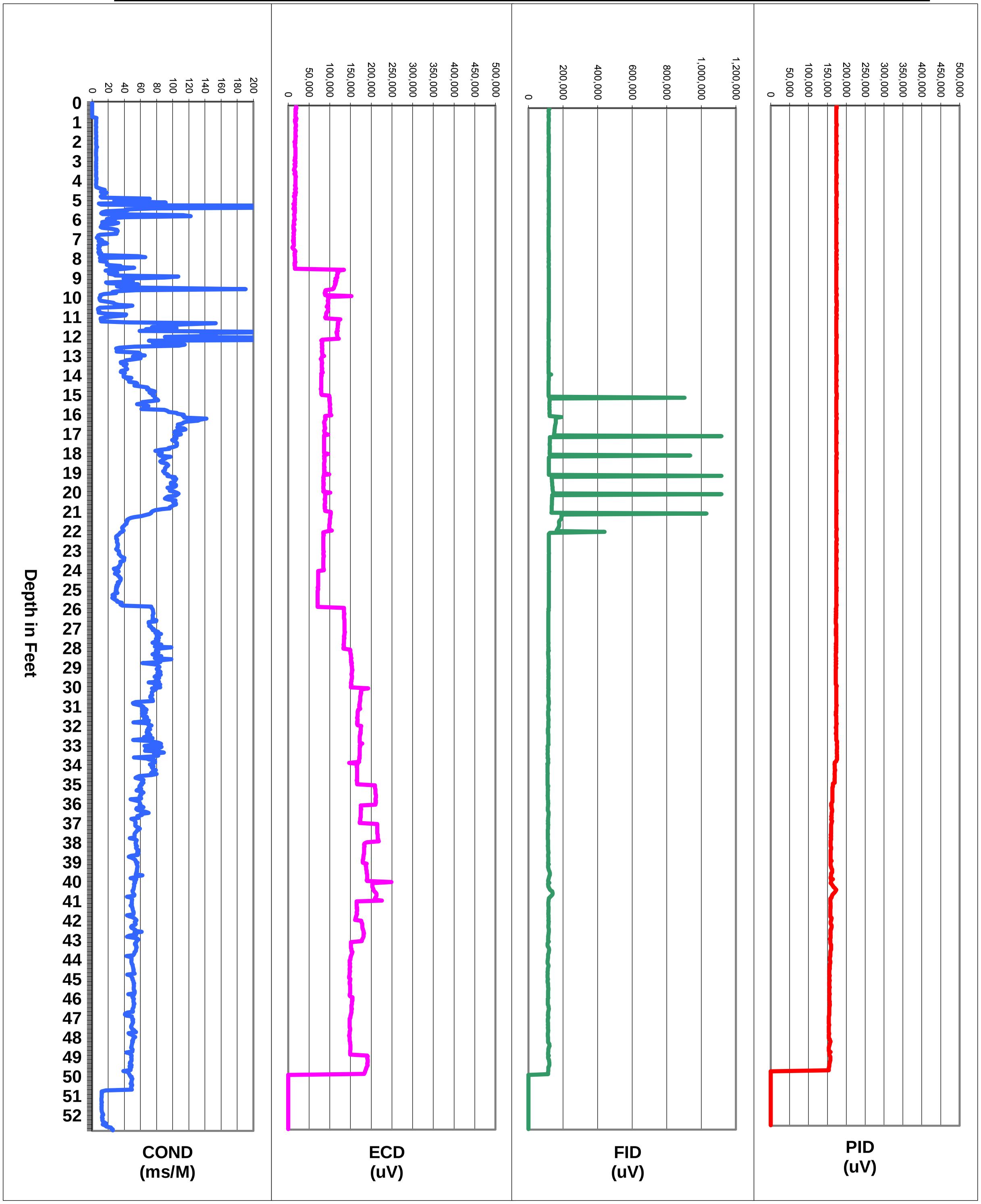
ZEBRA EC/MIP Summary Log, Point AEC23



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/2/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 17 of 0

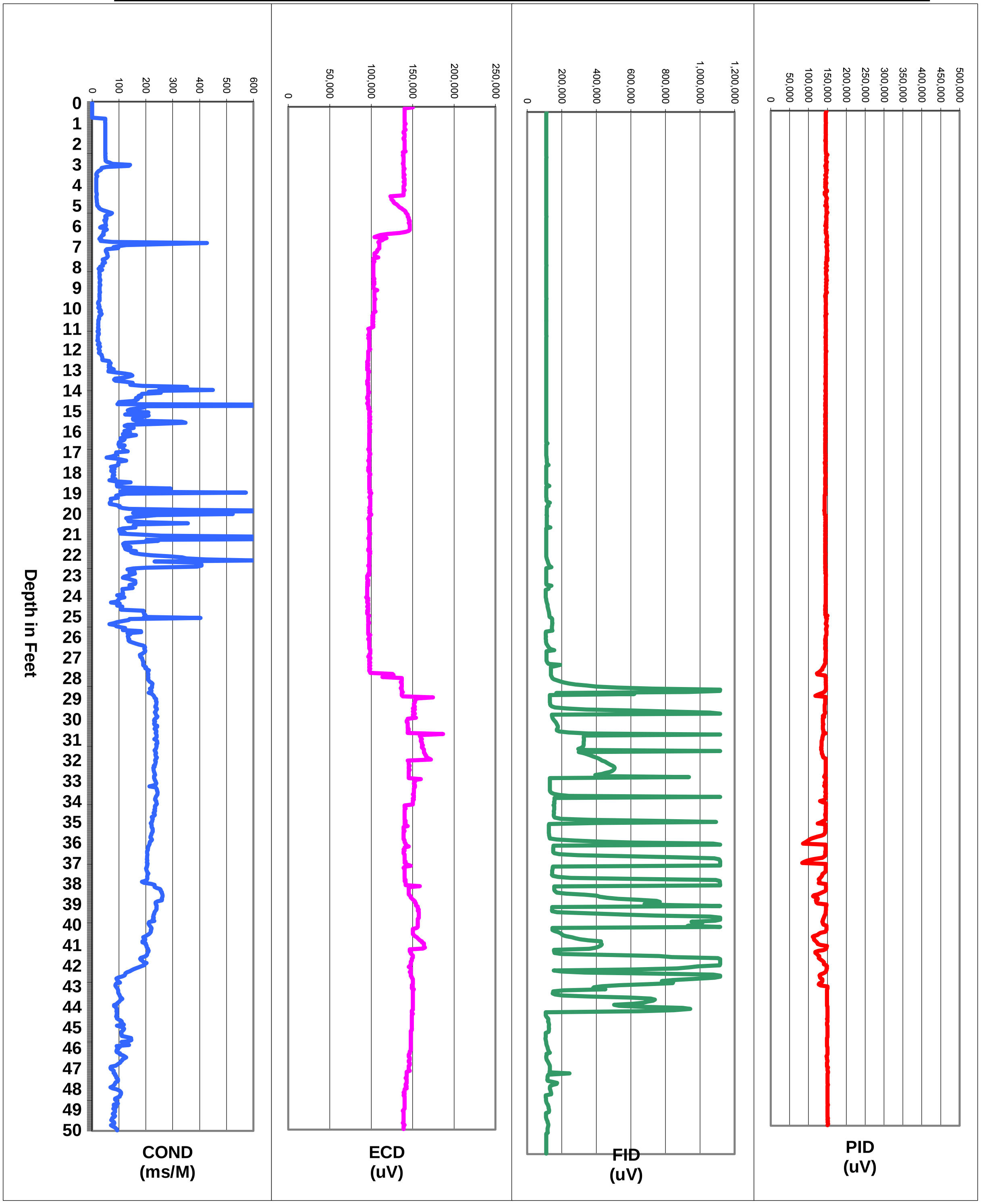
ZEBRA EC/MIP Summary Log, Point AEC24



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/2/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 18 of 0

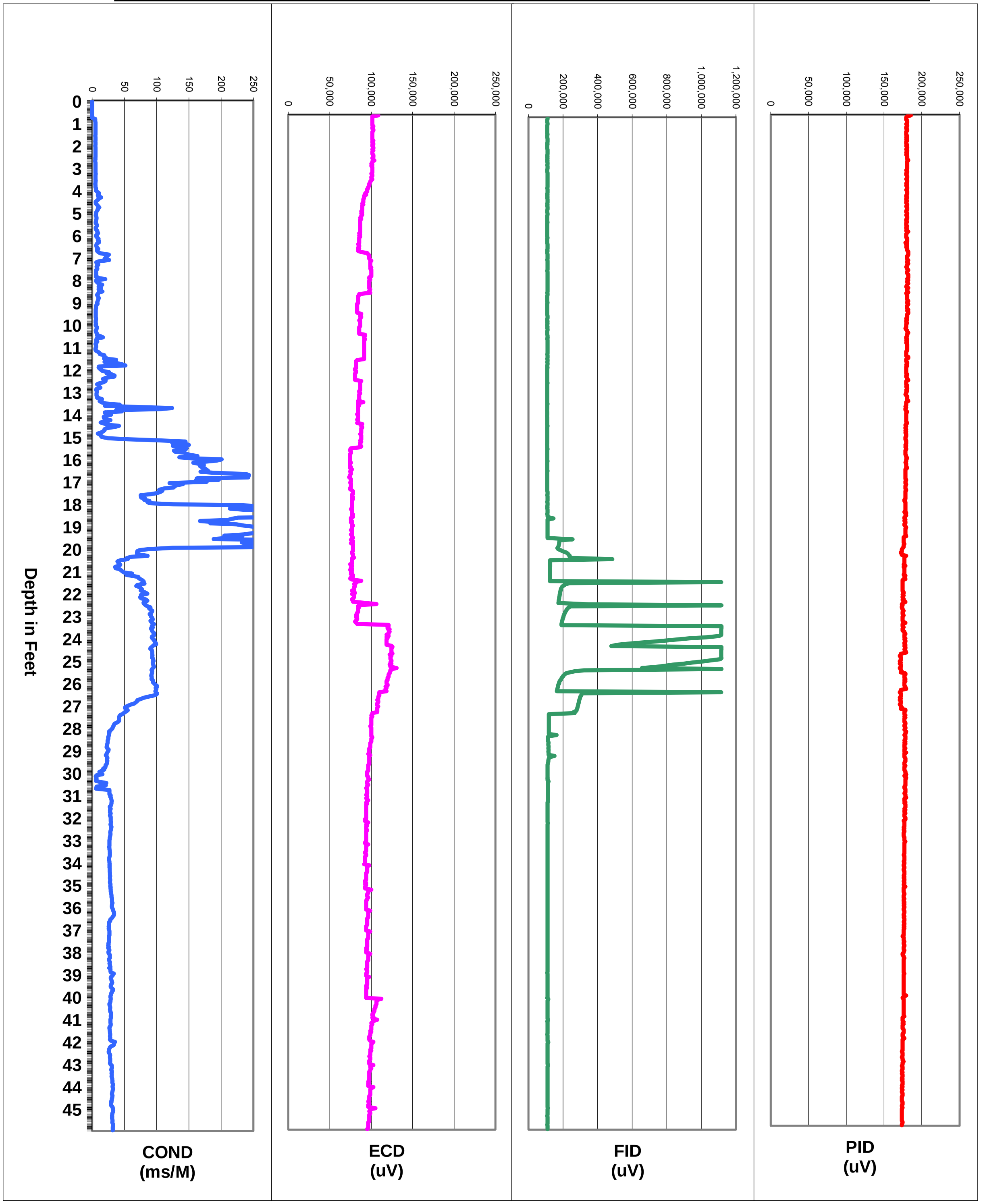
ZEBRA EC/MIP Summary Log, Point AEC25



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/2/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 19 of 0

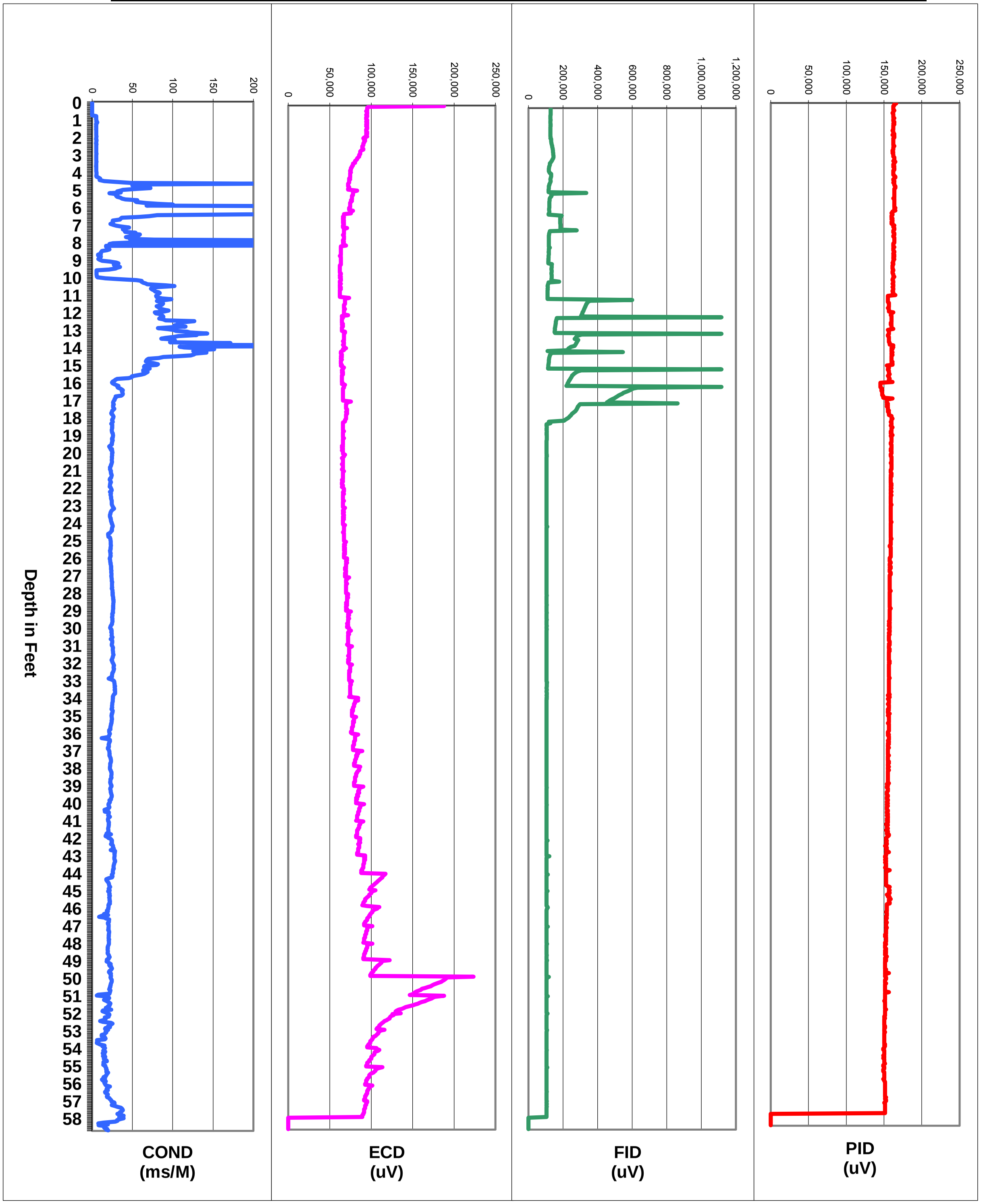
ZEBRA EC/MIP Summary Log, Point AEC26



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 2/29/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 20 of 0

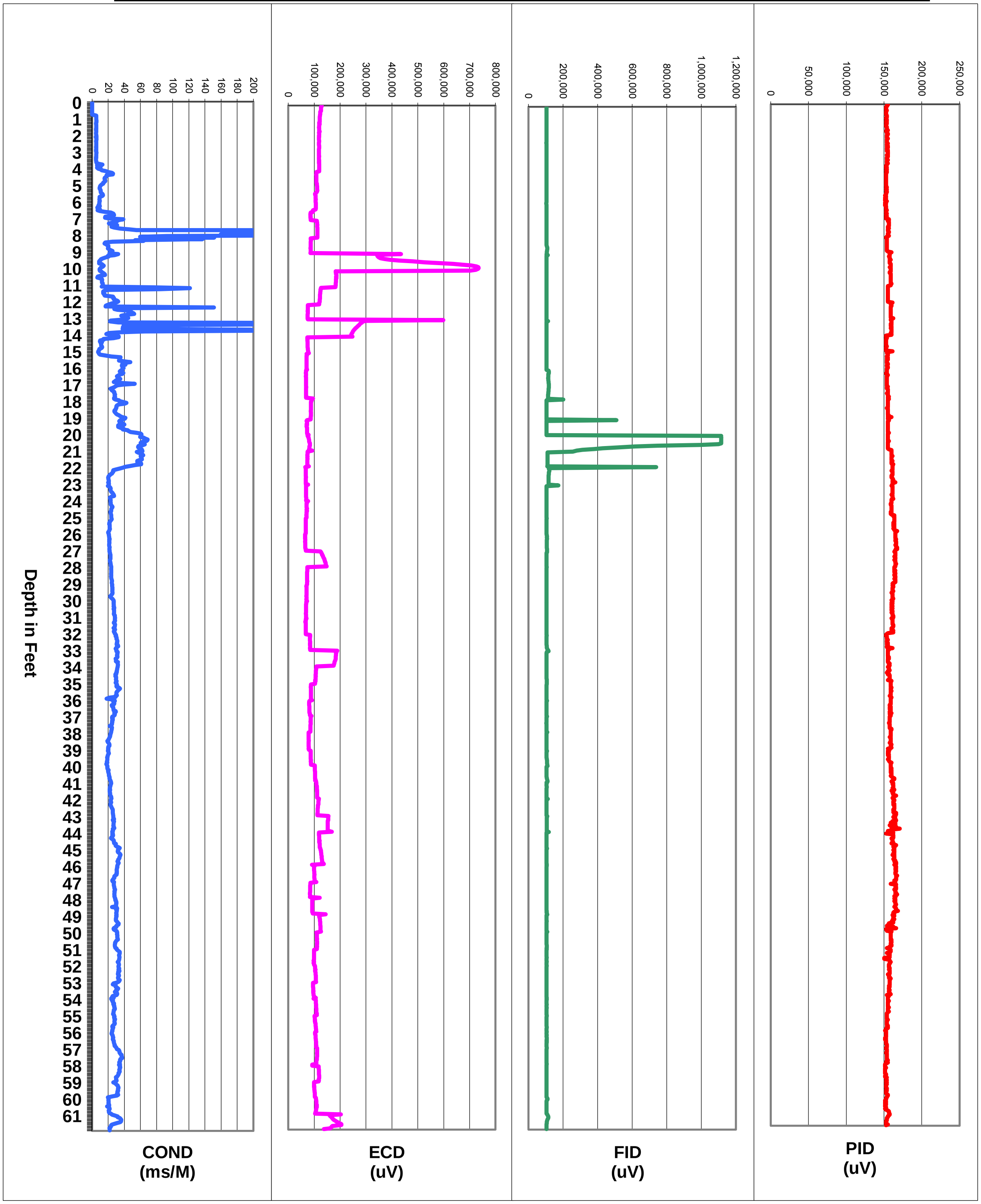
ZEBRA EC/MIP Summary Log, Point AEC27



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/1/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 21 of 0

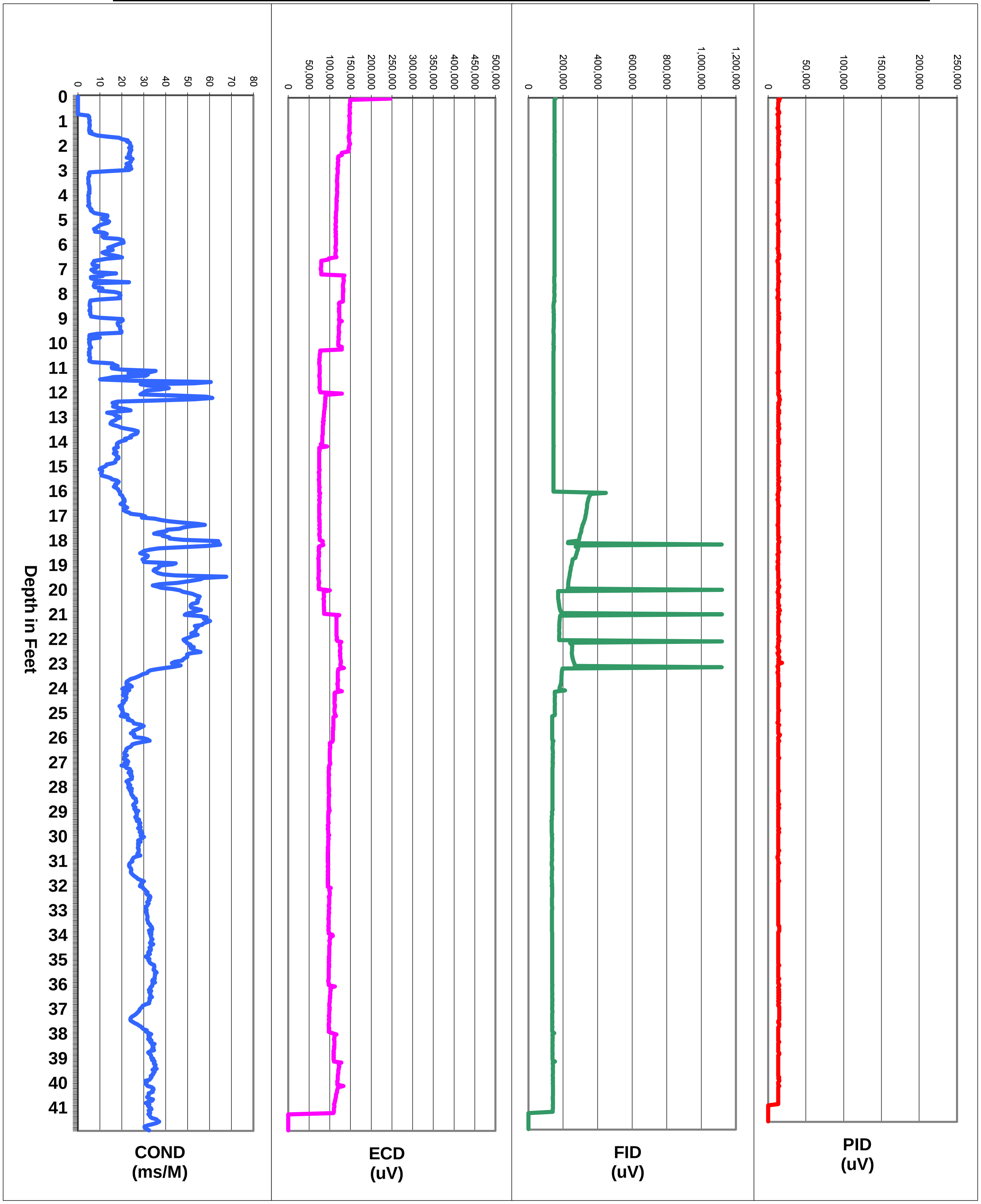
ZEBRA EC/MIP Summary Log, Point AEC28



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/1/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 22 of 0

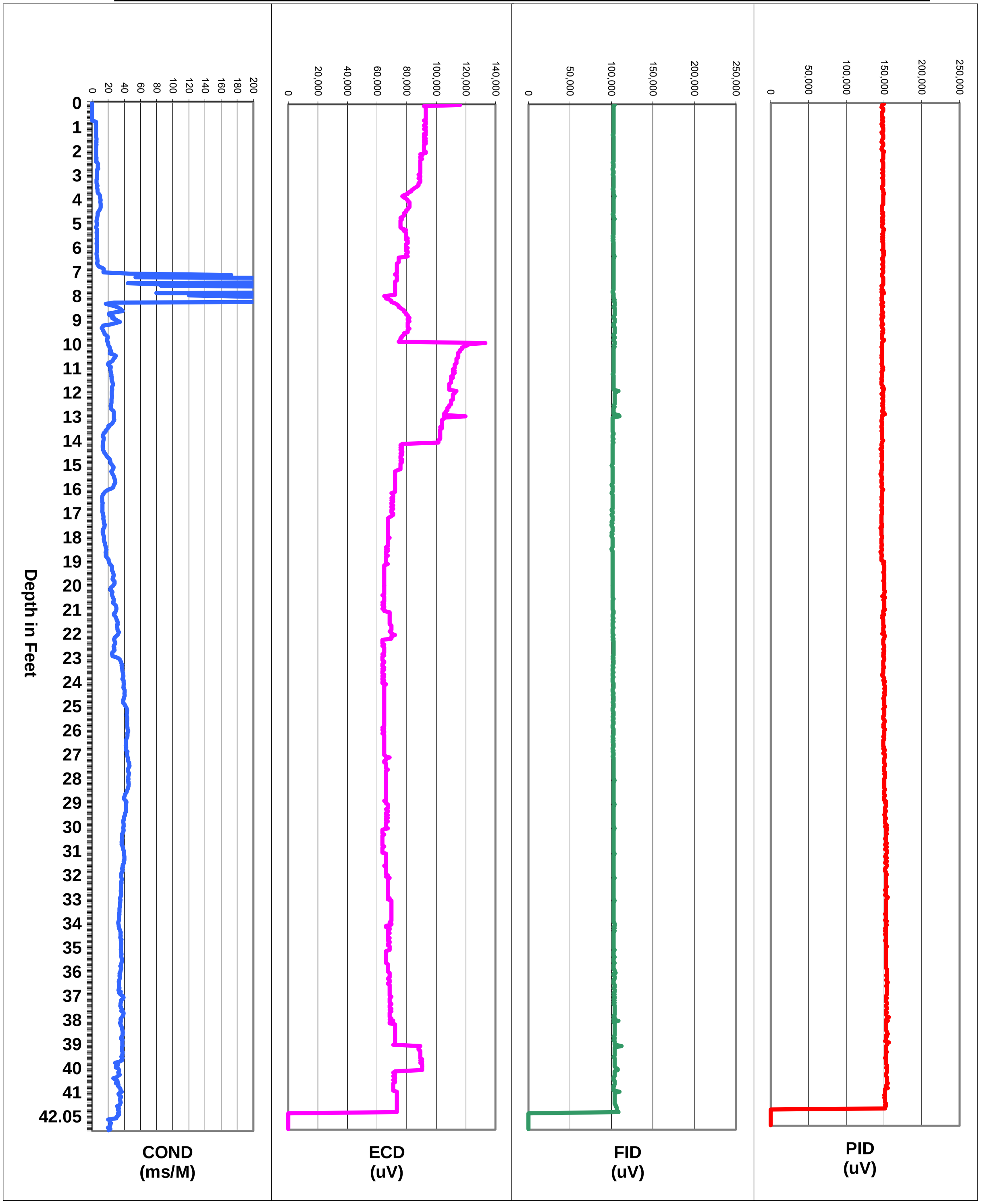
ZEBRA EC/MIP Summary Log, Point AEC29



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/6/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 23 of 0

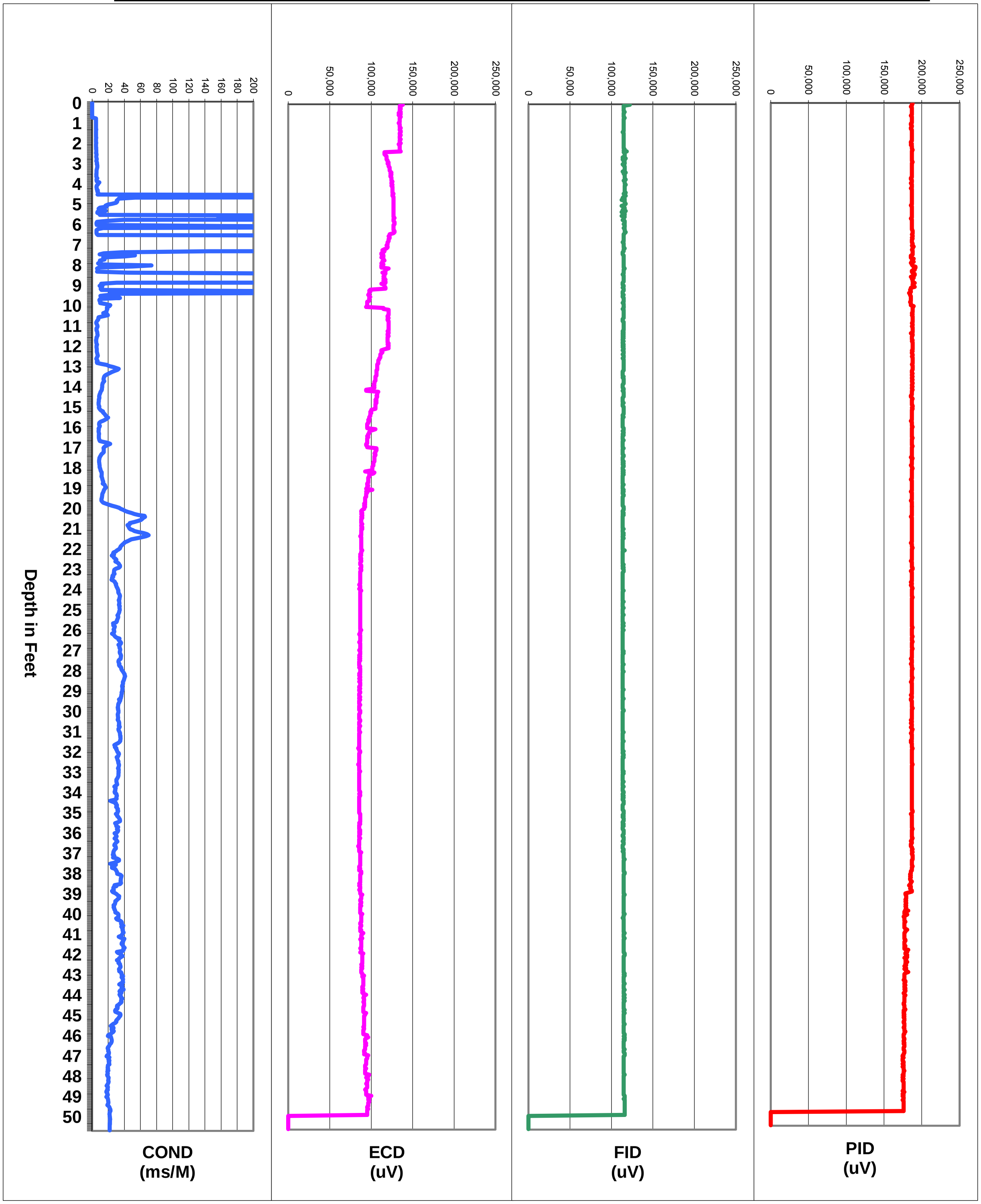
ZEBRA EC/MIP Summary Log, Point AEC30



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/1/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 24 of 0

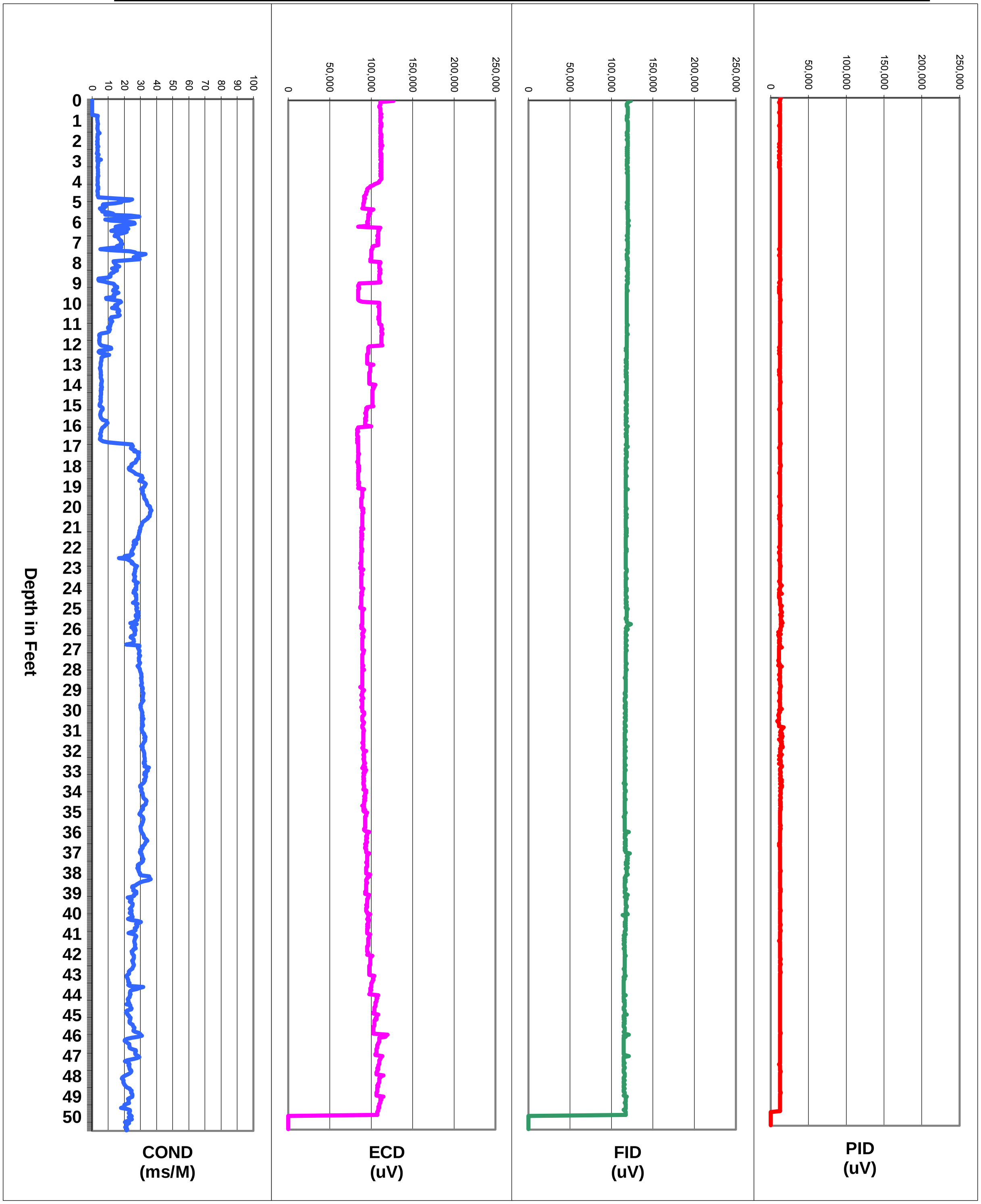
ZEBRA EC/MIP Summary Log, Point AEC31



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 2/29/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 25 of 0

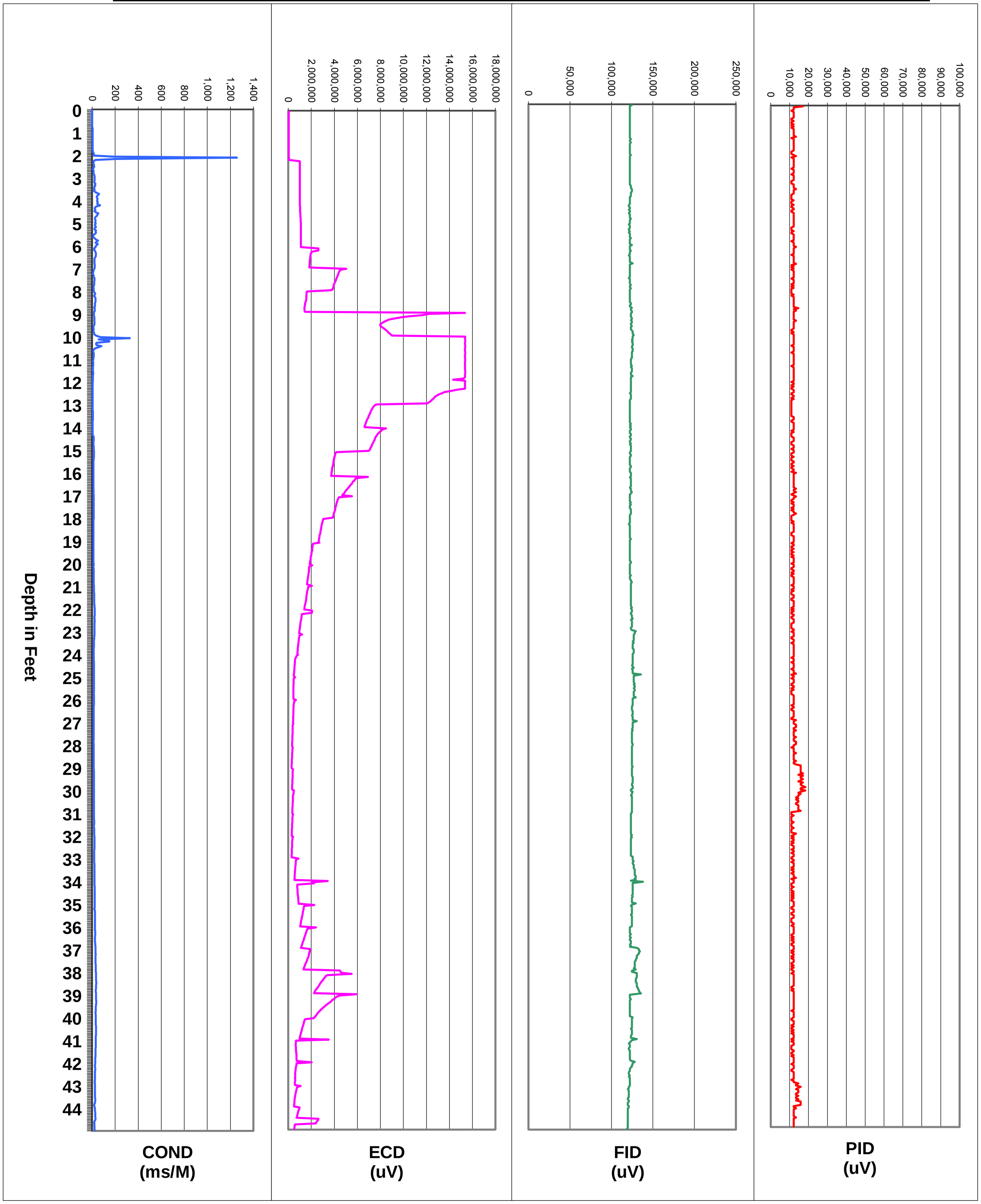
ZEBRA EC/MIP Summary Log, Point AEC32



for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 2/29/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 26 of 0

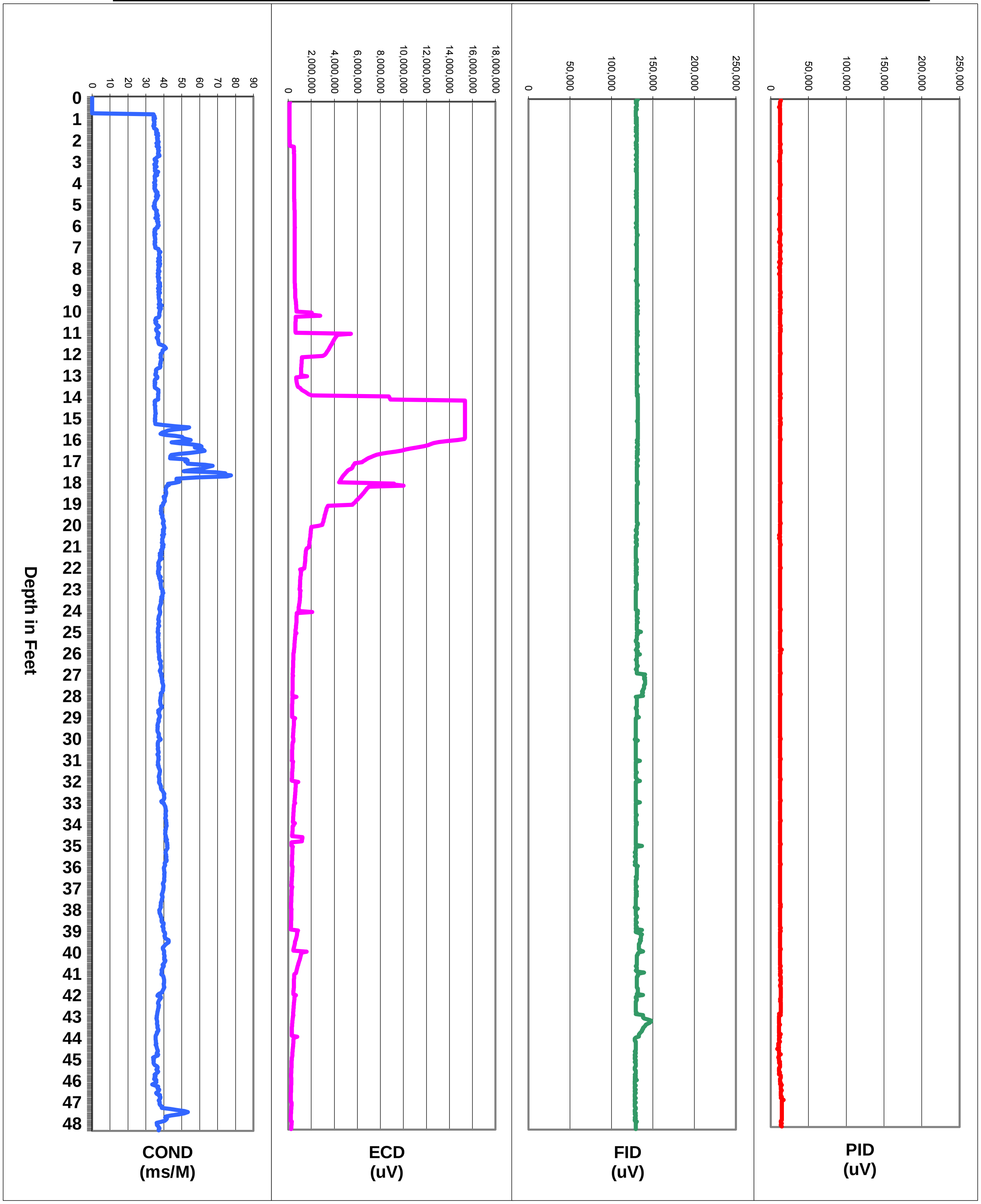
ZEBRA EC/MIP Summary Log, Point AEC33

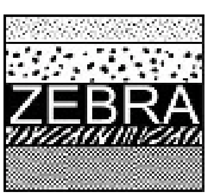


for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/6/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 27 of 0

ZEBRA EC/MIP Summary Log, Point AEC34





for: AECOM
by: Zebra Environmental
30 No. Prospect Avenue
Lynbrook, NY 11563
(516) 596-6300

Date: 3/6/2012
Proj. Name: Jung Sun Cleaners
Proj. #: DS20130
Operators: John D.
Point 28 of 0

Appendix D

Photo Log

Drilling Locations Sited during Geophysical Survey 2/20-21/12 and 3/1/12

All Borings Hand Cleared to 5 ft

MIP Investigation

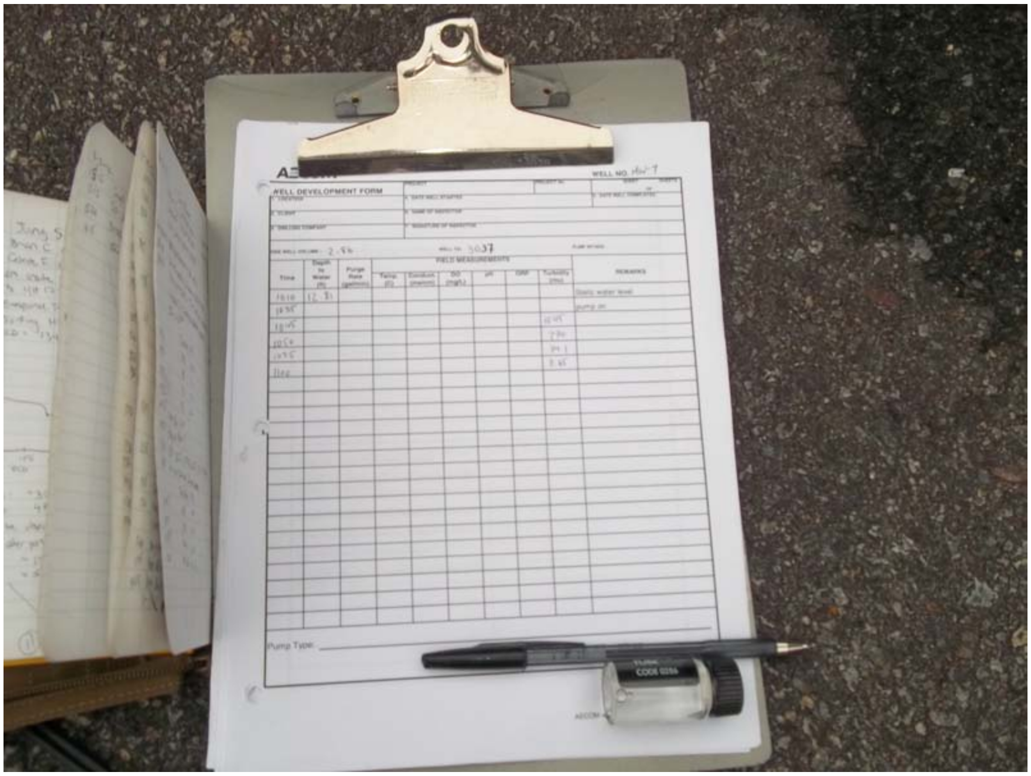
Example of Mica and Fill Identified in Soil Borings

Originally planned to sample "Dry Pit", but no soil present to sample

Example of Native Soils Found at Depth in Soil Borings (SB-13, 24 ft bgs)

Sub-Slab Sample and Indoor Sample from Breathing Zone, Structure B04

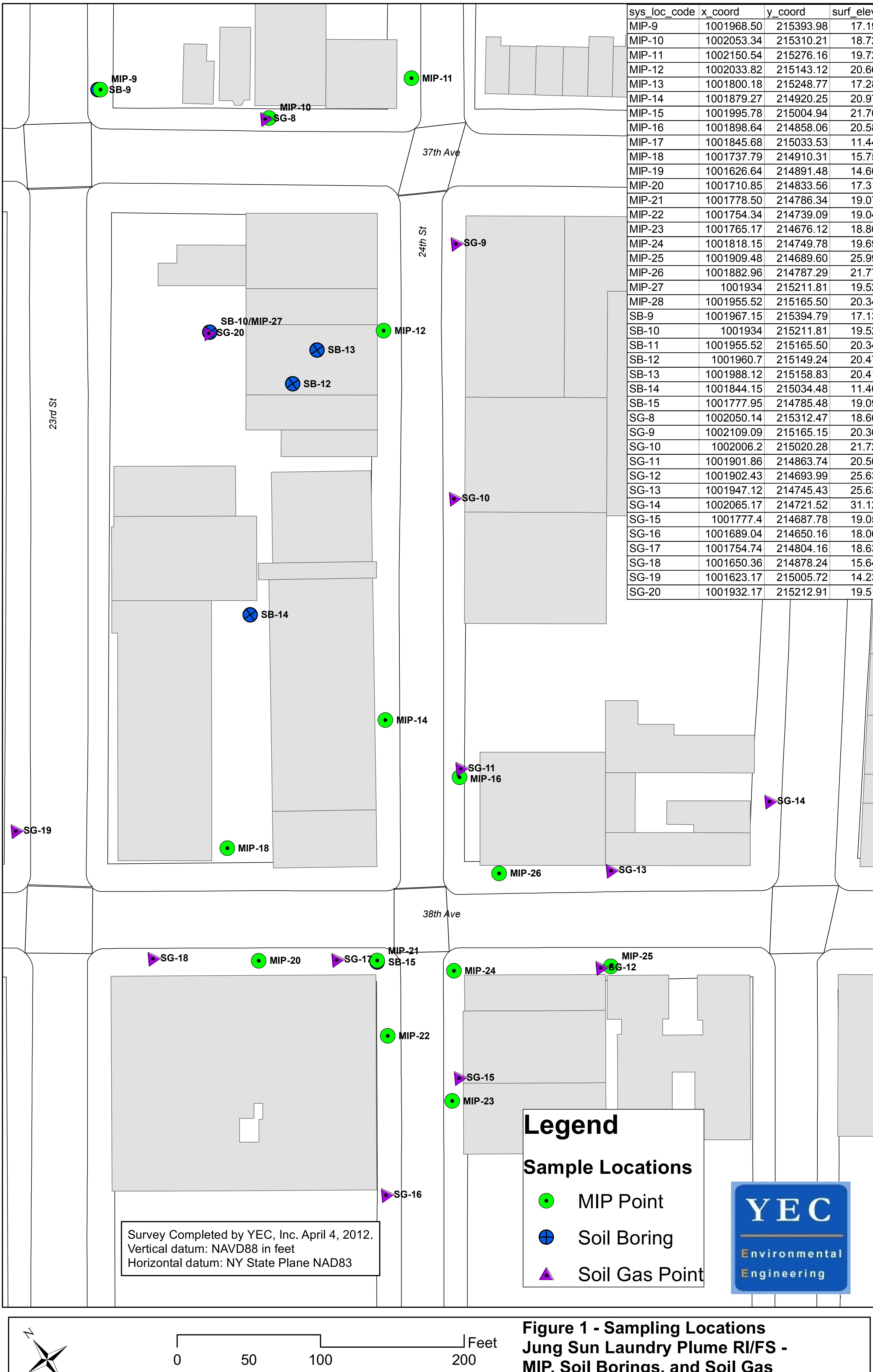
Sub-Slab Sample and Indoor Sample from Breathing Zone, Structure B04



Monitoring Well Development

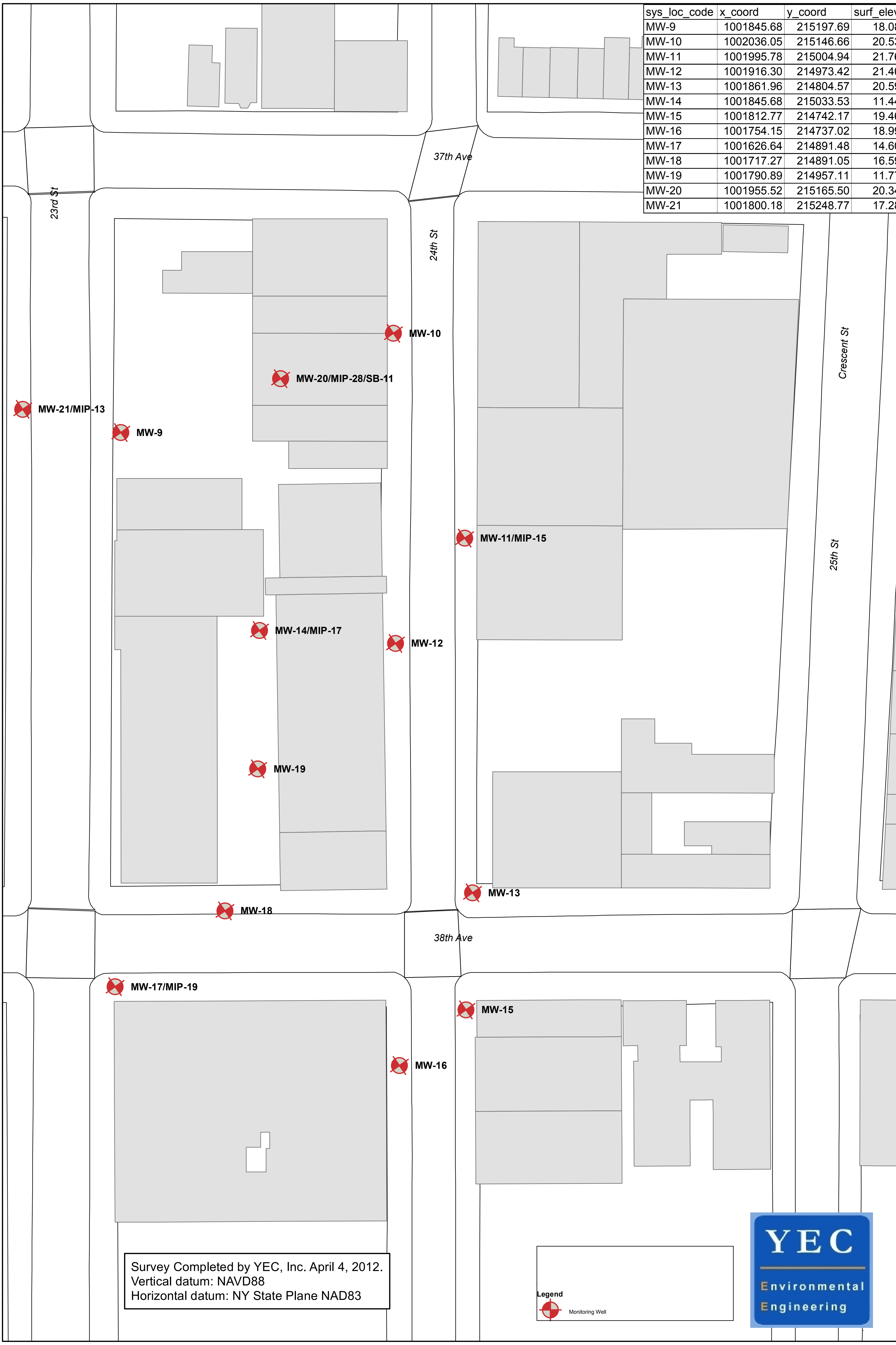
Appendix E

Land Survey Results



sys_loc_code	x_coord	y_coord	surf_elev
MIP-9	1001968.50	215393.98	17.19
MIP-10	1002053.34	215310.21	18.72
MIP-11	1002150.54	215276.16	19.72
MIP-12	1002033.82	215143.12	20.66
MIP-13	1001800.18	215248.77	17.28
MIP-14	1001879.27	214920.25	20.97
MIP-15	1001995.78	215004.94	21.76
MIP-16	1001898.64	214858.06	20.58
MIP-17	1001845.68	215033.53	11.44
MIP-18	1001737.79	214910.31	15.75
MIP-19	1001626.64	214891.48	14.60
MIP-20	1001710.85	214833.56	17.31
MIP-21	1001778.50	214786.34	19.07
MIP-22	1001754.34	214739.09	19.04
MIP-23	1001765.17	214676.12	18.86
MIP-24	1001818.15	214749.78	19.69
MIP-25	1001909.48	214689.60	25.99
MIP-26	1001882.96	214787.29	21.77
MIP-27	1001934	215211.81	19.52
MIP-28	1001955.52	215165.50	20.34
SB-9	1001967.15	215394.79	17.13
SB-10	1001934	215211.81	19.52
SB-11	1001955.52	215165.50	20.34
SB-12	1001960.7	215149.24	20.47
SB-13	1001988.12	215158.83	20.41
SB-14	1001844.15	215034.48	11.40
SB-15	1001777.95	214785.48	19.09
SG-8	1002050.14	215312.47	18.66
SG-9	1002109.09	215165.15	20.36
SG-10	1002006.2	215020.28	21.72
SG-11	1001901.86	214863.74	20.50
SG-12	1001902.43	214693.99	25.63
SG-13	1001947.12	214745.43	25.63
SG-14	1002065.17	214721.52	31.12
SG-15	1001777.4	214687.78	19.05
SG-16	1001689.04	214650.16	18.06
SG-17	1001754.74	214804.16	18.63
SG-18	1001650.36	214878.24	15.64
SG-19	1001623.17	215005.72	14.23
SG-20	1001932.17	215212.91	19.51

Figure 1 - Sampling Locations
Jung Sun Laundry Plume RI/FS -
MIP, Soil Borings, and Soil Gas



sys_loc_code	x_coord	y_coord	surf_elev
MW-9	1001845.68	215197.69	18.08
MW-10	1002036.05	215146.66	20.53
MW-11	1001995.78	215004.94	21.76
MW-12	1001916.30	214973.42	21.40
MW-13	1001861.96	214804.57	20.59
MW-14	1001845.68	215033.53	11.44
MW-15	1001812.77	214742.17	19.46
MW-16	1001754.15	214737.02	18.99
MW-17	1001626.64	214891.48	14.60
MW-18	1001717.27	214891.05	16.59
MW-19	1001790.89	214957.11	11.77
MW-20	1001955.52	215165.50	20.34
MW-21	1001800.18	215248.77	17.28

Survey Completed by YEC, Inc. April 4, 2012.
Vertical datum: NAVD88
Horizontal datum: NY State Plane NAD83

Figure 1 - Sampling Locations
Jung Sun Laundry Plume RI/FS -
Monitoring Wells

Appendix F

Laboratory Data and DUSRs on CD