Queens West (Hunter's Point) Parcel 8

BCP # C241087

Long Island City, New York

QUALITY ASSURANCE PROJECT PLAN for the SITE MANAGEMENT PLAN

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1.0 INTRODUCTION

The Quality Assurance Project Plan (QAPP) outlines the protocols and procedures that will be followed during implementation of the Site Management Plan (SMP) for Parcel 8 located at 47th Road and Center Blvd., Long Island City (Queens), NY, Brownfield Cleanup Program (BCP) site # C241087, located on Block 19, Lot 19, in Long Island City, New York (hereafter referred to as the "Site"). A Site Location Map is included as Figure 1. The Plan describes specific protocols for field sampling, sampling handling and storage, chain-of-custody, laboratory analysis, and data handling and management. The QAPP has been prepared in order to ensure Quality Assurance (QA) and Quality Control (QC) for the environmental sampling activities which will be conducted under the SMP and to ensure the acquisition of defensible data.

2.0 PROJECT TEAM

The project team will consist of FLS personnel and subcontractors. All field personnel and subcontractors will have completed a 40-hour HAZWOPER training course and the annual HAZWOPER 8-hour refresher in accordance with the Occupational Safety and Health Administration (OSHA) regulations and will have the training required for their respective duties as outlined for this investigation.

2.1 Remedial Engineer

The oversight of all aspects of the project will be conducted by the Remedial Engineer (RE). The RE is responsible for compliance with the RAWP. Mr. Arnold F. Fleming, P.E., will act as the RE for sampling activities at the Site.

2.2 Project Director

The general oversight of all aspects of the project will be conducted by the project director. Tasks will include the scheduling, budgeting, data management and decision-making for the field program. Mr. Steven Panter, CGWP; will act as the Project Director for sampling activities at the Site.

2.3 Project Manager

All components of the SMP will be directed and coordinated by the Project Manager. He/she will ensure a smooth flow of information between all parties involved in the investigation by communicating regularly with professionals from the New York State Department of Environmental Conservation (NYSDEC), the Site management personnel, and all members of the FLS project team. Mr. Steven Panter, Hydrogeologist, will act as the Project Manager for the project.

2.4 Field Team Leader

On-site sampling and health and safety activities will be supervised by a Field Team Leader. The team leader’s responsibilities will include ensuring adherence to the SMP and HASP and regularly reporting daily progress and deviations from the work plan to the Project Manager. Upon approval of the SMP, FLS will assign the role of Field Team Leader to appropriate FLS personnel.

2.5 Project Quality Assurance / Quality Control Officer

Adherence to the QAPP will be ensured by a FLS Quality Assurance/Quality Control (QA/QC) Officer. Tasks will include reviewing the QA procedures with all personnel before any fieldwork is conducted on-site as well as completing periodic site visits in order to assess the implementation of these procedures. Ms. Mindy Horowitz, Environmental Engineer, will act as the QA/QC officer for implementation of the SMP.

2.6 Laboratory Quality Assurance/Quality Control Officer

Laboratories used will be New York State Department of Health ELAP certified laboratories and include Accutest Laboratories of Dayton, NJ or other equivalent laboratories. The laboratories will communicate directly with the sampler regarding the analytical results and reporting and will be responsible for providing all labels, sample containers, field blank water, trip blanks, shipping coolers, and laboratory documentation.

Quality control procedures will be ensured by a laboratory QA/QC officer in the designated laboratory. This officer will be responsible for the adherence to laboratory protocols, quality control procedures, and checks in the laboratory. The officer will track the movement of the samples from check in to issue of the analytical results, conducting a final check on the analytical calculations. The laboratory groups performing the respective analyses will complete their own QA/QC and sign off on the data.

The sample analytical reports will undergo a third-party review of the analyses conducted. The third-party will produce a Data Usability Summary Report (DUSR) which will be submitted to the NYSDEC.

3.0 LABORATORY PROCEDURES

3.1 Laboratory Methods

The sample container type, preservation, applicable holding time, and laboratory methods of analysis of the field samples have been included as Table 1. Holding times are based on the SW-846 analytical method which, when adjusted to account for an assumed 2-day sample shipping time, match NYSDEC Analytical Services Protocol (ASP) holding times. Sample analyses will be completed by a New York State Department of Health Environmental Laboratory Approval Program (NYSDOH-ELAP) certified laboratory and reported as NYSDEC ASP Category B deliverables.

3.2 Quality Control Sampling

Additional analysis will be conducted for quality control assurance in addition to the laboratory analysis of the field soil and ground water samples. Quality control samples will include: equipment rinsate blanks, duplicate samples, matrix spike and matrix spike duplicate samples, and trip blanks. The quantities of field samples and quality control samples have been summarized in Table 2.

The equipment blank and duplicate samples will be analyzed for the same parameters as the samples, as shown on Table 1.

4.0 STANDARD OPERATING PROCEDURES

Environmental sampling done under the SMP may include soil, groundwater and soil vapor sampling. The standard operating procedures (SOPs) for post-excavation soil sampling, test-pit soil sampling, direct-push soil sampling, hollow-stem auger drilling soil sampling, soil gas sampling, monitoring well installation and development, and sampling equipment decontamination have been described in the following sections. Safety monitoring will be performed in accordance with the Site-Specific Health and Safety Plan (HASP), sections of which mandate that all field personnel wear the appropriate personal protective equipment.

4.1 Post-Excavation Soil Sampling

Bottom post-excavation samples will be collected by hand to document endpoint conditions at a sampling rate of one endpoint sample/900 ft^2 (approximate 30-foot center spacing). Sidewall post-excavation samples will be collected by hand around the perimeter of the excavation at a rate of one sample/30 linear feet, and will be collected in the approximate center of the contaminated interval. If end point sampling indicates that Part 375 Commercial Use SCOs or the Site-specific Track 4 SCOs were not met, additional excavation will be performed where feasible and the end point sampling will be repeated.

If additional excavation becomes necessary for construction purposes after post-excavation sampling documents clean conditions, then, assuming the soil is free of visible staining, other signs of contamination, or elevated PID readings, the excavation will not require further testing.

Post-excavation samples will be collected and analyzed for the parameters given on Table 1 and will be subject to all QA/QC requirements listed in Table 2.

4.2 Test Pit Soil Sampling

Soil samples will be collected utilizing a backhoe or excavator and dedicated sampling equipment. At most locations, test pits will be excavated to the groundwater table. A tape will be lowered into the excavated test pit to establish a depth profile prior to sample collection. At the direction of the field geologist, the excavator will collect soil from the test pit and bring the soil to a location where the field geologist will evaluate the soil quality. Each sample will be field screened following the procedures described for soil borings (see Section 4.3). The samples will be containerized for laboratory analysis in accordance with the procedures established for the soil borings.

4.3 Direct Push Soil Sampling

Sampling will be performed using four-foot-long acetate sleeves that will be advanced continuously to the desired depth below the surface. Soil samples from each sleeve will be screened using a photoionization detector (PID) to detect possible organic vapors. Organic vapor screening will be performed by slicing open the acetate sleeve, making a small slice in the soil column with a clean knife or sampling tool, inserting the PID probe and pushing the slice closed, and monitoring the soil for approximately 5 to 10 seconds. This procedure will be repeated at intervals along the soil column at the field geologist's discretion.

The samples will be examined for staining, discoloration, odors, and debris indicative of contamination (ash, coal fragments, wood chips, cinders, petroleum staining, etc.). Samples for laboratory analysis will be collected from the six-inch interval most likely to be contaminated, based on PID readings, discoloration, staining, and the field geologist's judgment (field conditions may require a section longer than six inches to make sufficient sample; however this decision will be field-based).

The samples will be collected by cutting the soil in two places with a decontaminated steel, stainless steel, or aluminum trowel, spoon, or knife and homogenized in a decontaminated stainless steel pan before being placed in the sample bottles. Samples collected for analysis for VOCs will be placed directly into the sample containers without homogenization. Samplers will wear phthalate-free gloves such as nitrile (no latex will be used) and will avoid contact of the gloves with the sample. Only clean metal instruments will be allowed to touch the sample. If there is insufficient soil volume in the spoon, then this will be made up by attempting a second direct push sleeve at the same depth, or by using the next immediate sample interval above or below this depth, if appropriate. If there is no recovery, then the sample depth will be skipped, and drilling will progress to the next depth interval.

4.4 Hollow-Stem Auger Drilling Soil Sampling

Soil samples will be collected utilizing 2-inch-diameter by 2-foot-long split spoon samplers driven ahead of a hollow stem auger. Three-inch-diameter split spoon samplers may also be used. Augers with a minimum inside diameter of 4¼ inches will be used for drilling where wells are proposed. If soil sampling below the groundwater table is required, augers will be equipped with center plugs and/or inert "knock out" plates to control sub-water table sediments from rising inside the auger flights and hampering collection of representative soil samples.

Each split spoon sample will be screened using a PID to detect possible organic vapors. Organic vapor screening will be performed by opening the split spoon, making a small slice in the soil column with a clean knife or sampling tool, inserting the PID probe and pushing the slice closed, and monitoring the soil for approximately 5 to 10 seconds. This procedure will be repeated at intervals along the split spoon soil column at the field geologist's discretion.

The split spoon samples will be examined for staining, discoloration, odors, and debris indicative of contamination (ash, coal fragments, wood chips, cinders, petroleum staining, etc.). One sample will be collected from each split spoon, from the six-inch interval most likely to be contaminated, based on PID readings, discoloration, staining, and the field geologist's judgment. Note that due to sample recovery or field conditions, sample intervals other than six inches may be necessary to collect sufficient sample.

The samples will be collected by cutting the soil in two places with a decontaminated steel, stainless steel, or aluminum trowel, spoon, or knife and homogenizing in a decontaminated stainless steel pan before being placed in the sample bottles. Samples collected for analysis for VOCs samples will be placed directly into the sample containers without homogenization. Samplers will wear phthalate-free gloves such as nitrile (no latex will be used) and will avoid contact of the gloves with the sample. Only clean metal instruments will be allowed to touch the sample. If there is no recovery, then the sample depth will be skipped, and drilling will progress to the next sampling interval.

4.5 Soil Gas Sampling

SUMMA canisters for TO+15 plus naphthalene will be collected from soil gas. The samples will be collected by driving the sample probe 2 to 4 ft-bg using the slam bar and/or a portable hand-held roto-hammer, inserting a 5/8-inch-diameter steel shaft with a hardened point and retractable slotted intake attached to a length of dedicated Teflon or polyethylene tubing into the hole. Once the soil gas sampling probe is secured, the shaft will be retracted to expose the screen, the annulus sealed with clay and/or bentonite, and a vacuum applied to the sampling probe head and the system purged to allow the collection and subsequent analysis of a representative sample of soil gas. A minimum of one soil gas volume will be purged from the borehole before collecting the sample according to NYSDOH requirements. With the vacuum maintained, the sample will then be collected by attaching the tubing to the dedicated SUMMA canister flow controller set to a sampling rate of 0.2 liters/minute or less.

4.6 Groundwater Sampling

Groundwater will be sampled according to the USEPA protocol for low flow purging and sampling (http://www.epa.gov/region1/lab/qa/pdfs/EQASOP-GW001.pdf). Groundwater samples will be collected from the monitoring wells applying the following procedures:

- As the well plug is removed, measure the vapor concentrations in the well using a PID.

- Measure depth to water and check for light non-aqueous phase liquid (LNAPL) or dense non-aqueous phase liquid (DNAPL) utilizing an oil/water interface probe and/or steel tape with indicator paste, if applicable. If the NAPL is measurable, groundwater samples will not be collected from such a well.

- Connect dedicated tubing to either a submersible or peristaltic pump and lower such that the intake of the pump is set at a mid-point of the water column within the screened interval of the well. The intake should be a minimum of two feet above the bottom of the well screen. Record the depth of the intake in the field notes. Connect the discharge end of the tubing to the flow-through cell of a multi-parameter (or equivalent) meter, such as a Horiba U-22. Connect tubing to the output of the cell and place the discharge end of the tubing in a 5-gallon bucket.

- At its lowest flow rate setting (but no more than 0.5 L/min), activate the pump.

- Measure the depth to water within the well. Increase the pump flow rate such that the water level a measurement does not deviate more than 0.3 feet compared to the initial static reading.

- Transfer discharged water from the 5-gallon buckets to 55-gallons drums designated for well-purge water.

- During purging, collect periodic samples (every five minutes) and analyze for water quality indicators (e.g., turbidity, pH, temperature, dissolved oxygen, reduction-oxidation potential, and specific conductivity).

- Continue purging the well until water quality indicators have stabilized (three successive readings) for the following parameters and criteria:

Parameter	Stabilization Criteria and Units
pH	+/- 0.1 pH units
Temperature	+/- 3% degrees Celsius
Specific Conductance	+/- 3% S / cm
ORP / Eh	+/- 10 mV
Turbidity	+/- 10% NTUs (< 5 NTUs); if three turbidity values are less than 5 NTU, consider the values as stabilized
Dissolved Oxygen	10% for values greater than 0.5 mg/L, if three DO values are less than 0.5 mg/L, consider the values as stabilized

- After purging, disconnect the tubing to the inlet of the flow-through cell. Collect groundwater samples directly from the discharge end of the tubing (first VOCs then SVOCs) and place into the required sample containers as described in Section 3.0. Containers are to be labeled as described in Section 4.4 and put in an ice-filled cooler. Samples will be maintained at 4° +/- 2° C in the field and during transport.

- Collect one final field sample and analyze for water quality parameters (e.g., turbidity, pH, temperature, dissolved oxygen, reduction-oxidation potential, and specific conductivity) and record the final readings in the field notes.

- Once sampling is complete, remove the pump and tubing from the well. Disconnect the tubing and place it back in the well for reuse during the next sampling event. Dispose of any sample filters in a 55-gallon drum designated for disposable sampling materials and PPE.

- Decontaminate the pump, oil/water interface probe and flow-through cell as described in Section 4.3.

- In the project logbook and field data sheet, record all measurements (depth to water, depth to NAPL, water quality parameters, turbidity), calculations (well volume) and observations.

4.7 Decontamination Procedures

Decontamination will be performed on plastic sheeting or other containment area that is deemed to prevent runoff to the ground. Prior to use on-site and between sampling locations, the hand trowel, pump, oil/water interface probe, and other non-disposable sampling equipment will be decontaminated using the following protocol:

1. Scrub using tap water / non-phosphate detergent mixture and bristle brush.
2. Rinse with tap water.
3. Repeat step 1 and 2
4. Final rinse with distilled water.
5. Air-dry the equipment.

4.8 Sampling Handling

4.8.1 Sample Identification

All samples collected will be identified using an alphanumeric code. The following table identifies the various sample identification scheme for the Site:

Sample Type	Prefix	Suffix 1	Suffix 2	Example
Soil Gas	SG	Sequential Number / Location	Depth (ft-bg)	SG-01 (0-3)
Test Pit	TP	Sequential Number / Location	Depth (ft-bg)	TP-01 (1-3)
Soil Boring Sample	SB	Sequential Number / Location	Depth (ft-bg)	SB-01 (0-4)
Post Excavation Soil Sample (Bottom Sample)	BS	Alphanumeric Grid Location/ Unique Identfier	Depth (ft-bg)	BS-A1 (20)
Post Excavation Soil Sample (Wall Sample)	SW[1] WW[2]	Distance From Origin located at the Southeast Corner of Grid Section A-1	Depth (ft-bg)	SW-30 (15) WW-30 (15)
Groundwater Sample (Monitoring Well)	MW	Well ID Number	--	MW-01

1-North Wall
2-West Wall

4.8.2 Sample Labeling and Shipping

All sample containers must contain the following information on the label:

- Project identification
- Sample identification
- Date and time of collection
- Analysis(es) to be performed
- Samplers initials

Collected and labeled samples will be placed in ice-filled coolers away from direct sunlight to await shipment/delivery to the laboratory. Samples will be maintained at 4° +/- 2° C in the field and during transport.

To prepare the samples for shipment place each sample in a sealable plastic bag. Finally, add fresh ice in two sealable plastic bags, or "blue ice" blocks, and the chain-of-custody form. Samples may be shipped overnight (e.g., via Federal Express or transported by a laboratory courier). All coolers shipped to the laboratory will be sealed with mailing tape and a COC seal to ensure that the coolers remain sealed during delivery.

4.8.3 Sample Custody

Field personnel will be responsible for maintaining the sample coolers in a secured area until arrival at the laboratory. Sample possession record from the time of obtainment in the field to the time of delivery to the laboratory or shipping off-site will be documented on chain-of-custody (COC) forms. The COC forms will contain the following information: project name; names of sampling personnel; sample number; date and time of collection and matrix; signatures of individuals involved in sample transfer; and the dates and times of transfers. Laboratory personnel will examine the custody seal's condition at sample check-in.

4.9 Field Instrumentation

Equipment will be calibrated at the start of each day of field work in accordance with the manufacturer's specifications. In the instance that an instrument fails calibration, the Project Manager or QA/QC Officer must be contacted immediately so as to arrange repairs or obtain a replacement instrument. A calibration log will be maintained on-site in the field book in order to record specific details regarding instrument calibration, including: dates, problems, and corrective actions. The PID will be calibrated each day using a standard of 100 parts per million (ppm) isobutylene, zeroed as per manufacturer specifications. The Dust monitor will be zero checked each morning and calibrated weekly.

Field personnel will be trained in the proper operation of all field instruments at the start of the field program; however, instruction manuals for all equipment will be stored on-site as a reference of the proper procedures for operation, maintenance and calibration.

5.0 DATA VALIDATION

All sample analytical reports will undergo a third party review of the analyses conducted. The third party will produce a Data Usability Summary Report (DUSR) which will be submitted to the NYSDEC.

6.0 REPORTING

All lab data will be submitted to NYSDEC in the approved electronic data deliverable format.

Table 1
Summary of Analytical Methods
QWDC Parcel 8
Long Island City, New York

Sample Type	Sample Matrix	Analytical Parameter	No. of Samples[1]	Analytical Method	Sample Preservation	Holding Time[2]	Sample Container[3]
Post-Ex. Grab, Soil Boring Grab, Test Pit Soil Grab	Soil	VOCs, TCL +10 TICs	TBD	SW-846 Method 8260B	Cool to 4° C; no headspace	14 days to analysis	(2) 2 oz. glass jars
Post-Ex. Grab, Soil Boring Grab, Test Pit Soil Grab	Soil	SVOCs, TCL +20 TICs	TBD	SW-846 Method 8270C	Cool to 4° C	14 days to extraction; 40 days from extraction to analysis	(1) 300 mL amber glass jar
Post-Ex. Grab, Soil Boring Grab, Test Pit Soil Grab	Soil	Metals, TAL	TBD	SW-846 Method 6010B/7000 Series Hg –SW-846 7491A	Cool to 4° C	28 days to analysis for Hg; 6 months to analysis for other metals	(1) 300 mL amber glass jar
Post-Ex. Grab Test Pit Grab	Soil	TCL PCBs	TBD	SW-846 Method 8082 & 8081A	Cool to 4° C	14 days to extraction; 40 days from extraction to analysis	(1) 300 mL amber glass jar
Soil Gas	Air	VOCs + naphthalene	TBD	TO+15 plus naphthalene	none	30 days	(1) summa cannister
Trip Blank	Aqueous	VOCs, TCL	TBD	SW-846 Method 8260B	Cool to 4° C; no headspace, HCl	14 days to analysis	(2) 40mL VOA Vials
Groundwater	Aqueous	VOCs, TCL	TBD	SW-846 Method 8260B	Cool to 4° C; no headspace, HCl	14 days to analysis	(3) 40mL VOA Vials
Groundwater	Aqueous	SVOCs, TCL	TBD	SW-846 Method 8270C	Cool to 4° C	7 days to extraction; 40 days from extraction to analysis	(2) 1 Liter amber glass jar
Groundwater	Aqueous	Total Metals (including Iron), TCL	TBD	SW-846 Method 6010B/7000 Series Hg –SW 846 7491A	Cool to 4° C HNO3	28 days to analysis for Hg; 6 months to analysis for other metals	(1) 500 or 950 mL Polyethylene container

Table 1
Summary of Analytical Methods
QWDC Parcel 8
Long Island City, New York

Groundwater	Aqueous	TCL PCBs	TBD	SW-846 Method 8082 & 8081A	Cool to 4° C	7 days to extraction; 40 days from extraction to analysis	(2) 1 Liter amber glass jar
Groundwater	Aqueous	Alkalinity	TBD	EPA 310.1	Cool to 4° C	14 days to analysis	(1) plastic 250-ml bottle
Groundwater	Aqueous	Sulfide	TBD	EPA 376.1	Cool to 4° C	28 days to analysis	(2) plastic 250-ml bottles with NaOH and ZnAc preservative
Groundwater	Aqueous	Sulfate	TBD	EPA 300/SW 846 9056	Cool to 4° C	28 days to analysis	(1) Plastic 250-ml bottle
Equipment Blank	Aqueous	VOCs, TCL	TBD	SW-846 Method 8260B	Cool to 4° C; no headspace, HCl	14 days to analysis	(3) 40mL VOA Vials
Equipment Blank	Aqueous	SVOCs, TCL	TBD	SW-846 Method 8270C	Cool to 4° C	7 days to extraction; 40 days from extraction to analysis	(2) 1 Liter amber glass jar
Equipment Blank	Aqueous	Total Metals, TCL	TBD	SW-846 Method 6010B/7000 Series Hg –SW 846 7491A	Cool to 4° C HNO3	28 days to analysis for Hg; 6 months to analysis for other metals	(1) 500 or 950 mL Polyethylene container
Equipment Blank	Aqueous	TCL PCBs	TBD	SW-846 Method 8082 & 8081A	Cool to 4° C	7 days to extraction; 40 days from extraction to analysis	(2) 1 Liter amber glass jar

[1] Actual number of samples may vary depending on field conditions, sample material availability, and field observations

[2] From date of sample collection, based on SW-846 and consistent with NYSDEC ASP when assuming 2 days for sample shipping

[3] MS/MSDs require duplicate volume for all parameters for solid matrices; MS/MSDs require triplicate volume for organic parameters for aqueous matrices and duplicate volume for inorganic parameters for aqueous matrices

TBD - To Be Determined

TCL – Target Compound List

Table 2
Summary of Quality Control Samples
QWDC Parcel 8
Long Island City, New York

Sample Type	Sample Matrix	Analytical Parameter	No. of QA/QC Samples
Trip Blank	Water	VOCs	1 per cooler
Duplicate, MS/MSD	Soil, Post-Ex.	VOC, SVOC, Metals, PCBs, alkalinity, sulfide, sulfate	1 per 20 samples
Equipment Blank	Water	VOC, SVOC, Metals, PCBs	1 per 20 samples per equipment type used