811-817 LEXINGTON AVENUE

BROOKLYN, NEW YORK

Pre-Design Investigation Work Plan

NY BCP Site Number: C224308

Prepared for:

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October 30, 2020

CERTIFICATIONS

I, Daniel Bellucci, certify that I am currently a NYS registered professional engineer and that this Pre-Design Investigation Work Plan (PDIWP) 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).

099470	10/30/20	
NYS Professional Engineer #	Date	Signature

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ATTACHMENT

1 INTRODUCTION

1.1 Purpose

This Pre-Design Investigation Work Plan (PDIWP) is provided as an Appendix to the Remedial Action Work Plan (RAWP) prepared for the property located at 811-817 Lexington Avenue, Brooklyn, New York (the "Site"; New York State Department of Environmental Conservation [NYSDEC] Brownfield Cleanup Program [BCP] ID C224308). The findings of previous Site investigations, and an analysis of alternative remediation strategies, including selection of the preferred remedial approach, are fully documented in the RAWP, which is incorporated by reference into this PDIWP.

The Site is comprised of two contiguous tax-lot parcels; Lot 51 is 8,000 square feet and is entirely occupied by a former commercial building (vacant since circa 1997) and Lot 56 is a 7,500 square feet paved parking lot. NYSDEC has determined that: 1) sufficient Site investigation has occurred in support of approval of a Remedial Investigation Report (RIR); and, 2) the RAWP must include a "pre-design" investigation to be implemented following the demolition of the structure on Lot 51, in accordance with the requirements of NYSDEC DER-10.

This PDIWP specifies fieldwork activities for the collection of additional soil, groundwater and soil vapor data throughout Lot 51 (and at additional areas at Lot 56, as needed), which are intended to provide a comprehensive data set supplementing the findings of the RIR, and allow for the proper implementation of the selected remedy.

1.2 Summary of Environmental Conditions

A previous Phase I Environmental Site Assessment identified Recognized Environmental Conditions including former petroleum storage tanks, historical commercial operations (e.g., trucking, laundry, metal working, dyeing) and potential impacts from historical commercial uses at adjoining properties.

Previous subsurface investigations included the collection of soil, groundwater and soil vapor samples. Subsurface soils consisted of urban fill (with concrete, brick, and cinders) to depths ranging from 10 to 13 feet below ground surface (bgs), underlain by native materials (silty sands and sands, documented

to 40 feet bgs in geotechnical borings). Bedrock was not encountered to depths of approximately 61 feet bgs (maximum depth reached during installation of monitoring wells). Boring refusal occurred at multiple locations at approximately 9 to 10 feet due to unknown conditions.

Twelve soil samples were collected from six soil borings, from 1 to 3 feet bgs and at deeper intervals ranging from 7 to 9 feet to 12 to 14 feet bgs. Five shallow samples contained elevated levels of metals, above NYSDEC Restricted-Residential Use (RRU) and/or Unrestricted Use (UU) Soil Cleanup Objectives (SCOs), and two locations also contained polycyclic aromatic hydrocarbons (PAHs) above RRU SCOs and pesticides above UU SCOs. Metals and PAHs above RRU SCOs were reported in one deep sample. The chlorinated solvents tetrachloroethene (PCE) and trichloroethene (TCE) were found at trace levels in several samples.

Groundwater in three wells on Lot 56 (MW-01 to MW-03) was recorded at depths from approximately 41 to 44 feet bgs, and direction of flow was determined to be easterly. Sampling documented elevated (but relatively low) levels of PCE (11 to 22 parts per billion [ppb]) and TCE (11 to 23 ppb), and impacts by metals and semi-volatile organic compounds (SVOCs; including PAHs).

Soil vapor was collected at nine locations (SV-01 to SV-09) throughout the Site. Elevated levels of PCE and/or TCE were reported throughout the Site, with the highest concentrations found at Lot 51 (peak values of 1,200 µg/m^3 PCE at SV-09 and 11,000 µg/m^3 TCE at SV-07). Elevated levels of VOCs associated with petroleum were reported at the southwestern corner of Lot 51 (e.g., total xylenes 1,910 µg/m^3).

1.3 Areas Requiring Additional Investigation

The NYSDEC has determined that additional investigation is warranted as follows:

1. Collection of soil from additional borings, including intervals corresponding to final construction depths (or deeper as required).
2. Installation of monitoring wells and collection of groundwater samples at Lot 51.
3. Targeted investigations to document the presence or absence of a solvent source area in groundwater and/or soil, and to delineate soil vapor impacts and potential off-Site migration.

2 PRE-DESIGN INVESTIGATION WORK PLAN

This PDIWP details activities proposed by GBTS to further characterize the Site so that a comprehensive assessment of Site conditions, as required by the NYSDEC BCP guidelines, is completed. All work will be conducted following the demolition of existing on-Site structures and prior to constructions activities for redevelopment. A Proposed Pre-Design Investigation Map depicting Site features, and previous and proposed sampling locations, is provided as an attachment. All proposed work will be conducted according to a Site-specific Health and Safety Plan (RAWP Appendix A).

For the purpose of the work detailed in this PDIWP, the Volunteer is 811 Lexington L.P.., who will contract with the environmental consultant/remediation firm (hereafter referred to as the On-Site Coordinator [OSC]) to provide the services detailed below. The OSC shall be a firm with experience in investigating NYSDEC BCP Sites, with the capability to certify investigation reports in conformance with DER-10 Section 1.5.

2.1 Overview of Proposed Investigative Services

The proposed investigative services described in detail in subsequent sections of this PDIWP consist of the following:

- Documentation of Underground Structures (2.2.3);
- Initiation of air monitoring during ground intrusive activities (Section 2.3.1);
- Collection of eight (8) soil vapor samples (Section 2.3.3);
- Extension of ten (10) on-Site soil borings and collection of one or more soil samples from each boring to document soil conditions (Section 2.3.4);
- Installation and sampling of five (5) new groundwater monitoring wells (Section 2.3.5); and,
- Preparation of a Pre-Design Investigation Report (PDIR; Section 2.4)

Prior to, or in conjunction with, the initiation of these actions (see Section 2.3), the tasks detailed in Section 2.2, below, will also be conducted.

2.2 Proposed Site Preparation Services

This section of the PDIWP provides details of activities and services necessary to be initiated and/or completed prior to the implementation of Site remediation services.

2.2.1 Agency Notification

The NYSDEC will be notified in writing at least five (5) business days prior to the start of fieldwork. Notification of subsequent field activities will be in accordance with reasonable business practice, with verbal notification for immediate (within 48 hours) activities and written notification otherwise. Written notifications will be transmitted to the NYSDEC via facsimile or electronic mail.

2.2.2 Utility Markout

Prior to the implementation of any of the investigative tasks outlined in Section 2.3, below, a request for a complete utility markout of the Site will be submitted as required by New York State Department of Labor regulations. Confirmation of underground utility locations will be secured, a field check of the utility markout will be conducted prior to the initiation of work.

2.2.3 Documentation of Underground Structures

The presence or absence of relevant underground structures will be documented throughout the Site, either using ground penetrating radar (GPR) or other means if GPR technology is determined to not be suitable to the Site (e.g., metal reinforcement in building slabs may be a significant limiting factor). A GPR survey will be of sufficient density to document the presence or absence of small subgrade structures, including tanks. Results will be provided to the OSC and NYSDEC prior to the extension of borings (which may be relocated based on the findings) and will be recorded on Site maps for inclusion in the PDIR. Should use of GPR not be feasible, alternative methodologies will be proposed to NYSDEC for review and approval.

2.2.4 Quality Assurance Project Plan

A Quality Assurance Project Plan (QAPP, RAWP Appendix B) has been prepared, detailing procedures necessary to generate data of sufficient quality and quantity to represent successful performance of

the Pre-Design Investigation at the Site. The QAPP includes a Sampling and Analysis Plan (SAP) for all media, which identifies methods for sample collection and handling.

A photo-ionization detector (PID) will be utilized to screen encountered materials for the presence of volatile vapors. The PID will be calibrated at the onset of each workday, and a written calibration log will be maintained for this project. The PID will be calibrated to read parts per million gas equivalents of isobutylene in accordance with protocols set forth by the equipment manufacturer.

All samples will be collected in accordance with applicable DER-10 requirements and NYSDEC and New York State Department of Health (NYSDOH) guidance documents and will be submitted to a NYSDOH ELAP-certified laboratory using appropriate chain of custody procedures. Dedicated, laboratory-supplied containers will be used for sample collection. Field personnel will maintain all samples at cold temperatures, as necessary, and complete all chain of custody forms.

Laboratory reports will include detailed Quality Assurance/Quality Control (QA/QC) analyses, including sample duplicates, rinse blanks (for non-dedicated sampling equipment), and trip blanks. A Data Usability Summary Report (DUSR) will be prepared by a third, independent party, which maintains NYSDOH ELAP CLP Certification.

2.2.5 Subcontractor Coordination

Subcontractors will perform requested services under the direct supervision of the OSC. Prior to the initiation of fieldwork, all subcontractors will be provided with a copy of the Health and Safety Plan (Section 2.2.6). Insurance certificates will be secured from subcontractors by the Volunteer and/or by the OSC. At this time, the following subcontractors are anticipated to be used on this project: GPR, driller, analytical laboratory and data validator.

2.2.6 Health and Safety Plan

The Site-specific Health and Safety Plan (RAWP Appendix A) will be reviewed with on-Site personnel (including subcontractors) prior to the initiation of fieldwork. It is anticipated that all work will be performed in “Level D” personal protective equipment; however, all on-Site field personnel will be prepared to continue services wearing more protective levels of equipment based on field conditions.

2.3 Proposed Specific Investigation Services

This section of the PDIWP provides a detailed description of the investigative tasks that will be conducted at the Site.

2.3.1 Community Air Monitoring

A Community Air Monitoring Plan (provided in the HASP) will be initiated during all ground intrusive activities. The implementation of the CAMP will document the presence or absence of specific compounds in the air surrounding the work zone, which may migrate off-Site due to fieldwork activities. This plan provides guidance on the need for implementing more stringent dust and emission controls based on air quality data. Air monitoring will be conducted for VOCs and for dust. Water misting will be used to control dust (as needed) during all ground intrusive activities, which will be limited to the extension of soil borings and installation of the monitoring wells (hand-held equipment and portable water tanks will be supplied by the driller). Water spray will include use of an odor/vapor suppressant (e.g., BioSolve) if required.

2.3.2 General Fieldwork Methodology

Fieldwork methodology will be in conformance with the QAPP (including sample handling and custody for per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane ("emerging contaminants" [ECs]), which includes copies of applicable Standard Operating Procedures (SOPs) for fieldwork activities. The QAPP provides tables indicating appropriate types of sample containers, sampling frequency and approved USEPA Methods for laboratory analysis.

All sampling locations will be determined in the field, measured to the nearest 0.5-foot relative to a permanent fixed on-Site marker, and will be recorded in logbooks for inclusion in all final maps. Anticipated sampling locations, and planned new monitoring wells, are depicted on the attached Proposed Pre-Design Investigation Map.

An assessment of media characteristics, including soil type, presence or absence of foreign materials, field indications of contamination (e.g., unusual coloration patterns or odors), and instrument readings, will be made by the OSC during all Site investigative work.

The OSC will be responsible for identifying any materials that require special handling (media that may contain elevated concentrations of contaminants or is grossly contaminated, hazardous materials, etc.) and will ensure that they are properly securely stored on-Site (soil stockpiled on plastic and covered, or soil and water placed in approved containers), pending characterization and proper disposition. The OSC will ensure that unforeseen environmental conditions are managed in accordance with applicable federal and state regulations.

2.3.3 Soil Vapor Sampling

Nine (9) soil vapor samples will be collected following building demolition from portions of the Site not well documented during the previous investigation, to screen for potential impacts from historical Site uses and/or any impacts associated with groundwater contamination.

Sampling Methodology

Soil vapor probes will be constructed by using mechanized direct-push equipment to extend a boring to a depth of 8 feet bgs.

Sample tubing (0.188-inch inner diameter Teflon) with an attached “air stone” will be inserted into the boring, which will be partially filled with clean sand. The remaining upper portion of the borehole and the surface opening will be filled and sealed with hydrated bentonite clay and/or cement grout to prevent surface air from entering the system. Construction may include the use of “Vapor Pins” or other industry standard fittings designed for sampling. Vapor in the tubing will be screened with a PID for VOCs prior to purging.

A tracer gas (e.g., helium) will be used at soil vapor sampling locations to verify that adequate sampling techniques are being implemented (i.e. to verify the absence of significant infiltration of outside air), in accordance with applicable NYSDOH guidance. The space around the sampling point will be enclosed and sealed (with a metal hemisphere and clay) in order to introduce a tracer gas (helium) into the area surrounding the probe point. Real-time sampling equipment (Radiodetection Multi-vapor Leak Locator, model MDG 2002, or equivalent) will be utilized to determine when the interior atmosphere in the enclosure reaches a concentration of 80%, and the tubing for the vapor implant will then be sampled

for the tracer gas. If helium is detected in vapor at a concentration greater than 10%, the annular seal will be repaired and gas tracing performed again until less than 10% helium is detected.

For all sampling locations, the exact purge volume will be dependent on the boring depth and subsequent length of tubing. Three borehole and tubing volumes will be purged prior to collection. The purge rate will not exceed 0.2 liters per minute. Following purging of the collection device, soil vapor samples will be collected over a two-hour period (at a rate not exceeding 0.2 liters per minute) into individual laboratory-certified clean Summa canisters equipped with two-hour flow regulators.

Sample Submission

Soil vapor samples will be analyzed for VOCs using USEPA method TO-15.

2.3.4 Soil Assessment

Soil Borings

A total of ten (10) soil borings will be extended on-Site, with additional "step out" borings extended based on field and instrument observations of contamination, in order to define the extent of Site soil containing analyte concentrations above the applicable SCOs or otherwise indicating potential contaminant source areas. Borings will be extended using mechanized equipment (or hand-held boring equipment, as necessary), capable of collecting soil cores at discreet intervals. Borings for the sampling of soil will be extended to at least 15 feet bgs. Soil will be collected into disposable acetate sleeves (the choice of equipment will be based on encountered field conditions).

Sampling Methodology

Soil will be continuously recovered from the borings and characterized in order to identify existing subsurface physical conditions and any overt evidence of contamination. Sampling of recovered material for laboratory submission will be conducted from all boring intervals, as warranted, to fully define and delineate contaminants in Site soil. Borings will be extended to a minimum depth of 15 feet bgs, with additional deeper intervals based on field evidence of contamination, unusual features, or the expected construction depths during redevelopment. Samples will be collected (at a minimum)

from the base of the boring, with additional samples to complete the characterization of upper soils, and from soil exhibiting field evidence of contamination (if encountered) or at soil strata corresponding to previously identified contamination in nearby boring locations (for delineation). Sampling events may occur in multiple rounds to ensure complete Site characterization.

Samples will be collected directly from the freshly cut open sleeve, using disposable plastic trowels or properly decontaminated stainless steel instruments, or may be manually collected directly from exposed soil or the sampling instrument using dedicated disposable latex gloves. Soil sampling for VOCs will follow USEPA Method 5035 protocols, using disposable 5-gram plastic syringes to place material into laboratory-supplied glass vials (prepared with stirs bars and appropriate preservatives).

Sample Submission

All samples will be analyzed for compounds identified in NYSDEC Part 375-6.8 Soil Cleanup Objective tables, including USEPA Target Compound List (TCL) VOCs and SVOCs plus 30 tentatively identified compounds (TICs), USEPA TAL metals (including Cr^{+6}) and cyanide, PCBs, pesticides, herbicides and ECs (1,4-dioxane and 21 PFAS identified in current NYSDEC guidance). Methods of analysis for all analyte classes are specified in the RAWP QAPP. Analytical requirements may be modified in consultation with the NYSDEC based on the presence or absence of field evidence of contamination. Additional sample collection and analysis may be performed in support of waste characterization efforts.

2.3.5 Groundwater Assessment

Five (5) new wells are proposed for locations within the existing building at Lot 51. Monitoring wells may be relocated in consultation with NYSDEC, or additional wells be installed, based on encountered conditions, including the presence of any non-aqueous phase liquids (NAPL) or other indications of gross contamination. All on-Site monitoring wells will be sampled. Well installation, well development, and sample collection and laboratory submission are detailed below.

Monitoring Well Installation

Based on previous fieldwork, it is anticipated that wells will be completed at a depth of approximately 50 feet bgs. The wells will be constructed of two-inch PVC casing with a ten-foot length of 0.01-inch

slotted PVC well screening across the water table. No glue will be used to thread the casing lengths. The wells will be constructed such that a minimum of 2 feet of screening will extend above the water table, with approximately 8 feet of screening below the water level.

The annular space between the well screen and the borehole will be backfilled with clean silica sand to a depth of approximately two feet above the well screen. A seal consisting of at least 12 inches of hydrated bentonite clay will be placed above the sand pack and the remaining annular space will be grouted with cement. A locked cap will be installed at the PVC riser and the well will be protected by a "drive-over" metal cover.

Wells will be surveyed to determine the elevation of the top of the PVC well riser for use in determining groundwater elevations. Well locations and elevations will be recorded in field logs and indicated on all fieldwork maps.

Monitoring Well Development

The wells will be developed one week following installation. The wells will be developed with a properly decontaminated mechanical pump and dedicated polyethylene tubing in order to clear fine-grained material that may have settled around the well screen and to enhance the natural hydraulic connection between the well screen and the surrounding soils.

Well development will begin at the top of the screened interval to prevent clogging of the pump within the well casing. Well development will be discontinued when the discharge water is free of obvious sediment, turbidity is below 50 NTUs and indicator parameters (e.g., dissolved oxygen, temperature, etc.) have stabilized. Upon completion, the pump assembly will be removed from the well while the pump is still running to avoid discharge of purged water back into the well. Development water will be securely stored on-Site pending laboratory analysis.

Sampling Methodology

All Site monitoring wells will be sampled (at least one week following well development) using USEPA Low-Stress ("low flow") methodology.

Sampling will be conducted using the following general protocol:

1. Basic weather conditions and all field observations will be recorded in the field logbook. Sampling will begin at the potentially least contaminated well (as determined from well location and/or previous data) and proceed to the potentially most contaminated well. Wells will be checked for damage or evidence of tampering before initiating sampling. If permissible under QAPP requirements, plastic sheeting will be placed around wells to minimize potential contamination of sampling equipment from the ground surface, and all monitoring, purging and sampling equipment will be placed on the sheeting.
2. The protective casing on the well will be unlocked, the air in the well head will be screened with a PID, and the static water level (relative to the top of the casing) will be measured with a decontaminated water-level meter. A submersible pump with plastic tubing (or equivalent equipment) will be used for sampling. The pump will be slowly lowered until reaching two to three feet off of the well bottom to prevent disturbance of sediment.
3. The water level will be measured before the pump is started and at three to five minute intervals. Pumping rates will be reduced (as needed) to the minimum capabilities of the pump to ensure stabilization of the water level (drawdown of 0.3 feet or less).
4. During pumping, field indicator parameters (turbidity, temperature, specific conductance, pH, redox potential, and dissolved oxygen) will be monitored and recorded approximately every five minutes. The well will be considered stabilized when the indicator parameters have stabilized for three consecutive readings (the minimum purge interval will be at least 15 minutes).
5. All groundwater samples will be collected in a manner consistent with the QAPP.
6. The protective cap on the well will be replaced and locked, and the field sampling crew will move to the next most contaminated well and the process will be repeated.

Sample Submission

All samples from on-Site monitoring wells (three wells on Lot 56 and five new wells at Lot 51) will be analyzed for TCL VOCs and SVOCs (+30 TICs), USEPA TAL metals (total and dissolved concentrations), pesticides, herbicides, PCBs, cyanide, Cr^{+6} and ECs. Analyses may be modified in consultation with the NYSDEC. All methods of analysis for all analyte classes are specified in the QAPP.

Groundwater Flow Calculations

The direction of groundwater flow will be determined based on elevations of static groundwater as measured at all wells, measured prior to water quality sample collection. Measurements will be collected with an electronic depth meter accurate to the nearest 0.01 foot. Data will be recorded in field logs and used to update existing maps showing direction of groundwater flow.

2.3.6 Management of Investigation-Derived Waste

Any soil cuttings will be backfilled within the originating borehole to within 12-inches of the surface, unless the following conditions exist: soil is grossly contaminated; the boring has penetrated a confining layer; a path for vertical migration would be completed; cuttings do not fit in the borehole; or, the boring will be converted to a monitoring point for groundwater or soil vapor.

Waste soil generated during the investigation will be stored on plastic sheeting or within approved DOT containers prior to being returned to the bore hole. Any materials remaining at the Site at the end of the workday will be properly covered and secured and all materials remaining after completion of the fieldwork will be containerized and disposed off-Site at a permitted facility. Discarded personal protective equipment and other fieldwork supplies will be disposed as municipal solid waste. Monitoring well purge water and other fluids will be securely stored on-Site in closed containers, pending the results of groundwater sampling and/or waste characterization, and disposed at an appropriate facility.

2.4 Documentation of Environmental Conditions

A Pre-Design Investigation Report RIR will be prepared at the completion of all fieldwork services, in accordance with DER-10, summarizing the nature of environmental conditions for all identified areas of concern. The PDIR will: document Site conditions and all investigative work; provide complete analytical findings and compare results to applicable Standards, Criteria, and Guidance (SCG); and, analyze all current and previous environmental data in regards to the remedial response action proposed in the RAWP.

The PDIR will provide complete data summary tables, figures showing all exceedances of SCGs, fieldwork and construction logs, laboratory and data validation reports, CAMP monitoring data and waste disposal documentation. All laboratory data presented in the PDIR will be submitted to NYSDEC in an acceptable electronic data deliverable (EDD) format.

3 PROJECT SCHEDULE

The following schedule is anticipated (Week 0 based on date of final Site demolition activities):

Week	Task
1	Utility markout (may include supplemental private markout, if warranted); selection of driller; secure insurance, NYSDEC notification of fieldwork
2	Installation of borings; collection of soil vapor and soil samples, completion of monitoring wells
3	Well development; collection of groundwater samples, documentation of groundwater elevation
4-6	Laboratory analysis of soil and groundwater samples
6-10	Submission of PDIR to NYSDEC (a revised RAWP may be submitted at this time)

N

LOT 56

MW-01

SB-2

SV-01

OA-01

SV-06

SB-1

MW-02

SV-02

SB-3

MW-03

approximate location of UST
observed at TP-3 (approx. 10 feet bsg)

LOT 51

SV-07

SV-08

SV-05

SB-5

BUILDING

SV-09

IA-01

SB-4

SV-04

SV-03

SB-6

811

817

sidewalk

LEXINGTON AVENUE

0 10 20
SCALE IN FEET
(APPROXIMATELY)

All feature locations are approximate. This map is intended as a schematic to be used in conjunction with the associated report, and it should not be relied upon as a survey for planning or other activities.

Legend:

- subject property border
- lot line
- proposed building outline
- ALC Environmental soil boring location (January 2018)
- ALC Environmental soil vapor location (January 2018)
- ALC Environmental ambient air sample location (January 2018)
- ALC Environmental soil vapor location (July 2019)
- GB monitoring well location (December 2019)
- proposed boring location
- proposed monitoring well location
- proposed soil vapor location

Pre-Design Investigation (PDI): Proposed Fieldwork Map

811-817 Lexington Avenue
Borough of Brooklyn, New York

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File: IB19062.40

Scale as shown

October 2020 | Attachment