ATLANTIC CHESTNUT – LOT 1

3264 FULTON STREET
BROOKLYN, NEW YORK

Remedial Design Investigation Work Plan

NYSDEC BCP Site Number: C224234
AKRF Project Number: 12492

Prepared for:

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1.0 INTRODUCTION

This Remedial Design Investigation (RDI) Work Plan (RDIWP) has been prepared by AKRF, Inc. (AKRF) on behalf of Atlantic Chestnut Affordable Housing LLC (the Volunteer) for the Atlantic Chestnut – Lot 1 site, located at 3264 Fulton Street in Brooklyn, New York, hereafter referred to as "the Site". The legal definition of the Site is Brooklyn Borough Tax Block 4143, Lot 1. Historically, Lot 1 encompassed the entirety of Block 4143, but was apportioned into three lots (Lots 1, 2, and 3) in 2016. It is noted that the New York City Tax Map has not yet been updated to reflect the tax lot apportionment. A Site Location Map is provided as Figure 1.

Atlantic Chestnut Affordable Housing LLC entered into a Brownfield Cleanup Agreement (BCA) (BCA Index No. C224234-05-16) with the New York State Department of Environmental Conservation (NYSDEC) on May 26, 2016. The Site is identified as Brownfield Cleanup Program (BCP) Site No. C224234. A Remedial Investigation (RI) was completed at the Site and a Draft RI Report (RIR) was submitted to NYSDEC in February 2017.

Based on an evaluation of the data and information from the RI, there is contaminated soil, groundwater, and soil vapor present at the Site. This RDIWP has been prepared to further delineate known soil and groundwater contamination at the Site to aid in the design of the proposed remedy, which is detailed in the Draft Remedial Action Work Plan (RAWP). The Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP), provided as Appendix E of the RAWP, will be implemented during all subsurface disturbance activities at the Site, including, but not limited to, those activities outlined in this RDIWP. The quality assurance/quality control (QA/QC) protocol detailed in the Quality Assurance Project Plan (QAPP), provided as Appendix F of the RAWP, will be strictly adhered to for the sampling described in the following sections.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description and Surrounding Land Use

The Site currently consists of an approximately 65,944-square foot concrete- and asphalt-paved parcel and was formerly developed with vacant, interconnected, fire-damaged factory buildings that extended across the two south-adjoining properties [235 Chestnut Street (BCP Site No. 224235) and 3301 Atlantic Avenue (BCP Site No. 224236)]. The buildings were demolished between July and December 2016. The elevated J and Z Metropolitan Transit Authority (MTA) subway tracks are located above Fulton Street to the north and the Long Island Railroad (LIRR) tracks are located beneath Atlantic Avenue to the south. The surrounding area is developed with residential, commercial, manufacturing, transportation, and industrial uses.

2.2 Site Geology, Hydrogeology, and Subsurface Characteristics

During the RI, groundwater was encountered at depths ranging from approximately 30.5 feet to 32.7 feet below sidewalk grade or 8.6 to 8.7 feet above national geodetic vertical datum (NGVD), an approximation of mean sea level, in groundwater monitoring wells on the northern and southern portions of the Site, respectively. Based on the well elevation survey of the Site and south-adjoining lots, groundwater flows in a southerly direction beneath the Site and surrounding area. Groundwater in this part of Brooklyn is not used as a potable source. There are no surface water bodies or streams on or immediately adjacent to the Site.

The stratigraphy of the Site, from the surface down, generally consisted of fill comprising sand, silt, gravel, concrete, brick, and metal up to a maximum depth of 6 feet below grade, underlain by apparent native sand with varying amounts of gravel and silt to boring termination depths (up to 35 feet below grade).

2.3 Site History and Previous Owners

Historic records indicate that the Site was developed with residences and a road in 1887 and with industrial and manufacturing uses, including the Columbia Machine Works and Malleable Iron Company, the Columbia Cable and Electric Corporation, Blue Ridge Farms, Inc., and Chloe Foods Corp. between 1908 and 2012. Blue Ridge Farms, Inc. and Chloe Foods Corp. are listed on multiple Federal and State databases. Prior uses that appear to have led to Site contamination include blacksmithing and stamping, a brass foundry, wood working, a blacksmith, a machine shop, tank and engine rooms, an iron works, wire braiding, and cable manufacturing. The Site has remained vacant since a July 2012 fire caused severe structural damage to the former Site buildings.

Demolition of the Site buildings was completed between July and December 2016. Past owners of Block 4143, Lot 1 include: Columbia Electric Realty, Inc. in 1980; Avnal, Inc. from 1980 to 1984; Blue Ridge Farms, Inc. from 1984 to 2004; 3301 Atlantic Avenue, LLC from 2004 to 2013; Sapphire Luxury Estates, LLC from 2013 to 2014; Atlantic Chestnut, LLC from 2014 to 2015; and Atlantic Chestnut Affordable Housing, LLC from 2015 to present.

3.0 PREVIOUS ENVIRONMENTAL REPORTS

Subsurface (Phase II) Investigation Report – Blue Ridge Farms, 3301 Atlantic Avenue, 84 Dinsmore Place, and 111 Dinsmore Place, Brooklyn, New York, AKRF, Inc. (AKRF), May 2001

AKRF conducted a Subsurface (Phase II) Investigation of a larger area including the Site in May 2001. At the time of this investigation, the Site was developed with food processing and storage buildings. The Subsurface (Phase II) Investigation included the performance of a geophysical survey across exterior portions of the Site and the advancement of four soil borings with the collection and analysis of soil samples, and the installation of temporary groundwater monitoring wells with the collection and analysis of groundwater samples. The scope of the investigation was based on a December 2000 Phase I Environmental Site Assessment (ESA) of the Site by IVI Environmental, Inc.

Due to reinforced concrete across the Site, the geophysical survey was inconclusive. Soil consisted of fill material (brick, concrete, asphalt, clay, silt, sand, and gravel) up to 6 feet below grade, underlain by native soil (sand, gravel, silt, and clay) to 16 feet below grade. Groundwater was encountered at approximately 32 feet below grade.

Petroleum-related volatile organic compounds (VOCs) and the semivolatile organic compound (SVOC) naphthalene were detected above NYSDEC Recommended Soil Cleanup Objectives (RSCOs) listed in the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) in the soil samples collected, the applicable soil cleanup objectives at the time of the investigation. Solvent and petroleum-related VOCs and metals were detected above Ambient Water Quality Standards (AWQS) and Guidance Values listed in the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) Memo in the groundwater sample collected from the south adjacent property. VOCs were detected above TOGS in pre- and post- process water samples. Based on elevated photoionization detector (PID) detections and laboratory analytical data from the soil borings surrounding the on-site tank system, Spill No. 0101620 was assigned to the historic address 3301 Atlantic Avenue.

AKRF recommended the preparation of a work plan to be submitted to the NYSDEC to further delineate, excavate, and dispose of petroleum-contaminated soil at the south-adjacent property to close Spill No. 0101620.

Phase I Environmental Site Assessment (ESA) – 3301 Atlantic Avenue, 3238 Fulton Street, 226-296 Euclid Avenue, and 215-279 Chestnut Street, Brooklyn, New York, Property Solutions, Inc. (PSI), June 2010

PSI conducted a Phase I ESA of a larger area including the Site in April 2014. The Phase I ESA identified historical uses at the Site including: a machine and iron works facility, an electrical cable manufacturer, and a food processing plant; records indicating that five underground storage tanks (USTs) were previously located on the Site; and Historic Recognized Environmental Conditions (HRECs) at the Site, including the Site's listing in the Leaking Underground Storage Tank (LUST) and Spills databases. PSI recommended conducting a Subsurface (Phase II) Investigation, including a geophysical survey, to investigate the potential impacts associated with historic operations and fuel oil storage at the Site.

Asbestos Investigation and Bulk Sample/Laboratory Analysis – 3301 Atlantic Avenue, Brooklyn, New York, Safety Environmental, Co. of NY, Inc. (Safety), July 2013

Safety conducted an asbestos survey of the buildings located on the southern portion of the Site and south-adjacent to the Site in July 2013. A total of 131 samples were collected for laboratory

analysis from on- and off-site portions of the building. Asbestos-containing material (ACM) was identified within the former buildings at the following locations: boiler No. 4 door insulation, boiler No. 3 caulking, first floor pipe insulation, roof transite shingles, roof membranes, roof flashing, and roof vent membranes. Safety recommended removal of all ACM prior to demolition of the former Site buildings.

Phase I Environmental Site Assessment (ESA) – 3301 Atlantic Avenue (Block 4143, Lot 1), Brooklyn, New York, Legette, Brashears, & Graham, Inc. (LBG), March 2014

LBG conducted a Phase I ESA of the Site and the south-adjoining lots in April 2014. The Phase I ESA identified Recognized Environmental Conditions (RECs) associated with former uses at the Site, including: blacksmithing and stamping, a machine and iron works shop, an electric cable manufacturer, a gasoline filling station, and listings in the Spills database. The report noted the following de Minimis conditions: nearby hazardous materials/waste storage, use, or releases; and the potential presence of ACM, lead based paint (LBP), and fluorescent lighting at the Site. LBG recommended that any contaminated soil discovered during redevelopment of the Site should be handled according to applicable federal, state, and local regulations.

Chain of Title Summary Report – 3301 Atlantic Avenue and 242 Chestnut Street, Brooklyn, New York, Phipps Houses, 2015

A Chain of Title Summary Report was compiled by Phipps Houses, which outlined ownership of the Site and south-adjacent and nearby properties between 2004 and 2015. The report showed the transfer of ownership from Blue Ridge Farms, Inc. to 3301 Atlantic Avenue, LLC in May 2004; from 3301 Atlantic Avenue, LLC to Sapphire Luxury Estates, LLC in July 2013; a foreclosure and sale judgement for the Site and north-adjacent properties to be sold at public auction in September 2013; and an agreement for assignment of rights and claims from Blue Ridge Farms, Inc. to 3301 Atlantic Partners, LLC in March 2014.

Phase I Environmental Site Assessment (ESA) – 3301 Atlantic Avenue and 242 Chestnut Street, Brooklyn, New York, AKRF, Inc. (AKRF), September 2015

AKRF conducted a Phase I ESA of a larger area including the Site in September 2015. The Phase I ESA identified the following RECs at the Site:

- Historic on-site industrial operations, including the Columbia Machine Works and Malleable Iron Company, and the Columbia Cable and Electric Corporation. It was concluded that undocumented releases from historic industrial uses may have affected subsurface conditions at the Site.
- The address 3301 Atlantic Avenue was formerly associated with the entirety of Block 4143. At the time of the Phase I ESA, 3301 Atlantic Avenue was listed in the following databases: PBS database for the storage of several USTs and aboveground storage tanks (ASTs); Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS); chemical bulk storage (CBS); Spill database for Spill No. 0101620; Toxic Release Inventory System (TRIS); and Air Discharge Facility (ADF) databases. It was reported that these listings may have been related to the Site and/or south-adjoining property(ies).
- The former interconnected factory buildings were damaged by a fire in 2012. Abundant debris, including metal, wood, and ash were observed throughout the buildings during the Site inspection. Based on the documented storage of petroleum and chemicals, it was

concluded that undocumented discharges due to the fire may have affected subsurface conditions at the Site, including high concentrations of metals and SVOCs in the ash.

- Two July 2013 Asbestos Reports identified ACM throughout the former buildings' interiors and on exterior built-up roofing materials. Interior and exterior building materials were observed to be in fair to poor condition, with the majority of the eastern portion of the former Site buildings damaged by fire. Observed painted surfaces were generally in fair to poor condition. Based on the age of the former Site buildings, it was concluded that LBP may have been present and the fluorescent lighting fixtures and remaining electrical equipment may have contained mercury and/or polychlorinated biphenyls (PCBs). No evidence of leaks or stains from these fixtures and equipment was observed; however, it was noted that releases may have occurred during the fire that were not able to be investigated due to inaccessibility and/or debris throughout the Site buildings.

AKRF recommended a Subsurface (Phase II) Investigation to characterize subsurface conditions of soil, groundwater, and soil vapor throughout the Site prior to redevelopment.

Subsurface (Phase II) Investigation Report – 3264 Fulton Street, Brooklyn, New York, AKRF, Inc. (AKRF), January 2016

AKRF conducted a Subsurface (Phase II) Investigation at the Site in December 2015. The Subsurface (Phase II) Investigation included the advancement of three soil borings with the collection and laboratory analysis of six soil samples; the installation of one temporary, one-inch diameter polyvinyl chloride (PVC) groundwater monitoring well at one of the boring locations with the collection and laboratory analysis of one groundwater sample; and the installation of one temporary soil vapor point with the collection and laboratory analysis of one soil vapor sample. An ambient air sample was collected for comparison and QA/QC purposes. The scope of the investigation was based on the September 2015 Phase I ESA by AKRF.

Soil beneath the Site consisted of fill material (sand, gravel, silt, concrete, brick, ash, and asphalt) to depths up to approximately 11 feet below grade, underlain by apparent native soil (sand and gravel) up to 40 feet below grade (the extent of the soil borings). Groundwater was encountered at approximately 30 feet below grade.

The VOC TCE was detected in two soil samples at concentrations above its Unrestricted Use Soil Cleanup Objective (UUSCO). Arsenic, copper, lead, and zinc were detected in soil samples at concentrations above respective UUSCOs and/or RRSCOs. The VOC chloroform was detected in the groundwater sample at a concentration slightly above its Ambient Water Quality Standard (AWQS). Sodium was detected in the unfiltered and filtered groundwater sample at concentrations above its AWQS. VOCs associated with petroleum were detected in soil vapor samples at individual concentrations up to 161 micrograms per cubic meter ($\mu g/m^3$). Solvent-related VOCs were detected at individual concentrations up to 903 $\mu g/m^3$. TCE was detected in the soil vapor sample at concentrations of 903 $\mu g/m^3$, above its AGV of 2 $\mu g/m^3$. According to New York State Department of Health (NYSDOH) Soil Vapor/Indoor Air Matrix 1, the applicable matrix for TCE, sub-slab soil vapor concentrations of 250 $\mu g/m^3$ and above result in a mitigate action, even if the indoor air concentration is less than 0.25 $\mu g/m^3$.

AKRF concluded that these soil, groundwater, and soil vapor contaminants appear to be associated with former industrial operations at the Site.

Remedial Investigation (RI) Report (RIR) – Atlantic Chestnut – Lot 1, 2364 Fulton Street, Brooklyn, New York, AKRF, Inc. (AKRF), April 2017

AKRF conducted an RI at the Site in December 2016 in accordance with the NYSDEC-approved November 2015 RI Work Plan (RIWP). The RI included: the performance of a geophysical survey across accessible portions of the Site; the advancement of 14 soil borings and the collection of 26 soil samples for chemical analysis; the installation of 5 permanent, 2-inch diameter groundwater monitoring wells and the collection of 5 groundwater samples for chemical analysis; the installation of 6 temporary soil vapor probes across the Site and the collection of 6 soil vapor samples and one ambient air samples for chemical analysis; and the survey of groundwater monitoring well elevations on the Site and south-adjoining lots to develop Site-specific and local groundwater contour maps to determine groundwater flow beneath the Site and surrounding area.

The stratigraphy of the Site, from the surface down, generally consisted of fill comprising sand, silt, gravel, concrete, brick, and metal up to a maximum depth of 6 feet below grade, underlain by apparent native sand with varying amounts of gravel and silt to boring termination depths (up to 35 feet below grade). Groundwater was encountered at depths ranging from approximately 30.5 feet to 32.7 feet below sidewalk grade or 8.6 to 8.7 feet above national geodetic vertical datum (NGVD), an approximate of mean sea level in groundwater monitoring wells on the northern and southern portions of the Site, respectively. Based on the well elevation survey, groundwater flows in a southerly direction beneath the Site and surrounding area.

The RIR concluded that contaminated soil, groundwater, and soil vapor present at the Site were likely attributable to historic Site usage, including industrial and manufacturing uses. The presence of copper, hexavalent chromium, lead, mercury, and zinc in shallow fill and the elevated detections of polycyclic aromatic hydrocarbons (PAHs) in soil were attributed to historic filling, undocumented discharges due to a fire in 2012, and/or historic operations at the Site. The presence of petroleum-related compounds in soil vapor were likely related to the former storage tanks and/or historic Site usage. The presence of the chlorinated solvent-related compounds TCE (in soil, groundwater, and soil vapor), PCE (in groundwater and soil vapor), chloroform (in groundwater), and carbon tetrachloride (in soil vapor) were likely related to the historic manufacturing operations at the Site.

4.0 FIELD PROGRAM

The RDI field program will focus on collecting soil and groundwater data to determine the vertical and horizontal extent of Site contamination and to aid in the design of the proposed remedy.

4.1 Field Program Summary

The field sampling scope of work (SOW) consists of the advancement of 22 soil borings with the collection and laboratory analysis of soil samples from each boring; and the installation of 4 nested groundwater monitoring wells with the collection and laboratory analysis of 12 groundwater samples from the proposed nested groundwater monitoring wells. Five groundwater samples will also be collected from the five monitoring wells (L1-RI-MW-1 through L1-RI-MW-5) installed during the December 2016 RI. The proposed soil borings and nested groundwater monitoring well locations, and the existing groundwater monitoring wells are shown on Figure 2. The following sections describe the methods that will be used to complete the aforementioned SOW.

The rationale for the proposed sample locations is summarized on Table 1.

Table 1
Proposed Sample Locations and Rationale

Sampling Locations	Location	Rationale
L1-RDI-SB-15 and L1-RDI-SB-16	Southwestern portion of Site	To assess CVOCs, PAHs, and heavy metals in soil between 5 and 15 feet below grade on the southwestern portion of the Site
L1-RDI-SB-17 through L1-RDI-SB-33	Southern portion of Site	To horizontally and vertically delineate elevated concentrations of TCE in soil on the southern portion of the Site
L1-RDI-SB-34 through L1-RDI-SB-36	Eastern portion of Site	To assess CVOCs, PAHs, and heavy metals in soil between grade and 6 feet below grade (15 feet below sidewalk grade) on the eastern portion of the Site
L1-RDI-MW-6 through L1-RI-MW-8	South-central portion of Site	To horizontally and vertically delineate CVOC concentrations in groundwater on the southern portion of the Site
L1-RDI-MW-9	North-central portion of south-adjacent property (Lot 2)	To horizontally and vertically delineate CVOC concentrations in groundwater downgradient/off-site of soil source identified during the RI
L1-RI-MW-1 through L1-RI-MW-5	Eastern, southern, and western portions of the Site	To assess groundwater for the presence of emerging contaminants (1,4-dioxane, PFOA, and PFOS)

4.2 Soil Boring Installation and Soil Sampling

A Geoprobe™ direct-push drill rig will be used to advance soil borings L1-RI-SB-15 through L1-RI-SB-33 and a Rotosonic drill rig will be used to advance soil borings L1-RI-SB-34 through L1-RI-SB-36 at the approximate locations shown on Figure 2. For soil borings drilled using the Geoprobe™, soil cores will be collected in five-foot long, two-inch diameter, stainless steel macrocore piston rod samplers fitted with an internal, dedicated acetate liner. For soil borings drilled using a Rotosonic drill rig, soil cores will be collected in five-foot long, four-inch diameter dedicated plastic bags. Soil samples will be inspected by AKRF field personnel for evidence of contamination (e.g., odors and staining), screened for the presence of VOCs with a PID equipped with a 11.7 electron volt (eV) lamp, and logged using the modified Burmister soil classification

system. The PID will be calibrated in accordance with manufacturer's recommendations prior to sampling.

Five of the 22 soil borings (L1-RDI-SB-15, L1-RDI-SB-16, and L1-RDI-SB-34 through L1-RDI-SB-36) will be advanced at the location of the proposed new building cellars. Soil borings L1-RDI-SB-34 through L1-RDI-SB-36 will be advanced at the location of the proposed eastern cellar to approximately 6 feet below surface grade (approximately 15 feet below sidewalk grade). At these sampling locations, one soil sample will be collected from each soil boring from approximately 4 to 6 feet below grade (approximately 13 to 15 feet below sidewalk grade). Soil borings L1-RDI-SB-15 and L1-RDI-SB-16 will be advanced along the western portion of the Site at the location of the western proposed cellar to approximately 15 feet below grade. At these sampling locations, two soil samples will be collected from each of the soil borings at 5 and 15 feet below grade. Four additional soil samples will be collected from each boring at 7, 9, 11, and 13 feet below grade, and will be placed on hold pending the laboratory results of the 5- and 15-foot samples.

The remaining 17 soil borings (L1-RDI-SB-17 through L1-RDI-SB-33) will be advanced across the southern portion of the Site to approximately 15 feet below grade. At these sampling locations, one soil sample will be collected from approximately 4 to 5 feet below grade. Additional soil samples will be collected from each two-foot interval between 5 and 15 feet below grade (i.e., 5-7 feet below grade, 7-9 feet below grade, etc.) and will be placed on hold pending laboratory analytical results of the 4-5 foot sample in each boring.

Soil samples slated for laboratory analysis (including soil samples placed on hold) will be labeled and placed in laboratory-supplied containers and shipped to the laboratory via courier with appropriate chain of custody documentation in accordance with appropriate United States Environmental Protection Agency (USEPA) protocols to a NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory. The soil samples collected from soil borings L1-RDI-SB-15, L1-RDI-SB-16, and L1-RDI-SB-34 through L1-RDI-SB-36) will be analyzed for chlorinated solvent VOCs (CVOCs) by EPA Method 8260, PAHs by EPA Method 8270, and Resource Conservation and Recovery Act (RCRA) metals by EPA Method 6000/7000 series. The soil samples collected from soil borings L1-RDI-SB-17 through L1-RDI-SB-33 will be analyzed for CVOCs by EPA Method 8260 only. The soil samples placed on hold will be activated as necessary to further delineate any elevated CVOCs identified in adjacent soil borings. A standard turnaround time and Category B deliverables will be requested from the laboratory.

One blind duplicate, field blank, trip blank and matrix spike/matrix spike duplicate (MS/MSD) will be collected for QA/QC purposes for every 20 field samples collected. It is anticipated that four field blanks, four blind duplicates, four matrix spike/matrix spike duplicates (MS/MSDs), and four trip blanks will be required during the soil boring portion of the field investigation. The QA/QC samples, with the exception of the trip blanks, will be analyzed for the testing parameters of the associated collected samples. Trip blanks will be analyzed for CVOCs only. The data will be reviewed by a third-party validator and a Data Usability Summary Report (DUSR) will be prepared to document the usability and validity of the data. The soil boring locations will be surveyed using the Global Positioning System (GPS) and will be measured off of fixed points in the field.

4.3 Nested Groundwater Monitoring Well Installation and Development

Four nested permanent monitoring wells (denoted as L1-RDI-MW-6 through L1-RDI-MW-9) will be installed using a Rotosonic drill rig at the locations shown on Figure 2. To collect groundwater samples from varying depths beneath the Site, each of the nested groundwater wells

will be installed with three, 2-inch diameter polyvinyl chloride (PVC) well casings (shallow, intermediate, and deep). The casings will be screened between 25 and 35 feet below grade, 50 and 60 feet below grade, and 70 and 80 feet below grade to sample shallow, intermediate, and deep groundwater, respectively. Groundwater well construction of each casing will consist of 10 feet of 0.020-inch slotted PVC well screen; solid PVC riser will be installed to the ground surface. A No. 2 morie sandpack will be installed to two feet above the well screen. The annular space around the solid well riser will be sealed with bentonite and the well will be completed with a non-shrinking cement mixture to approximately one foot below grade. Each of the wells will be finished with locking j-plugs and a flush-mounted protective locking well cover. Well construction logs will be prepared and included as an appendix to the RDI Report (RDIR).

Immediately following installation, each groundwater monitoring well will be developed via pumping and surging to remove any accumulated fines and establish a hydraulic connection with the surrounding aquifer. Development will continue until turbidity within the well is less than 50 nephelometric turbidity units (NTUs) for three successive readings and until water quality indicators have stabilized to within 10% for pH, temperature and specific conductivity for three successive readings, or until at least three well volumes have been purged from the well. Well development details will be noted on groundwater development logs.

4.4 Groundwater Elevation Survey

The monitoring wells will be surveyed by a New York State-licensed surveyor to determine their accurate location and elevation. Four elevation measurements will be taken at each well location: the at-grade elevation; and the elevation of the top of each of the three PVC casings (north sides, at marking), to facilitate preparation of a groundwater contour map and the direction of groundwater flow. The elevation datum for the sampling points will be based on NVAD 88 Elevation Datum with the horizontal datum being based on NYS Plane Coordinates Long Island Zone.

4.5 Groundwater Sampling

In accordance with Environmental Protection Agency (EPA) low-flow sampling protocols, the groundwater wells will be sampled one to two weeks following development using a submersible pump. Prior to sampling, an electronic interface meter will be used to measure water levels and thickness of separate phase product, if any. The purge water will be monitored for turbidity and water quality indicators (i.e., pH, dissolved oxygen, oxidation-reduction potential, temperature, and specific conductivity) with measurements collected approximately every five minutes. The criteria for stabilization will be three successive readings within ±10% for pH, temperature, and specific conductivity.

Groundwater samples will be placed in laboratory-supplied containers and shipped in accordance with appropriate EPA protocols to a NYSDOH ELAP-certified laboratory. The samples will be analyzed for 1,4-Dioxane by EPA Method modified 8260C Selective Ion Monitoring (SIM), and Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) by EPA Method 537 using Category B deliverables. The groundwater samples collected from groundwater monitoring wells L1-RDI-MW-6 through L1-RDI-MW-9 will also be analyzed for CVOCs by EPA Method 8260. A standard turnaround time will be requested from the laboratory.

One blind duplicate, field blank, trip blank and MS/MSD sample will be collected for QA/QC purposes. The QA/QC samples will be analyzed for the same analytes as the samples with the exception of the trip blank, which will be analyzed for CVOCs and 1,4-Dioxane only. The data

will be reviewed by a third-party validator and a DUSR will be prepared to document the usability and validity of the data.

4.6 Quality Assurance / Quality Control (QA/QC)

Additional analysis will be included for quality control measures, as required by the Category B sampling techniques. The QA/QC samples for soil and groundwater will include one field blank, one trip blank, one MS/MSD, and one blind duplicate sample at a frequency of one sample per 20 field samples per media. The field blank, blind duplicate, and MS/MSD soil samples will be analyzed for CVOCs by EPA Method 8260, PAHs by EPA Method 8270, and RCRA metals by EPA Method 6000/7000s series using Category B deliverables. The field blank, blind duplicate, and MS/MSD groundwater samples will be analyzed for CVOCs by EPA Method 8260, 1,4-Dioxane by EPA Method modified 8260C SIM, and PFOA and PFOS by EPA Method 537. One laboratory-prepared trip blank will be submitted for analysis of CVOCs and 1,4-dioxane to determine the potential for cross-contamination. The QAPP describes the QA/QC protocols and procedures that will be followed during implementation of this RDIWP. The QAPP is included as Appendix A.

4.7 Decontamination Procedures

All non-dedicated sampling equipment (e.g., submersible pumps and oil/water interface probe) will be decontaminated between sampling locations using the following procedure:

1. Scrub equipment with a bristle brush using a tap water/Simple Green® solution.
2. Rinse with tap water.
3. Scrub again with a bristle brush using a tap water/Simple Green® solution.
4. Rinse with tap water.
5. Rinse with distilled water.
6. Air-dry the equipment.

4.8 Management of Investigation-Derived Waste (IDW)

After each soil boring is completed, the hole will be filled with bentonite chips (hydrated) and patched with asphalt or concrete to match existing surface conditions. Soil cuttings and development, purge, and sampling groundwater will be containerized in properly labeled DOT-approved 55-gallon drums for future off-site disposal at a permitted facility. The drums will be sealed at the end of each work day and labeled with the date, the well or boring number(s), the type of waste (i.e., drill cuttings, decontamination fluids, development water, or purge water) and the name of an AKRF point-of-contact. All drums will be labeled "pending analysis" until laboratory data is available. All IDW will be disposed of or treated according to applicable local, state, and federal regulations. Disposable sampling equipment, including spoons, gloves, bags, paper towels, etc. that come in contact with environmental media will be double bagged and disposed of as municipal trash in a facility trash dumpster as non-hazardous refuse.

5.0 REPORTING REQUIREMENTS

5.1 Remedial Design Investigation Report (RDIR)

Upon completion of all field work and receipt of laboratory analytical results, a RDIR will be prepared that will document field activities; present field and laboratory data; discuss conclusions and recommendations drawn from the results of the investigation; and detail the soil and groundwater remedies.

5.1.1 Description of Field Activities

This section of the RDIR will describe the field methods used to characterize the Site conditions, including: sampling techniques; field screening equipment; drilling and excavation equipment; monitoring well installation procedures; and management of IDW.

5.1.2 Soil Boring Assessment

The RDIR will include a section that presents field and laboratory data for soil results. The section will include a description of soil characteristics and figures will be provided that illustrate soil boring locations. Field and laboratory analytical results will be presented in the body of the report, summarized in tables and figures, and the detected concentrations will be compared to regulatory standards and/or guidance values. Soil boring logs and laboratory analytical reports will be provided as attachments. Category B deliverables will be provided by the laboratory and a third-party DUSR will be prepared.

5.1.3 Groundwater Assessment

The RDIR will include a section that presents field and laboratory data from the groundwater monitoring results. The section will include a description of groundwater characteristics and figures will be provided that illustrate monitoring well locations. Well survey data and water level measurements will be used to create a groundwater contour map and determine groundwater flow direction. Field and laboratory analytical results will be presented and compared with regulatory standards and/or guidance values. Well construction, well development, and low-flow groundwater sampling logs and laboratory analytical reports will be provided as attachments. Category B deliverables will be provided by the laboratory and a third-party DUSR will be prepared.

6.0 CERTIFICATION

I, Deborah Shapiro, QEP, certify that I am currently a Qualified Environmental Professional (QEP) as defined in 6 NYCRR Part 375 and that this RDIWP 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).

Deborah Shapiro, QEP		06/30/2017
Name	***Signature***	***Date***

7.0 REFERENCES

1. Subsurface (Phase II) Investigation Report – Atlantic Chestnut- Lot 3, 3301 Atlantic Avenue, Brooklyn, New York, AKRF, Inc., January 2016.
2. Subsurface (Phase II) Investigation – 235 Chestnut Street, Brooklyn, New York, AKRF, January 2016.
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4. U.S. Geological Survey, Brooklyn, N.Y. – Brooklyn Quadrangle, 7.5 minute Series (Topographic), Scale 1:24,000, 1966, Photorevised 2011.
5. 6 NYCRR Section 375-6: Remedial Program Soil Cleanup Objectives (SCOs), December 14, 2006.
6. NYSDEC Division of Water Technical and Operational Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, March 1998.
7. U.S. Geological Survey, Open Files Report 89-462, Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey, Sheet 3 - Bedrock Contours and Outcrops, 1990.
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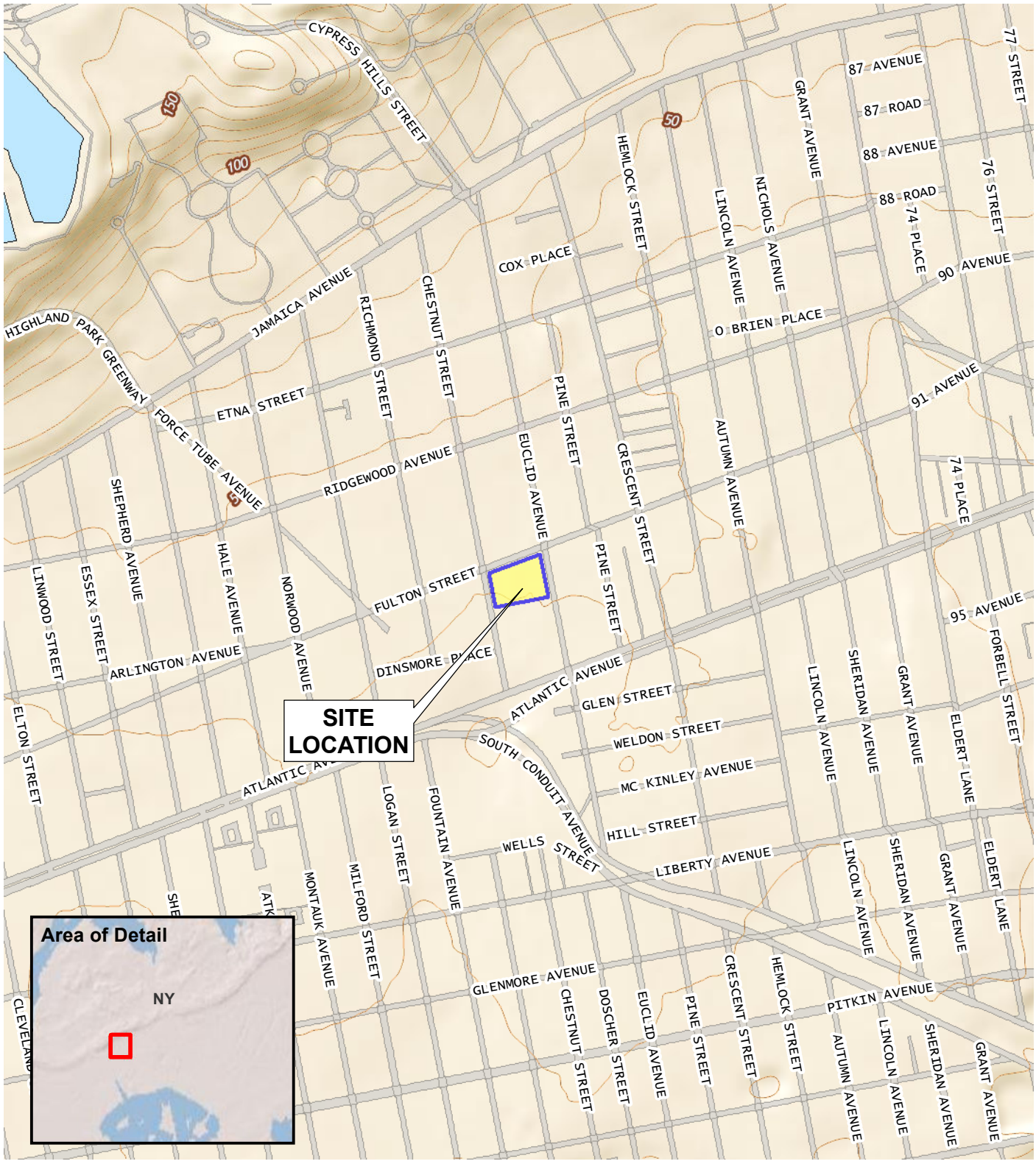
10. Conestoga-Rovers & Associates – Status Report, February 2007.
11. Conestoga-Rovers & Associates – Status Report, September 2007.
12. Phase I Environmental Site Assessment (ESA) – 3301 Atlantic Avenue, 3428 Fulton Street, 226-296 (even) Euclid Avenue, and 215-279 (odd) Chestnut Street, Brooklyn, New York, Property Solutions, Inc., June 2010.
13. Asbestos Investigation and Bulk Sample/Laboratory Analysis – 3301 Atlantic Avenue, Brooklyn, New York, Safety Environmental Co. of NY, Inc., July 2013.
14. Phase I Environmental Site Assessment (ESA) – 3301 Atlantic Avenue (Block 4143, Lot 1), Brooklyn, New York, Legette, Brashears, & Graham, Inc., April 2014.
15. Test Pit Report – 3301 Atlantic Avenue, Brooklyn, New York, Galli Engineering, P.C., October 2014.
16. Chain of Title Summary Report – 3301 Atlantic Avenue and 242 Chestnut Street, Brooklyn, New York, Phipps Houses, 2015.
17. Phase I Environmental Site Assessment (ESA) – 3301 Atlantic Avenue and 242 Chestnut Street, Brooklyn, New York, AKRF, September 2015.
18. Remedial Investigation Report (RIR) – Atlantic Chestnut – Lot 1, 3301 Atlantic Avenue, Brooklyn, New York, AKRF, Inc., April 2016.

FIGURES



SOURCE
USGS: Copyright:© 2014 Esri, USGS The National Map:

0 800 1,600 Feet

AKRF
440 Park Avenue South, New York, NY 10016

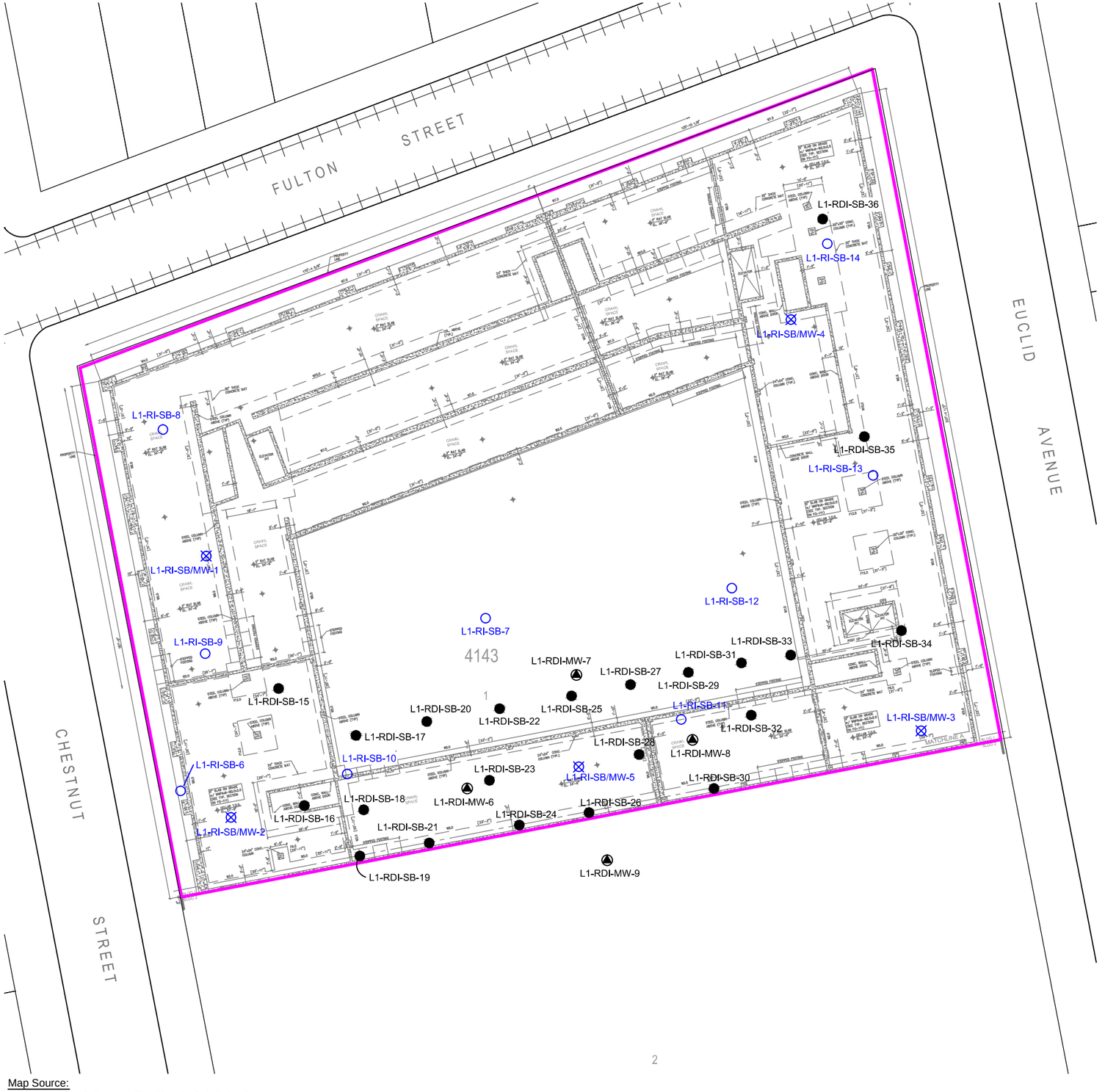
Atlantic Chestnut - Lot 1
3264 Fulton Street
Brooklyn, New York

SITE LOCATION

DATE
3/8/2017

PROJECT NO.
12492

FIGURE
1



Map Source:
- NYCDCP (NYC Dept. of City Planning) GIS database.

LEGEND

- PROJECT SITE BOUNDARY
- 1 — LOT BOUNDARY
- 4143 — BLOCK NUMBER
- ○ — REMEDIAL INVESTIGATION SOIL BORING LOCATION (2015)
- ⊠ — REMEDIAL INVESTIGATION SOIL BORING/GROUNDWATER MONITORING WELL LOCATION (2015)
- ● — PROPOSED SOIL BORING LOCATION
- ◭ — PROPOSED NESTED GROUNDWATER MONITORING WELL LOCATION

0 20 40 80
SCALE IN FEET

AKRF
440 Park Avenue South, New York, N.Y. 10016

Atlantic Chestnut - Lot 1
3264 Fulton Street
Brooklyn, New York

PROPOSED SAMPLE LOCATION PLAN

DATE
4/4/2017

PROJECT NO.
12492

FIGURE
2

APPENDIX A

ATLANTIC CHESTNUT – LOT 1
3264 FULTON STREET
BROOKLYN, NEW YORK

Quality Assurance Project Plan

AKRF Project Number: 12492
BCP Site Number: C224234

Prepared for:

NYSDEC Region 2
1 Hunter's Point Plaza
47-40 21st Street
Long Island City, New York 11101

On Behalf Of:

Atlantic Chestnut Affordable Housing LLC
902 Broadway, 13th Floor
New York, New York 10010

Prepared by:

AKRF, Inc.
440 Park Avenue South
New York, New York 10016
(212) 696-0670

JUNE 2017

TABLE OF CONTENTS

TABLES

ATTACHMENTS

1.0 INTRODUCTION

This Draft Quality Assurance Project Plan (QAPP) describes the protocols and procedures that will be followed during implementation of all environmental sampling, including under the Remedial Design Investigation Work Plan (RDIWP) and the Remedial Action Work Plan (RAWP) at the Atlantic Chestnut – Lot 1 site, hereafter referred to as the Site. The Site is an approximately 65,994-square foot parcel located at 3264 Fulton Street in the East New York neighborhood of Brooklyn, New York. The Site is legally identified as Brooklyn Borough Tax Block 4143, Lot 1. Historically, Lot 1 encompassed the entirety of Block 4143; however, the New York City Department of Finance (NYSDOF) issued a tax lot apportionment in January 2016, which redefined Lot 1 as Lots 1, 2, and 3. It is noted that the New York City Tax Map has not been updated to reflect the tax lot apportionment.

The objective of this QAPP is to provide for Quality Assurance (QA) and maintain Quality Control (QC) of environmental investigative, sampling, and remedial activities conducted under the New York State Department of Environmental Conservation (NYSDEC) oversight in the Brownfield Cleanup Program (BCP) (BCP Site No. C224234). Adherence to the QAPP will ensure that defensible data will be obtained during all environmental work at the Site.

2.0 PROJECT TEAM

The project team will be drawn from AKRF professional and technical personnel, and AKRF's subcontractors. All field personnel and subcontractors will have completed a 40-hour training course and updated 8-hour refresher course that meet the Occupational Safety and Health Administration (OSHA) requirements of 29 CFR Part 1910. The following sections describe the key project personnel and their responsibilities.

2.1 PROJECT DIRECTOR, REMEDIAL ENGINEER, AND QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) OFFICER

The project director will be responsible for the general oversight of all aspects of the project, including scheduling, budgeting, data management, and field program decision-making. The project director will communicate regularly with all members of the AKRF project team and the NYSDEC to ensure a smooth flow of information between involved parties. Michelle Lapin, P.E. will serve as the project director for the RAWP.

Ms. Lapin will also serve as the QA/QC officer and will be responsible for adherence to the QAPP. The QA/QC officer will review the procedures with all personnel prior to commencing any fieldwork and will conduct periodic Site visits to assess implementation of the procedures. The QA/QC officer will also be responsible for reviewing Data Usability Summary Reports (DUSRs) for soil analytical results. Ms. Lapin's resume is included in Attachment A.

2.2 PROJECT MANAGER

The project manager will be responsible for directing and coordinating all elements of the RAWP. The project manager will prepare reports and participate in meetings with the Site owner/Volunteer, and/or the NYSDEC. Deborah Shapiro will serve as the project manager for the RAWP. Ms. Shapiro's resume is included in Attachment A.

2.3 PROJECT MANAGER ALTERNATE

The project manager alternate will be responsible for assisting the project manager. The project manager alternate will help prepare reports and will participate in meetings with the Site

owner/Volunteer, and/or the NYSDEC. Amy Jordan will serve as the project manager alternate for the RAWP. Ms. Jordan's resume is included in Attachment A.

2.4 FIELD TEAM LEADER,FIELD TECHNICIAN, AND SITE SAFETY OFFICER, AND ALTERNATES

The field team leader will be responsible for supervising the daily sampling and health and safety activities in the field and will ensure adherence to the work plan and Health and Safety Plan (HASP), included in Appendix H of the RAWP. The field team leader will also act as the field technician and Site safety officer (SSO), and will report to the project manager or project manager alternate on a regular basis regarding daily progress and any deviations from the work plan. The field team leader will be a qualified and responsible person able to act professionally and promptly during environmental work at the Site. Tom Giordano will be the field team leader. The field team leader alternate is Adrianna Bosco of AKRF. Mr. Giordano's and Ms. Bosco's, resumes are included in Attachment A.

2.5 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) OFFICER

The laboratory QA/QC officer will be responsible for quality control procedures and checks in the laboratory and ensuring adherence to laboratory protocols. The QA/QC officer will track the movement of samples from the time they are checked in at the laboratory to the time that analytical results are issued, and will conduct a final check on the analytical calculations and sign off on the laboratory reports. The laboratory QA/QC officer will be Nick Straccione of SGS Accutest Inc. (Accutest), the New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory being employed for all environmental sampling at the Site.

3.0 STANDARD OPERATING PROCEDURES (SOPS)

The following sections describe the SOPs for the remedial activities included in the RDIWP and the RAWP. During these operations, safety monitoring will be performed as described in the HASP, included as Appendix H of the RAWP.

3.1 DECONTAMINATION OF SAMPLING EQUIPMENT

All sampling equipment (augers, drilling rods, split spoon samplers, probe rods, pumps, etc.) will be either dedicated or decontaminated between sampling locations. Decontamination will be conducted on plastic sheeting (or equivalent) that is bermed to prevent discharge to the ground. The decontamination procedure will be as follows:

1. Scrub using tap water/Simple Green® mixture and bristle brush.
2. Rinse with tap water.
3. Scrub again with tap water/Simple Green® mixture and bristle brush.
4. Rinse with tap water.
5. Rinse with distilled water.
6. Air-dry the equipment, if possible.

3.2 MANAGEMENT OF INVESTIGATION DERIVED WASTE (IDW)

IDW will be containerized in New York State Department of Transportation (NYSDOT)-approved 55-gallon drums or disposed of via tri-axel trucks during excavation activities. The

drums will be sealed at the end of each work day and labeled with the date, the excavation grid(s), the type of waste (i.e., drill cuttings), and the name and phone number of an AKRF point-of-contact. All IDW exhibiting field evidence of contamination will be disposed of or treated according to applicable local, state, and federal regulations.

4.0 SAMPLING AND LABORATORY PROCEDURES

4.1 SOIL SAMPLING

Soil sampling will be conducted according to the following procedures:

- Characterize the sample according to the modified Burmister soil classification system.
- Field screen the sample for evidence of contamination (e.g., odors, staining,) using visual and olfactory methods and screen for volatile organic compounds (VOCs) using a photoionization detector (PID) equipped with an 11.7 electron Volt (eV) lamp.
- Collect an aliquot of soil from each proposed sample location, place in laboratory-supplied glassware, label the sample in accordance with Section 4.4.1, Table 3 of this QAPP, and place in an ice-filled cooler for shipment to the laboratory.
- Complete the proper chain of custody paperwork and seal the cooler.
- Record sample location, sample depth, and sample observations (evidence of contamination, PID readings, soil classification, etc.) in field log book and boring log data sheet, if applicable.
- Decontaminate any soil sampling equipment between sample locations as described in Section 3.1 of this QAPP.

4.2 LABORATORY METHODS

Table 1 summarizes the laboratory methods that will be used to analyze field samples and the sample container type, preservation, and applicable holding times. Accutest of Dayton, New Jersey, a NYSDOH ELAP-certified laboratory subcontracted to AKRF, will be used for all chemical analyses in accordance with the Division of Environmental Remediation (DER)-10 2.1(b) and 2.1(f) with Category B Deliverables.

Table 1
Laboratory Analytical Methods for Analysis Groups

Matrix	Analysis	EPA Method	Bottle Type	Preservative	Hold Time
Soil	Volatile Organic Compounds (VOCs)	8260C	EnCore samplers (3) and 2 oz. plastic jar	≤ 6 °C	48 hours to extract; 14 days to analyze
	Semivolatile Organic Compounds (SVOCs)	8270D	8 oz. Glass Jar	≤ 6 °C	14 days to extract; 40 days to analyze
	Total Analyte List (TAL) Metals, RCRA 8 Metals, and Hexavalent Chromium	6000/7000 Series, 6010C, and 7196A	8 oz. Glass Jar	≤ 6 °C	6 months holding time; Mercury 28 days holding time; Hexavalent chromium 30 days to extract, 7 days to analyze
	Pesticides	8081B	8 oz. Glass Jar	≤ 6 °C	14 days to extract; 40 days to analyze
	Polychlorinated Biphenyls (PCBs)	8082A	8 oz. Glass Jar	≤ 6 °C	14 days to extract; 40 days to analyze
Groundwater	VOCs	8260C	5 40 mL Glass Vials	HCl to pH < 2 and ≤ 6 °C	48 hours to extract; 14 days to analyze
	SVOCs and 1,4-Dioxane	8270D plus Selective Ion Monitoring (SIM) for 1,4-Dioxane	2,000 mL Amber Jar	≤ 6 °C	7 days to extract; 40 days to analyze
	TAL Metals, RCRA 8 Metals, and Hexavalent Chromium	6000/7000 Series, 6010C, and 7196A	2,000 mL Amber Jar	HNO_3 to pH <2	6 months for metals; 28 days for mercury; 24 hours for hexavalent chromium
	Pesticides	8081B	2,000 mL Amber Jar	≤ 6 °C	7 days to extract; 40 days to analyze
	PCBs	8082A	2,000 mL Amber Jar	≤ 6 °C	7 days to extract; 40 days to analyze
	Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS)	Modified 537	3 250mL Polypropylene Bottles	≤ 6 °C, Trizma	14 days to analyze
Soil Vapor	VOCs	TO-15	6L SUMMA® Canister	None	14 days

Notes:
EPA - Environmental Protection Agency
Hg – Mercury
RCRA – Resource Conservation and Recovery Act

4.3 QUALITY CONTROL (QC) SAMPLING

In addition to the laboratory analysis of the soil samples, additional analysis will be included for QC measures, as required by the Category B sampling techniques. These samples will include field blank, trip blank, matrix spike/matrix spike duplicate (MS/MSD), and blind duplicate samples at a frequency of one sample per 20 field samples collected or per sample digestion

group (SDG). QC samples will be analyzed for the same parameters as the accompanying samples, with the exception of any trip blanks, which will be analyzed for the VOC list only.

4.4 SAMPLE HANDLING

4.4.1 Sample Identification

All samples will be consistently identified in all field documentation, chain-of-custody (COC) documents, and laboratory reports. All samples will be amended with "L1" at the beginning of the sample name and the collection date at the end of the sample same in a year, month, day (YYYYMMDD) format. Blind duplicate sample nomenclature will consist of the sample type, followed by an "X"; MS/MSD samples nomenclature will consist of the parent sample name, followed by "MS/MSD"; and trip and field blanks will consist of "TB-" and "FB-", respectively, followed by a sequential number of the trip/field blanks collected within the sample digestion group (SDG). Special characters, including primes/apostrophes (’), will not be used for sample nomenclature.

4.4.1.1. Remedial Design Investigation (RDI) Sample Identification

In addition to the and the nomenclature detailed in Section 4.4.1, soil and groundwater samples collected during the RDI will be identified with "RDI-", "SB-" for soil borings or "MW-" for groundwater monitoring wells, and the soil boring or groundwater monitoring well number. Soil samples will also be amended with the depth interval the same was collected from in parentheses. Additionally, groundwater monitoring wells screened at shallow, intermediate, and deep intervals will be appended with "S", "I", or "D", respectively, after the groundwater monitoring well number. Table 2 provides examples of the sampling identification scheme for samples collected during the RDI.

Table 2
RDI Sample Nomenclature

Sample Description	Sample Designation
Groundwater sample collected from groundwater monitoring well L1-RDI-MW-7 from the shallow-screened casing on May 1, 2017	L1-RDI-MW-7S 20170501
Matrix spike/matrix spike duplicate sample of groundwater sample collected from groundwater monitoring well L1-RDI-MW-7 from the intermediate-screened casing on May 1, 2017	L1-RDI-MW-7I MS/MSD 20170501
Blind duplicate sample of groundwater sample collected from groundwater monitoring well L1-RDI-MW-7 from the deep-screened casing on May 1, 2017	L1-RDI-MW-XD 20170501
Second field blank collected with SDG during the RDI on May 1, 2017	L1-RDI-TB-2 20170501
Soil sample collected from soil boring L1-RDI-SB-10 between 12 and 14 feet below grade on May 1, 2017	L1-RDI-SB-10 (12-14) 20170501
Blind duplicate sample of soil sample collected from soil boring L1-RDI-SB-10 between 12 and 14 feet below grade on May 1, 2017	L1-RDI-SB-X (12-14) 20170501

4.4.1.2. Import Soil Sampling

In addition to the nomenclature detailed in Section 4.4.1, soil import samples will be identified with "ISP-" and the import sample number in sequential order that the import sample was collected. Table 3 provides examples of the sampling identification scheme for import soil samples.

Table 3
Import Sample Nomenclature

Sample Description	Sample Designation
Import soil sample ISP-1 collected on May 1, 2017	L1-ISP-1 20170501
Matrix spike/matrix spike duplicate sample of import soil sample ISP-1 collected on May 1, 2017	L1-ISP-1 MS/MSD 20170501
Blind duplicate of import soil sample ISP-1 collected on May 1, 2017	L1-ISP-X 20170501

4.4.1.3. Endpoint Soil Sampling

In addition to the nomenclature detailed in Section 4.4.1, soil endpoint samples will be identified with "EP-" and the endpoint sample number in sequential order that the endpoint sample was collected, and the depth below grade the sample was collected from in parentheses. Table 4 provides examples of the sampling identification scheme for the 57 proposed post-excavation endpoint samples.

Table 4
Endpoint Sample Nomenclature

Sample Description	Sample Designation
Excavation endpoint soil sample EP-1 collected from two feet below grade on May 1, 2017	L1-EP-1 (2) 20170501
Matrix spike/matrix spike duplicate sample of excavation endpoint soil sample EP-1 collected from two feet below grade on May 1, 2017	L1-EP-1 (2) MS/MSD 20170501
Blind duplicate of excavation endpoint soil sample EP-1 collected from two feet below grade on May 1, 2017	L1-EP-X (2) 20170501

4.4.1.4. Waste Classification/Tank Excavation Soil Sampling

In addition to the nomenclature detailed in Section 4.4.1, any confirmatory endpoint samples collected from a previously unknown tank excavation will be identified by the excavation grid area and the cardinal direction of the sidewalls. The sample(s) collected from the bottom of the excavation will be amended with a "B-", followed by the number of bottom samples collected from the excavation in sequential order. Waste classification samples will be amended with "WC-" and the alphanumeric grid identification. Five-point composite samples will be amended with "C-" and grab samples to be analyzed for VOCs will be amended with "G-". Additionally, samples will be amended with the depth the sample was collected in feet below grade in parentheses. The alphanumeric grid is presented on Figure 12 of the RAWP. Table 5 provides

examples of the sampling identification scheme for proposed waste classification samples and any hotspot or tank excavation samples.

Table 5
Waste Classification/Tank Excavation Sample Nomenclature

Sample Description	Sample Designation
Waste classification composite sample collected between grade and 5 feet below grade in grid A1 on May 1, 2017	L1-WC-A1-C (0-5) 20170501
Waste classification grab sample collected between grade and 5 feet below grade in grid A1 on May 1, 2017	L1-WC-A1-G (0-5) 20170501
Soil sample collected from the northern sidewall of the second tank grave encountered at 4 feet below grade on May 1, 2017	L1-UST-2N (4) 20170501

Sample Labeling and Shipping

All sample containers will be provided with labels containing the following information:

- Project identification, including Site name, BCP Site number, Site address
- Sample identification
- Date and time of collection
- Analysis(es) to be performed
- Sampler's initials

Once the samples are collected and labeled, they will be placed in chilled coolers and stored in a cool area away from direct sunlight to await shipment to the laboratory. All samples will be shipped to the laboratory at least twice per week. At the start and end of each workday, field personnel will add ice to the cooler(s) as needed.

The samples will be prepared for shipment by placing each sample in laboratory-supplied glassware, then wrapping each container in bubble wrap to prevent breakage, and adding freezer packs and/or fresh ice in sealable plastic bags. The COC form will be properly completed by the sampler in ink, and all sample shipment transactions will be documented with signatures, and the date and time of custody transfer. Samples will be shipped overnight (e.g., 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 samples remain under strict COC protocol.

Sample Custody

Field personnel will be responsible for maintaining the sample coolers in a secured location until they are picked up and/or sent to the laboratory. The record of possession of samples from the time they are obtained in the field to the time they are delivered to the laboratory or shipped off-site will be documented on 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; and signatures of individuals involved in sample transfer, and the dates and times of transfers. Laboratory personnel will note the condition of the custody seal and sample containers at sample check-in.

4.5 FIELD INSTRUMENTATION

Field personnel will be trained in the proper operation of all field instruments at the start of the field program. Instruction manuals for the equipment will be on file at the Site for referencing proper operation, maintenance, and calibration procedures. The equipment will be calibrated according to manufacturer specifications at the start of each day of fieldwork. If an instrument fails calibration, the project manager or QA/QC officer will be contacted immediately to obtain a replacement instrument. A calibration log will be maintained to record the date of each calibration, any failure to calibrate and corrective actions taken. The PID will be equipped with an 11.7 electron volt (eV) lamp and will be calibrated each day using 100 parts per million (ppm) isobutylene standard gas in accordance with the manufacturer's standards.

4.6 QUALITY ASSURANCE (QA)

All soil and groundwater laboratory analytical data will be reviewed by a third-party validator and a Data Usability Summary Report (DUSR) will be prepared to document the usability and validity of the data. The Final Engineering Report (FER) will include a detailed description of endpoint sampling activities, data summary tables, concentration map showing endpoint sample locations and concentrations, DUSR, and laboratory reports.

ATTACHMENT A

RESUMES OF PROJECT DIRECTOR, PROJECT MANAGER, PROJECT MANAGER ALTERNATE, AND FIELD TEAM LEADER

MICHELLE LAPIN, P.E.

SENIOR VICE PRESIDENT

Michelle Lapin is a Senior Vice President with more than 29 years of experience in the assessment and remediation of hazardous waste issues. She leads the firm's Hazardous Materials group and offers extensive experience providing strategic planning and management for clients. Ms. Lapin has been responsible for the administration of technical solutions to contaminated soil, groundwater, air and geotechnical problems. Her other duties have included technical and report review, proposal writing, scheduling, budgeting, and acting as liaison between clients and regulatory agencies, and project coordination with federal, state, and local authorities.

Ms. Lapin's hydrogeologic experience includes groundwater investigations, formulation and administration of groundwater monitoring programs and remediation throughout the Northeast. Her experience with groundwater contamination includes Level B hazardous waste site investigations; leaking underground storage tank studies, including hazardous soil removal and disposal and associated soil and water issues; soil gas/vapor intrusion surveys; and wetlands issues. Ms. Lapin is experienced in investigation and remediation concerning hazardous waste cell closures, and landfills. She has directed hundreds of Phase I, Phase II, and Phase III investigations and remediations, many of them in conjunction with developers, law firms, lending institutions, and national retail chains. She is also experienced in the cleanup of contaminated properties under Brownfield Cleanup Program (BCP) regulations.

BACKGROUND

Education

M.S., Civil Engineering, Syracuse University, 1985
B.S., Civil Engineering, Clarkson University, 1983

Professional Licenses/Certifications

New York State P.E.
State of Connecticut P.E.

Professional Memberships

Member, National Society of Professional Engineers (NSPE), National and CT Chapters
Member, American Society of Civil Engineers (ASCE), National and CT Chapters
Member, Connecticut Business & Industry Association (CBIA), CBIA Environmental Policies Council (EPC)
Member, Environmental Professionals' Organization of Connecticut (EPOC)
Board Member, New York City Brownfield Partnership
Member, NAIOP, a Commercial Real Estate Development Association

Years of Experience

Year started in company: 1994
Year started in industry: 1986

RELEVANT EXPERIENCE

Gedney Way Landfill, White Plains, NY

Ms. Lapin was the Engineer of Record for this closure of a former ash landfill, which is also utilized as a leaf and yard waste compost facility by the City of White Plains. The landfill closure required investigations to document the landfill's disposal history and the extent of the solvent contamination and methane. The investigation and

closure of the landfill were completed to satisfy the requirements of a New York State Department of Environmental Conservation's (NYSDEC) consent order, were completed in compliance with NYSDEC DER-10 and 6NYCRR Part 360, and included placement of landfill cap, methane recovery system, and sealing of storm sewers traversing the landfill.

Roosevelt Union Free School District – District-wide Improvement Program, Roosevelt, NY

Ms. Lapin managed the hazardous materials investigation for the Draft and Final Environmental Impact Statements (EIS) for the improvement program, which included the demolition of three existing elementary schools and portions of the junior-senior high school, and the reconstruction of three replacement elementary schools, a separate replacement middle school, and renovations to the high school. Following the EIS, additional hazardous materials investigations were completed, including comprehensive asbestos and lead surveys; Phase I and Phase II Environmental Site Assessments; the preparation of asbestos, lead, hazardous materials and demolition specifications; and obtaining site-specific variances from the New York State Department of Labor (NYSDOL). The middle school remediation was conducted through coordination with the New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH), the New York State Education Department (NYSED) and the local school district. The project was approved, and construction/renovation for the new middle school completed such that the school opened for the Fall 2008 semester as planned.

Memorial Sloan Kettering Cancer Center-CUNY 74th Street EIS, New York, NY

AKRF was engaged by Memorial Sloan-Kettering Cancer Center (MSK) and CUNY-Hunter College (CUNY) to prepare an EIS for a proposed joint facility located on a New York City-owned parcel located between East 73rd Street and East 74th Street adjacent to the FDR Drive in Manhattan. The proposed facility was formerly occupied by the Department of Sanitation, and had included over 41 underground storage tanks, will include an ambulatory medical care center for MSK and educational and medical research facilities for CUNY.

Ms. Lapin is leading the hazardous materials work which includes the preparation of the Phase I and II environmental site assessments, remedial action work plans (RAWPs), and construction health and safety plans (CHASPs) for submission to the New York City Office of Environmental Remediation (OER) for the Voluntary Cleanup Program (VCP) and to the New York State Department of Environmental Conservation (NYSDEC) for remediation of a petroleum spill. The RAWPs and CHASPs included provisions for excavation of contaminated soil and rock, removal of tanks and environmental monitoring during the construction activities. AKRF also performed a pre-demolition asbestos survey of the remaining concrete foundation structures and prepared specifications for asbestos abatement, soil management and underground storage tank removal and disposal.

Brooklyn Bridge Park, Brooklyn, NY

AKRF prepared an Environmental Impact Statement (EIS) and is continuing to provide technical and planning support services for Brooklyn Bridge Park, which revitalizing the 1.3-mile stretch of the East River waterfront between Jay Street on the north and Atlantic Avenue on the south. The new park, allows public access to the water's edge, allowing people to enjoy the spectacular views of the Manhattan skyline and New York Harbor. It also provides an array of passive and active recreational opportunities, including lawns, pavilions, and a marina. As with many waterfront sites around New York City, the lands along the Brooklyn waterfront have a long history of industrial activities. Some of these industries used dangerous chemicals and generated toxic by-products that could have entered the soil and groundwater. In addition, landfilling activities along the shoreline also used ash and other waste materials from industrial processes. Based on site inspections, historical maps, government records, and other sources, AKRF has been investigating the potential for the presence for hazardous materials in the park. This information was compiled into a Phase 1 Environmental Site Assessment report. AKRF has also provided and continues to support to the design team related to designing the project to minimize costs related to remediating hazardous materials where possible. Ms. Lapin is serving as senior manager for the hazardous materials investigations.

East River Science Park, New York, NY

Originally, New York University School of Medicine (NYUSOM) retained the firm to prepare a full Environmental Impact Statement (EIS) for its proposed East River Science Park (ERSP). The proposed complex was to occupy an underutilized portion of the Bellevue Hospital campus between East 30th Street and approximately East 28th Street, immediately south of NYU's campus. As originally contemplated, Phase I was to include 618,000 square feet of development, including a clinical practice and research building, a biotech center, 220 housing units for post-doctorate staff, a child care center, and a conference center. This phase would include reuse of the former Bellevue Psychiatric Building, a historic structure on East 30th Street east of First Avenue. Phase II was to include a second biotech building with a library to serve NYU and Bellevue at the eastern end of the block between 29th and 30th Streets. Phase III was to include a third biotech building and parking. The project's EIS considered a full range of issues, including land use, socioeconomics, shadows, historic resources, open space, traffic and transportation, air quality, noise, and construction. The firm also prepared all of the traffic and transportation studies for the urban design and master planning efforts. Ms. Lapin managed the Phase I Environmental Site Assessment and other hazardous materials-related issues.

Events relating to September 11, 2001 put a hold on the project for a number of years. When the project resurfaced, it had a new developer and a decreased scope. Ms. Lapin updated the hazardous materials issues for the new developer and consulted with them regarding remediation strategies and involvement of regulatory agencies. For the actual remediation/development, the city requested oversight by AKRF to represent its interests (the city is retaining ownership of the land). Ms. Lapin completed directing the remediation oversight on behalf of the City of New York for the remediation of the former psychiatric hospital building, laundry building and parking areas associated with Bellevue Hospital. The new development includes a biotechnology center (Commercial Life Science Research and Office Park) comprising two buildings (combined 550,000 square feet), street level retail, and an elevated plaza.

New York City School Construction Authority (SCA), Environmental Consulting Hazardous Materials Services

The SCA was established by the New York State government to construct school facilities to reduce overcrowding and to provide new schools in growing neighborhoods. Focusing on the environmental consulting services, dating back to the 1980s and the days of the New York City Board of Education, the firm continues to provide broad support to SCA's effort, including environmental assessments in meeting the requirements of the State Environmental Quality Review Act (SEQRA), and site selection and property acquisition support for potential new sites. AKRF is currently serving under three individual on-call contracts for site acquisition and environmental consulting services, hazardous materials consulting services, and architectural and engineering services.

AKRF has undertaken various assignments under two consecutive hazardous materials on-call contract, including environmental assessment, remedial design, and plumbing disinfection consulting tasks. For potential new school sites, assignments include initial due diligence, Phase I environmental site assessments (ESAs) and multi-media subsurface investigation of soil, groundwater, and soil vapor to determine the suitability of a site for development as a school, likely remediation requirements, and associated costs. For sites undergoing design and development, assignments include preparation of remediation plans, design of sub-slab depressurization systems (SSDS) and contract specifications, and construction oversight. The work has also included conducting Phase I ESAs and indoor air quality testing, preparation of specifications, supervision of storage tank removals, and investigation and remediation of spills for existing schools. Due to the sensitivity of school sites, work under this contract is often conducted on short notice and during non-school hours. Ms. Lapin is the QA/QC officer for all of the SCA hazardous materials assignments and the Professional Engineer (P.E.) of record for the various remediation systems, including sub-slab depressurization systems (SSDS).

Hudson River Park, New York, NY

Ms. Lapin is directing AKRF's hazardous materials work during construction of Hudson River Park, a five-mile linear park along Manhattan's West Side. As the Hudson River Park Trust's (HRPT's) environmental consultant, AKRF has overseen preparation and implementation of additional soil and groundwater investigations [working with both the New York State Department of Environmental Conservation (NYSDEC) and the New York City Department of Environmental Protection (NYCDEP)], all health and safety activities, and removal of both known underground storage tanks and those encountered during construction. Previously, the firm performed hazardous materials assessments as part of the Environmental Impact Statement (EIS) process, including extensive database and historical research, and soil and groundwater investigations. Ms. Lapin has been the senior consultant for the soil and groundwater investigations and remediation, and the asbestos investigations and abatement oversight.

Davids Island Site Investigations, New Rochelle, NY

Ms. Lapin managed the hazardous materials investigation of Davids Island, the largest undeveloped island on the Long Island Sound in Westchester County. The 80-acre island features pre- and post-Civil War military buildings and parade grounds, and is viewed as a major heritage, tourism, and recreational amenity. The island, formerly known as Fort Slocum, was used by the U.S. military, beginning in the 19th century, as an Army base, hospital, and training center. The island was planned for county park purposes. The investigation included a Phase I Environmental Site Assessment, with historical research going back to the 17th century, a Phase II (Subsurface) Investigation, underground storage tank investigations, asbestos surveys, and conditions surveys of all remaining structures. Cost estimates were submitted to Westchester County for soil remediation, asbestos abatement, and building demolition.

Yonkers Waterfront Redevelopment Project, Yonkers, NY

For this redevelopment along Yonkers' Hudson River waterfront, Ms. Lapin headed the remedial investigation and remediation work that included Phase I Environmental Site Assessments of 12 parcels, investigations of underground storage tank removals and associated soil remediation, remedial alternatives reports, and remedial work plans for multiple parcels. Several of the city-owned parcels were remediated under a Voluntary Cleanup Agreement; others were administered with state Brownfields grants. Hazardous waste remediation was completed on both brownfield and voluntary clean-up parcels, which enabled construction of mixed-use retail, residential development, and parking.

Storage Deluxe, Various Locations, NY

Ms. Lapin manages the firm's ongoing work with Storage Deluxe, which includes Phase I Environmental Site Assessments and Phase II Subsurface Investigations, underground storage tank removals and associated remediation, asbestos surveys and abatement oversight, and contaminated soil removal and remediation for sites in Connecticut, the Bronx, Brooklyn, Manhattan, Queens, Westchester County, and Long Island.

Columbia University Manhattanville Academic Mixed-Use Development, New York, NY

Ms. Lapin served as Hazardous Materials Task Leader on this Environmental Impact Statement (EIS) for approximately 4 million square feet of new academic, research and neighborhood uses to be constructed north of Columbia University's existing Morningside campus. The work included Phase I Environmental Site Assessments for the properties within the site boundaries, and estimates for a Subsurface (Phase II) Investigation of the entire development area. The firm's Hazardous Materials group performed over 30 individual Phase I Environmental Site Assessments for properties within the development area. In addition, a Preliminary Environmental Site Assessment (PESA) was completed in conjunction with the Environmental Impact Statement (EIS). Based on the Phase I studies, AKRF conducted a subsurface (Phase II) investigation in accordance with a New York City Department of Environmental Protection (NYCDEP) approved investigative work plan and health and safety plan. Subsurface activities included the advancement of soil borings, groundwater monitor wells, and the collection of soil and groundwater samples for laboratory analysis. This study was used to estimate costs to remediate contaminated soil and groundwater, and underground storage tanks and hazardous building materials, including lead-based paint and asbestos-containing materials.

DPR Soundview Park Playgrounds and Open Space, Bronx, NY

AKRF is part of a team working on the reconstruction of this 212-acre NYCDPR public park located along the Bronx River in the Bronx, New York. The park was identified as an underutilized park and is being improved in accordance with the goals of PlaNYC. Ms. Lapin is overseeing AKRF's hazardous materials investigations including environmental and remediation-related work. AKRF prepared the Environmental Assessment Statement (EAS) and the project has moved into the design and construction phase. The remediation/construction of multiple phases of the development is currently underway.

Rego Park Home Depot, Queens, NY

Solvent contamination was encountered during retail development of a former industrial property in Rego Park, Queens, New York. The site work included an extensive investigation and a multi-phase remediation performed under the NYSDEC Voluntary Cleanup Program (BCP). Remediation included removal of aboveground and underground storage tanks (ASTs and USTs) and hotspot soil removal. An Air Sparging/Soil Vapor Extraction (AS/SVE) groundwater remediation system designed by AKRF was installed as part of the building construction. Continued remediation work included upgrading and expanding the AS/SVE system after the store was opened. AKRF prepared the Final Engineering Report and obtained closure with a Release and Covenant Not to Sue issued by NYSDEC in 2013. AKRF continues operations, maintenance, and monitoring under the NYSDEC-approved Site Management Plan. Ms. Lapin is the Professional Engineer (P.E.) of record for the remediation design and implementation in accordance with the NYSDEC Brownfield Cleanup Program (BCP).

DEBORAH SHAPIRO, QEP

TECHNICAL DIRECTOR

Deborah Shapiro is a Technical Director with more than 16 years of experience in the assessment and remediation of hazardous waste issues. Ms. Shapiro supervises project teams and manages all aspects of assessment and remediation projects. Ms. Shapiro works with developers, non-profit organizations, architects, local community groups, local businesses, and government agencies. Her projects fall under the regulatory oversight of NYSDEC, NYCDEP, and NYCOER including the New York State Brownfield Cleanup Program (BCP), New York City Voluntary Cleanup Program (VCP), NYSDEC petroleum spills program, RCRA/UIC closures, and NYCOER's E-designation program. Ms. Shapiro has also assisted commercial and industrial property owners with maintaining the integrity of their portfolios by providing compliance related cleanup and chemical storage management services.

Ms. Shapiro manages all aspects of redevelopment projects from the initial Phase I ESA, Phase II, and remediation through post-remedial site management. In addition, her experience includes groundwater investigations, monitoring, and sampling programs; Brownfield and hazardous waste site investigations; In-Situ Chemical Oxidation; underground storage tank studies, including soil contamination delineation, classification, removal and disposal; waste characterization sampling; exposure assessments; on-going remedial action (especially AS/SVE), and permitting.

Prior to joining AKRF, Ms. Shapiro was a Senior Project Manager at CA RICH Consultants, Inc. in Plainview, New York. She was responsible for the design, implementation, and management of environmental assessment, investigation and remediation projects on Long Island and across the New York Metropolitan Area. Ms. Shapiro was also a panelist at the Northeast Sustainable Communities Workshop that was held in May 2012.

BACKGROUND

Education

M.S., Environmental Science, American University, 2001
B.A., Environmental Studies, American University, 1998

Professional Licenses/Certifications

Qualified Environmental Professional
Health and Safety Operations at Hazardous Materials Sites 29 CFR 1910.120

OSHA 10 Hour Occupational Construction Safety and Health

Professional Memberships

President, New York City Brownfield Partnership
Board Member, Residents for a More Beautiful Port Washington
Member, Institute of Professional Environmental Practitioners (IPEP)

Awards

Big Apple Brownfield Award recipient as part of the Courtlandt Crescent redevelopment team 2013
Big Apple Brownfield Award recipient as part of the Via Verde redevelopment team 2012
Big Apple Brownfield Award recipient as part of the Cornerstone B1 (LaTerraza) redevelopment team 2011

Years of Experience

Year started in company: 2013
Year started in industry: 1998

Relevant Experience

Bradhurst Cornerstone II Residences, Manhattan, NY

AKRF, Inc. prepared a Part 58 Environmental Assessment and a City Environmental Quality Review Environmental Assessment Statement for the Bradhurst Cornerstone II Apartments project. Issues of concern for the environmental review included the identification of project commitments for certain of the four sites related to historic resources, hazardous materials, air quality, and building attenuation. As part of the mitigation of hazardous materials, AKRF conducted a Phase II investigation, and prepared a Remedial Action Plan and Construction Health and Safety Plan.

Lambert Houses, Bronx, NY

AKRF performed a Phase I ESA of the Lambert Houses affordable housing complex located in the West Farms section of the Bronx, NY. Lambert Houses consisted of multi-story apartment buildings, parking garage, and a multi-tenant retail/commercial building alongside the elevated NYC subway. AKRF also conducted a vapor intrusion screen of the Property to satisfy HUD's vapor intrusion requirements. The Phase I and vapor intrusion screens were prepared in accordance with ASTM E1527-05, ASTM E2600, and EPA's All Appropriate Inquiry (AAI) rule.

Courtlandt Crescent, Bronx, NY

Ms. Shapiro directed all Phases of this NYS Brownfield Cleanup Program project in the Melrose Commons section of the Bronx from the initial Phase I and II through the Certificate of Completion and is currently managing the implementation of the Site Management Plan. A New York State Brownfield Cleanup Program (BCP) Application was submitted simultaneously with the Remedial Investigation Report (RIR) and Remedial Action Work Plan (RAWP), which sped up the timetable so that the remediation could be implemented concurrently with the planned site redevelopment activities. The site comprised an entire city block whose historic usage included a gasoline filling station, auto repair shop, machine shop, auto junkyard, iron works, boiler repair shop, brass fabricator shop, universal machinery manufacturing, waste paper company, cosmetic company, and a saw works. The investigation included soil and soil vapor testing as well as the installation and sampling of groundwater monitoring wells. The remedial activities included the removal of underground storage tanks and hydraulic lifts, soil waste classification testing, the excavation and removal of approximately 23,000 tons of non-hazardous petroleum and metals contaminated soil as well as hazardous soil containing lead, in-situ chemical oxidation, and installation of a composite cover system. In addition, site dewatering activities allowed the elevator pits to be advanced into the groundwater table. A vapor barrier (and water-proofing for the elevator pits) was installed beneath the two new buildings' foundations and a sub-slab depressurization system (SSDS) was incorporated into the buildings' foundations to eliminate the potential exposure pathway for soil vapor into the new affordable housing residential buildings. Ms. Shapiro directed the remedial activities and monitoring under a construction health and safety plan, which included a community air monitoring program. Site management activities include post-remedial groundwater monitoring and sampling, SSDS start-up testing and operations and maintenance, and annual institutional control/engineering control inspections. The project was the recipient of the 2013 Big Apple Brownfield Award.

Brook 156, Bronx, NY

AKRF performed a Phase I ESA of two lots located at the northeast intersection of Brook Avenue and East 156th Street in the Bronx, NY. One lot was a NYC-owned former gasoline service station and the other lot was a former railroad. In addition, AKRF conducted a vapor intrusion screen of the Property to satisfy HUD's vapor intrusion requirements. The Phase I and vapor intrusion screens were prepared in accordance with ASTM E1527-05, ASTM E2600, and EPA's All Appropriate Inquiry (AAI) rule.

La Terrazza, Cornerstone Site B-1, Bronx, NY

Ms. Shapiro provided environmental consulting services to an affordable housing developer who purchased a property in the Melrose Commons section of the Bronx, New York. The Phase I ESA revealed that a portion of the Property was historically used as a drycleaner. The Phase II showed that tetrachloroethene (PCE) was present in the soil gas beneath the building, within perched groundwater and groundwater within the bedrock fractures at levels indicating possible DNAPL. Based on the results of the Phase II, a NYSDEC Brownfield Cleanup Program (BCP) Application was completed on behalf of the developer as a "Volunteer" to eliminate off-site liability. The redevelopment site consisted of three adjacent lots; however only two were accepted into the BCP and included in the BCP Agreement. A remedial action work plan (RAWP) was completed and approved by NYSDEC within a few months to enable redevelopment work for a new affordable housing complex with underground parking and retail on the first floor. The RAWP included the removal of aboveground storage tanks, excavation of soil to 15 feet below grade site wide, in-situ chemical oxidation injections, a multi-well pump and treat system for the recovery of non-aqueous and dissolved phase contamination in groundwater within the bedrock fractures, and installation of a composite cover system. Ms. Shapiro directed the remedial activities and monitoring for additional potential contamination during construction. The groundwater remediation system was installed during site development and began operation once development was complete. Although only two lots were accepted into the program, intuitional and engineering control measures were incorporated into the entire redevelopment site to protect future building occupants. The Certificate of Completion (COC) for this site was received within two years after conducting the Phase II. The COC enabled the developer to receive tax credits from NYS. In addition, this project was the recipient of the 2011 Big Apple Brownfield Award.

Tenant Inspection Program, Multiple Locations, NY

Ms. Shapiro directed a Tenant Inspection Program for a landlord who owned 1.2 million square feet of multi-tenanted industrial and commercial properties located in Queens, Nassau, and Suffolk counties for nearly a decade. The Tenant Inspection Program was a compliance program established to address concerns that certain tenant's operations may have been negatively impacting the property. The program included an annual inspection of each tenant space to determine their processes, chemical usage, waste disposal habits, current permits, and fire safety procedures. In addition, each sanitary system was sampled for chemical constituents identified during the inspections and approximately 300 exterior storm drains were inspected for evidence of illegal discharges or dumping. Based on the results of the inspection and sampling, letter reports were sent to the tenants informing them of any issues and educating them on best practices. Each tenant was assisted with regulatory compliance, permitting, and health and safety. The landlord received a report for each building detailing the findings of the inspection and sampling, and any follow-up actions. The landlord became educated on environmental issues and was able to incorporate the cost for this program and environmental compliance requirements into their leases as common area maintenance (CAM) charges. This resulted in a direct improvement in tenant housekeeping practices and enabled the landlord to obtain a comprehensive environmental insurance policy covering the entire property portfolio.

Federal Express at JFK Airport, Jamaica, NY

Ms. Shapiro served as a senior scientist during the investigation and remediation of a petroleum spill at the Federal Express Hanger located at JFK Airport. The investigation included the installation and sampling of a network of monitoring wells located within the hanger as well as on the tarmac. A remedial action work plan (RAWP) was completed and approved by the New York State Department of Environmental Conservation (NYSDEC). The RAWP included the removal of free-floating petroleum products and installation and operation of an air sparge/soil vapor extraction system.

ExxonMobil, Multiple Locations, NY

Ms. Shapiro has managed the investigation and remediation of numerous ExxonMobil retail service stations in the five boroughs and Long Island. The investigations have included Phase I, II, and III site assessments, regulatory compliance, emergency spill response, UST removals, and soil and groundwater remediation.

AMELIA TAYLOR JORDAN

ENVIRONMENTAL SCIENTIST

Amy Jordan is an Environmental Scientist in AKRF's Hazardous Materials Department. She has experience in Phase I and Phase II site investigations, including water, air, and soil sampling. Ms. Jordan is a 2011 graduate of Franklin and Marshall College, where she studied Geosciences, Environmental Studies, and French. She has experience doing environmental fieldwork along the east and west coasts of the United States and the East African Rift System in Kenya.

BACKGROUND

Education

B.A. Geosciences, Franklin and Marshall College, Lancaster, PA, 2011

Licenses/Certifications

40 Hour OSHA HAZWOPER Certified, November 2011

Years of Experience

Year started in company: 2012
Year started in industry: 2011

RELEVANT EXPERIENCE

250 North 10th Street, Williamsburg, NY

Investigation and remediation of this former warehouse are being conducted under the New York City Office of Environmental Remediation (OER) E-designation program. AKRF completed a Phase I Environmental Site Assessment, Phase II Subsurface Investigation, and prepared a Remedial Action Plan (RAP) and Construction Health and Safety Plan to obtain a Notice to Proceed from OER to allow start of the proposed construction. AKRF is currently providing environmental oversight during implementation of the RAP. For this project, Ms. Jordan serves as the on-site environmental monitor to oversee soil management activities, conduct air quality monitoring, and prepare daily reports for submittal to the OER project manager.

New City Plaza, New City, NY

Investigation and remediation at this former dry cleaning facility site are being conducted under the NYSDEC Brownfield Cleanup Program. Tasks have included preparation and state approval of a Site Investigation Work Plan, Site Quality Assurance Project Plan, Health and Safety Plan, a Community Participation Plan, and completion of the investigation phase of the Brownfield's program. Interim Remedial activities included contamination source removal from soil and installation of a sub-slab depressurization system to address soil vapor. For this project, Ms. Jordan conducted quarterly groundwater and indoor air sampling.

Proposed Whitney Museum Expansion, Meat Packing District, Manhattan, NY

In 2007 and 2008, AKRF prepared an EAS for a proposed new 230,000-square-foot museum facility located in Gansevoort Market Historic District. This new building will provide exhibition galleries, an auditorium, education space, administrative offices, a café and bookstore, and ancillary storage for the Whitney. As part of the project AKRF completed a Phase I Environmental Site Assessment, Phase II Subsurface Investigation, and prepared a Remedial Action Plan (RAP) and Construction Health and Safety plan to obtain a Notice to Proceed from NYC Office of Environmental Remediation (OER) to allow start of the proposed construction. AKRF is currently providing environmental oversight during implementation of the RAP. For this project, Ms. Jordan has served as an on-site environmental monitor to oversee soil management activities, conduct air quality monitoring, and prepare daily reports for submittal to the OER project manager.

AvalonBay, West Chelsea, Manhattan, NY

Investigation and remediation of this former warehouse and auto-repair facility are being conducted under the New York City Office of Environmental Remediation (OER) E-designation program. AKRF is currently providing environmental oversight during implementation of the Remedial Action Plan (RAP) for the site. For this project, Ms. Jordan has served as the on-site environmental monitor to oversee soil management activities, conduct air quality monitoring, and prepare daily reports for submittal to the OER project manager.

25 Broad Street, Manhattan, NY

AKRF was retained by LCOR to design and implement a Community Air Monitoring program during demolition of a former residential building on a property in lower Manhattan that is to be redeveloped. The program includes real-time community monitoring for volatile organic compounds and particulate matter, personnel monitoring for particulate matter, and confirmatory sampling for silica. Ms. Jordan has served as the on-site monitor to calibrate and operate the real time monitoring equipment, download data, and prepare daily email status reports to be submitted to the Client.

Brownfield Science & Technology, Inc., Cochranville, PA

Before joining AKRF, Ms. Jordan worked as a field geoscientist for Brownfield Science and Technology doing soil, air, and groundwater sampling. She also did Phase I and Phase II site investigations and assessments, soil vapor intrusion assessments, and general maintenance and repairs of field equipment.

The Wetlands Institute, Stone Harbor, NJ

Before joining AKRF, Ms. Jordan established a research project, participated in laboratory and field projects previously established by the institute. She also contributed to conservation and public education efforts.

Thomas Giordano

Environmental Scientist

Thomas Giordano is an Environmental Scientist in AKRF's Hazardous Materials Department. He has experience in air monitoring and construction oversight. Mr. Giordano is a graduate of the Class of 2015 at the State University of New York, College at Oneonta, where he majored in both Environmental Science and Geography.

Background

Professional II / Field Technician

Education

B.S. Environmental Science; B.A. Geography, State University of New York, College at Oneonta, Oneonta, NY 13820.

Licenses/Certifications

40-Hour OSHA HAZWOPER Certified

10-Hour OSHA Construction Certified

Years of Experience

Year Started in Company: 2015

Year Started in Industry: 2014 (Langan Engineering, 4 months)

Experience

AKRF, Inc. (June 2015 – Present)

Professional I (June 2015-December 2016)

As an Environmental Scientist in the Hazardous Materials Department at AKRF, Mr. Giordano has 40-Hour OSHA HAZWOPER training and was the field lead for a Phase III on 145 West Street, Brooklyn, NY 11222, a NYSDEC Brownfield Cleanup Program Site between the months of June 2015 to March 2016. Responsibilities on-site included general construction oversight of excavation and foundation activities. He also conducted the oversight of the Community Air Monitoring Program (CAMP) as well as soil and vapor monitoring, signing of both hazardous and non-hazardous waste disposal manifests and collected field samples including soil and groundwater.

In April 2016, Mr. Giordano was placed as the field lead for Tres Puentes, L.P. Bronx, NY 10454, another NYSDEC Brownfield Cleanup Program Site. Responsibilities include general construction oversight of excavation, foundation and deep foundation installation activities. He also conducts the oversight of the Community Air Monitoring Program (CAMP) as well as soil and vapor monitoring, signing of non-hazardous waste disposal manifests and the collection of field samples including soil, soil vapor and groundwater.

Mr. Giordano also conducted other tasks as a Professional I at AKRF, Inc., including site turnover reporting after remedial completion at 145 West Street, lead water sampling for the School Construction Association (SCA) and low-flow groundwater sampling in Rego Park, Queens.

Professional II (January 2017 – Present)

Mr. Giordano continues to conduct all responsibilities stated above at Tres Puentes, L.P. Remedial work at Tres Puentes, L.P. is anticipated to be completed by April 2017.

Langan Engineering & Environmental Services (Summer 2014, Winter 2015)

As an Environmental intern, Mr. Giordano has been exposed to all phases of the environmental remediation process. Mr. Giordano assisted with Phase I property inspections, including the Long Island College Hospital, and residential sites. He has also participated / assisted in Phase II waste characterizations on several projects throughout his experience with Langan. Mr. Giordano has been on-site for Phase III, during construction, most notably: 501 West 17th Street (MGP site for the DEC), 50 West Street, and the Hudson Yards. Mr. Giordano participated in setting up the Community Air Monitoring Program at various sites, endpoint soil sampling, and groundwater sampling.