SUPPLEMENTAL REMEDIAL INVESTIGATION WORK PLAN
1885 ATLANTIC AVENUE REDEVELOPMENT SITE
NYSDEC BCP SITE C224347
1885 ATLANTIC AVENUE
BROOKLYN, NEW YORK

by Haley & Aldrich of New York
New York, New York

for 1885 Atlantic Realty LLC
40 Oser Avenue, Suite 4
Hauppauge, New York

File No. 0205125-001

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January 2023
File No. 0205125-001

New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233

Attention: Mr. Sadique Ahmed

Subject: Supplemental Remedial Investigation Work Plan
1885 Atlantic Avenue Redevelopment Site
NYSDEC BCP Site C224347
1885 Atlantic Avenue
Brooklyn, New York

Dear Mr. Ahmed,

On behalf of 1885 Atlantic Realty LLC, Haley & Aldrich of New York is submitting for the review and approval of the New York State Department of Environmental Conservation (NYSDEC) this draft Supplemental Remedial Investigation Work Plan (SRIWP) for the above referenced subject site (Site). This SRIWP has been developed based on the NYSDEC's "Technical Guidance for Site Investigation and Remediation" (DER-10, dated May 2010).

Please do not hesitate to contact us if there are any questions regarding this submittal or any other aspects of the project.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK

James M. Bellew
Principal

Matthew Levy
Project Manager

Cc: Joel Kohn – 1885 Atlantic Realty LLC
Jacob Kohn – 1885 Atlantic Realty LLC
William Bennett – NYSDEC
Scarlett McLaughlin – NYSDOH
Sarita Wagh - NYSDOH
Christine Leas – Sive, Paget & Riesel PC

Certification

This report details proposed supplemental investigation activities to be conducted at the 1885 Atlantic Avenue Redevelopment BCP Site C224347.

I, James Bellew, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Supplemental Investigation Work Plan was prepared in accordance with all statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan(s) and any DER-approved modifications.

James Bellew — *1/11/2023*

James Bellew — *Date*

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1. Introduction and Purpose

On behalf of 1885 Atlantic Realty LLC (the Volunteer), Haley & Aldrich of New York (Haley & Aldrich) has prepared this Supplemental Remedial Investigation Work Plan (SRIWP) for the 1885 Atlantic Avenue Redevelopment Site, BCP Site C224347, located at 1885 Atlantic Avenue (the "Site", see Figure 1) in Brooklyn, NY (Site). This SRIWP is being submitted to obtain additional supplemental data for verifying the extent/depth of volatile organic compound (VOC) contamination at the Site and for verifying the effectiveness and size of the soil vapor extraction system. This SRIWP was prepared in accordance with the regulations and guidance applicable to the BCP, including, without limitation, DER-10 which is entitled "Technical Guidance for Site Investigation and Remediation" and dated May 2010 (DER-10).

The Site, identified as Block 1714 Lot 30 on the New York City tax map, is approximately 9,280-square feet and bound to the north by a parking lot followed by a vacant vegetated lot, to the east by Ralph Avenue followed by mixed-use commercial and residential buildings, to the south by Atlantic Avenue and the Long Island Railroad Tracks followed by commercial buildings, including an auto repair facility, and to the west by a commercial building occupied by "McDonalds." The Site is currently vacant and most recently operated as a Speedway gasoline service station. The Site location is shown on Figure 1. Existing Site features are shown on Figure 2.

The Site is located within a residential and manufacturing zoning district (M1-1 and R7D) within a special mixed-use (MX-10) zoning area including Mandatory Inclusionary Housing (MIH). The Volunteer plans to redevelop the Site for mixed-use commercial and residential purposes (including affordable housing) consistent with current zoning. The Site is located in an urban area surrounded by commercial, industrial, and residential properties served by municipal water.

2. Background

2.1 CURRENT LAND USE

The Site is currently a vacant, undeveloped lot and is enrolled in the NYSDEC Brownfield Cleanup Program as NYSBCP Site Number C224347. Former structures associated with the Site's operation as a gasoline service station were demolished as part of an Interim Remedial Measure (IRM) in May 2022. The Site is accessed from Atlantic Avenue and Ralph Avenue.

2.2 SITE HISTORY

Earliest records identify the Site was vacant until 1908, when it was partially developed with a two-story woodworking shop in the western portion of the property. By 1932, the woodworking shop was replaced with an auto repair shop, and a garage was developed on the southern half of the property. A gasoline tank is indicated on the 1932 Sanborn Fire Insurance Map in the southern portion of the property along Atlantic Avenue. By the early 1950s, the former garage operated as a metal product manufacturing facility, and the former auto repair shop was occupied by a plumber. By the early 1960s, the formerly identified structures were razed, and the Site was identified as a gasoline filling station and an auto wrecking facility, with the Site partially developed with a one-story building. The formerly identified gasoline tank was not depicted on Sanborn Fire Insurance Maps after 1951. By 1978, the formerly identified structures were razed and the auto wrecking facility was no longer present. The entire Site was identified as a gasoline service station with a one-story commercial building in the northwest corner of the property. City directories indicate that "Safeway Ralph" operated the gasoline station in the early to mid-1970s, followed by "Merit Gasoline Stations." The Site most recently operated as a Speedway gasoline service station and has been vacant since early 2022.

2.3 SURROUNDING LAND USE

The Site is located in a mixed-use commercial, residential, and industrial area. The Site is bound to the north by a parking lot followed by a vacant vegetated lot, to the east by Ralph Avenue followed by mixed-use commercial and residential buildings, to the south by Atlantic Avenue and the Long Island Railroad Tracks followed by commercial buildings, including an auto repair facility, and to the west by a commercial building occupied by "McDonalds."

One daycare center, the Shirley Chisolm Day Care Center, is located at 2023 Pacific Street, approximately 415 feet to the southeast of the Site. No hospitals or schools are located within a 500-foot radius of the Site.

Direction	Adjoining properties	Surrounding Properties
North	Parking Lot	Vacant lot and multi-family residential buildings
South	Atlantic Avenue and the Long Island Railroad tracks followed by commercial buildings	Commercial buildings

East	Ralph Avenue followed by mixed-use commercial and residential buildings	Residential apartment buildings and commercial storefronts
West	Commercial building occupied by a "McDonalds" restaurant and associated parking lot	Multi-family residential buildings

Additionally, the following sensitive receptors are located within a one-half mile radius including schools and day cares listed below:

No.	Name (Approximate Distance from Site)	Address
1	PS 021 Crispus Attucks (1,450 ft Southwest)	180 Chauncey Street Brooklyn, NY 11233
2	PS 335 Granville T. Woods (1,900 ft southwest)	130 Rochester Avenue Brooklyn, NY 11213
3	Public School 77 (1,820 ft southeast)	2163 Dean Steet, Brooklyn, NY 11233
4	PS 144/PS 12 (1,500 ft southeast)	43 Howard Avenue, Brooklyn, NY 11233
5	PS 040 George Washington Carver School (1,000 ft north)	265 Ralph Avenue Brooklyn, NY 11233
6	Shirley Chisolm Day Care Center (400 ft southeast)	2023 Pacific Street Brooklyn, NY 11233
7	Tiny Hands & Feet Daycare 2 (2,300 ft northwest)	466 MacDonough Street, Brooklyn, NY 11233
8	Lions, Tigers & Bears Daycare (2,000 ft northwest)	368 Decatur Street, Brooklyn, NY 11233
9	Arise and Shine Childcare and After School (2,500 ft northwest)	222 Patchen Avenue, Brooklyn, NY 11233
10	Little Hops Daycare Inc. (2,000 ft northwest)	238 Bainbridge Street, Brooklyn, NY 11233
11	Bedford Stuyvesant Early Childhood Development Center (700 ft northeast)	133 Kings First Walk, Brooklyn, NY 11233
12	ABC Wonderland Group Day (1,000 ft northeast)	1943 Fulton Street, Brooklyn, NY 11233
13	Shirley Chisolm Day Care Center 5 (2,400 ft northeast)	265 Sumpter Street, Brooklyn, NY 11233
14	Teddy's Little Teddy Bear Group (1,300 ft southeast)	1881 Bergen Street, Brooklyn, NY 11233

2.4 SURROUNDING LAND USE HISTORY

The area surrounding the Site was historically used for dwellings and stores purposes from the late 1800s through the early 1930s. Until the early 2000s, the area to the south of the Site was historically developed as filling stations and auto repair facilities after which it was developed with commercial use

buildings. The area to the west was developed with auto garages and some light manufacturing through the 1970s. The vast majority of the surrounding area is now developed with dwellings and commercial use properties.

2.5 PREVIOUS INVESTIGATIONS

To date the following investigations have been performed at the Site.

1. Site Investigation Report, 21 April 1993, Prepared by Groundwater & Environmental Services, Inc., Prepared for Merit Oil of New York, Inc.
2. Site Investigation Report Underground Storage Tank Closure, 27 June 1994, prepared by Groundwater & Environmental Services, Inc., Prepared for Merit Oil of New York, Inc.
3. Site Assessment Report, 2 November 1994, Prepared by Groundwater & Environmental Services, Inc., Prepared for Merit Oil of New York, Inc.
4. Remedial Investigation Report, 3 June 1998, Prepared by Groundwater & Environmental Services, Inc., Prepared for Merit Oil of New York, Inc.
5. Spill Closure Report, December 2002, Prepared by EnviroTrac, Ltd.
6. Limited Phase II Report, November 2021, Prepared by Haley and Aldrich
7. Remedial Investigation Report, September 2022, Prepared by Haley and Aldrich

Site Investigation Report, 21 April 1993, Prepared by Groundwater & Environmental Services, Inc., Prepared for Merit Oil of New York, Inc.

A Site Investigation was conducted by Groundwater & Environmental Services, Inc. (GES) after a 4,000-gallon gasoline tank failed a pressure integrity test and was assigned Spill Case #92-09626. A total of five soil borings were advanced to 25 feet below ground surface (ft bgs) with a total of five soil samples collected. Borings were advanced on 23 March 1993, each located within 15 feet of the tank field. Samples were collected generally from around 11 to 16 ft bgs. Soil samples were analyzed for total petroleum hydrocarbons (TPH) with TPH concentrations ranging from 53.6 to 114 parts per million (ppm). Based on the results of the investigation, GES recommended no further action.

Site Investigation Report Underground Storage Tank Closure, 27 June 1994, prepared by, Groundwater & Environmental Services, Inc., Prepared for Merit Oil of New York, Inc.

GES oversaw and documented the removal of eighteen underground storage tanks (USTs) including: 1) four 4,000-gallon and two 2,000-gallon gasoline USTs; 2) one 550-gallon and one 2,000-gallon wastewater USTs; and 3) eleven 550-gallon gasoline USTs (one of which was abandoned in-place with concrete slurry). All tanks were found in a previously unknown tank field, and five dispenser islands were found at the Ralph Gasoline Station. Spill Case # 93-03355 was assigned following a tank tightness test failure determined during tank removal in June 1993. The excavated tanks were replaced with five 4,000-gallon, double-walled, fiberglass gasoline USTs and one 550-gallon, double-walled, fiberglass wastewater UST.

On 15 June 1993, three soil samples were collected beneath the former dispenser islands. TPH concentrations ranged from 143 to 164 ppm. Toluene and xylenes were detected at low concentrations.

Additionally, the four 4,000-gallon and two 2,000-gallon gasoline USTs were removed. Some corrosion was visible on the tanks, product was visible in the excavation, and petroleum odors and elevated photoionization detector (PID) readings were recorded in the excavation. The maximum TPH concentration was 428 ppm.

On 22 June 1993, the 550-gallon and 2,000-gallon wastewater USTs were removed, and post-excavation soil samples were collected. TPH concentrations ranged from 4,960 ppm to 24,200 ppm. This area contained the highest TPH concentrations.
On 28 June 1993, ten 550-gallon gasoline USTs were removed as part of an unknown tank grave, and post-excavation soil samples were collected. An eleventh 550-gallon gasoline UST was abandoned in-place with concrete slurry due to its close proximity to a structural footing. Petroleum odors, separate-phase product, and elevated PID readings were documented during the excavation. Analytical results indicated that TPH concentrations ranged from 44.8 to 882 ppm.

A total of 980 tons of petroleum-impacted soil was excavated and properly disposed of at Posillico Brothers Asphalt Company of Farmingdale, New York. Soils with PID readings less than 100 ppm were left on Site, and soil with readings above 100 ppm were properly removed. Post-excavation samples were collected in each tank removal area and analyzed for TPH, and benzene, toluene, ethylbenzene, and xylenes (BTEX). The greatest concentration of TPH was located in the former wastewater UST excavation area with a maximum concentration of 24,200 ppm.

GES concluded that no further action was necessary at the time since petroleum-impacted soils were removed from the Site and replaced with clean fill. The NYSDEC also closed Spill Case #92-09626 based on review of this Site Investigation Report.

Site Assessment Report, 2 November 1994, prepared by Groundwater & Environmental Services, Inc., Prepared for Merit Oil of New York, Inc.

The purpose of this site assessment was to determine if subsurface soils and groundwater had been impacted from the use of the USTs previously removed in June 1993. Monitoring wells were intended to be installed; however, groundwater was not encountered during drilling of the first boring which was advanced to 55 ft bgs. Therefore, no groundwater monitoring wells were installed.
On 14 October 1993 and 21 to 22 March 1994, a total of nineteen subsurface soil samples were collected from nine soil borings advanced at locations around the area of the former UST fields. Analytical results indicated total BTEX concentrations ranging from non-detect to 142,300 parts per billion (ppb), with benzene non-detect in all samples. The greatest concentrations of petroleum-related compounds were found in soil boring SB1 in the northwestern portion of the Site and exceed the toxicity characteristic leaching procedure (TCLP) Alternative Guidance Values.
GES concluded that since the groundwater table is greater than 53 ft bgs, the Site was not considered a threat to potable groundwater and no further action was recommended.

Remedial Investigation Report, 3 June 1998, prepared by Groundwater & Environmental Services, Inc., Prepared for Merit Oil of New York, Inc.

A Remedial Investigation was performed by GES in March 1995 including the installation of four soil borings and four soil vapor extraction points in order to delineate subsurface soils and perform a SVE pilot

test. Soil borings were advanced to a maximum depth of 42 ft. Groundwater was expected to be encountered around 65 ft bgs. A total of five soil samples were collected, and total BTEX concentrations ranged from non-detect to 532 ug/kg. Additionally, of the four vapor extraction points, one soil vapor extraction test was performed achieving a maximum radius of influence of approximately 40 ft, and a total of 0.014 pounds of benzene was removed during the test. The results of the SVE test indicated that petroleum hydrocarbon-impacted soils were present up to depths of 22 ft bgs.
GES recommended installation of two monitoring wells to determine if groundwater had been impacted by contamination: one in the impacted soil area of the former tank field and one in the downgradient (southern) portion of the Site.

Based on available information and Site observations, no groundwater monitoring wells have been installed on the Site, thus, no groundwater monitoring has been conducted at the Site.

Spill Closure Report, December 2002, prepared by EnviroTrac, Ltd.

Based on previous Site investigations, it was concluded that limited volatile organic compound (VOC) contamination exists at the Site. A clean soil horizon has been established from 22 to 55 ft bgs. In August 2002, after reviewing available Site data, NYSDEC determined that the Site was a candidate for spill closure. The Amerada Hess Corp. requested closure of Spill Case #93-03355 (assigned in 2000) and #00-00590 and #01-05801 (assigned in 2001), with the cause of spill noted as "unknown." Subsequently, EnviroTrac conducted a Site visit to determine potential areas of concern, any sensitive receptors in the area, and reviewed appropriate environmental databases. Documentation of the Spill Closure was not included in this report; however, the three spill cases listed above are registered as closed in the NYSDEC Spill Incident Database, with closure dates ranging from 2003 through 2005.

It is noted that according to NYSDEC spill reports, spill cases 0000590, 0105801, 0611614, 0612533, 0907189 and 9303355 are closed however spill report details note that standards were not met.

Limited Phase II Environmental Site Assessment (ESI) Report, November 2021, prepared by Haley & Aldrich

The Limited Phase II ESI activities, including installation of eight soil borings up to 6 feet below ground surface (ft bgs), with samples collected at variable depths from the surface to 6 ft bgs, were completed in October 2021 at the Site.

Remedial Investigation Report, September 2022, prepared by Haley & Aldrich

A Remedial Investigation (RI) was completed by Haley & Aldrich in accordance with the Remedial Investigation Work Plan (RIWP) approved by NYSDEC in March 2022. The RI activities, including installation of eight soil borings up to 35 ft bgs, five permanent groundwater monitoring wells and six soil vapor probes, were completed in March and April 2022 and reported in the Remedial Investigation Report (RIR) submitted to NYSDEC in September 2022.

The RI found contaminants of concern at the Site are primarily metals, semi-volatile organic compounds (SVOCs), and per- and polyfluoroalkyl substances (PFAS) with impacts to soil and groundwater, and VOCs

with impacts to soil, groundwater, and soil vapor. Supplemental data is required to determine the extent and depth of VOC contamination above applicable standards in the vicinity of boring SB-3.

3. Supplemental Remedial Investigation

This section describes the field activities to be conducted during the Supplemental Remedial Investigation (SRI) and provides the sampling scope, objectives, methods, anticipated number of samples, and sample locations. A summary of the sampling and analysis plan is provided in Table 1 and Figure 3. The following investigation activities will be conducted to fill data gaps so that the extent and depth of VOC contamination at the Site can be determined.

3.1 UTILITY MARKOUT

Field personnel will mobilize to the Site to stake (with flagging or paint) the proposed soil sample locations. Once the sample locations are marked, Dig Safely New York will be contacted to mark underground utilities. A ground penetrating radar survey was completed in October 2021 prior to the RI. Once the utilities are marked, field equipment and personnel will be mobilized to the Site.

3.2 SOIL SAMPLING

Additional on-site soil samples will be collected at varying intervals to identify the extent and depth of VOC contamination at the site.

The sampling and analysis plan is summarized in Table 1. Eleven soil borings will be installed to 60 feet below grade surface (ft bgs) by a track-mounted direct push drill rig (Geoprobe®) operated by a licensed operator. Soil samples will be collected from acetate liners using a stainless-steel trowel or sampling spoon. Samples will be placed in laboratory provided clean bottle ware.

Soils will be logged continuously by a geologist or engineer using a modified Burmister method. The presence of staining, odors, and photoionization detector (PID) response will be noted. Samples will be collected using laboratory-provided clean bottle ware. VOC grab samples will be collected using terra cores. Sampling methods are described in the Field Sampling Plan (FSP) provided as Appendix B. A Quality Assurance Project Plan (QAPP) is provided as Appendix C. Laboratory data will be reported in ASP Category B deliverable format.

Soil samples representative of Site conditions will be collected at boring location SB-3 as well as 10-foot step-outs to the north, east, south and west, 20-foot step outs to the east, south and west, and 30-foot step outs to the east, south and west, as shown on Figure 3. Samples intervals have been proposed based data gaps identified in the RI. Additional soil samples are needed from the deepest sample depth from the RI, 35 ft bgs, to just above the groundwater table to determine the extent of VOC contamination. One grab sample will be collected from each five-foot interval from 35 ft bgs to approximately 60 ft bgs, just above the groundwater table to avoid interference from the smear zone. Within each five-foot interval, a soil sample will be collected from the one-foot interval exhibiting the highest observed visual and olfactory indications of potential petroleum hydrocarbon impacts and/or elevated PID readings. If no impacts are observed a sample will be collected from the base of each 5 ft interval.

This is to characterize the depth and extent of VOC contamination within the vicinity of soil boring SB-3 which may represent an on-site source as well as characterize pesticides sitewide in shallow and deeper soils.

SB-3 delineation soil samples will be analyzed for:

- Target Compound List (TCL) VOCs using EPA method 8260B

Sitewide characterization soil samples will be analyzed for:

- Pesticides using EPA Method 8081

3.3 INVESTIGATION DERIVED WASTE

Following sample collection, boreholes will be backfilled with soil cutting and an upper bentonite plug. Boreholes will be restored to grade with surrounding area. If soil is identified as grossly contaminated, it will be separated and placed into a sealed and labeled Department of Transportation (DOT) approved 55-gallon drum pending characterization and offsite disposal.

3.4 SOIL VAPOR SAMPLING

Samples will be collected in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH October 2006). Five soil vapor probes will be installed to approximately 45 ft bgs, approximately the midpoint between the groundwater table and base of anticipated excavation. The vapor implants will be installed with a direct-push drilling rig (e.g., Geoprobe®) to advance a stainless-steel probe to the desired sample depth. Sampling will occur for the duration of two (2) hours.

Samples will be collected in appropriately sized Summa canisters that have been certified clean by the laboratory, and samples will be analyzed by using USEPA Method TO-15. Flow rate for both purging and sampling will not exceed 0.2 L/min. Sampling methods are described in the Field Sampling Plan (FSP) provided as Appendix B.

3.5 PROPOSED SAMPLING RATIONALE

Haley & Aldrich has proposed the sample plan described herein and as shown in Figure 3, in consideration of the data generated during the Remedial Investigation performed in March 2022. Proposed sampling locations will address data gaps from the RI to further delineate soil and soil vapor contamination. Sampling locations will also help characterize soil conditions post-corrective action. To delineate soil contamination stemming from SB-3, samples will be collected to the north, east, south and west of RI boring SB-3 at various depths to delineate both vertically and horizontally across the Site down to the groundwater table.

4. Quality Assurance and Quality Control

Quality Assurance/Quality Control (QA/QC) procedures will be used to provide performance information with regard to accuracy, precision, sensitivity, representation, completeness, and comparability associated with the sampling and analysis for this investigation. Field QA/QC procedures will be used (1) to document that samples are representative of actual conditions at the Site and (2) identify possible cross-contamination from field activities or sample transit. Laboratory QA/QC procedures and analyses will be used to demonstrate whether analytical results have been biased either by interfering compounds in the sample matrix, or by laboratory techniques that may have introduced systematic or random errors to the analytical process.

QA/QC procedures are defined in the Quality Assurance Project Plan included in Appendix C.

5. Data Use

5.1 DATA SUBMITTAL

Analytical data will be supplied in ASP Category B Data Packages. If more stringent than those suggested by the United States Environmental Protection Agency, the laboratory's in house QA/QC limits will be utilized.

5.2 DATA VALIDATION

Data packages will be sent to a qualified data validation specialist for evaluation of accuracy and precision of the analytical results. A DUSR will be created to confirm the compliance of methods with the protocols described in the NYSDEC Analytical Service Protocol (ASP). DUSRs will summarize and confirm usability of the data for project-related decisions. Data validation will be completed in accordance with the DUSR guidelines from NYSDEC Division of Environmental Remediation. The DUSR will be included with the submittal of a Supplemental Remedial Investigation Report (SRIR).

6. Health and Safety

6.1 HEALTH AND SAFETY PLAN

A Site-specific Health and Safety Plan (HASP) has been prepared in accordance with NYSDEC and NYSDOH guidelines and is provided as Appendix D.

6.2 COMMUNITY AIR MONITORING PLAN

The proposed SRI work will be completed outdoors at the Site. Where intrusive drilling operations are planned, community air monitoring will be implemented to protect the downwind receptors. A Haley & Aldrich representative will continually monitor the breathing air in the vicinity of the immediate work area using a PID to measure total VOCs in air at concentrations as low as 1 part per million (ppm). The air in the work zone also will be monitored for visible dust generation.

If VOC measurements above 5 ppm are sustained for 15 minutes or visible dust generation is observed, the intrusive work will be temporarily halted and a more rigorous monitoring of VOCs and dust using recordable meters will be implemented in accordance with the NYSDOH Generic Community Air Monitoring Plan (CAMP).

7. Project Organization

A project team for the site has been created based on qualifications and experience with personnel suited for successfully completing the project.

The NYSDEC Case Manager is Sadique Ahmed. The Case Manager will be responsible for overseeing the successful completion of the project work and adherence to the work plan on behalf of NYSDEC.

The NYSDOH Case Manager will be Sarita Wagh. The Case Manager will be responsible for overseeing the successful completion of the project work and adherence to the work plan on behalf of NYSDOH.

James Bellew will be the Qualified Environmental Professional (QEP) and Principal in Charge for this work. Mr. Bellew has over 15 years of experience in investigation and remediation in New York and throughout the eastern United States. In this role, Mr. Bellew will be responsible for the overall completion of each task as per requirements outlined in this work plan and in accordance with the DER-10 guidance.

Matthew Levy will be the Project Manager for this work. In this role, Mr. Levy will manage the day-to-day tasks including coordination and supervision of field engineers and scientists, adherence to the work plan and oversight of project schedule. As the Project Manager, Mr. Levy will also be responsible for communications with the NYSDEC Case Manager regarding project status, schedule, issues, and updates for project work.

Elizabeth Scheuerman will be the Assistant Project Manager for this work as well as the Quality Assurance Officer (QAO). The QAO will assure the application and effectiveness of the QAPP by the analytical laboratory and the project staff, provide input to field team as to corrective actions that may be required as a result of the above-mentioned evaluations and prepare and/or review data validation and audit reports.

Nicholas Manzione will be the field engineer responsible for implementing the field effort for this work. Mr. Manzione's responsibilities will include implementing the work plan activities and directing the subcontractors to ensure successful completion of all field activities.

The drilling subcontractor will be Eastern Environmental Solutions and/or Coastal Environmental. Eastern Environmental Solutions and/or Coastal Environmental will provide a geoprobe operator to implement the scope of work in this SRIWP.

The analytical laboratory will be Alpha Analytical of Westborough, MA, a New York Environmental Laboratory Approval Program (ELAP) certified laboratory. Alpha Analytical will be responsible for analyzing samples as per the analyses and methods identified in Section 3.

8. Reporting

During implementation of this work plan, daily reports will be provided to the NYSDEC and NYSDOH which summarize daily activities and provide the CAMP monitoring data. Following completion of the work, a summary of the SRI will be provided to NYSDEC as an appendix to the Remedial Action Work Plan to support implementation of proposed remedial action. The report will include:

- Summary of the activities;
- Figure showing sampling locations;
- Tables summarizing laboratory analytical results;
- Laboratory analytical data reports;
- Field sampling data sheets;
- Findings regarding the nature and extent of contamination at the Site;
- Qualitative exposure assessment of any contamination from an on-site source that has migrated offsite; and
- Conclusions and recommendations.

References

1. Site Assessment Report, 2 November 1994, Prepared by Groundwater & Environmental Services, Inc., Prepared for Merit Oil of New York, Inc.

2. Remedial Investigation Report, 3 June 1998, Prepared by Groundwater & Environmental Services, Inc., Prepared for Merit Oil of New York, Inc.

3. Limited Phase II Environmental Site Investigation Report, November 2021, prepared by Haley & Aldrich.

4. Brownfield Cleanup Program Application, 1885 Atlantic Avenue, Brooklyn, New York, Prepared by 1885 Atlantic Avenue Realty LLC & Haley & Aldrich of New York, prepared for the New York State Department of Environmental Conservation, approved February 2022.

5. Remedial Investigation Work Plan, 1885 Atlantic Avenue, Brooklyn, New York, Prepared by Haley & Aldrich of New York, prepared for the New York State Department of Environmental Conservation, approved March 2022.

6. Draft Remedial Investigation Report, 1885 Atlantic Avenue, Brooklyn, New York, Prepared for 1885 Atlantic Realty LLC by Haley & Aldrich of New York for submission to the New York State Department of Environmental Conservation, submitted September 2022.

7. Draft Remedial Action Work Plan, 1885 Atlantic Avenue Redevelopment Site, Brooklyn, New York, Prepared for 1885 Atlantic Realty LLC by Haley & Aldrich of New York for submission to the New York State Department of Environmental Conservation, submitted October 2022.

8. Program Policy DER-10, “Technical Guidance for Site Investigation and Remediation,” New York State Department of Environmental Conservation, May 2010.

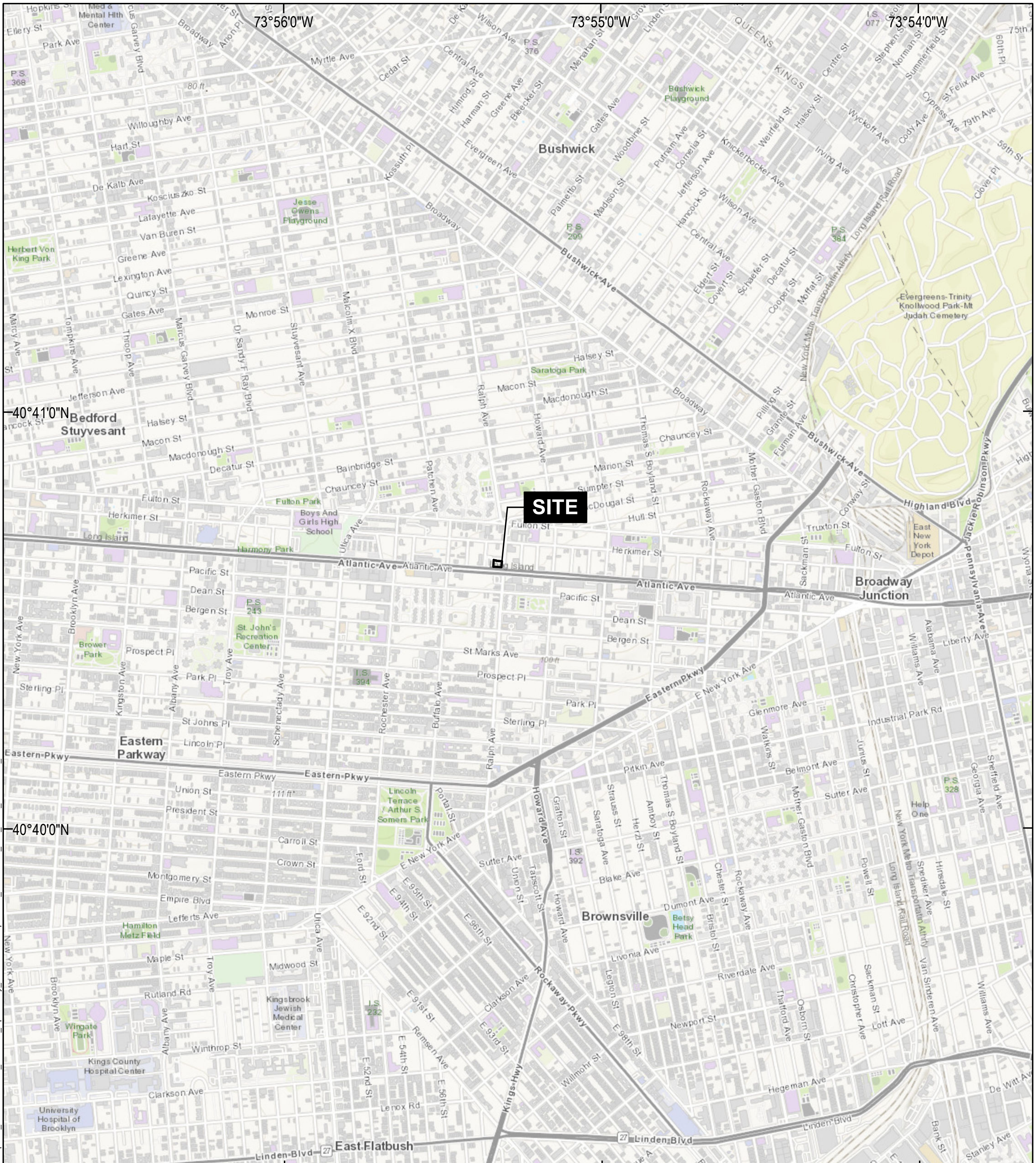
TABLES

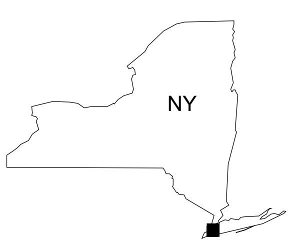
Table 1. PDI Sampling and Analysis Plan
1885 Atlantic Avenue, Brooklyn, New York

Location	Boring Interval* (ft bgs)	Target Compound List VOCs (8260B)	Pesticides (8081)	USEPA Method TO-15
SOIL				
SB-3	35-40	X		
	40-45	X		
	45-50	X		
	50-55	X		
	55-60	X		
SB-3_N	35-40	X		
	40-45	X		
	45-50	X		
	50-55	X		
	55-60	X		
SB-3_E	35-40	X		
	40-45	X		
	45-50	X		
	50-55	X		
	55-60	X		
SB-3_E1	35-40	X		
	40-45	X		
	45-50	X		
	50-55	X		
	55-60	X		
SB-3_E2	35-40	X		
	40-45	X		
	45-50	X		
	50-55	X		
	55-60	X		
SB-3_W	35-40	X		
	40-45	X		
	45-50	X		
	50-55	X		
	55-60	X		
SB-3_W1	35-40	X		
	40-45	X		
	45-50	X		
	50-55	X		
	55-60	X		
SB-3_W2	35-40	X		
	40-45	X		
	45-50	X		
	50-55	X		
	55-60	X		
SB-3_S	35-40	X		
	40-45	X		
	45-50	X		
	50-55	X		
	55-60	X		
SB-3_S1	35-40	X		
	40-45	X		
	45-50	X		
	50-55	X		
	55-60	X		
SB-3_S2	35-40	X		
	40-45	X		
	45-50	X		
	50-55	X		
	55-60	X		
SB-9	0-0.5		X	
	13-15		X	
SB-10	0-0.5		X	
	13-15		X	
SB-11	0-0.5		X	
	13-15		X	
SB-12	0-0.5		X	
	13-15		X	
SOIL VAPOR				
SG-7	45			X
SG-8	45			X
SG-9	45			X
SG-10	45			X
SG-11	45			X

Notes:
VOCs - Volatile Organic Compounds
Ft bgs - Feet below grade surface
* - Within each proposed five-foot boring interval for VOC samples, grab samples will be collected from a one-foot interval exhibiting the highest visual, olfactory, and/or PID readings observed in the field. If no impacts are observed a sample will be collected from the base of each 5 ft interval.
QA/QC sample sets include:
MS - 1 for every 20 samples
MSD - 1 for every 20 samples
Field Duplicate - 1 for every 20 samples
Trip Blanks - 1 per cooler of samples to be analyzed for VOCs
Field Blanks - 1 for every 20 samples

FIGURES





N

MAP SOURCE: ESRI
SITE COORDINATES: 40°40'38"N, 73°55'19"W

HALEY ALDRICH

1885 ATLANTIC AVENUE REDEVELOPMENT SITE
1885 ATLANTIC AVENUE
BROOKLYN, NY

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
OCTOBER 2022

FIGURE 1

LEGEND

COMMUTER RAIL LINE BLOCK 1714

SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ASSESSOR PARCEL DATA SOURCE: KINGS COUNTY
3. AERIAL IMAGERY SOURCE: NEARMAP, 12 AUGUST 2021

N

0 40 80

SCALE IN FEET

HALEY ALDRICH

1885 ATLANTIC AVENUE REDEVELOPMENT SITE
1885 ATLANTIC AVENUE
BROOKLYN, NY

SITE MAP

SEPTEMBER 2022

FIGURE 2

GIS: C:\Users\khensen\OneDrive - haleyaldrich.com\Desktop\KH_LOCAL\Phase_I\Former_Speedway_#7833\GIS\Maps\2021_09\000000_000_0002_SITE_PLAN.mxd - khensen - 9/6/2021 7:12:55 AM

LEGEND

- COMMUTER RAIL LINE BLOCK 1714
- SITE BOUNDARY
- PROPOSED SOIL BORING LOCATION FOR VOC SAMPLES
- PROPOSED SOIL VAPOR LOCATION
- PROPOSED SOIL BORING LOCATION FOR PESTICIDE SAMPLES

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ASSESSOR PARCEL DATA SOURCE: KINGS COUNTY
3. AERIAL IMAGERY SOURCE: NEARMAP, 12 AUGUST 2021

N

0 40 80

SCALE IN FEET

HALEY ALDRICH

1885 ATLANTIC AVENUE REDEVELOPMENT SITE
1885 ATLANTIC AVENUE
BROOKLYN, NY

PROPOSED SUPPLEMENTAL REMEDIAL INVESTIGATION SAMPLE LOCATION PLAN

JANUARY 2023

FIGURE 3

GIS: C:\Users\khensen\OneDrive - haleyaldrich.com\Desktop\KH_LOCAL\Phase_I\Former_Speedway_#7833\GIS\Maps\2021_09\000000_000_0002_SITE_PLAN.mxd - khensen - 9/9/2021 7:12:55 AM

APPENDIX A

Previous Reports

https://haleyaldrich.sharefile.com/d-s55eca86bde2e4e28874d13b9a602b7c9

APPENDIX B

Field Sampling Plan

HALEY ALDRICH

HALEY ALDRICH

www.haleyaldrich.com

FIELD SAMPLING PLAN
1885 ATLANTIC AVENUE REDEVELOPMENT
BROOKLYN, NEW YORK

by
Haley & Aldrich of New York
New York, New York

for
1885 Atlantic Realty LLC
Hauppauge, New York

File No. 0205125-001
January 2023

Table of Contents

Table of Contents

1. Introduction

This Field Sampling Plan (FSP) has been prepared as a component of the Supplemental Remedial Investigation Work Plan (SRIWP) for the subject Site located at 1885 Atlantic Avenue in Brooklyn, New York. This document was prepared to establish field procedures for field data collection to be performed in support of the SRIWP for the Site.

The SRIWP includes this Field Sampling Plan, a Quality Assurance Project Plan (QAPP), and Health and Safety Plan (HASP), which are included as part of this plan by reference.

The standard operating procedures (SOP) included as components of this plan will provide the procedures necessary to meet the project objectives. The SOPs will be used as reference for the methods to be employed for field sample collection and handling and the management of field data collected in the execution of the approved SRIWP. The SOPs include numerous methods to execute the tasks of the SRIWP. The Project Manager will select the appropriate method as required by field conditions and/or the objective the respective project task at the time of sample collection. Field procedures will be conducted in general accordance with the New York State Department of Conservation (NYSDEC) Technical Guidance for Site Investigation and Remediation (DER-10) and the Sampling, Analysis and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) under NYSDEC Part 375 Remedial Program when applicable.

2. Field Program

This FSP provides the general purpose of sampling as well as procedural information. The SRIWP contains the details on sampling and analysis (locations, depths, frequency, analyte lists, etc.).

The field program has been designed to acquire the necessary data to comply with the SRIWP, and includes the following tasks:

- Soil sampling;
- Soil vapor sampling;
- Sampling of investigation of derived wastes (IDW) as needed for disposal.

Based on the former use of the Site, and previous investigations conducted, volatile organic compounds (VOCs) are the anticipated contaminants of concern. A Remedial Investigation (RI) was performed in May 2022 to further investigate and delineate the petroleum-related contamination previously identified in Site soils and assess soil vapor at the Site. This RI revealed elevated VOC concentrations in Site soils with RI boring SB-3 to depths of 60 feet below grade surface (ft bgs) and elevated photoionization detector (PID) detections of hydrocarbons in soil vapor.

These SOPs presented herein may be changed as required, dependent on-site conditions, or equipment limitations, at the time of sample collection. If the procedures employed differ from the SOP, the deviations will be documented in the associated sampling report.

3. Utility Clearance

Invasive remedial activities such as excavation or remedial construction activities require location of underground utilities prior to initiating work. Such clearance is sound practice in that it minimizes the potential for damage to underground facilities and more importantly, is protective of the health and safety of personnel. Under no circumstances will invasive activities be allowed to proceed without obtaining proper utility clearance by the appropriate public agencies and/or private entities. This clearance requirement applies to all work on both public and private property, whether located in a dense urban area or a seemingly out-of-the-way rural location.

The drilling contractor performing the work will be responsible for obtaining utility clearance.

Utility clearance is required by law, and obtaining clearance includes contacting a public or private central clearance agency via a "one-call" telephone service and providing the proposed exploration location information. It is important to note that public utility agencies may not, and usually do not have information regarding utility locations on private property.

Before beginning subsurface work at any proposed exploration locations, it is critical that all readily-available information on underground utilities and structures be obtained. This includes publicly available information as well as information in the possession of private landowners. Any drawings obtained must be reviewed in detail for information pertaining to underground utilities.

Using the information obtained, the site should be viewed in detail for physical evidence of buried lines or structures, including pavement cuts and patches, variation in or lack of vegetation, variations in grading, etc. Care must also be taken to avoid overhead utilities as well. Presence of surface elements of buried utilities should be documented, such as manholes, gas or water service valves, catch basins, monuments or other evidence.

Overhead utility lines must be considered when choosing exploration and excavation locations. Most states require a minimum of 10 ft of clearance between equipment and energized wires. Such separation requirements may also be voltage-based and may vary depending on state or municipality regulations. In evaluating clearance from overhead lines, the same restrictions may apply to "drops", or wires on a utility pole connecting overhead and underground lines.

Using the information obtained and observations made, proposed exploration or construction locations should be marked in the field. Marking locations can be accomplished using spray paint on the ground, stakes, or other means. All markings of proposed locations should be made in white, in accordance with the generally-accepted universal color code for facilities identification (AWMA 4/99):

- White: Proposed Excavation or Drilling location
- Pink: Temporary Survey Markings
- Red: Electrical Power Lines, Cables, Conduit and Lighting Cables
- Yellow: Gas, Oil, Steam, Petroleum or Gaseous Materials
- Orange: Communication, Alarm or Signal Lines, Cables or Conduits
- Blue: Potable Water
- Purple: Reclaimed Water, Irrigation and Slurry Lines
- Green: Sewers and Drain Lines

In order to effectively evaluate the proposed locations with these entities, detailed, accurate measurements between the proposed locations and existing surface features should be obtained. Such features can be buildings, street intersections, utility poles, guardrails, etc.

Obtaining the utility clearance generally involves the designated "One-Call" underground facilities protection organization for the area and the landowner and one or both following entities:

- A third-party utility locator company will be utilized to locate underground utilities outside of the public right-of-way; and/or
- "Soft dig" excavation techniques to confirm or deny the presence of underground utilities in the area.

The proposed locations should be evaluated in light of information available for existing underground facilities. The detailed measurement information described above will be required by the "one call" agency. The owners of the applicable, participating underground utilities are obligated to mark their respective facilities at the site in the colors described above. Utility stake-out activities will typically not commence for approximately 72 hours after the initial request is made.

The public and private utility entities generally only mark the locations of their respective underground facilities within public rights-of-way. Determination of the locations of these facilities on private property will be the responsibility of the property owner or Contractor. If available information does not contain sufficient detail to locate underground facilities with a reasonable amount of confidence, alternate measures may be appropriate, as described below. In some cases, the memory of a long-time employee of a facility on private property may be the best or only source of information. It is incumbent on the Consultant or Contractor to exercise caution and use good judgement when faced with uncertainty.

Note: It is important to note that not all utilities are participants in the "one-call" agency or process. As such, inquiries must be made with the "one-call" agency to determine which entities do not participate, so they can be contacted independently.

Most utility stakeouts have a limited time period for which they remain valid, typically two to three weeks. It is critical that this time period be considered to prevent expiration of clearance prior to completion of the invasive activities, and the need to repeat the stake-out process.

Care must be exercised to document receipt of notice from the involved agencies of the presence or absence of utilities in the vicinity of the proposed locations.

Most agencies will generally provide a telephone or fax communication indicating the lack of facilities in the project area. If contact is not made by all of the agencies identified by the "one-call" process, do not assume that such utilities are not present. Re-contact the "one-call" agency to determine the status.

For complicated sites with multiple proposed locations and multiple utilities, it is advisable to arrange an on-site meeting with utility representatives. This will minimize the potential for miscommunication amongst the involved parties.

Completion of the utility stake out process is not a guarantee that underground facilities will not be encountered in excavations or boreholes; in fact, most "one-call" agencies and individual utilities do not

offer guarantees, nor do they accept liability for damage that might occur. In areas outside the public right-of-way, a utility locating service may be utilized to locate underground utilities. It is advisable that any invasive activities proceed with extreme caution in the upper four to five feet in the event the clearance has failed to identify an existing facility. This may necessitate hand-excavation or probing to confirm potential presence of shallow utilities. If uncertainty exists for any given utility, extra activities can be initiated to solve utility clearance concerns. These options include:

- Screening the proposed work areas with utility locating devices, and/or hiring a utility locating service to perform this task.
- Hand digging, augering or probing to expose or reveal shallow utilities and confirm presence and location. In northern climates, this may require advancing to below frost line, typically at least four feet.
- Using "soft dig" techniques that utilize specialized tools and compressed air to excavate soils and locate utilities. This technique is effective in locating utilities to a depth of four to five feet.

Equipment/Materials:

- White Spray paint
- Wooden stakes, painted white or containing white flagging
- Color-code key
- Available drawings

4. Field Data Recording

This procedure describes protocol for documenting the investigation activities in the field. Field data serves as the cornerstone for an environmental project, not only for site characterization but for additional phases of investigation or remedial design. Producing defensible data includes proper and appropriate recording of field data as it is obtained in a manner to preserve the information for future use. This procedure provides guidelines for accurate, thorough collection and preservation of written and electronic field data.

Field data to be recorded during the project generally includes, but is not limited to, the following:

- general field observations;
- numeric field measurements and instrument readings;
- quantity estimates;
- sample locations and corresponding sample numbers;
- relevant comments and details pertaining to the samples collected;
- documentation of activities, procedures and progress achieved;
- contractor pay item quantities;
- weather conditions;
- a listing of personnel involved in site-related activities;
- a log of conversations, site meetings and other communications; and,
- field decisions and pertinent information associated with the decisions.

4.1 WRITTEN FIELD DATA

Written field data will be collected using a standardized, pre-printed field log form. In general, use of a field log form is preferable as it prompts field personnel to make appropriate observations and record data in a standardized format. This promotes completeness and consistency from one person to the next. Otherwise, electronic data collection using a handheld device produces equal completeness and consistency using a preformatted log form.

In the absence of an appropriate pre-printed form, the data should be recorded in an organized and structured manner in a dedicated project field log book. Log books must be hard cover, bound so that pages cannot be added or removed, and should be made from high-grade 50% rag paper with a water-resistant surface.

The following are guidelines for use of field log forms and log books:

1. Information must be factual and complete.
2. All entries will be made in black indelible ink with a ballpoint pen and will be written legibly. Do not use “rollerball” or felt tip-style pens, since the water-soluble ink can run or smear in the presence of moisture.
3. Field log forms should be consecutively numbered.
4. Each day’s work must start a new form/page.
5. At the end of each day, the current log book page or forms must be signed and dated by the field personnel making the entries.

6. Make data entries immediately upon obtaining the data. Do not make temporary notes in other locations for later transfer; this only increases the potential for error or loss of data.
7. Entry errors are to be crossed out with a single line and initialed by the person making the correction.
8. Do not leave blanks on log forms, if no entry is applicable for a given data field, indicate so with "NA" or a dash ("--").
9. At the earliest practical time, photocopies or typed versions of log forms and log book pages should be made and placed in the project file as a backup in the event the book or forms are lost or damaged.
10. Log books should be dedicated to one project only, i.e., do not record data from multiple projects in one log book.

4.2 ELECTRONIC DATA

Electronic data recording involves electronic measurement of field information through the use of monitoring instruments, sensors, gauges, and equipment controls. The following is a list of guidelines for proper recording and management of electronic field data:

1. Field data management should follow requirements of a project-specific data management plan (DMP), if applicable.
2. Use only instruments that have been calibrated in accordance with manufacturer's recommendations.
3. Usage of instruments, controls and computers for the purpose of obtaining field data should only be performed by personnel properly trained and experienced in the use of the equipment and software.
4. Use only fully-licensed software on personal computers and laptops.
5. Loss of electronic files may mean loss of irreplaceable data. Every effort should be made to back up electronic files obtained in the field as soon as practical. A backup file placed on the file server will minimize the potential for loss.
6. Electronic files, once transferred from field instruments or laptops to office computers, should be protected if possible, to prevent unwanted or inadvertent manipulation or modification of data. Several levels of protection are usually available for spreadsheets, including making a file "read-only" or assigning a password to access the file.
7. Protect CD disks from exposure to moisture, excessive heat or cold, magnetic fields, or other potentially damaging conditions.
8. Remote monitoring is often used to obtain stored electronic data from site environmental systems. A thorough discussion of this type of electronic field data recording is beyond the scope of this Section. Such on-site systems are generally capable of storing a limited amount of data as a comma-delimited or spreadsheet file. Users must remotely access the monitoring equipment files via modem or other access and download the data. In order to minimize the potential for loss of data, access and downloading of data should be performed frequently enough to ensure the data storage capacity of the remote equipment is not exceeded.

Equipment/Materials:

- Appropriate field log forms, or iPad® or equivalent with preformatted log forms.
- Indelible ball point pen (do not use "rollerball" or felt-tip style pens);
- Straight edge;
- Pocket calculator; and,
- Laptop computer (if required).

5. Sample Collection for Laboratory Analysis

5.1 SOIL SAMPLE COLLECTION FOR LABORATORY ANALYSIS

The following procedure is an introduction to soil sampling techniques and an outline of field staff responsibilities. All samples will be collected with dedicated sampling equipment.

5.1.1 Preparatory Requirements

Prior to the beginning of any remedial investigation or remedial measures activities, staff must attend a project briefing for the purpose of reviewing the project work plan, site and utility plans, drawings, applicable regulations, sampling location, depth, and criteria, site contacts, and other related documents. Health and safety concerns will be documented in a site-specific Health & Safety Plan.

A file folder for the field activities should be created and maintained such that all relevant documents and log forms likely to be useful for the completion of field activities by others are readily available in the event of personnel changes.

5.1.2 Soil Classification

The stratigraphic log is a factual description of the soil at the borehole location and is relied upon to interpret the soil characteristics, and their influence and significance in the subsurface environment. The accuracy of the stratigraphic log is to be verified by the person responsible for interpreting subsurface conditions. An accurate description of the soil stratigraphy is essential for a reasonable understanding of the subsurface conditions. Confirmation of the field description by examination of representative soil samples by the project geologist, hydrogeologist, or geotechnical engineer (whenever practicable) is recommended.

The ability to describe and classify soil correctly is a skill that is learned from a person with experience and by systematic training and comparison of laboratory results to field descriptions.

5.1.2.1 Data Recording

Several methods for classifying and describing soils or unconsolidated sediments are in relatively widespread use. The Unified Soil Classification System (USCS) is the most common. With the USCS, a soil is first classified according to whether it is predominantly coarse-grained or fine-grained.

The description of fill soil is similar to that of natural undisturbed soil except that it is identified as fill and not classified by USCS group, relative density, or consistency. Those logging soils must attempt to distinguish between soils that have been placed (i.e., fill) and not naturally present; or soils that have been naturally present but disturbed (i.e., disturbed native).

It is necessary to identify and group soil samples consistently to determine the subsurface pattern or changes and non-conformities in soil stratigraphy in the field at the time of drilling. The stratigraphy in each borehole during drilling is to be compared to the stratigraphy found at the previously completed boreholes to ensure that pattern or changes in soil stratigraphy are noted and that consistent terminology is used.

Visual examination, physical observations and manual tests (adapted from ASTM D2488, visual-manual procedures) are used to classify and group soil samples in the field and are summarized in this subsection. ASTM D2488 should be reviewed for detailed explanations of the procedures. Visual-manual procedures used for soil identification and classification include:

- visual determination of grain size, soil gradation, and percentage fines;
- dry strength, dilatancy, toughness, and plasticity (thread or ribbon test) tests for identification of inorganic fine-grained soil (e.g., CL, CH, ML, or MH); and
- soil compressive strength and consistency estimates based on thumb indent and pocket penetrometer (preferred) methods.

Soil characteristics like plasticity, strength and dilatancy should be determined using the Haley & Aldrich Soil Identification Field Form.

5.1.2.2 Field Sample Screening

Upon the collection of soil samples, the soil is screened with a photoionization detector (PID) for the presence of organic vapor. This is accomplished by running the PID across the soil sample. The highest reading and sustained readings are recorded.

Note: The PID measurement must be done upwind of the excavating equipment or any running engines so that exhaust fumes will not affect the measurements.

Another method of field screening is head space measurements. This consists of placing a portion of the soil sample in a sealable glass jar, placing aluminum foil over the jar top, and tightening the lid. Alternatively, plastic sealable bags may be utilized for field screen in lieu of glass containers. The jar should only be partially filled. Shake the jar and set aside for at least 30 minutes. After the sample has equilibrated, the lid of the jar can be opened; the foil is punctured with the PID probe and the air (headspace) above the soil sample is monitored. This headspace reading on the field form or in the field book is recorded. All head space measurements must be completed under similar conditions to allow comparability of results. Soil classification and PID readings will be recorded in the daily field report.

Equipment/Materials:

- Pocket knife or small spatula
- Small handheld lens
- Stratigraphic Log (Overburden) (Form 2001)
- Tape Measure

5.1.3 Soil Sampling

Soil samples will be collected from acetate liners installed by a track-mounted direct push drill rig (Geoprobe®) operated by a licensed operator. Soil samples will be collected using a stainless-steel trowel or sampling spoon into laboratory provided sample containers. If it is necessary to relocate any proposed sampling location due to terrain, utilities, access, etc., the Project Manager must be notified, and an alternate location will be selected.

Prior to use and between each sampling location at an environmental site, the sampling equipment must be decontaminated. All decontamination must be conducted in accordance with the project specific plans or the methods presented in SOP 7.0.

5.1.4 Sampling Techniques

The following procedure describes typical soil sample collection methods for submission of samples to a laboratory for chemical analysis. The primary goal of soil sampling is to collect representative samples for examination and chemical analysis (if required).

Environmental soil samples obtained for chemical analyses are collected with special attention given to the rationale behind determining the precise zone to sample, the specifics of the method of soil extraction and the requisite decontamination procedures. Preservation, handling and glassware for environmental soil samples varies considerably depending upon several factors including the analytical method to be conducted, and the analytical laboratory being used.

5.1.4.1 Grab Versus Composite Samples

A grab sample is collected to identify and quantify conditions at a specific location or interval. The sample is comprised of the minimum amount of soil necessary to make up the volume of sample dictated by the required sample analyses. Composite samples may be obtained from several locations or along a linear trend (in a test pit or excavation). Sampling may occur within or across stratification.

5.2 SUB-SLAB/SOIL VAPOR SAMPLING

The following procedure is an introduction to soil vapor sampling techniques and an outline of field staff responsibilities.

5.2.1 Preparatory Requirements

Prior to collecting the field sample, ensure the stainless steel oil vapor probe has been installed to the desired depth and sealed completely to the surface using a material such as bentonite. As part of the vapor intrusion evaluation, a tracer gas should be used in accordance with NYSDOH protocols to serve as a quality assurance/quality control (QA/QC) device to verify the integrity of the soil vapor probe seal. A container (box, plastic pail, etc.) will serve to keep the tracer gas in contact with the probe during testing. A portable monitoring device will be used to analyze a sample of soil vapor for the tracer gas prior to sampling. If the tracer sample results show a significant presence of the tracer, the probe seals will be adjusted to prevent infiltration. At the conclusion of the sampling round, tracer monitoring should be performed a second time to confirm the integrity of the probe seals.

5.2.2 Sampling Techniques

Samples will be collected in appropriately sized Summa canisters that have been certified clean by the laboratory and samples will be analyzed by using USEPA Method TO-15. Flow rate for both purging and sampling will not exceed 0.2 L/min. One to three implant volumes shall be purged prior to the collection of any soil-gas samples. A sample log sheet will be maintained summarizing sample identification, date and time of sample collection, sampling depth, identity of samplers, sampling methods and devices, soil

vapor purge volumes, volume of the soil vapor extracted, vacuum of canisters before and after the samples are collected, apparent moisture content of the sampling zone, and chain of custody protocols.

5.3 SAMPLE HANDLING AND SHIPPING

Sample management is the continuous care given to each sample from the point of collection to receipt at the analytical laboratory. Good sample management ensures that samples are properly recorded, properly labeled, and not lost, broken, or exposed to conditions which may affect the sample's integrity.

All sample submissions must be accompanied with a chain of custody (COC) document to record sample collection and submission. Personnel performing sampling tasks must check the sample preparation and preservation requirements to ensure compliance with the Quality Assurance Project Plan.

The following sections provide the minimum standards for sample management.

5.3.1 Sample Handling

Prior to entering the field area where sampling is to be conducted, especially at sites with defined exclusion zones, the sampler should ensure that all materials necessary to complete the sampling are on hand. If samples must be maintained at a specified temperature after collection, dedicated coolers and ice must be available for use. Conversely, when sampling in cold weather, proper protection of water samples, trip blanks, and field blanks must be considered. Sample preservation will involve pH adjustment, cooling to 4°C, and sample filtration and preservation.

5.3.2 Sample Labeling

Samples must be properly labeled immediately upon collection.

Note that the data shown on the sample label is the minimum data required. The sample label data requirements are listed below for clarity.

- Project name
- Sample name/number/unique identifier
- Sampler's initials
- Date of sample collection
- Time of sample collection
- Analysis required
- Preservatives

To ensure that samples are not confused, a clear notation should be made on the container with a permanent marker. If the containers are too soiled for marking, the container can be put into a "zip lock" bag which can then be labeled.

All sample names will be as follows:

- Sample unique identifier: Enter the sample name or number. There should be NO slashes, spaces or periods in the date.

- Date: Enter the six-digit date when the sample was collected. Note that for one-digit days, months, and/or years, add zeros so that the format is MMDDYY (050210). There should be NO slashes, dashes, or periods in the date.

The QA/QC samples will be numbered consecutively as collected with a sample name, date and number of samples collected throughout the day (i.e., when multiple QA/QC samples are collected in one day).

Examples of this naming convention are as follows:

Sample Name:	Comments
TB-050202-0001	TRIP BLANK
TB-050202-0002	TRIP BLANK
FD-050202-0001	FIELD DUPLICATE
FD-050202-0002	FIELD DUPLICATE

NOTE: The QA/QC Sample # resets to 0001 EACH DAY, this will avoid having to look back to the previous day for the correct sequential number.

5.3.3 Field Code

The field code will be written in the 'Comments' field on the chain of custody for EVERY sample but will not be a part of the actual sample name. Enter the one/two-character code for type of sample (must be in CAPITALS):

N	Normal Field Sample
FD	Field Duplicate (note sample number (i.e., 0001) substituted for time)
TB	Trip Blank (note sample number (i.e., 0001) substituted for time)
EB	Equipment Blank (note sample number (i.e., 0001) substituted for time)
FB	Field Blank (note sample number (i.e., 0001) substituted for time)
KD	Known Duplicate
FS	Field Spike Sample
MS	Matrix Spike Sample (note on 'Comments' field of COC – laboratory to spike matrix.
MD	Matrix Spike Duplicate Sample (note on 'Comments' field of COC – laboratory to spike matrix.
RM	Reference Material

The sample labeling – both chain and sample bottles must be EXACTLY as detailed above. In addition, the Field Sample Key for each sample collected must be filled out.

5.3.4 Packaging

Sample container preparation and packing for shipment should be completed in a well-organized and clean area, free of any potential cross contamination. The following is a list of standard guidelines which must be followed when packing samples for shipment.

- Double bag ice in "Zip Lock" bags.
- Double check to ensure trip and temperature blanks have been included for all shipments containing VOCs, or where otherwise specified in the QAPP.

- Enclose the Chain of Custody form in a "Zip Lock" bag.
- Ensure custody seals (two, minimum) are placed on each cooler. Coolers with hinged lids should have both seals placed on the opening edge of the lid. Coolers with "free" lids should have seals placed on opposite diagonal corners of the lid. Place clear tape over custody seals.
- Containers should be wiped clean of all debris/water using paper towels (paper towels must be disposed of with other contaminated materials).
- Clear, wide packing tape should be placed over the sample label for protection.
- Do not bulk pack. Each sample must be individually padded.
- Large glass containers (1 liter and up) require much more space between containers.
- Ice is not a packing material due to the reduction in volume when it melts.

Note: Never store sterile sample containers in enclosures containing equipment which use any form of fuel or volatile petroleum-based product. When conducting sampling in freezing conditions at sites without a heated storage area (free of potential cross contaminants), unused trip blanks should be isolated from coolers immediately after receipt. Trip blanks should be double bagged and kept from freezing.

5.3.5 Chain-of-Custody Records

Chain of custody (COC) forms will be completed for all samples collected. The form documents the transfer of sample containers. The COC record, completed at the time of sampling, will contain, but not be limited to, the sample number, date and time of sampling, and the name of the sampler. The COC document will be signed and dated by the sampler when transferring the samples.

Each sample cooler being shipped to the laboratory will contain a COC form. The cooler will be sealed properly for shipment. The laboratory will maintain a copy for their records. One copy will be returned with the data deliverables package.

The following list provides guidance for the completion and handling of all COCs:

- COCs used should be a Haley & Aldrich standard form or supplied by the analytical laboratory.
- COCs must be completed in black ball point ink only.
- COCs must be completed neatly using printed text.
- If a simple mistake is made, cross out the error with a single line and initial and date the correction.
- Each separate sample entry must be sequentially numbered.
- If numerous repetitive entries must be made in the same column, place a continuous vertical arrow between the first entry and the next different entry.
- When more than one COC form is used for a single shipment, each form must be consecutively numbered using the "Page ___ of ___" format.
- If necessary, place additional instructions directly onto the COC in the Comment Section. Do not enclose separate instructions.
- Include a contact name and phone number on the COC in case there is a problem with the shipment.
- Before using an acronym on a COC, clearly define the full interpretation of your designation [i.e., polychlorinated biphenyls (PCBs)].

5.3.6 Shipment

Prior to the start of the field sampling, the carrier should be contacted to determine if pickup will be at the field site location. If pick-up is not available at the Site, the nearest pick-up or drop off location should be determined. Sample shipments must not be left at unsecured drop locations.

Copies of all shipment manifests must be maintained in the field file.

6. Field Instruments – Use and Calibration

A significant number of field activities involve usage of electronic instruments to monitor for environmental conditions and health and safety purposes. It is imperative the instruments are used and maintained properly to optimize their performance and minimize the potential for inaccuracies in the data obtained. This section provides guidance on the usage, maintenance and calibration of electronic field equipment.

- All monitoring equipment will be in proper working order and operated in accordance with manufacturer's recommendations.
- Field personnel will be responsible for ensuring that the equipment is maintained and calibrated in the field in accordance with manufacturer's recommendations.
- Instruments will be operated only by personnel trained in the proper usage and calibration.
- Personnel must be aware of the range of conditions such as temperature and humidity for instrument operation. Usage of instruments in conditions outside these ranges will only proceed with approval of the Project Manager and/or Health and Safety Officer as appropriate.
- Instruments that contain radioactive source material, such as x-ray fluorescence (XRF) analyzers or moisture-density gauges require specific transportation, handling and usage procedures that are generally associated with a license from the Nuclear Regulatory Commission (NRC) or an NRC-Agreement State. Under no circumstance will operation of such instruments be allowed on site unless by properly authorized and trained personnel, using the proper personal dosimetry badges or monitoring instruments.

6.1 GENERAL PROCEDURE DISCUSSION

Care must be taken to minimize the potential for transfer of contaminated materials to the ground or onto other materials. Regardless of the size or nature of the equipment being decontaminated, the process will utilize a series of steps that involve removal of gross material (dirt, grease, oil etc.), washing with a detergent, and multiple rinsing steps. In lieu of a series of washes and rinse steps, steam cleaning with low-volume, high-pressure equipment (i.e., steam cleaner) is acceptable.

Exploration equipment, and all monitoring equipment in contact with the sampling media must be decontaminated prior to initiating site activities, in between exploration locations to minimize cross-contamination, and prior to mobilizing off site after completion of site work.

The following specific decontamination procedure is recommended for sampling equipment and tools:

- Brush loose soil off equipment;
- Wash equipment with laboratory grade detergent (i.e., Alconox or equivalent);
- Rinse with tap water;
- Rinse equipment with distilled water;
- Allow water to evaporate before reusing equipment; and
- Wrap equipment in aluminum foil when not being used.

6.2 DECONTAMINATION OF MONITORING EQUIPMENT

Because monitoring equipment is difficult to decontaminate, care should be exercised to prevent contamination. Sensitive monitoring instruments should be protected when they are at risk of exposure to contaminants. This may include enclosing them in plastic bags allowing an opening for the sample intake. Ventilation ports should not be covered.

If contamination does occur, decontamination of the equipment will be required; however, immersion in decontamination fluids is not possible. As such, care must be taken to wipe the instruments down with detergent-wetted wipes or sponges, and then with de-ionized water-wetted wipes or sponges.

6.3 DISPOSAL OF WASH SOLUTIONS AND CONTAMINATED EQUIPMENT

All contaminated wash water, rinses, solids and materials used in the decontamination process that cannot be effectively decontaminated (such as polyethylene sheeting) will be containerized and disposed of in accordance with applicable regulations. All containers will be labeled with an indelible marker as to contents and date of placement in the container, and any appropriate stickers required (such as PCBs). Storage of decontamination wastes on site will not exceed 90 days under any circumstances.

Equipment/Materials:

Decontamination equipment and solutions are generally selected based on ease of decontamination and disposability.

- Polyethylene sheeting;
- Metal racks to hold equipment;
- Soft-bristle scrub brushes or long-handle brushes for removing gross contamination and scrubbing with wash solutions;
- Large galvanized wash tubs, stock tanks, or wading pools for wash and rinse solutions;
- Plastic buckets or garden sprayers for rinse solutions;
- Large plastic garbage cans or other similar containers lined with plastic bags can be used to store contaminated clothing;
- Contaminated liquids and solids should be segregated and containerized in DOT-approved plastic or metal drums, appropriate for offsite shipping/disposal if necessary.

7. Investigation Derived Waste Disposal

7.1 RATIONALE/ASSUMPTIONS

This procedure applies to the disposition of investigation derived waste (IDW) including soils and/or groundwater. IDW is dealt with the following "Best Management Practices" and is not considered a listed waste due to the lack of generator knowledge concerning chemical source, chemical origin, and timing of chemical introduction to the subsurface.

Consequently, waste sampling and characterization is performed to determine if the wastes exhibit a characteristic of hazardous waste. The disposal of soil cuttings, test pit soils and/or purged groundwater will be reviewed on a case by case basis prior to initiation of field activities. Two scenarios typically exist:

- When no information is available in the area of activity or investigation, and impacted media/soils are identified. Activities such as new construction and /or maintenance below grade may encounter environmental conditions that were unknown.
- Disposal Required/Containerization Required – When sufficient Site information regarding the investigative Site conditions warrant that all materials handled will be contained and disposed.

If a known listed hazardous and/or characteristically hazardous waste/contaminated environmental media is being handled, then handling must be performed in accordance with RCRA Subtitle C (reference 2, Part V, Section 1(a),(b),(c)).

The following outlines the waste characterization procedures to be employed when IDW disposal is required.

The following procedure describes the techniques for characterization of IDW for disposal purposes. IDW may consist of soil cuttings (augering, boring, well installation soils, test pit soils), rock core or rock flour (from coring, reaming operations), groundwater (from well development, purging and sampling activities), decontamination fluids, personal protective equipment (PPE), and disposal equipment (DE).

7.2 PROCEDURE

The procedures for handling and characterization of field activity generated wastes are:

A.) Soil Cuttings - Soils removed from boring activities will be contained within an approved container, suitable for transportation and disposal.

- Once placed into the approved container, any free - liquids (i.e., groundwater) will be removed for disposal as waste fluids or solidified within the approved container using a solidification agent such as Speedy Dri (or equivalent).
- Contained soils will be screened for the presence of Volatile Organic Compounds (VOCs), using a Photo ionization detector (PID); this data will be logged for future reference.

- Once screened, full and closed; the container will be labeled and placed into the container storage area. At a minimum, the following information will be shown on each container label: date of filling/generation, Site name, source of soils (i.e., borehole or well), and contact.
- Prior to container closure, representative samples from the containers will be collected for waste characterization purposes and submitted to the project laboratory.
- Typically, at a location where an undetermined site-specific parameter group exists, sampling and analysis may consist of the full RCRA Waste Characterization (ignitability, corrosivity, reactivity, toxicity), or a subset of the above based upon data collected, historical information, and generator knowledge.

B.) Decon Waters/Decon Fluids - Decon waters and/or fluids will be segregated, contained, and disposed accordingly.

- Decon waters may be disposed of with the containerized groundwater once analytical results have been acquired.

C.) PPE/DE – A number of disposal options exists for spent PPE/DE generated from investigation tasks. The options typically employed are:

- Immediately disposed of within on-Site dumpster/municipal trash; or
- If known to be contaminated with RCRA hazardous waste, dispose off-Site at a RCRA Subtitle C facility.
- Spent Solvent/Acid Rinses - The need for sampling must be determined in consultation with the waste management organization handling the materials. If known that only the solvent and/or acids are present, then direct disposal/treatment using media specific options may be possible without sampling (i.e., incineration).
- PPE/DE – Typically not sampled and included with the disposal of the solid wastes.

Equipment/Materials:

- Sample spoons, trier, auger,
- Sample mixing bowl,
- Sampling bailer, or pump,
- Sample glassware.

References

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2. ASTM Standard D 2487, “Classification of Soils for Engineering Purposes (Unified Soil Classification System)”.
3. ASTM 4750 Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well (Observation Well)
4. ASTM D6000 Guide for Presentation of Water Level Information from Ground Water Sites
5. ASTM D5474: Guide for Selection of Data Elements for Groundwater Investigations
6. ASTM D4696: Guide for Pore-liquid Sampling from the Vadose Zone
7. ASTM D5979: Guide for Conceptualization and Characterization of Groundwater Systems
8. ASTM D5903: Guide for Planning and Preparing for a Groundwater Sampling Event
9. ASTM D4448: Standard Guide for Sampling Groundwater Wells
10. ASTM D6001: Standard Guide for Direct Push Water Sampling for Geo-environmental Investigations.
11. ASTM (1991), Standard D1452-80, “Practice for Soil Investigation and Sampling by Auger Borings”, Annual Book of ASTM Standard, Section 4, Volume 04.08.
12. ASTM Standards on Environmental Sampling (1995), Standard D 2488-93, “Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)”
13. ASTM Standards on Environmental Sampling (1995), Standard D 4700-91, “Guide for Soil Sampling from the Vadose Zone”.
14. ASTM Standards on Environmental Sampling (1995), Standard D 1586-92, “Test Method for Penetration Test and Split-Barrel Sampling of Soils”.
15. ASTM D5088 - Practice for Decontamination of Field Equipment Used at Non-Radioactive Waste Sites
16. Geotechnical Gauge, Manufactured by W.F. McCollough, Beltsville, MD.
17. New York State Code Rule 753
18. New York State Department of Environmental Conservation Technical Guidance for Site Investigation and Remediation, DER-10, (3 May 2010).
19. New York State Department of Environmental Conservation, Division of Environmental Remediation, Sampling, Analysis and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) under NYSDEC Part 375 Remedial Program (January 2021).
20. Sand Grading Chart, by Geological Specialty Company, Northport, Alabama.
21. USEPA Office of Solid Waste- SW846 Chapter 9 Sampling Plan, Chapter 10 Sampling Methods (September 1986).
22. USEPA (1986), RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, OSWER-9950.1.
23. USEPA (1987), A Compendium of Superfund Field Operations Methods, EPA/540/P-87/001.

24. USEPA (1988), Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, OSWER-9950.1.
25. USEPA RCRA - Guidance and Policies: Management of Remediation Waste Under RCRA (October 1998).
26. USEPA RCRA - Management of Contaminated Media (October 1998).
27. USEPA CERCLA Guidance (Options Relevant to RCRA Facilities): Guide to Management of Investigation - Derived Wastes (January 1992).
28. USEPA: Low-flow (Minimal Drawdown) Groundwater Sampling Procedures (EPA/540/S-95/504)
29. USEPA: RCRA Groundwater Monitoring: Draft Technical guidance (EPA/530 R 93 001)
30. The Occupational Safety and Health Administration's (OSHA) Excavation and Trenching Standard Title 29 of the Code of Federal Regulation (CFR) Part 1926.650.

APPENDIX A
Field Forms

HALEY & ALDRICH

EQUIPMENT CALIBRATION LOG

Project: RG&E Brooks Ave GMP
Location: 755 Brooks Ave, Rochester, NY
Model Name: Horiba U-22 water quality meter
Model Number: _____ Serial Number: _____
Cal. Standards: pH 4 solution

Instruments will be calibrated in accordance with manufacturer's recommendations at least once per day.

Date	Time	Calibration Satandard Solution	Calibration Result	Calibrated by

Other Comments: _____

HALEY ALDRICH

EQUIPMENT CALIBRATION LOG

Project: _____

Location: _____

Model Name: _____

Model Number: _____ Serial Number: _____

Cal. Standards: _____

_____

_____

Instruments will be calibrated in accordance with manufacturer's recommendations at least once per day.

Date	Time	Calibration Satandard Solution	Calibration Result	Calibrated by

Other Comments: _____

_____

_____

_____

_____

_____

_____

_____

HALEY & ALDRICH

EQUIPMENT CALIBRATION LOG

Project: RG&E Brooks Ave GMP
Location: 755 Brooks Ave, Rochester, NY
Model Name: Lamotte 2020WE Tubidity Meter
Model Number: _____ Serial Number: _____
Cal. Standards: pH 4 solution

Instruments will be calibrated in accordance with manufacturer's recommendations at least once per day.

Date	Time	Calibration Satandard Solution	Calibration Result	Calibrated by

Other Comments: _____

HALEY ALDRICH

SAMPLE IDENTIFICATION KEY

Page of

PROJECT _____ **H&A FILE NO.** _____

LOCATION _____ **PROJECT MGR.** _____

CLIENT _____

CONTRACTOR _____

Sample ID	Parent Sample ID	Location ID	Sample Date	Sample Time (military)	Sample Type Code	Filtered (Water Only T/D/N)	Composite Y/N	Soil Type	Depth To Top Of Sample	Depth To Bottom Of Sample	C.O.C. Number	Notes	Collected By

Notes:

Common Sample Type Codes:

N	Normal Environmental Sampl	WG	Groundwater	WS	Surface Water	SO	Soil	GS	Soil Gas	SE	Sediment
WQ	Water for Quality Control	FD	Field Duplicate	EB	Equipment Blank	TB	Trip Blank	MS	Matris Spike	MSD	Matrix Spike Duplicate

see Memorandum dated 08/08/05 from Melanie Satanek "Sample Labeling for Submission to Analytical Laboratory" for less common codes

DAILY FIELD REPORT

Page of

Project		**Report No.**	20
Location		**Date**	
Client		**Page**	of
Contractor		**File No.**	
Weather		**Temperature**	

Field Representative(s)	**Time on site**	**Report/Travel/Other**	**Total hours**

Distribution:

Haley & Aldrich, Inc.

GEOPROBE BORING REPORT

BORING NO.

Page 1 of

PROJECT
LOCATION
CLIENT
CONTRACTOR
DRILLER

PROJECT MGR.
FIELD REP.
DATE STARTED
DATE FINISHED

Elevation ft. Datum

Boring Location

Item	Casing	Sampler	Core Barrel
Type			
Inside Diameter (in.)			
Hammer Weight (lb.)			
Hammer Fall (in.)			

Rig Make & Model

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☐ Winch
☐ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☐ Cutting Head

Hammer Type: ☐ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☐ None

Casing Advance: Type Method Depth

Drilling Notes:

Depth (ft.)	Casing Blows	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft)	Elev./ Depth (ft)	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
Date					

Sample ID

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon Sample
G Geoprobe

Summary

Overburden (Linear ft.) _____
Rock Cored (Linear ft.) _____
Number of Samples _____

BORING NO.

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification

Form #3000

APPENDIX C

QAPP

APPENDIX D

HASP