Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

August 17, 2021

Mandy Yau
NYSDEC
Division of Environmental Remediation
47-40 21st Street
Long Island City, NY 11101

Re: Off-Site Soil Vapor Intrusion Investigation Work Plan
Main Street Kew Gardens Site (C241205)

Dear Mandy,

Please accept this letter as an Off-Site Soil Vapor Intrusion Investigation Work Plan for the above-referenced site. All sampling, analytical and reporting protocols will follow the Quality Assurance Project Plan attached. Samples IA/SS-18 through IA/SS-22 will be installed in offsite properties to determine the extent of any soil vapor intrusion emanating from the site. The locations of IA/SS-18 through IA-SS-22 are specified in the attached Figure 1.

The Community Air Monitor Plan (CAMP) contained in Appendix F of the approved RIWP is attached to this workplan and will be followed with the following additions:

a. When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

b. If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of

sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

c. If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.

CAMP reports will be submitted to NYSDEC and NYSDOH for review on a weekly basis. Data will be provided to NYSDEC and NYSDOH via email as soon as possible the same day if an exceedance occurs including a description of the exceedance, the cause of the exceedance, and corrective actions taken, if any. If the exceedance occurs after regular business hours, the Agencies will be notified as soon as possible the next business day. All data from the CAMP will be included in the resultant sampling report.

1. Preconstruction

Sampling events conducted beneath the Site have identified a tetrachloroethene(PCE) soil vapor plume with a hotspot under 68-38 Main Street (Queens Pita). Soil Vapor sampling beneath sidewalks around the Site have identified detectable levels of PCE in soil vapor.

2. Sub-Slab Soil Vapor Sampling

Sub-slab soil vapor will be sampled at the approximate locations indicated in the proposed sampling diagram (Figure 1). Five sub-slab soil vapor samples (SS-18 through SS-22) will be collected from the basement or first-floor grade of the occupied buildings. Sub-slab soil vapor points will be installed utilizing a power drill, a 1-foot-long drill bit, dedicated Teflon tubing and VOC free putty for sealant. The surface of the vapor point will be finished with a flush-mounted brass fitting and hex nut.

Prior to sampling, a leak test will be performed on each soil vapor probe utilizing a helium gas tracer in accordance with the NYSDOH Soil Vapor Intrusion Guidance.

A 6-Liter stainless steel Summa canister with a flow regulator set to a flow rate of approximately 0.025 liters per minute will be connected to the Teflon tubing exiting each soil vapor probe. Once the canisters are in place, the flow regulators will be opened, and sampling will continue for approximately 4 hours until the canisters are full.

3. Indoor and Outdoor Air Sampling

Indoor and outdoor air will be sampled concurrently with the sub-slab soil vapor samples at the approximate locations indicated in the proposed sampling diagram (Figure 1). One round of indoor air sampling be performed outside of the heating season. If warranted, a second round of samples will be collected during the next heating season. Outdoor air samples OA-1 through OA-3 will be collected upgradient of each of the areas to be sampled.

Indoor air samples will be collected by placing 6-Liter stainless steel Summa canisters on surfaces approximately 3 feet above the floor. Each Summa canister will be equipped with a flow regulator. Samples IA-18 and IA-19 are in residential buildings. The canisters for these samples will be set to a flow rate of approximately 0.004 liters per minute, which will fill in approximately 24 hours. Samples IA-20 through IA-22 are in commercial buildings. The canisters for these samples will be set to a flow rate of approximately 0.0125 liters per minute, which will fill in approximately 8 hours. The cannisters will be opened to initiate sampling, which will continue for the approximate durations until the canisters are almost full, and the regulators are closed.

Letters will be transmitted to the owners of off-site properties to request access. A template for the transmittal letters is attached. If access is not granted for the requested sampling locations, alternative sampling locations IA-23/SS-3 through IA-27/SS-27 will be sampled as necessary. All alternative sampling locations have residences present in the buildings. The canisters for these samples would be set to a flow rate of approximately 0.004 liters per minute, which will fill in approximately 24 hours.

Attached is updated project timeline for the site.

4. Quality Assurance/Quality Control

4.1 Quality Assurance/Quality Control Procedures

QA/QC procedures will be used to provide performance information regarding 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. A summary of the field and laboratory QA/QC procedures is provided below.

4.2 Field QA/QC

Field QA/QC will include the following procedures:

- Prior to collecting sub-slab soil vapor, a helium leak test will be performed to ensure that the sub-slab soil vapor probes are sealed effectively. The helium leak test will be performed using a Leak Locater ("helium tracer"), a helium shroud, and helium canister. The helium tracer will be connected through the helium shroud to the Teflon tubing exiting each sub-slab soil vapor probe. Once helium is injected into the shroud, the Helium Tracer screened sub-slab soil vapor for approximately ten minutes. No helium detected will verify an effective seal.
- Calibration of field equipment, including PID, on a daily basis;
- Use of dedicated and/or disposable field sampling equipment;
- Proper sample handling and preservation;
- Proper sample chain of custody documentation; and
- Completion of report logs.

The above procedures will be executed as follows:

- Disposable sampling equipment, including acetate sleeves, latex gloves, and disposable bailers (or sample tubing), will be used to minimize cross-contamination between samples;
- Appropriate sample preservation techniques, including cold temperature storage at 4º C, will be utilized to ensure that the analytical parameters concentrations do not change between the time of sample collection and analysis; and
- Samples will be analyzed prior to the expiration of the respective holding time for each analytical parameter to ensure the integrity of the analytical results.

4.3 Sample Custody

Sample handling in the field will conform to appropriate sample custody procedures. Field custody procedures include proper sample identification, chain-of-custody forms, and packaging and shipping procedures. Sample labels will be attached to all sampling bottles before field activities begin to ensure proper sample identification. Each label will identify the site and sample location. Styrofoam or bubble wrap will be used to absorb shock and prevent breakage of sample containers. Ice or ice packs will be placed in between the plastic bags for sample preservation purposes.

After each sample is collected and appropriately identified, the following information will be entered into the chain-of-custody form:

- Site name;
- Sampler(s)' name(s) and signature(s);
- Names and signatures of persons involved in the chain of possession of samples;
- Sample number;
- Number of containers;
- Sample location;
- Date and time of collection;
- Type of sample, sample matrix and analyses requested;

- Preservation used (if any); and
- Any pertinent field data collected (pH, temperature, conductivity, DO).

The sampler will sign and date the "Relinquished" blank space prior to removing one copy of the custody form and sealing the remaining copies of the form in a Ziploc plastic bag taped to the underside of the sample cooler lid. The sample cooler will be sealed with tape prior to delivery or shipment to the laboratory.

4.4 Report Logs

Field logs and borings logs will be completed during this investigation. A field log will be completed daily which will describe all field activities including:

- Project number, name, manager, and address;
- The date and time;
- The weather conditions;
- On-site personnel and associated affiliations;
- Description of field activities; and
- Pertinent sample collection information including sample identification numbers, description of samples, location of sampling points, number of samples taken, method of sample collection and any factors that may affect its quality, time of sample collection, name of collector, and field screening results.
- A building inspection/product inventory will be conducted prior to the sampling event to note potential indoor air sources.

4.5 Laboratory QA/QC

An ELAP-certified laboratory will be used for all sample analyses. The laboratory will follow the following QA/QC protocols. All samples will be delivered to the laboratory within 24 hours of sample collection. Samples will be received by laboratory personnel, who will inspect the sample cooler(s) to check the integrity of the custody seals. The cooler(s) will then be opened, the samples unpackaged, and the information on the chain-of-custody form examined. If the shipped samples match those described on the chain-of-custody form, the laboratory sample custodian will sign and date the form on the next "Received" blank and assume responsibility for the samples. If problems are noted with the sample shipment, the laboratory custodian will sign the form and record problems in the "Remarks" box. The custodian will then immediately notify the Project Manager so appropriate follow-up steps can be implemented on a timely basis.

A record of the information detailing the handling of a particular sample through each stage of analysis will be maintained by the laboratory. The record will include:

- Job reference, sample matrix, sample number, and date sampled;
- Date and time received by laboratory, holding conditions, and analytical parameters;
- Extraction date, time and extractor's initials (if applicable), analysis date, time, and analyst's initials; and

- Extraction date, time and extractor's initials (if applicable), analysis date, time, and analyst's initials; and
- QA batch number, date reviewed, and reviewer's initials.

NYSDEC ASP Category B Data Deliverables will be submitted for all of the samples representing the final delineation of the nature and extent of contamination for a remedial investigation. Data validation packages and Data Usability Summary Reports (DUSRs) will be provided in the RIR to support the remedial investigation. The DUSRs for this project will be prepared by LABORATORY DATA CONSULTANTS, INC. Resumes and qualifications for preparing the DUSR reports is provided in the attached Quality Assurance Project Plan.

I, Paul P. Stewart certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Off-Site Soil Vapor Intrusion Investigation Work Plan 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).

Feel free to contact me if you have any questions or comments concerning the above.

Very truly yours,

Paul P. Stewart, MS, QEP

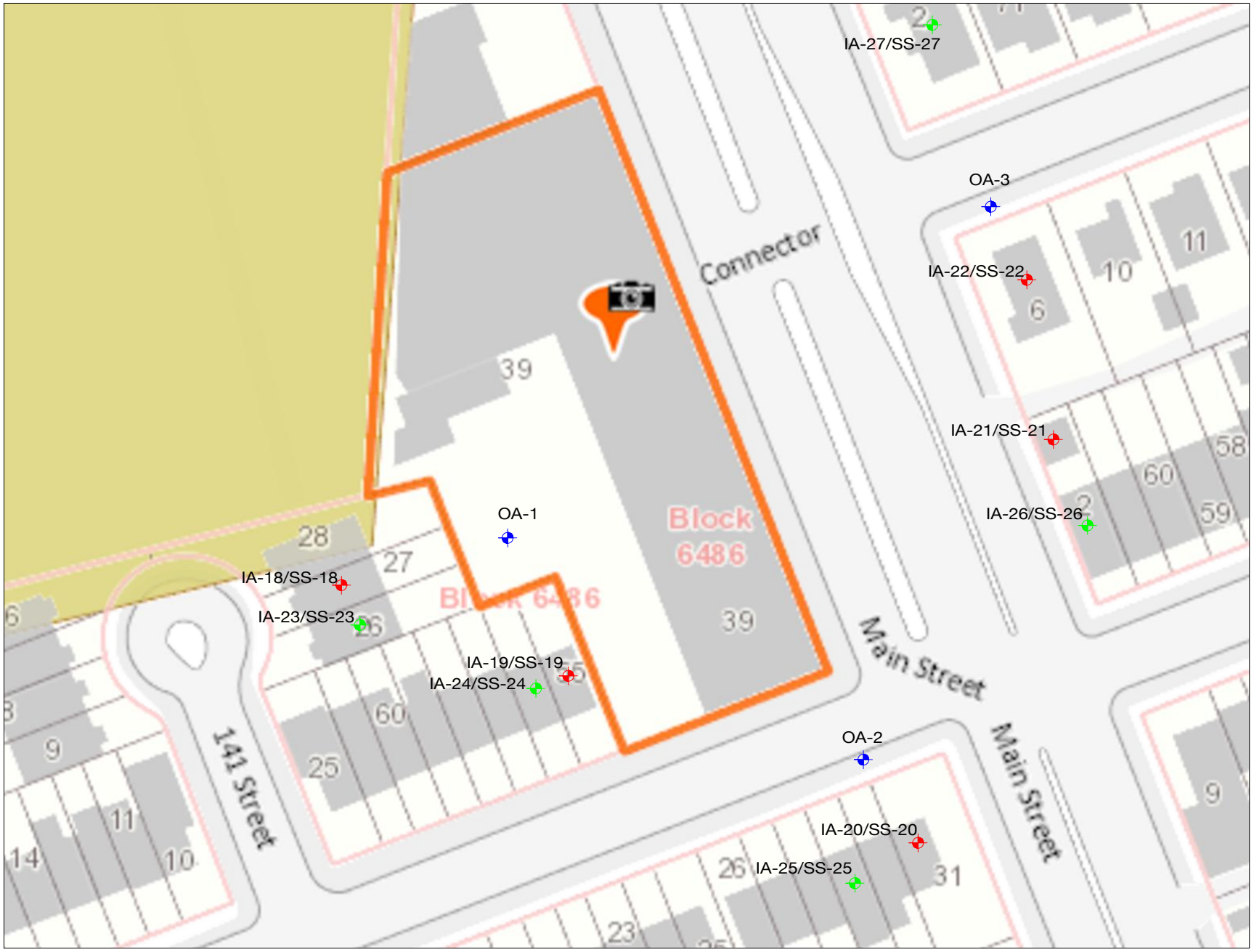
Signature and Date:  August 17,2021

cc: O'Connell, Jane H (DEC)
O'Neil, Eamonn M (DOH)
Paul Boyce, P.E.

.

Appendix A

Sampling Diagram



Notes

Legend	
	Indoor Air and Sub-slab Vapor Sample

Title

Off-Site SVI Sampling Diagram

No.	Revision/Issue	Date

Advanced Cleanup Technologies
Environmental Consultants
200 Broadhollow Road-Suite 207
Melville, New York 11747

Project Name and Address

NYSDEC SITE: C241205
68-32 Main St.
Kew Gardens
New York 11367

Project	Figure
9233-KGNY	1
Date: 6/4/2021	
Scale: As Noted	

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Appendix B

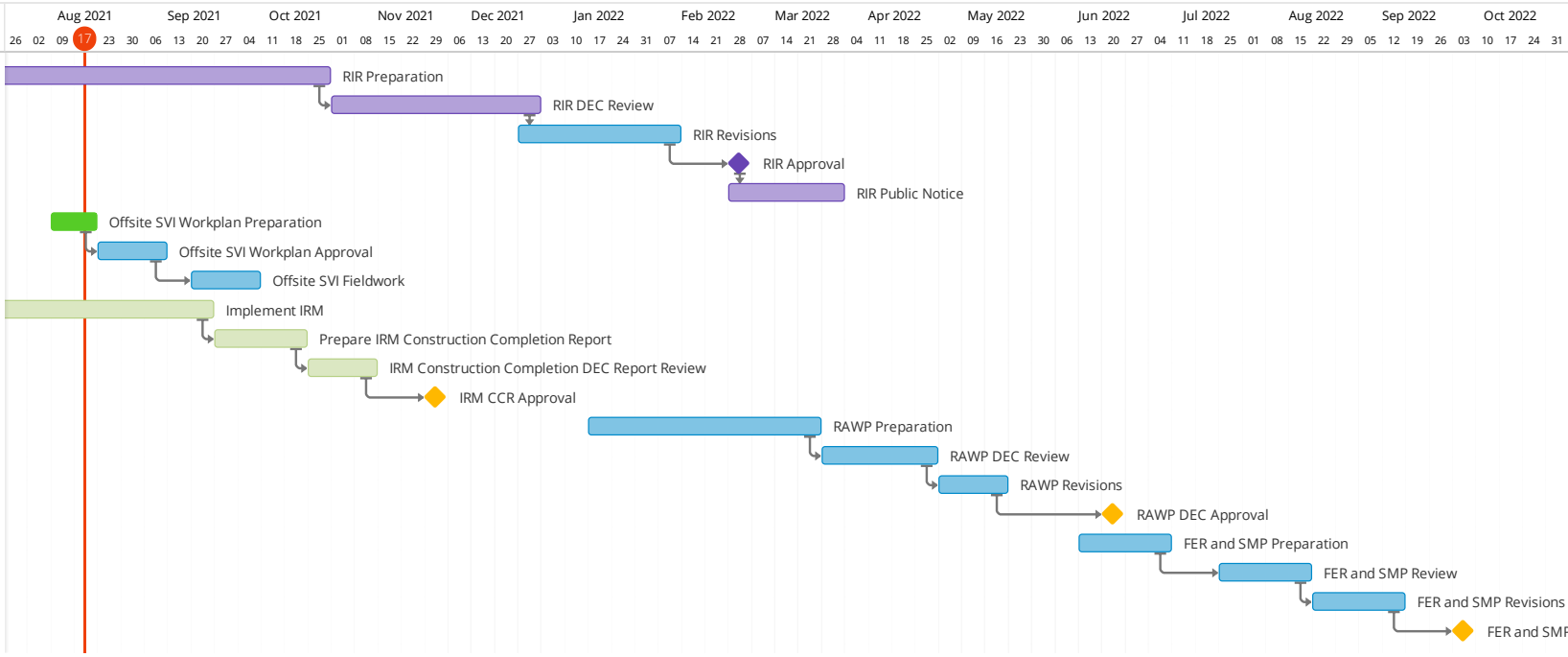
Project Timeline

9233-KGNY 68 - 16 to 68 - 48 Main Stre...

Read-only view, generated on 17 Aug 2021

Instagantt

	ACTIVITIES	START	DUE
0	RIR Preparation	01/May	29/Oct
1	RIR DEC Review	01/Nov	31/Dec
2	RIR Revisions	31/Dec	11/Feb
3	RIR Approval	28/Feb	28/Feb
4	RIR Public Notice	28/Feb	30/Mar
5	Offsite SVI Workplan Preparation	09/Aug	20/Aug
6	Offsite SVI Workplan Approval	23/Aug	10/Sep
7	Offsite SVI Fieldwork	20/Sep	08/Oct
8	Implement IRM	12/Jul	24/Sep
9	Prepare IRM Construction Completion Report	27/Sep	22/Oct
10	IRM Construction Completion DEC Report Review	25/Oct	12/Nov
11	IRM CCR Approval	03/Dec	03/Dec
12	RAWP Preparation	17/Jan	21/Mar
13	RAWP DEC Review	29/Mar	28/Apr
14	RAWP Revisions	06/May	19/May
15	RAWP DEC Approval	23/Jun	23/Jun
16	FER and SMP Preparation	13/Jun	08/Jul
17	FER and SMP Review	25/Jul	19/Aug
18	FER and SMP Revisions	22/Aug	16/Sep
19	FER and SMP Approval	07/Oct	07/Oct



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Appendix C

Notification Letter Template

Advanced Cleanup Technologies, Inc.

ENVIRONMENTAL CONSULTANTS

July 22, 2021

[PROPETY OWNER]
[ADDRESS]

Re: Soil Vapor Intrusion Investigation at [ADDRESS]

Dear Property Owner,

On June 18 and 19, 2019, Advanced Cleanup Technologies, Inc. (ACT) collected air samples at the property located at 68-14 to 68-50 Main Street Kew Gardens, New York 11367. A total of nineteen samples—nine indoor-air, nine sub-slab soil vapor, and one outdoor-air—were collected from inside and outside the commercial units.

The results of the investigation indicate that 5.1 micrograms per cubic meter (ug/m^3) of Tetrachloroethene (PCE) and 0.36 ug/m^3 of Trichloroethene (TCE) were detected in the air inside of the basement area of the shopping center; and as high as 4,800 ug/m^3 of PCE and 2,000 ug/m^3 of TCE were detected in sub-slab soil vapor beneath the foundation of the building. PCE is used in dry cleaning practices and as a degreaser. TCE is an impurity and degradation product of PCE.

The New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) have requested that indoor air and sub-slab vapor testing also be performed at properties adjacent to the shopping center to determine if any PCE or TCE contamination could be entering those properties from the former drycleaner, which formerly utilized PCE in historical dry-cleaning operations.

The NYSDEC and NYSDOH have requested ACT to investigate your property located at [ADDRESS] to determine the sub-slab soil vapor and indoor air levels in your building. We are requesting access to your building's basement for the purposes of collecting these samples. The work will involve drilling a small hole (1/2-inch diameter) through the basement floor and setting up small vacuum canisters to collect air samples over a 24-hour period. A technician will set up the canisters in the morning, leave and then come back after 24 hours to retrieve them and patch the hole. The sampling will not disrupt any use of the building.

200 Broadhollow Road, Suite 207, Melville, New York 11747 • Tel: (516) 441-5800 • Fax: (516) 441-5511
Website Address: act.earth

The sampling will be performed by ACT on behalf of the owner of 68-14 to 68-50 Main Street Kew Gardens, New York 11367 in accordance with a NYSDEC-approved work plan and under the oversight of the NYSDEC and NYSDOH. **You will not be responsible for any costs associated with this work and your basement will be restored to pre-sample conditions**.

Please be aware that pursuant to Environmental Conservation Law (ECL 27-2405), property owners or owners' agents (such as landlords) are required to notify all their tenants and occupants in buildings that were sampled of the test results.

If you agree to provide access for the investigation in your building, we agree to minimize any and all inconvenience to you in connection with this work. If we accidentally damage your property in any way, we agree to repair any damages caused by this work, and to restore your basement to essentially the way it was before we entered. ACT also maintains insurance that would cover any accidents on the job. Finally, you are not responsible to pay for any of this work under any circumstances. The results will be sent to you via certified US mail.

If you have any health-related questions, please contact Eamonn O'Neil from NYSDOH at 518-402-7877.

Please sign the first attached paragraph below and return one of the two copies of this signed letter in the enclosed self-addressed stamped envelope so that this work can be scheduled. You can keep the other copy for your records. After we receive this letter back with your signature, we will call you at the number you provide below to schedule an appropriate day and time to schedule the sampling at your property. If you refuse to grant us access to perform this work, please sign the second attached paragraph below and send that page back to us in the enclosed envelope. Thank you for your cooperation.

Sincerely,

Paul P. Stewart, MS, QEP
President

As the property owner, I **agree** to allow the owner of 68-14 to 68-50 Main Street Kew Gardens, New York 11367, by its contractor Advanced Cleanup Technologies, Inc. to enter my property located at [ADDRESS} to perform a soil vapor intrusion investigation requested by NYSDOH and NYSDEC under the terms and conditions in this letter agreement.

_____	_____
Property Owner Signature	Telephone Number(s) to schedule appointment
_____	_____
Print Name	Print Address

As the property owner, I **refuse** to allow the owner of 68-14 to 68-50 Main Street Kew Gardens, New York by its contractor Advanced Cleanup Technologies, Inc.to enter my property located at [ADDREESS] to perform a soil vapor intrusion investigation requested by NYSDOH and NYSDEC under the terms and conditions in this letter agreement.

_____	_____
Property Owner Signature	Telephone Number(s) to schedule appointment
_____	_____
Print Name	Print Address

Enc. Summary of Soil Vapor Intrusion Investigation Results
Tenant Notification Fact Sheet for Tetrachloroethene and Trichloroethene

cc: W. Zheng, J. O'Connell, S. Martinkat, NYSDEC
E. O'Neil, S. McLaughlin, NYSDOH
Main Properties JM, LLC

.

Appendix D

Community Air Monitoring Plan

* For Internal Use Only *

Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m^3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m^3 or less at the monitoring point.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Special Requirements for Indoor Work With Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under "Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures" except that in this instance "nearby/occupied structures" would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

APPENDIX E
QUALITY ASSURANCE PROJECT PLAN

Advanced Cleanup Technologies, Inc.
ENVIRONMENTAL CONSULTANTS

QUALITY ASSURANCE PROJECT PLAN

Main Street Kew Gardens Site
68-14 to 68-50 Main Street
Kew Gardens, New York 11367
Block 6486, Lot 39

NYSDEC BCP No. C241205

August 2020

Prepared for:

Lewis & Murphy Realty
47 Hillside Avenue
Manhasset, New York 11030

Prepared by:

Advanced Cleanup Technologies
200 Broadhollow Road-Suite 207
Melville, New York 11747

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1.0 INTRODUCTION

Advanced Cleanup Technologies, Inc. (ACT) has prepared this Quality Assurance Project Plan (QAPP) for site activities to be undertaken at the property located at 68-14 to 68-50 Main Street, Kew Gardens, New York 11367 (the site). This QAPP has been prepared to define the quality assurance (QA) and quality control (QC) measures to be implemented, to verify the integrity of the work to be performed at the site, and that the data collected will be of the appropriate type and quality needed for the intended use. Specifically, this QAPP addresses the following:

- Project Objectives, including Quality Assurance Objectives for Data
- Overview of Field Sampling Program and Procedures
- Sample Packaging and Shipping
- Sample Documentation
- Sample Analytical Program
- Quality Assurance/Quality Control Procedures

1.1 Project Scopes and Goals

Investigations to date have consisted of shallow soil, soil vapor, and indoor air sampling at the Site. The proposed project scope is to perform a comprehensive investigation of on and offsite soil, soil vapor, and groundwater quality. The project goal is to fully evaluate the nature and extent of contamination from the Site.

1.2 Clean-up Criteria

Soil quality data will be compared to NYSDEC Part 375-6.8(a) Unrestricted Used Soil Cleanup Objectives, Part 375-6.8(b) Protection of Groundwater for applicable compounds, Restricted Commercial Use Soil Cleanup Objectives (SCOs). Groundwater quality data will be compared to NYSDEC Part 703 Groundwater Quality Standards (Class GA) or Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards. Soil vapor quality data will be compared to NYSDOH soil vapor screening levels contained in Matrix

A, B and C of the NYSDOH Guidance and Indoor Air Guidelines. A site map depicting sampling locations is attached below.

2.0 PROJECT ORGANIZATION AND PERSONNEL RESPONSIBILITIES

The investigative efforts defined in the RIWP will be coordinated by ACT on behalf of the NYSDEC. The NYSDEC is the lead regulatory agency overseeing the investigation site. An organization structure has been developed to identify the roles and responsibilities of the various parties involved with the project, as discussed below.

The **NYSDEC Project Manager, Mandy Yau,** will be responsible for reviewing and approving work plans and amendments, coordinating approval of requested modifications, and providing guidance on regulatory requirements.

The **Environmental Contractor Project Director, Paul Stewart of ACT,** will provide technical expertise for review of the project plans, reports and ongoing field activities. The program manager will be responsible for the coordination of the overall project with the NYSDEC. The Project Director will act as the project's Quality Assurance Manager.

The **Environmental Contractor Project Manager, Jason Stewart of ACT,** will be responsible for the day to day project management, task leadership, and project engineering support and for the planning and implementation of RIWP activities. The Project Manager will be responsible for ensuring that the requirements of the RIWP are implemented. The project manager will also act as the site Health and Safety Manager (HSM).

The **Environmental Contractor Field Team Leader, Timothy Young of ACT,** will be responsible for sample collection, oversight of subcontractor personnel, and coordination of daily field activities. The Field Team Leader will act as the Site Health and Safety Officer ensuring implementation of the Site Health and Safety Plan.

A NYSDOH Environmental Laboratory Accreditation Program (ELAP) certified laboratory, **York Analytical Laboratories, Inc. (NYSDOH #10854),** will be contracted to perform required analyses and reporting, including Analytical Services Protocol (ASP) Category B Deliverables, which will allow for data validation.

Subcontractors will perform remedial construction, surveying, drilling, and/or sampling at the direction of the Field Team Leader in accordance with this RIWP.

3.0 QUALITY ASSURANCE PROJECT OBJECTIVES

The objective of RIWP activities for the site is to obtain sufficient data at a known quality level to assess the effectiveness of the remedy selected in eliminating, reducing, or controlling risks to human health and the environment.

3.1 Data Quality Categories

Data quality objectives (DQO) are qualitative and quantitative statements that specify the quality of the data required to support decisions during remedial and monitoring activities. DQOs composed of written expectations for precision, accuracy, representativeness, completeness and comparability of a data set (see Section 3.2). The DQO process provides a logical basis for linking the QA/QC procedures to the intended use of the data, primarily through the decision maker's acceptable limits on decision error. One descriptive data categories - definitive data - will be used for the site.

Definitive data is generated using specific analytical methods and guidelines and have satisfied known QA/QC requirements. Analytical data provided by an off-site laboratory shall be definitive data, and are deemed critical to project objectives. QA/QC elements of definitive data include determination and documentation of calibrations, detection limits, method blanks, and matrix spike recoveries.

3.2 QA/QC Characteristics

The overall QA/QC objective for RIWP activities is to develop and implement procedures that will provide data of known and documented quality. QA/QC characteristics for data include precision, accuracy, representativeness, completeness, and comparability (PARCC). Data quality objectives for each of these parameters are determined based on the level of data required. Descriptions of these characteristics are provided below:

Precision is the measurement of agreement in repeated tests of the same or identical samples, under prescribed conditions. Analytical precision can be expressed in terms of Standard Deviation (SD), Relative Standard Deviation (RSD) and/or Relative Percent Difference (RPD). The precision of analytical environmental samples has two components - laboratory precision and sampling precision. Laboratory precision is determined by replicate measurements of laboratory duplicates and by analysis of reference materials. The precision of the field sampling effort is determined by the analysis of field duplicate samples. Field duplicate analysis will be performed at a rate of five percent (i.e., one duplicate collected for every 20 samples). Acceptance criteria for duplicates analyzed by an off-site laboratory shall be an RPD of 25 percent.

Accuracy is the degree of agreement of a measured sample result or average of results with an accepted reference or true value. It is the quantitative measurement of the bias of a system, and is expressed in terms of percent recovery (%R). Measurements of accuracy for the laboratory include surrogate spike, laboratory control spike, matrix spike and matrix spike duplicate samples. The laboratory must meet or exceed control limit objectives and the applicable methodologies.

Representativeness is the degree to which the results of the analyses accurately and precisely represent a characteristic of a population, a process condition, or an environmental condition. In this case, representativeness is the degree to which the data reflect the contaminants present and their concentration magnitudes in the sampled site areas. Representativeness of data will be ensured through the implementation of approved sampling procedures. Results from environmental field duplicate sample analyses can be used to assess representativeness, in addition to precision.

Completeness is defined as the percentage of samples that meet or exceed all the criteria objective levels for accuracy, precision and detection limits within a defined time period or event. It is the measure of the number of data "points" which are judged to be valid, usable results. The objective for completeness for this project is 100 percent, and will be calculated by dividing the number of usable data results (i.e., all results not considered to be "rejected" and all samples able to be analyzed) by the number of possible data results (i.e., the total number of field samples collected), and then multiplying by 100 percent.

Comparability is the degree of confidence with which results from two or more data sets, or two or more laboratories, may be compared. To achieve comparability, standard environmental methodologies will be employed in the field and in the laboratory. See Section 6.0 for analysis methods and detection limits for this RIWP activities.

4.0 SITE MONITORING ACTIVITIES

Monitoring activities to be performed at the site will be conducted in accordance with established technical guidelines, methods, policies and Standard Operating Procedures (SOPs). The subsections below present an overview of the sampling program procedures; a more detailed discussion of the monitoring activities is presented in the RIWP.

4.1 Soil Sampling

Soil samples will be collected continuously from grade to the water table surface. Soil recovered from each macro core sampler will be visually characterized for color, texture, and moisture content and screened with a photoionization detector (PID). The presence of visible staining and elevated PID readings will be noted. Soil samples will be collected for laboratory analysis as prescribed in Section 3.2 of the RIWP.

4.2 Soil Vapor Sampling

Soil vapor samples will be collected utilizing dedicated Teflon tubing connected to a dedicated 6 inch woven stainless steel sampling probe located at basement slab elevation or within 2 feet of the water table, whichever is shallower. The probe will be backfilled with coarse sand followed by hydrated bentonite pellets and that native soil to grade. Prior to sampling, a leak test will be performed on each soil vapor probe utilizing a helium gas tracer in accordance with the NYSDOH Soil Vapor Intrusion Guidance. A 6-Liter stainless steel Summa canister with a flow regulator set to collect an entire sample in 4 to 6 hours will be connected to the end of Teflon tubing exiting the ground. Once the canister is in place, the canister intake valve will be opened and sampling will continue until the canister pressure gauge indicates that the canister is full.

Sub-slab soil vapor sample will be collected utilizing dedicated Teflon tubing implanted within 6 inches of the base of the basement slab and backed with coarse sand. A 6-Liter stainless steel Summa canister with a flow regulator set to collect an entire sample in 4 to 6 hours will be connected to the other end of Teflon tubing. Once the canister is in place, the flow regulator will be opened and sampling will continue until the canister is full. Soil vapor samples will be transmitted under chain of custody to ELAP-certified laboratory.

All samples will be analyzed for VOCs in accordance with USEPA Method TO-15.

4.3 Groundwater Sampling

Groundwater samples will be collected from cased monitoring wells no sooner than two weeks following well development. The depth to water elevation will be measured with an electronic conductivity meter. Dedicated polyethylene tubing will be inserted within the casing of the monitoring well. A peristaltic pump will be utilized to purge and sample the groundwater well. Groundwater samples will be collected utilizing low-flow techniques in accordance with USEPA guidance for Low-Stress (Low-Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells (EPASOP-GW4, Revised 9/19/17).

The groundwater samples will be placed into laboratory supplied sampling containers. Nitric acid will be utilized as a preservative for total Metals. The samples will be placed in a chilled

cooler pending refrigeration. A courier will be utilized to transport the samples to the designated analytical laboratory. Proper chain of custody documentation will accompany the samples.

Following sample collection, boreholes not converted into monitoring wells will be backfilled with soil cuttings, if appropriate and an upper bentonite seal and capped with concrete. Contaminated soil cuttings will be placed in sealed and labeled DOT approved 55-gallon drums pending off-site disposal at a permitted facility.

4.4 Indoor and Outdoor Air Sampling

Indoor and outdoor air samples will be collected by placing 6-Liter stainless steel Summa canisters on surfaces approximately 3 feet above the floor. Each Summa canister will be equipped with a flow regulator set to a flow rate of approximately 0.0125 liters per minute. The canisters will be opened to initiate sampling, which will continue for approximately 8 hours until the canisters are almost full and the regulators are closed.

5.0 SAMPLE CUSTODY AND DOCUMENTATION

Each day that samples are collected, a chain-of-custody/request for analysis form will be completed and submitted to the laboratory with samples to be analyzed. A copy of the chain-of-custody will be retained by the Project Manager. The chain-of-custody will include the project name, sampler's signature, sample IDs, date and time of sample collection, and analysis requested.

Samples will be packaged and shipped in a manner that maintains sample preservation requirements during transport (i.e., ice to keep samples cool until receipt at the laboratory), ensures that sample holding times can be achieved by the laboratory, and prevents samples from being tampered with.

If a commercial carrier ships samples, a bill of lading (waybill) will be used as documentation of sample custody. Receipts for bills of lading and other documentation of shipment shall be maintained as part of the permanent custody documentation. Commercial

carriers are not required to sign the chain-of-custody as long as it is enclosed in the shipping container and evidence tape (custody seal) remains in place on the shipping container.

Identification and documentation of samples are important in maintaining data quality. Strict custody procedures are necessary to ensure the integrity of the environmental samples. Sections below address sample identification, packaging, shipping, and documentation.

5.1 Sample Identification System

The method of identification of a sample depends on the type of measurement or analysis performed. When field screening measurements (e.g., vacuum pressure, flow rate) are made, data are recorded directly in logbooks. Identifying information such as project name, sample location and depth, date and time, name of sampler, field observations, remarks, etc. shall be recorded.

Each sample collected for off-site laboratory analysis during the field investigation should be specifically designated for unique identification. Samples should be identified using a letter code to indicate sample collection methodology. A letter code (see below) will follow, along with the name and/or number that identifies the specific location where the sample was collected. Field equipment blanks will be denoted by the letter code "FB" and trip blanks with "TB". Sample collection date and time should be recorded in the field logbook, chain of custody as well as the sample label.

Letter code prefixes for RIWP activities are as follows:

SB	Delineation Soil Sample
FB	Field Blank Sample
TB	Trip Blank Sample

At a minimum, all location and identification information for the samples shall be recorded in the field sampling logbook, and on the appropriate chain of custody record form for shipment.

5.2 Sample Custody and Packaging

Sample custody shall be strictly maintained and carefully documented each time sample material is collected, transported, received, prepared, and analyzed. Custody procedures are necessary to ensure the integrity of the samples, and samples collected during monitoring activities must be traceable from the time the samples are collected until they are disposed of and/or stored, and their derived data are used in the subsequent monitoring report. Sample custody is defined as (1) being in the sampler's possession; (2) being in the sampler's view, after being in the sampler's possession; (3) being locked in a secured container, after being in the sampler's possession; and (4) being placed in a designated secure area.

5.2.1 Field Custody and Packaging Procedures

Field custody procedures shall be implemented for each sample collected. The field sampler shall be responsible for the care and custody of the samples until they are properly transferred or dispatched. To maintain the integrity of the samples, the samples are to be stored in a designated, secure area and/or be custody sealed in the appropriate containers prior to shipment.

Each environmental sample will be properly identified and individually labeled. Labels will be filled out in indelible ink with at least the following information: sample identification (see Section 5.1), type and matrix of sample, date and time of sample acquisition, name of sampler, analysis required, and preservation (as necessary). The sample label will be securely attached to the sample container.

A laboratory supplied completed chain of custody form will be included with all samples.

5.2.2 Laboratory Custody Procedures

The following generally summarizes laboratory custody procedures; more detailed operations are presented in the laboratory’s SOPs.

- A designated sample custodian will accept custody of the shipped samples and will verify that the information on the sample labels matches that on the chain of custody record(s).
- The laboratory custodian will use the sample label number or assign a unique laboratory number to each sample label and will assure that all samples are transferred to the proper analyst or stored in the appropriate secure area; and,
- Laboratory personnel are responsible for the care and custody of samples from the time they are received until the sample is exhausted or returned to the custodian or sample storage area. Internal chain of custody records shall be maintained by the laboratory.

The laboratory shall communicate with ACT personnel by telephone, email or facsimile, as necessary, throughout the process of sample scheduling, shipment, analysis and data reporting, to ensure that samples are properly processed. If a problem occurs during sample shipment or receipt (e.g., a sample container arrives broken or with insufficient sample volume, a sample was not preserved correctly, a sample was not listed on the chain of custody, etc.), the laboratory shall immediately notify the appropriate person for resolution.

Samples received by the laboratory will be retained until analyses and QA checks are completed. When sample analyses and necessary QA checks have been completed, the unused portion of the sample and the sample container must be disposed of properly by the laboratory. All identifying tags, data sheets, and laboratory records shall be retained as part of the permanent documentation.

6.0 ANALYTICAL REQUIREMENTS

Analytical services will be provided by a NYSDOH ELAP approved laboratory. The laboratory will follow NYSDEC Analytical Sampling Protocol (ASP) and provide data in results only format, with the exception of the final round of sampling in which data will be reported with Category B deliverables (ASP-B). Analyses not available using ASP-B will be provided in results only format.

6.1 Verification Soil Samples

Delineation soil samples will be collected as described in the RIWP. Each delineation soil sample will be analyzed for Target Analyte List (TAL) metals by USEPA Method 6010/7473. Soil samples will be collected in a Terracore sampling kit (or equivalent). Glassware will be supplied pre-cleaned and pre-preserved by the analytical laboratory. The hold time for TAL metals is six months and for mercury analysis the hold time is 28 days.

7.0 DECONTAMINATION PROCEDURES

In order to minimize the potential for cross-contamination, non-dedicated drilling and sampling equipment shall be properly decontaminated prior to and between sampling/drilling locations.

Decontamination of sampling equipment will be kept to a minimum in the field, and wherever possible, dedicated disposable sampling equipment will be used. Decontamination fluids will be stored in US Department of Transportation (DOT)-approved 55-gallon drums or in an on-site storage tank (liquids only) until proper disposal.

Personnel directly involved in equipment decontamination will wear protective clothing in accordance with the project Health and Safety Plan (HASP).

7.1 General Procedures

Drilling equipment will be decontaminated in a designated area. Sampling equipment and probes will be decontaminated in an area covered with plastic sheeting near the sampling location. Waste material generated during decontamination activities will be containerized, stored and disposed of. Decontamination of sampling equipment shall be kept to a minimum, and wherever possible, dedicated sampling equipment shall be used. Personnel directly involved in equipment decontamination shall wear appropriate protective equipment.

7.2 Drilling Equipment

Drilling equipment shall be decontaminated by steam cleaning prior to performance of the first boring/excavation and between all subsequent borings/excavations. This shall include hand tools, casing, augers, drill rods, temporary well material and other related tools and equipment. Water used during drilling and/or steam cleaning operations shall be from a potable source.

7.3 Sampling Equipment

Sampling equipment (i.e., trowels, knives, split-spoons, bowls, hand augers, etc.) will be decontaminated prior to each use as follows:

- Laboratory-grade glassware detergent and tap water scrub to remove visual contamination
- Generous tap water rinse
- Distilled water rinse

8.0 QUALITY ASSURANCE/QUALITY CONTROL SAMPLE REQUIREMENTS

This section will discuss the type and quantities of QA/QC samples to be utilized during implementation of the field program.

8.1 Field Quality Control Samples

The subsections below present general information and guidance on field QC samples, including definition and frequency of QC blanks. Field QC samples will be labeled and shipped according to the procedures outlined in Section 5.1.

8.1.1 Field Blanks

A field blank will be collected to evaluate the potential for contamination of environmental samples from inadequate decontamination of field equipment. Field blanks shall be collected by pouring laboratory supplied distilled/deionized (DI) water over and/or through decontaminated non-disposable equipment or disposable equipment, and collecting the rinsate. Field blanks will

be collected at a frequency of one per decontamination event per type of sampling equipment, not to exceed one per day per sample matrix. Preservation and analysis of field blanks will be identical to that of the associated environmental samples.

8.1.2 Trip Blanks

A trip blank serves to detect possible cross-contamination of samples resulting from handling, storage and shipment procedures. Blanks are stored by the laboratory under the same conditions as the environmental samples. A trip blank will accompany each cooler containing samples submitted for VOC analysis (if any), and will be preserved identically to the associated environmental samples. Due to the lack of VOC impact identified at the site, it is not anticipated that trip blanks will be necessary during the final soil sampling.

8.1.3 Temperature Blanks

A temperature blank will be sent with each cooler of samples to be analyzed for VOCs to verify that the cooler temperature has been maintained at 4ºC. One non-preserved VOA vial shall be filled with either potable or DI water, and labeled with "NYSDEC cooler temperature indicator" and the date. If supplied, the laboratory's temperature blank will be used in place of the VOA vial. The laboratory shall record the temperature of the blank water on the chain of custody immediately upon cooler arrival.

8.1.4 Field Environmental Duplicate Samples

Duplicate environmental samples will be analyzed by the off-site laboratories to evaluate the reproducibility of the sampling procedures. Duplicate samples will be collected at a rate of five percent of the total samples for each specific matrix for each type of analysis (i.e., one duplicate for up to every 20 samples). The duplicate samples will be collected from the same location and at the same time as the original environmental sample; however, the duplicated samples will be "coded" in such a manner that the laboratory will not be able to determine of which original field sample they are duplicated (i.e., "blind" duplicates). For example, the duplicate sample of location EP001 may be "coded" as location EP051, as long as there are not more than fifty endpoint samples

being collected (i.e., the coded sample name should not be assigned a legitimate sample location identification). An explanation of the duplicate "coding" must be written in the field logbook. Preservation and analysis of duplicate samples will be identical to those for the environmental samples. Precision of field data will be evaluated based on the calculation of Relative Percent Difference (RPD), with acceptance criteria of 25 percent for the off-site laboratory samples. Blind duplicate samples will be collected in the same manner as the environmental samples.

8.2 Laboratory Quality Control Samples

General information and guidance on laboratory QC samples are presented in the subsections below. A summary of QC procedures, frequencies, criteria, and corrective actions for the samples, as determined by the applicable method guidelines.

8.2.1 Method Blanks/Preparation Blanks

A method blank (for organics) or a preparation blank (for inorganics) will be analyzed with every batch of samples to ensure that contamination has not occurred during the analytical process. Method blanks consist of a portion of analyte-free solid that is processed through the entire sample procedure the same as an environmental sample.

8.2.2 Laboratory Control Samples

A laboratory control sample (LCS) consists of an analyte- solid phase sample that is spiked with target analytes at a known concentration. The LCS shall be analyzed for every batch of samples (i.e., 1 per 20) to assess the ability of the analytical procedure to generate a correct result without matrix effects/interferences affecting the analysis. The percent recoveries for the LCS compounds will be compared to QC limits stated in the appropriate methods. MS/MSD will be collected on groundwater and soil samples at a rate of 1 per 20 samples per matrix.

8.2.3 Surrogate Compounds

Surrogates (also known as System Monitoring Compounds) are compounds of known concentrations added to every organic analysis sample for analytical chromatography methods at the beginning of the sample preparation to monitor their recovery. Surrogate recoveries will be used to assess potential matrix interferences and to monitor any potential effects of sample preparation and analysis on final analyte concentrations. The recovery values will be compared to values established in the applicable methodologies to determine the validity of the data.

8.2.4 Internal Standards

Internal standards are used to provide instrument correction for variation in instrument performance and injection volumes. Internal standards also establish relative response factors for the analytes.

9.0 INSTRUMENT CALIBRATION AND PREVENTIVE MAINTENANCE

9.1 Calibration

Equipment will be inspected and approved by the Field Team Leader before being used. Equipment will generally be calibrated in the field to factory specifications. Monitoring equipment will be calibrated following manufacturers recommended schedules. Daily field response checks and calibrations will be performed as necessary following manufacturers standard operating procedures. Equipment calibrations will be documented in a designated field logbook.

The Field Team Leader or his designee will be responsible for ensuring that instrumentation is of the proper range, type and accuracy for the measurement/test being performed, and that all of the equipment are calibrated at their required frequencies, according to their specific calibration protocols/procedures.

All field measurement instruments must be calibrated according to the manufacturer's instructions prior to the commencement of the day's activities. Exceptions to this requirement

shall be permitted only for instruments that have fixed calibrations pre-set by the equipment manufacturer. Calibration information shall be documented on in a designated field logbook. Information to be recorded includes the date, the operator, and the calibration standards (concentration, manufacturer, etc.). All project personnel using measuring equipment or instruments in the field shall be trained in the calibration and usage of the equipment and are personally responsible for ensuring that the equipment has been properly calibrated prior to its use.

In addition, all field instruments must undergo response verification checks at the end of the day's activities and at any other time that the user suspects or detects anomalies in the data being generated. The checks consist of exposing the instrument to a known source of analyte (e.g., the calibration solution), and verifying a response. If an unacceptable instrument response is obtained during the check the data shall be labeled suspect, the problem documented in the site logbook, and appropriate corrective action taken.

Any equipment found to be out of calibration shall be recalibrated. When instrumentation is found to be out of calibration or damaged, an evaluation shall be made to ascertain the validity of previous test results since the last calibration check. If it is necessary to ensure the acceptability of suspect items, the originally required tests shall be repeated (if possible), using properly calibrated equipment. Any instrument consistently found to be out of calibration shall be repaired or replaced.

9.2 Preventive Maintenance

Field equipment shall be maintained at its proper functional status in accordance to manufacturer manual specifications. A check of the equipment shall be performed before field activities begin, and any potential spare parts (e.g., batteries, connectors, etc.) and maintenance tools will be brought on site, to minimize equipment downtime during the field activities. Visual checks of the equipment will be conducted on a daily basis. Routine preventive maintenance shall be performed to assure proper operation of the equipment. Any maintenance performed on field

equipment will be documented in the designated field logbook, and shall be undertaken by personnel who have the appropriate skills and/or training in the type of maintenance required.

10.0 DATA REDUCTION, VALIDATION AND REPORTING

Standard methods and references will be used as guidelines for data handling, reduction, validation, and reporting. All data for the project will be compiled and summarized with an independent verification at each step in the process to prevent transcription/typographical errors. Any computerized entry of data will also undergo verification review.

10.1 Data Reduction

10.1.1 Field Data Reduction

Field instrumentation data will be reported by site personnel in field logbooks associated with the monitoring event. At the end of each monitoring event, the field screening data results shall be summarized in tabulated form, as warranted.

10.1.2 Laboratory Data Reduction

All data generated by the off-site laboratory will be reported in a specified format containing all required elements to perform data validation. Analytical results shall be presented on standard NYSDEC Analytical Sampling Protocol (ASP) forms or equivalents and reported with Category B (ASP-B) deliverables and include the dates the samples were received and analyzed, and the actual methodology used with the exception of interim sampling in which data will be reported in Category A (ASP-A) format.

Laboratory QA/QC information required by the method protocols will be compiled, including the application of data QA/QC qualifiers as appropriate. In addition, laboratory worksheets, laboratory notebooks, chains-of-custody, instrument logs, standards records,

calibration records, and maintenance records, as applicable, will be provided in the laboratory data packages to determine the validity of data.

10.1.3 Project Data Reduction

Following receipt of the laboratory analytical results by Advanced Cleanup Technologies, Inc., the data results will be compiled and presented in an appropriate tabular form. Where appropriate, the impacts of QA/QC qualifiers resulting from laboratory or external validation reviews will be assessed in terms of data usability.

10.2 Data Usability and Validation

The main purpose of the data is for use in defining the extent of contamination at the site, to aid in evaluation of potential human health and ecological exposure assessments, and to support remedial action decisions. Based upon this, data use usability and validation will be performed as described below. Complete data packages will be archived in the project files, and if deemed necessary additional validation can be performed using procedures in the following sections. It is anticipated that data validation will be performed on data collected during the final round of sampling, only.

10.2.1 Data Usability and Validation Requirements

Data usability and validation are performed on analytical data sets, primarily to confirm that sampling and chain-of-custody documentation are complete, sample IDs can be tied to specific sampling locations, samples were analyzed within the required holding times, and analyses are reported in conformance to NYSDEC ASP data deliverable requirements as applicable to the method utilized.

All data should be provided to NYSDEC in draft form prior to being validated by a third party data validator namely LABORATORY DATA CONSULTANTS, INC.

10.2.2 Data Usability and Validation Methods

If deemed necessary by NYSDEC, a data usability evaluation for the data collected during the RIWP and a data usability summary report (DUSR) will be prepared. The DUSR will be prepared in accordance with USEPA National Function Guidelines for Organic Superfund Methods Data Review, January 2017 (EPA-540-R-2017-002); USEPA National Function Guidelines for Inorganic Superfund Methods Data Review, January 2017 (EPA-540-R-2017-002); and USEPA Region 2 SOPs.

11.0 CORRECTIVE ACTION

Review and implementation of systems and procedures may result in recommendations for corrective action. Any deviations from the specified procedures within approved RIWP due to unexpected site-specific conditions shall warrant corrective action. All errors, deficiencies, or other problems shall be brought to the immediate attention of Jason Stewart of ACT, who in turn shall contact the Quality Assurance/Data Quality Manager or her designee.

Procedures have been established to ensure that conditions adverse to data quality are promptly investigated, evaluated and corrected. These procedures for review and implementation of a change are as follows:

- Define the problem.
- Investigate the cause of the problem.
- Develop a corrective action to eliminate the problem, in consultation with the personnel who defined the problem and who will implement the change.
- Complete the required form describing the change and its rationale (see below for form requirements).

- Obtain all required written approvals.
- Implement the corrective action.
- Verify that the change has eliminated the problem.

During the project, all changes to the SI monitoring program will be documented in field logs/sheets and Jason Stewart of ACT will be advised.

If any problems occur with the laboratory or analyses, the laboratory must immediately notify Jason Stewart of ACT, who will consult with other ACT project staff. All approved corrective actions shall be controlled and documented.

All corrective action documentation shall include an explanation of the problem and a proposed solution which will be maintained in the project file or associated logs. Each report must be approved by the necessary personnel (e.g., the PM) before implementation of the change occurs. Jason Stewart of ACT shall be responsible for controlling, tracking, implementing and distributing identified changes.

Analytical Methods/Quality Assurance Summary Table

Sample ID	Matrix	Sample Interval	Analytical Parameter	Analytical Method	Preservation Method	Container Type/Volume	Sample Holding Time
SS-18	Soil Vapor	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
SS-19	Soil Vapor	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
SS-20	Soil Vapor	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
SS-21	Soil Vapor	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
SS-22	Soil Vapor	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
SS-23	Soil Vapor	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
SS-24	Soil Vapor	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
SS-25	Soil Vapor	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
SS-26	Soil Vapor	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
SS-27	Soil Vapor	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
IA-18	Indoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days

IA-19	Indoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
IA-20	Indoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
IA-21	Indoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
IA-22	Indoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
IA-23	Indoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
IA-24	Indoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
IA-25	Indoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
IA-26	Indoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
IA-27	Indoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
OA-1	Outdoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
OA-2	Outdoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days
OA-3	Outdoor Air	-	VOCs	EPA Method TO-15	Ambient	Canister	30 days

PRESERVATION and HOLDING TIMES

The following Table lists the appropriate container, preservation conditions, holding time requirements and sample amounts required for common analyses

Determination	Matrix[b]	Container[c]	Preservation	Maximum Holding Time from collection	Amount of Sample Needed, minimum
Bacterial Tests					
Coliform, Colilert	W, DW	P, Bottle or Bag, Sterile	Cool, 4°C, 0.008% $Na_2S_2O_3$[d]	6 hours-24 hours for Drinking water	60 ml
Coliform, Fecal and Total	W, DW	P,G, Sterile	Cool, 4°C, 0.008% $Na_2S_2O_3$[d]	6 hours-24 hours for Drinking water	60 ml
Fecal Streptococci	W	P,G, Sterile	Cool, 4°C, 0.008% $Na_2S_2O_3$[d]	6	60 ml
Inorganic Tests					
Acidity	W	P,G	Cool, 4°C	14 days	250 ml
Alkalinity	W, DW	P,G, no headsapce	Cool, 4°C	14 days	250 ml
Ammonia	W, DW	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days	250 ml
Biochemical Oxygen Demand (BOD)	W	P,G	Cool, 4°C	48 hours	1 liter
Bromide	W, DW	P,G	None Required	28 days	50 ml
Chemical Oxygen Demand (COD)	W	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days	50 ml
Chloride	W, DW	P,G	None Required	28 days	50 ml
Chlorine, Total Residual	W, DW	P,G	None Required	15 minutes	50 ml
Chromium VI	W	P,G	Cool, 4°C	24 hours	100 ml
Color	W, DW	P,G	Cool, 4°C	48 hours	100 ml
Cyanide, Total and Amenable to Chlorination	W, DW	P,G	Cool, 4°C, NaOH to pH>12, plus 0.6 g Ascorbic Acid	14 days	250 ml
Ferrous Iron	W, DW	G Amber	Cool, 4°C	24 hours	100 ml
Fluoride	W, DW	P,G	None Required	28 days	50 ml
Hardness	W, DW	P,G	HNO_3 to pH<2	6 months	100 ml
Hydrogen Ion (pH)	W, DW, S	P,G	None Required	Analyze immediately	100 ml, 2 oz.
Ignitability	W	G	None Required	14 days	100 ml
Kjeldahl and Organic Nitrogen	W	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days	500 ml
Nitrate-Nitrogen	W, DW	P,G	Cool, 4°C	48 hours	50 ml
Nitrite-Nitrogen	W	P,G	Cool, 4°C	48 hours	50 ml
Orthophosphate	W, DW	P,G	Cool, 4°C	48 hours	100 ml
Oxygen, Dissolved	W, DW	G, Bottle and Top	None Required	Analyze immediately	300 ml
Phenolics, Total	W	G Only	Cool, 4°C, H_2SO_4 to pH<2	28 days	1 liter
Phosphorus, Total	W	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days	250 ml
Residue, Total	W	P,G	Cool, 4°C	7 days	250 ml
Residue, Filterable (TDS)	W	P,G	Cool, 4°C	7 days	250 ml
Residue, Nonfilterable (TSS)	W	P,G	Cool, 4°C	7 days	500 ml
Residue, Settleable	W	P,G	Cool, 4°C	48 hours	1 liter
Residue, Volatile	W	P,G	Cool, 4°C	7 days	1 liter
Specific Conductance	W, DW	P,G	Cool, 4°C	28 days	100 ml
Sulfate	W, DW	P,G	Cool, 4°C	28 days	50 ml
Sulfide	W	P,G	Cool, 4°C, Add ZnOAc + NaOH to pH>9	7 days	250 ml
Sulfite	W	P,G	None Required	Field parameter-15 minutes	250 ml
Surfactants (MBAS)	W	P,G	Cool, 4°C	48 hours	1 liter
Turbidity	W, DW	P,G	Cool, 4°C	48 hours	100 ml

Determination	Matrix[b]	Container[c]	Preservation	Maximum Holding Time from collection	Amount of Sample Needed, minimum
Metals					
Metals (except Cr^{+6} and Mercury)	W, DW	P,G	HNO_3 to pH<2	6 months	250 ml
	S	G, Teflon-Lined Cap	Cool, 4°C	6 months	2 oz.
Chromium, hexavalent	W	P,G	Cool, 4°C	24 hours	250 ml
	S	G	Cool, 4°C	28 days	2 oz.
Mercury	W	P,G	HNO_3 to pH<2	28 days	250 ml
	S	G	Cool, 4°C	28 days	2 oz.
Organics					
Organics, miscellaneous					
Oil and Grease, Hexane Extractable Material (EPA 1664)	W	G, Teflon-Lined Cap, AMBER	Cool, 4°C, H_2SO_4 to pH<2	28 days	1 liter
Organic Carbon, Total (TOC)	W	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days	100 ml
Organic Halogens, Total (EOX)	S	G, Teflon-Lined Cap	Cool, 4°C	14 days	4 oz.
Petroleum Hydrocarbons, Total Recoverable	W	G, Teflon-Lined Cap	Cool, 4°C, HCl or H_2SO_4 to pH<2	28 days	1 liter
Petroleum Hydrocarbons, Total	W	G, Teflon-Lined Cap	Cool, 4°C, HCl or H_2SO_4 to pH<2	7 days until extraction; 40 days after extraction to analysis	1 liter
	S	G, Teflon-Lined Cap	Cool, 4°C	14 days until extraction; 40 days after	4 oz.
Volatile Organics					
GRO-Petroleum Hydrocarbons, Volatile (Gasoline-Range Organics)	W	G, Teflon-Lined Septum Cap	Cool, 4°C, HCl to pH<2, No Headspace	14 days	3 x 40 ml vials
	S	G, Teflon-Lined Cap, 5035 MeOH vial only	Cool, 4°C, Minimize Headspace	14 days	1 x 40 ml vial
VOLATILES, 8260, 524.2	W, DW	G, Teflon-Lined, Septum Cap	HCl to pH<2, Cool, 4°C, No Headspace	14 days	3 x 40 ml vials
			DW- ascorbic acid + HCl to pH<2, Cool, 4°C, No Headspace		
	S	Method 5035A vial sets: 2 VOA vials with 5 ml H_2O, 1 with MeOH plus a	Cool 4°C, freeze at lab within 48 hours	14 days	2 x 40 ml vials with H2O
			Cool 4°C, methanol preserved	14 days	1 x 40 ml vial with MeOH
			Separate container for % solids	NA	40 mL vial or 2 oz. jar
		Method 5035A ENCORE Samplers	Cool 4°C in coring tool, extrude in lab to appropriate vials	48 hours to extrusion at lab	3 - 5g. ENCORES
			Separate container for % solids	NA	40 mL vial or 2 oz. jar
EDB and DBCP	W	G, Teflon-Lined Cap	Cool, 4°C, 3 mg $Na_2S_2O_3$, No Headspace	28 days	2 x 40 mL vials

Determination	Matrix[b]	Container[c]	Preservation	Maximum Holding Time from collection	Amount of Sample Needed, minimum[e]
Semivolatile Organics					***See note e. below***
DRO-Petroleum Hydrocarbons, Extractable (Diesel-Range Organics)	W	G, Teflon-Lined Cap	Cool, 4°C[a]	7 days until extraction; analysis within 40 days after extraction	1 liter
	S	G, Teflon-Lined cap	Cool, 4°C	14 days until extraction; analysis within 40 days after extraction	4 oz.
CT-ETPH	W	G, Teflon-Lined cap	Cool, 4°C	7 days until extraction; analysis within 40 days after extraction	1 liter
	S	G, Teflon-Lined cap	Cool, 4°C	14 days until extraction; analysis within 40 days after extraction	4 oz.
MADEP/CTDEP-EPH	W	G, Teflon-Lined cap	5 mls 1:1 HCl, Cool, 4°C	7 days until extraction; analysis within 40 days after extraction	1 liter
	S	G, Teflon-Lined cap	Cool, 4°C	14 days until extraction; analysis within 40 days after extraction	4 oz.
NJDEP EPH	W	G, Teflon-Lined cap	5 mls 1:1 HCl, Cool, 4°C	14 days until extraction; analysis within 40 days after extraction	1 liter
	S	G, Teflon-Lined cap	Cool, 4°C	14 days until extraction; analysis within 40 days after extraction	4 oz.
Acid Extractables-Phenols	W	G, Teflon-Lined Cap, AMBER	Cool, 4°C	7 days until extraction; analysis within 40 days after extraction	2 liters
	S	G, Teflon-Lined cap	Cool, 4°C	14 days until extraction; analysis within 40 days after extraction	4 oz.
Base-Neutral Extractables	W	G, Teflon-Lined Cap	Cool, 4°C	7 days until extraction; analysis within 40 days after extraction	2 liters
	S	G, Teflon-Lined cap	Cool, 4°C	14 days until extraction; analysis within 40 days after extraction	4 oz.
Base-Neutral/Acid (BNA) Extractables	W	G, Teflon-Lined Cap	Cool, 4°C	7 days until extraction; analysis within 40 days after extraction	2 liters
	S	G, Teflon-Lined cap	Cool, 4°C	14 days until extraction; analysis within 40 days after extraction	100 g.
Organochlorine Pesticides and PCBs	W	G, Teflon-Lined Cap	Cool, 4°C[a]	7 days until extraction; analysis within 40 days after extraction	2 liters
	S	G, Teflon-Lined cap	Cool, 4°C	14 days until extraction; analysis within 40 days after extraction	100 g.
Polynuclear Aromatic Hydrocarbons	W	G, Teflon-Lined Cap	Cool, 4°C[a]	7 days until extraction; analysis within 40 days after extraction	2 liters
	S	G, Teflon-Lined cap	Cool, 4°C	14 days until extraction; analysis within 40 days after extraction	100 g.
Chlorinated Herbicides	W	G, Teflon-Lined Cap	Cool, 4°C	7 days until extraction; analysis within 40 days after extraction	500 ml
	S	G, Teflon-Lined cap	Cool, 4°C	14 days until extraction; analysis within 40 days after extraction	100 g.

Determination	Matrix[b]	Container[c]	Preservation	Maximum Holding Time from collection	Amount of Sample Needed, minimum[e]
Toxicity Characteristic Leaching Procedure (TCLP) and SPLP					
Mercury	HW	G	Sample: Cool, 4°C	28 days until extraction;	4 oz.
			TCLP extract: HNO_3 to pH<2	28 days after extraction	
Metals, except Mercury	HW	G	Sample: Cool, 4°C	180 days until extraction;	4 oz.
			TCLP extract: HNO_3 to pH<2	180 days after extraction	
Volatile Organics	HW	G, Teflon-Lined Cap or 5035A ENCORES-25g.	Sample: Cool, 4°C , Minimize Headspace' ENCORE, frozen	14 days until extraction;	4 oz. or 1 x 25 g. ENCORE, frozen
			TCLP extract: Cool, 4°C, HCl to pH<2, No Headspace	14 days after extraction	
Semivolatile Organics	HW	G, Teflon-Lined Cap	Sample: Cool, 4°C, Store in Dark[a]	14 days to prepare leachate;	8 oz.
				7 days to extract	
			TCLP extract: Cool, 4°C, Store in Dark[a]	40 days after extraction to analyze	
Organochlorine Pesticides	HW	G, Teflon-Lined Cap	Sample: Cool, 4°C	14 days until TCLP extraction	8 oz.
			TCLP extract: Cool, 4°C	7 days until extraction; 40 days after extraction to analysis	
Chlorinated Herbicides	HW	G, Teflon-Lined Cap	Sample: Cool, 4°C	14 days until TCLP extraction	8 oz.
			TCLP extract: Cool, 4°C	7 days until extraction; 40 days after extraction to analysis	
Air					
Volatile Organics by EPA TO-15	A	Canister	Ambient	30 days	NA
Volatile Organics by EPA TO-15, modified	A	Tedlar bag	Ambient	72 hours	NA
Polynuclear Aromatic Hydrocarbons by EPA TO-13A	A	PUF media	Cool, 4°C	7 days until extraction; 40 days after extraction	NA
Organochlorine Pesticides and PCBs by EPA TO-10A	A	PUF	Cool, 4°C	7 days until extraction; 40 days after extraction	NA
Air Petroleum Hydrocarbons by MassDEP APH Method	A	Canister	Ambient	30 days	NA
Permanent Gases by EPA 3C modified	A	Canister/Tedlar bag	Ambient	30 days/72 hours if tedlar bag	NA
Helium by GC/TCD	A	Canister or tedlar bag	Ambient	30 days/72 hours if tedlar bag	NA
Hydrogen by GC/TCD	A	Canister or tedlar bag	Ambient	30 days/ 72 hours if tedlar bag	NA
Methane by GC/FID	A	Canister or tedlar bag	Ambient	30 days/ 72 hours if tedlar bag	NA

Notes:

a. $4^{o}C \pm 2C$; If the water sample contains residual chlorine, 10% sodium thiosulfate is used to dechlorinate

b. DW = Drinking Water; W = Water; S = Soil or Sediment; HW = Hazardous Waste; A = Air

c. P = Plastic-Polyethylene; G = Glass

d. For chlorinated water samples

e. If combining tests, the total amounts necessary for analysis will be reduced

CURRICULUM VITAE

PAUL P. STEWART
ADVANCED CLEANUP TECHNOLOGIES, INC.
110 MAIN STREET, SUITE 103
PORT WASHINGTON, NY 11050
BUSINESS: (516)-441-5800 x102

EDUCATION:

Professor	Polytechnic Institute, (NY) Environmental Law and Regulations	1996- 1999
J.D.	Vermont Law School, (VT) Environmental Law	1982
M.S.	Tufts University, (MA) Environmental Health Engineering	1979
B.S.	Boston University, (MA) Biology	1978

PROFESSIONAL HISTORY:

PRESIDENT, ADVANCED CLEANUP TECHNOLOGIES, INC.

Joined the firm in February, 1989 with extensive expertise in the investigation of environmental contamination incidents. Has been employed by industrial facilities, retail petroleum distributors, insurance companies and financial institutions to investigate past and present chemical handling practices and conditions at subject locations.

Mr. Stewart has developed a Forensics department which directs all investigations into the occurrence of contamination and sources of its release. These services are geared towards identifying the nature, extent and causes of environmental contamination. He is also affiliated with Polytechic Institute of New York where he is engaged in joint research into groundwater flow, chemical transport modeling and remediation as applied to major chemical releases.

PROFESSIONAL HISTORY (Continued)

ASSOCIATE ATTORNEY	RIVKIN, RADLER, DUNNE & BAYH EAB Plaza, Uniondale, NY 11556	1985- 1989

A member of the Science/Causation Team and Environmental Practice Group with extensive experience in groundwater investigations and major environmental litigation. He coordinated the development of major scientific and technical issues involved in complex hazardous waste and toxic tort law suits including Agent Orange, Shell and many others.

His responsibilities included the allocation of liabilities and costs for the release of chemicals into the environment and developing appropriate levels of remedial action. He was also responsible for researching and evaluating evidence of property damage and environmental exposure in conjunction with the Real Estate Department, where he developed environmental due diligence procedures for commercial real estate transactions.

His additional responsibilities included investigating companies' chemical handling, transport and disposal practices and impacts on their regulatory requirements. This work involved surveying industrial activities and chemical release incidents at numerous facilities including literature research, public agency records review and the coordination of appropriate soil, soil vapor and ground water investigations. He also made appearances before federal, state and local regulatory agencies and successfully negotiated the resolution of regulatory compliance issues under numerous statutory frameworks.

ASSOCIATE ATTORNEY	ESCHEN & ESCHEN North Broadway, Hicksville, NY	1983- 1985

Responsible for personal injury and property damage trials and depositions. Successfully perfected numerous appellate briefs and issues including negligence, contract and insurance law. Appearance before regulatory and penal tribunals. Applications of land use development and management law.

INTERN EXAMINER	U.S. PATENT & TRADEMARK OFFICE Washington, D.C.	1981

Screened applications for statutory compliance. Prepared legal memoranda in support of official determinations in pending actions.

PROFESSIONAL HISTORY (Continued)

AFFILIATIONS:

National Water Well Association
American Chemical Society
American Association for the Advancement of Science
American Society of Testing and Materials
American Bar Association
New York Bar Association

CERTIFICATIONS AND LICENSES:

New Jersey Certification in Subsurface Evaluations
New York State Restricted Handler Class II
Portable Gas Chromatography Operator
Licensed to Practice Law in New York and Florida

SELECT PRESENTATIONS:

The Scene of the Accident: Forensic Engineering in Hazardous Waste Litigation, Purdue University Industrial Waste Symposium, in Indiana, May 10, 1988.

A Case Study of Petroleum Contamination, Environmental Claim Seminar, St. Paul, Minnesota, May 14, 1990.

PUBLICATIONS:

Numerous technical reports and articles on environmental health engineering and science including the following:

Evaluation of an Ecological Habitat in an Urban New England Environment, 1978.

Environmental Impact Analysis, Construction of the Kennedy Memorial Library, 1978.

Pretreatment of Chromium Waste Sludge from Metal Plating Facility, 1979.

Environmental Impact Analysis, Expansion of the Block Island Sewage Treatment Plant, 1979.

Environmental Report, 11th Annual ALI-ABA Conference on Environmental Law, Vermont Law School Forum, 1981.

Official Comments, Final Environmental Impact Statement, Proposed Runaway Extension and Industrial Park Development, Lebanon Municipal Airport, Lebano, New Hamsphire, 1982.

Laboratory Scale Design, Treatment of Wastewater from Soda Manufacturing, 1985.

PROFESSIONAL HISTORY (Continued)

Development of a Groundwater Evaluation Program, Hazardous Waste and Toxic Torts Law and Strategy, 1985.

The scene of the Accident: Forensic Engineering in Hazardous Waste Litigation, Journal of the Industrial Waste Symposium, Prudue University, 1988.

History of Commercial use of Methyl tert-Butyl Ether in gasoline products, 1990.

A Case Study of Petroleum Contamination, April 16, 1990.

Effect of Bentonite Diversion Wall on the Migration of Wastes at a Hazardous Waste Landfill, Sato, C., A. Protopapas, P. Stewart, June, 1991.

RELATED PROJECT EXPERIENCE:

Beekman, New York

Performance of an environmental services audit of on-going groundwater remediation project.

Bellmore, New York

The investigation of soil and groundwater contamination associated with retail gasoline distribution facilities.

Brockton, Massachusetts

Performance of a soil, soil vapor and groundwater investigation associated with a retail dry cleaning facilities.

Falls Village, Connecticut

The investigation and remediation of soil and groundwater contamination associated with the release of fuel oil from an underground storage tank.

Garden City, New York

The investigation and remediation of chlorinated solvent contamination associated with printing industry wastes.

Pineola, North Carolina

The investigation of soil and groundwater contamination associated with the release of petroleum from a retail gasoline and bulk petroleum distribution facility.

Ridgefield, Connecticut

The investigation and remediation of soil and groundwater contamination associated with the release of fuel oil from an above ground petroleum storage facility.

Wilmington, North Carolina

Performance of an environmental services audit associated with on-going groundwater remedial activities involving the release of fuel oil and gasoline products.

EXPERT TESTIMONY:

Merrick, New York

Provided expert trial testimony associated with the extent of ground water contamination at a former retail gasoline station.

Deluth, Minnesota

Provided expert trial testimony related to the generation, storage, disposal of wastes and the associated environmental contamination at a waste oil re-refinery.

Oakgrove, Minnesota

Provided deposition testimony related to the nature, extent and timing of ground water contamination associated with several municipal landfills.

Somerset, Wisconsin

Provided an expert affidavit related to a fuel oil spill.

East Boston, Massachusetts

Provided expert testimony at an environmental mediation related to soil and ground water contamination associated with an existing retail service station.

Springfield and Billerica, Massachusetts

Provided expert affidavits related to discharges of industrial chemicals at elevator and automotive manufacturing facilities.

Brockton, Massachusetts

Provided expert affidavits related to the discharge of chlorinated solvents at a drycleaning facility.

Timothy Young

Versatile, resourceful, and dedicated Geologist offering extensive geologic experience in field and laboratory work with a strong foundation in leadership. Field work in diverse geographical regions including Pennsylvania, Texas, Oklahoma, West Virginia, upstate New York, and Hawaii. Specific expertise in detailed geologic sample analysis; experienced with variety of microscopes and imaging software. Highly capable of training and safety conscious in work environment. Other skills include preparing detailed field notes, diagrams for written reports and utilizing geologic tools to formulate conclusions. Self-directed, highly-motivated professional who can work effectively with cross-functional teams. Able to focus efforts and prioritize work flow under pressure and adapt effectively to different work environments. Committed to leadership, team work, quality and safety standards. Value exceeding expectations through collaborative problem solving with focus on delivering top quality products under daily deadlines.

Oceanside, NY
young.gsx12@yahoo.com - 5166402947

WORK EXPERIENCE

Founder - Senior Vice President of Field Operations - PA - Marcellus Shale

EVOLVED WELL LOGGING LLC - Wysox, PA - September 2011 to July 2012

Founder of Evolved Well Logging, LLC. Constructed company from ground up. Composed Evolved business plan and company policies. Secured company office, employee housing and equipments for expected daily operations. Calculated all costs and expenses for prospective operations. Drafted six contracts, safety policies, field training workbooks, website, logo, terms of service, invoices, bid proposals. Researched and utilized unique groundbreaking ideas for Evolveds identity. Organized proposal meeting and presented to Shell Appalachia. Interviewed for potential field, safety and office positions.

Field Geologist

HORIZON WELL LOGGING LLC - Appalachia - Marcellus Region, PA, US - May 2011 to July 2011

Graduated from Field Geologist Development Program (FGDP). Conducted geosteering, operated as field team leader and executed mud logging duties in field. Assembled and imported real time survey and gamma data from MWD into SES program. Interpreted geologic structure and well path. Provided senior geologists and drilling team with generated cross sections of pay zone with structural analysis to guide wells. Successfully and accurately analyzed and described approximately 20,000 lithology (cuttings) and core samples on 100 well sites in Appalachia Marcellus Shale region. Trained 50 new employees in field. Edited a variety of company quality standards. Designed Horizon Well Loggings "Training Guide" bolstering efficiency of training.

Team Leader

HORIZON WELL LOGGING LLC - Appalachia - Marcellus Region, PA, US - January 2011 to May 2011

Assisted the Eastern Division Supervisor. Executed daily tasks as a lead logger on drilling locations and aided Supervisor with personnel assignments, trailer management, resource and equipment logistics, and customer relations. Managed daily field operations on eight assigned wells. Reviewed quality, timeliness and accuracy of team work product daily. Effectively prioritized work product, assignment spreadsheets and training under pressure in fast paced conditions. Provided geologic knowledge and troubleshooting guidance with equipments to mud loggers and trainees. Motivated strongest lead loggers to train mud logger trainees effectively and in accordance with safety and operating processes.

Field Supervisor

HORIZON WELL LOGGING LLC - Appalachia - Marcellus Region, PA, US - October 2010 to January 2011

Coordinated a team of 38 mud loggers and trainees. Supervised all mud logging operations on 22 wells. Maintained daily resource and assignment spreadsheets for all operations. Close interaction with senior geologists and well site personnel. Attended confidential pre-spud meetings with three energy companies. Enforced personnel assignments, trailer management and assignments, resource and equipment logistics and customer relations. Oversaw daily mud logging reports were completed in a timely and accurate manner in accordance with operating processes and quality standards.

Lead Mud Logger

HORIZON WELL LOGGING LLC - Appalachia - Marcellus Region, PA, US - December 2009 to October 2010

Recruited to participate in company's unique and innovative Field Geologist Development Program (FGDP) at on- site natural gas drilling rigs as a subcontracted field geologist for major energy companies. Reported to senior geologists from a field laboratory. Obtained, analyzed and described the lithology and accessory minerals of rock cuttings at interval depths (mud log), monitored gas data, collected Istotube gas samples, and developed daily mud log reports. Evaluated prognoses, geosteering reports, mud check reports from Mud Engineers and survey and gamma data from MWD. Participated in Shell Resources Safety Orientation. Completed OSHA Standard General Industry Training and Rig Safety.

EDUCATION

BA in Geology

Hartwick College - Oneonta, NY
2005 to 2009

SKILLS

MS Office, Stereo and Digital Compound Microscopes, Amscope and ToupView Microscope Camera Softwares, Wellsight Systems Mud Log V6 and Horizontal Log V6, Stoner Engineering Geosteering Software (SES), Isotube gas sampling and Isojar sampling equipment (Isotech Laboratories Inc.), iBall Bloodhound Gas Detector and Chromatograph Systems, iBall Gas Charting and Logging Software, Portable GPS systems

LINKS

http://www.evolvedgeo.com

ADDITIONAL INFORMATION

Thesis: "Examination of the Effectiveness of Diffusive Mass Transfer in Contamination of Magma."

Recipient of "Richard Dawkins Award" awarded to the most dedicated student-athlete (Lacrosse)

Joseph Sgueglia, B.A.
Project Manager/Environmental Scientist

Mr. Sgueglia is an Environmental Scientist holding a Bachelor of Arts Degree in Ecosystems and Human Impact from the State University of New York at Stony Brook. His experience focuses on managing and conducting Phase I Environmental Site Assessments, Phase II Environmental Site Investigations, Transaction Screens and Environmental Reviews on behalf of financial institutions, developers, property owners, and other interested parties. While at ACT, Mr. Sgueglia has utilized his numerous technical capabilities in a variety of functions, including coordinating and performing environmental site inspections, interacting with State and Local Regulatory Agencies, and preparing hundreds of Phase I and Phase II reports and site summary diagrams. He is well versed in the interpretation of ASTM Standard E1527-13 and is a member of ASTM's Committee E50 on Environmental Assessments.

Yisong Yang, Ph.D
Environmental Engineer

Mr. Yang comes to ACT with a wealth of experience from his time spent as a practicing engineer and in academia. Mr. Yang received his Bachelor of Engineering, Master of Engineering and Ph.D in Fluid Mechanics and Fluid Engineering from Wuhan University in China, where he also taught as an Associate Professor. He has taught an conducted research at universities for nearly two decades and went on to earn a second Ph.D in Civil and Environmental Engineeri ng from the University of Western Ontario.

As an Engineer, Mr. Yang has worked on projects ranging from the ship lock discharge system for the Three Gorges Dam to precise forensic analysis of groundwater contamination using state-of-the-art modeling techniques. Mr. Yang is proficient in data processing, statistical analysis, computational fluid dynamics (CFD), has developed a number of fluid and gas flow modeling algorithms and is also highly experienced in conducting environmental surveys.

Karen Friedman, B.B.A., CPA
Vice President

Karen Friedman is a Certified Public Accountant with a Bachelor of Business Administration from the Ross School of Business at the University of Michigan and a post graduate degree in business management. She specializes in the planning, budgeting and scheduling of major construction projects, utilizing PERT, CPM and other project management tools to maintain control over costs and scheduling.
Prior to her long-time stay at ACT, Ms. Friedman gained widespread experience as a cost control accountant for major construction firms in New York City and throughout the United States. She is well suited and qualified to manage all budgeting and scheduling requirements, including cost estimation of proposed investigations, remedial designs, and subcontractor compensation.
Ms. Friedman has managed and audited accounts associated with multimillion dollar remediation projects. She adds a unique and significant facet to our project team to insure the efficient and successful performance of investigation and remedial activities over the duration of a project, a quality which is lacking in most competing firms.

Contact

jastew1011@gmail.com

www.linkedin.com/in/jasonstewart4 (LinkedIn)

Top Skills

PTC Creo
CATIA
CATIA FEA

Jason Stewart

Project Manager/EIT Advanced Cleanup Technologies Inc. Port Washington, New York

Experience

Advanced Cleanup Technologies, Inc.

Project Manager
August 2019 - Present

• Manages fieldwork for and design of SSDS installations
• Professional Report Writing
• Assist in organization of fieldwork and reporting for Brownfield and Superfund projects

Ford Motor Company

3 years 2 months

Core Calibration Engineer
April 2019 - August 2019 (5 months)

Assisted electrified powertrain calibration teams with data analysis

PMT Engineer
September 2018 - April 2019 (8 months)

Electric Motor Calibration Engineer
March 2018 - September 2018 (7 months)

Core Calibration Engineer
July 2017 - March 2018 (9 months)

Systems Engineer
January 2017 - July 2017 (7 months)

D&R Engineer
July 2016 - January 2017 (7 months)

Volvo Construction Equipment

Pipelayer Product Platform Intern
January 2015 - June 2015 (6 months)
Shippensburg, PA

• Modeled lightweight digital mock-ups for two Pipelayer machines

• Designed and analyzed new boom designs for a future concept vehicle using FEA
• Proposed various cost and weight reduction projects on structural components with potential savings of over $3000 per unit
• Developed SQL-based phone load chart calculator application for the sales team and customers
• Performed several investigations on machine load performance and developed a machine performance calculator
• Supported the sales and marketing team with requests for machine and competitor information and analysis
• 3D printed a full vehicle scale model concept machine with interchangeable parts and several degrees of freedom
• Drafted 2D part, assembly and weldment engineering drawings according to corporate standards

Institute for Software Integrated Systems
Student Intern
June 2014 - August 2014 (3 months)

• Developed modules for Google's Project Ara smartphone
• Used software developed at ISIS to prototype and build two smartphone modules
• Selected by Google to receive 1 of 50 Ara early development boards for our module ideas
• Created functional prototypes for glucometer and IR blaster modules

Vanderbilt University
Research Assistant
January 2014 - May 2014 (5 months)
Greater Nashville Area

• Assisted with ongoing project development
• Developed and machined prototypes for a patentable Device for geriatrics

Advanced Cleanup Technlogies inc.
Research and Development Assistant
September 2009 - May 2014 (4 years 9 months)
Port Washington, NY

• Performed research on remote telemetry systems using Labview and microcontrollers

• Supervised group of interns developing remote telemetry systems that reduced costs by 80% from comparable commercial systems and added flexibility
• Improved the efficiency of report writing by 40% with visual basic computer-aided macros

Education

University of Michigan - Rackham Graduate School

Master of Science in Engineering (MSE) , Mechanical Engineering · (2017 - 2019)

Vanderbilt University

Bachelor's Degree, Mechanical Engineering · (2012 - 2016)

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760/827-1100 Fax: 760/827-1099

Resumes of Key Staff

- Stella Cuenco, Senior Chemist
- Pei Geng, Senior Chemist
- Richard Amano, Principal Chemist
- Linda Rauto, Principal Chemist
- Christina Rink-Ashdown, Inorganic Chemist
- Shauna McKellar, Chemist/EDD Specialist
- Linda Ta, Chemist

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RESUME
STELLA S. CUENCO

EDUCATION

B.S. Chemistry, 1991
University of the Philippines (UP)

PROFESSIONAL HISTORY

Laboratory Data Consultants, Inc.
Senior Chemist
1996 to present

Ceimic Corporation
GC/MS Chemist
1996

Analytical Technologies, Inc.
GC/MS VOA Group Leader
1992 to 1996

Analytical Technologies, Inc.
GC/MS Chemist
1991 to 1992

Natural Products Research, UP
Research Assistant
1990 to 1991

REPRESENTATIVE EXPERIENCE

Ms. Cuenco has over 27 years combined environmental laboratory and data validation experience. Her experience includes performance of data validation in the GC and GC/MS areas for major Federal projects. She has performed large validation projects under Boeing, Navy Southwest, Northwest and Pacific Division, EPA Region IX ESAT, USACE and AFCEE/AFCEC programs. Her laboratory experience includes hands-on CLP and EPA analysis of GC and GC/MS volatile organic compounds.

Specifically, Ms. Cuenco has over 22 years organic data validation experience using USEPA (including Region III) functional guidelines and other applicable documents.

- As senior chemist with LDC, Ms. Cuenco specializes in the data validation and contract compliance screening of gas chromatography-mass spectrometry analyses as well as gas chromatography analyses. She has a thorough knowledge and understanding of gas chromatography and gas chromatography-mass spectrometry (GCMS) and high resolution GCMS methods referenced in EPA CLP, SW-846, EPA 500, 600 and 1600 series documents. She has performed large data validation under Boeing, Navy Southwest and Pacific Divisions and EPA Region IX ESAT, USACE and AFCEE/AFCEC projects.

Ms. Cuenco has over 5 years experience in an environmental laboratory performing the analysis of organic parameters.

- As GC/MS chemist at Ceimic Corporation, a full service environmental analytical chemistry facility, Ms. Cuenco performed GC and GC/MS volatile analyses. She was responsible for the final reporting of analytical data for this section.

- As GC/MS VOA Group Leader at Analytical Technologies Inc., a full service environmental analytical chemistry facility, Ms. Cuenco was responsible for all GC/MS functions which included overseeing daily operations, training staff, final reporting of analytical data, and compliance with method requirements.

- As research assistant at Natural Products Research, UP, Ms. Cuenco researched chemical literature for plants with known medicinal properties as well as performed microbiological and pharmacological tests on plant extracts.

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RESUME
PEI GENG

EDUCATION

M.S. Organic Chemistry, 1989
Sam Houston State University

B.S. Environmental Chemistry, 1983
Nankai University

PROFESSIONAL HISTORY

Laboratory Data Consultants, Inc.
Senior Chemist
1997 to present

Ceimic Corporation
GC/MS and GC Chemist
1996 to 1997

PACE Analytical Service Inc.
GC/MS and GC Chemist
1990 to 1996

REPRESENTATIVE EXPERIENCE

Ms. Geng has over 28 years combined environmental laboratory and data validation experience. Her experience includes performance of data validation in the GC and GC/MS areas for major Federal projects. She has performed large validation projects under Boeing, Navy Southwest, Northwest and Pacific Division, EPA Region IX ESAT, USACE and AFCEE/AFCEC programs. Her laboratory experience includes hands-on CLP and EPA analysis of GC and GC/MS volatile organic compounds.

Specifically, Ms. Geng has over 21 years organic data validation experience using USEPA CLP (including Region III) functional guidelines and other applicable documents.

- As chemist with LDC, Ms. Geng specializes in the data validation and contract compliance screening of gas chromatography-mass spectrometry analyses as well as gas chromatography analyses. She has a thorough knowledge and understanding of gas chromatography and gas chromatography-mass spectrometry (GCMS) and high resolution GCMS methods referenced in EPA CLP, SW-846, EPA 500, 600 and 1600 series documents. She has performed large data validation under Boeing, Navy Southwest and Pacific Divisions and EPA Region IX ESAT, USACE and AFCEE/AFCEC projects.

Ms. Geng has over 7 years of experience in an environmental laboratory performing the analysis of organic parameters.

- As both a GC and GC/MS chemist at Ceimic Corporation, a full service environmental analytical chemistry facility, Ms. Geng performed GC and GC/MS volatile and semivolatile analyses.

- As both a GC and GC/MS chemist at PACE Analytical Service Inc., a full service environmental analytical chemistry facility, Ms. Geng performed GC and GC/MS volatile and semivolatile analyses as well as overseeing the final reporting of analytical data, and compliance with method requirements.

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RESUME
RICHARD M. AMANO

EDUCATION

B.S. Biochemistry
University of California, Los Angeles, 1979

A.A. Chemistry
El Camino College, 1977

PROFESSIONAL HISTORY

Laboratory Data Consultants, Inc.
Program Manager/Principal Scientist
2011-present
President/Principal Chemist,
1991 to 2011

Analytical Technologies, Inc
Laboratory Director
1986 to 1991

Brown & Caldwell
Laboratory Supervisor
1983 to 1986

West Coast Technical Service
Senior Chemist
1980 to 1983

University of California, Los Angeles
Laboratory Technician
1979 to 1980

REPRESENTATIVE EXPERIENCE

Mr. Amano has over 38 years of combined environmental laboratory, QA/QC, laboratory auditing, data management, environmental software development, and data validation experience. Prior to founding LDC in 1991, he directed to two major laboratories, Analytical Technologies, Inc. (San Diego) and Brown and Caldwell. His experience includes oversight and direction of major QA/QC and data validation efforts for confidential petroleum spill projects, Boeing sites, Superfund sites, DoE sites, Navy RI/FS projects, Army Corps of Engineers investigations, and AFCEE/AFCEC projects. He has also overseen several laboratory audits for major analytical testing programs and large scale environmental software development for the US Army Corps of Engineers (USACE).

Specifically, Mr. Amano has over 26 years of experience with validation of organic, inorganic, and radiochemical analyses using USEPA, Navy, USACE, DoD, AFCEE/AFCEC, and other applicable guidance documents.

- As program manager/principal scientist with LDC, Mr. Amano provides management and technical support to the data validation, data quality, and software group. He oversees and directs all environmental software projects developed for the USACE. Additionally, he acts as the primary LDC/USACE contract manager for software development projects. He is the primary author of the nationally distributed Automated Data Review (ADR) software used by the USACE, Navy, DTSC, and commercial clients.

- As President/principal chemist with LDC, Mr. Amano provided management and technical support to the data validation, data quality, and software group. He provided technical support in the organic, inorganic, and radiochemical areas. Under several major QA/QC and data validation programs, he provided, as needed, a final review of data validation and assessment reports. Mr. Amano specializes in the evaluation, validation, and interpretation of environmental testing data. Additional responsibilities include laboratory QA/QC and NELAC audits, implementation and support of QA/QC programs and data management support for engineering firms, environmental lab training, consultation on LIMS data base designs for environmental laboratories, and expert witness litigation support. Mr. Amano has managed and directed several major data validation and QA/QC projects for Army Corps, Navy, Air Force, and commercial contracts. Industrial projects include major petroleum oil spill related data validation and assessment of hydrocarbon analyses. The DoD projects include Southwest Division CLEAN 1 (Jacobs Engineering/IT Corporation/CH2M Hill), Southwest Division CLEAN 2 (Bechtel National), Pacific Northwest Division CLEAN (URS Greiner), Southern Division CLEAN (ABB Environmental), Atlantic Division CLEAN (EA Engineering), Southwest Division RAC (OHM Remediation), Pacific Division CLEAN (Earth Tech), AFCEE/AFCEC Mather AFB (Montgomery Watson), AFCEE/AFCEC Pease AFB (Bechtel Environmental), AFCEE/AFCEC England AFB (Law Environmental), Army Corps Travis AFB (CH2M Hill), Army Corps Hawthorne Army Depot (Tetra Tech), Nevada Test Site (IT Corp), and Army Corps Fort Ord (Harding Lawson). He provided oversight and direction for major USACE environmental software development including Automated Data Review (ADR), FUDSFORUM, MRSPP, and FUDSCHEM. He has a thorough knowledge and understanding of EPA CLP, SW-846, EPA 500, EPA 900, and EPA 600 series methods. He additionally has supported attorneys as an expert witness and has taught data integrity and lab ethics courses for several organizations.

Mr. Amano has over 12 years environmental laboratory experience in commercial laboratories supervising or performing the analyses of organic, inorganic, and radiochemical parameters.

- As laboratory director and technical director of Analytical Technologies, Inc, a full service environmental analytical chemistry facility, Mr. Amano was responsible for all facets of operations. These responsibilities include direct technical input for GC, GC/MS, and inorganic operations, personnel selection, assisting in method development, and selection of non-routine analysis. In addition, Mr. Amano was responsible for supervision of the 80 scientists employed at ATI's San Diego laboratory with all group supervisors, quality assurance and safety coordinators reporting directly to him. Mr. Amano has managed numerous analytical testing programs including the North Island Navy Confirmation Study, Miramar Air Force Base Confirmation Study, and investigations at several of the EPA Superfund sites. His environmental expertise focuses on the chemical testing related to hazardous waste investigations, site remediation, and groundwater monitoring programs.

- While at Brown & Caldwell, Mr. Amano's responsibilities encompassed supervision of daily operations of the laboratory, personnel staffing, technical advisor for operation of the gas chromatograph/mass spectrometer (GC/MS) section, maintenance of QA/QC programs, and coordination between engineers, clients, and laboratory analysts. Additionally, he supervised the daily operation of all radiochemistry activities which included alpha, beta, and radium analyses.

- At West Coast Technical Service, Mr. Amano was responsible for daily operation and quality control of the GC/MS group. Mr. Amano was highly involved with the USEPA hazardous waste contracts. Some special projects included dioxin selected ion monitoring analysis, EPA method 624 and 625 validation studies, and low level drinking water evaluations.

TECHNICAL PRESENTATIONS

"Understanding the Workings of an Environmental Laboratory"
Southern California Department of Health Services, 1984
Hargis & Associates, Inc, La Jolla, CA, 1987
Hargis & Associates, Inc, Tucson, AZ, 1987
Westec Services, San Diego, CA, 1987
Applied Hydrogeologic, Inc, San Diego, CA 1989

"Data Validation, QA/QC, and Environmental Analysis"
Van, Waters, and Rogers, Seattle, WA, 1990
ERC Environmental, Honolulu, HI, 1991
Harding Lawson Associates, Honolulu, HI, 1991
Pacific Division Naval Engineering Group, Honolulu, HI, 1991
OHM, Irvine, CA, 1996
Southwest Division Naval Engineering Group, San Diego, CA, 1996
Navy Public Works Center, San Diego, CA 1996

"GC versus GC/MS"
J.H. Kleinfelder & Associates, Artesia, CA 1986
Hargis & Associates, Inc, La Jolla, CA 1987

"Analytical Methods and QA/QC Procedures for Environmental Analysis"
County of San Diego Department of Health Services, San Diego, CA 1989
Regional Water Quality Control Board, San Diego, CA 1990
ERC Environmental, San Diego, CA 1990
Mittlehauser Corporation, Laguna Hills, CA 1991

"Hydrocarbon Testing Related to Underground Storage Tanks (UST)"
San Diego County DOHS, San Diego, CA, 1986
J.H. Kleinfelder & Associates, Artesia, CA 1986
Woodward Clyde Consultants, San Diego, CA 1987

Engineering Enterprises, Long Beach, CA 1987

"Quality Control/Quality Assurance in Laboratories"
Assoc of Hazardous Materials Professionals, Anaheim, CA 1986
R.L. Stollar & Associates, Santa Ana, CA 1989

"The Influence of Sample Matrix on Environmental Analysis"
Assoc of Hazardous Materials Professionals, San Diego, CA 1990

"Comparison of Air Sampling Media"
Assoc of Hazardous Materials Professionals, Anaheim, CA 1991

"Building a Second Generation LIMS for Commercial Laboratory Operations"
Pittsburgh Conference, New York, NY, 1990 (Invited Speaker)

"Employment Outlook in Environmental Laboratories"
Southern California American Chemical Society, 1985

"Opportunities in the Environmental Lab in the 1990's"
American Chemical Society, 1990

"Data Validation of Radiochemical Analyses"
Hargis + Associates, La Jolla, CA 1991

"Detection Limits - MDL, PQL, RDL, LOD ?"
Analytical Technologies, Inc., 1991

"Poor QA/QC or Laboratory Fraud: Have labs crossed the fine line?"
Environmental Professionals Organization, Newport Beach, CA 1996

"Electronic Data Deliverables and Automated Data Review/Validation"
Army Corps of Engineers, Sacramento District, Sacramento, CA 1996

"Navy Environmental Data Transfer Standards"
Kleinfelder, San Diego, CA 1997

"Laboratory QA/QC Update for DoD Programs"
ACTLabs, Long Beach, CA 1997

LECTURING AND TEACHING

"Instrumental Analysis of Hazardous Materials"
University of California, San Diego 1988 - 1995

"Field Monitoring & Laboratory Analysis of Hazardous Materials"

University of California, San Diego 1995 - 1998

California State Fullerton, Guest Lecturer, 1985 & 1990

San Diego State University, Hydrology Department, Guest Lecturer, 1988

"EPA Level 4 Data Validation" Workshop
Applied Geotechnology, Inc., Bellevue, WA, 1993

"Environmental Analyses in the 90's"

National University, Guest Lecturer, 1993

"Data Quality Objectives for Federal Environmental Programs"
University of California, San Diego 1993

"Data Integrity and Data Management for Federal Environmental Programs"
University of California, San Diego 1994

"Laboratory QA/QC and Electronic Data Requirements for DoD Programs"
University of California, San Diego 1995

"Application and Utilization of Department of Defense (DoD) Guidance Documents"
University of California, San Diego 1996

"Laboratory Quality Assurance for Department of Defense Programs"
University of California, San Diego 1997

PUBLICATIONS

"Managing an Environmental Chemistry Laboratory for Profit",
John H. Taylor, Jr and Richard M. Amano,
Journal of Chromatographic Science, 1987

MEMBERSHIPS AND AFFILIATIONS

American Chemical Society
Association of Hazardous Materials Professionals, (Steering Committee 1988-1994)
Association of California Testing Laboratories, (Board Member 1989-1991)
County of San Diego, Site Assessment and Mitigation Technical Forum (Steering Committee 1990-2000)
American Society Quality Control (1992-2005)

FOUNDATIONS

Golf for Autistic Children in America (GACA), Founder/President (2011)

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RESUME
ERLINDA T. RAUTO

EDUCATION

B.S. Chemical Engineering 1967
Feati University - Manila, Philippines

PROFESSIONAL HISTORY

Laboratory Data Consultants, Inc.
Senior Chemist/Validation Group Manager
1993 to present

Appropriate Technologies, Inc.
Chemist II
1992 to 1993

AECOS Inc.
Laboratory Supervisor
1989 to 1992

PWCSA #4 County Complex
Laboratory Analyst
1986 to 1989

Kalama Specialty Chemical
Chemist
1980 to 1982

REPRESENTATIVE EXPERIENCE

Ms. Rauto has over 38 years combined environmental laboratory, QA/QC, and data validation experience. Her experience includes performance of data validation in the GC, trace metals, and wet chemistry areas for major Federal projects. Her laboratory experience includes hands-on CLP and EPA ICP/GFAA analysis, pesticide/PCBs and wet chemistry analysis.

Specifically, Ms. Rauto has over 25 years of experience with organic data validation and assessment using USEPA (including Region III) functional guidelines and other applicable documents.

- As a Principal chemist with LDC, Ms. Rauto provides management and technical support to the data validation group. She specializes in the data validation and compliance screening of gas chromatography organic analyses. This validation includes EPA CLP, SW-846, and EPA Water and Wastewater methods. Over the past 16 years, Ms. Rauto has performed USEPA Level 3 and Level 4 (including NFESC Level C and D) validation for projects including Boeing SSFL, Southwest Division CLEAN 1 (Jacobs Engineering/IT Corporation/CH2M Hill), Southwest Division CLEAN 2 (Bechtel National), Pacific Northwest Division CLEAN (URS Greiner), Southern Division CLEAN (ABB Environmental), Atlantic Division CLEAN (EA Engineering), Southwest Division RAC (OHM Remediation), Pacific Division CLEAN (Earth Tech), DoE Atomic City (Jacobs

Engineering Group), Army Corps of Engineers, Travis AFB (CH2M Hill), Army Corps of Engineers, Camp Navajo (Tetra Tech), AFCEE/AFCEC Mather AFB (Montgomery Watson), AFCEE/AFCEC Pease AFB (Bechtel Environmental), AFCEE/AFCEC England AFB (Law Environmental), Army Corps of Engineers, Hawthorne Army Depot (Tetra Tech), Army Corps of Engineers, Fort Ord (Harding Lawson), Nevada Test Site (IT Corp), and AFCEE/AFCEC Beale AFB (Law/Crandall, Inc.).

Ms. Rauto has organic laboratory experience with over 13 years of experience in an environmental laboratory supervising or performing the analyses of organic parameters.

- As a chemist II at Appropriate Technologies, Inc., a hazardous waste disposal facility, Ms. Rauto was responsible for the operation of the gas chromatographs. Organochlorine pesticides and PCBs analysis was the primary method performed. In addition, Ms. Rauto performed ICP analyses for trace metals, as well as, supported engineers in developing waste treatment processes.

- As the laboratory supervisor at AECOS Inc., Ms. Rauto supervised and directed operation of gas chromatography, atomic absorption, and wet chemistry instrumentation. She interfaced with state and federal agencies to maintain certification and developed a written QA/QC plan for the laboratory.

- As chemist at Kalama Specialty Chemical, Ms. Rauto performed gas chromatography analysis on raw materials and finished products. She worked on the research and development of new chemicals.

Additionally, Ms. Rauto has 2 years inorganic/conventional analytical experience.

- While employed at the Prince William County laboratory, Ms. Rauto was involved in the analysis of water and wastewater for metals and wet chemistry parameters. This included BOD, COD, nitrate, nitrite, sulfate, chloride, fluoride, TDS, conductivity, pH, cyanide, and phenols analyses. She maintained the QA/QC program to assure compliance with EPA guidelines.

AFFILIATIONS
American Society for Quality Control

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RESUME
CHRISTINA RINK-ASHDOWN

EDUCATION

BS Biology, 2006
University of California, San Diego

PROFESSIONAL HISTORY

Laboratory Data Consultants, Inc.
Inorganic Chemist
2009 to present

Enviromatrix Analytical, Inc.
Metals Chemist
2007 to 2009

REPRESENTATIVE EXPERIENCE

Ms. Rink-Ashdown has over 11 years combined environmental laboratory and data validation experience. Her experience includes performance of data validation in the trace metals, radiochemistry, and wet chemistry areas for major Federal and commercial projects. Her laboratory experience includes hands-on CLP and SW-846 ICP/CVAA analysis and overall technical review of data deliverables. Specifically, Ms. Rink-Ashdown has over 6 years inorganic and radiochemistry data validation experience using USEPA (including Region III) functional guidelines and other applicable documents.

As chemist with LDC, Ms. Rink-Ashdown specializes in the data validation of trace metals, wet chemistry, methyl mercury and radiochemistry analyses using USEPA functional guidelines or equivalent protocol. She has worked under various CERCLA and EPA data validation guidelines for the various CERCLA, Navy, Army Corps, AFCEE/AFCEC and commercial projects. She is certified as a “Radiometric Data Validation Specialist” through course work and testing by the Radiochemistry Society. **Ms. Rink-Ashdown has validated over 2,000 samples for various isotopes in the last two years.**

Ms. Rink-Ashdown has over 2 years of environmental laboratory experience in a laboratory performing the analyses of inorganic parameters.

As lead inorganic chemist at Enviromatrix Analytical, Inc., Ms. Rink-Ashdown managed the inorganic chemistry section which performed techniques such as atomic absorption and inductively coupled argon plasma spectrometry. These analyses were performed from methods referenced in EPA CLP, SW-846, and Standard Methods documents.

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RESUME
SHAUNA McKELLAR

EDUCATION

B.S. Environmental Toxicology, 2006
University of California at Davis

PROFESSIONAL HISTORY

Laboratory Data Consultants, Inc.
Project Manager / Chemist
May 2010 to present

D-Max Engineering, Inc.
Assistant Project Scientist
January 2007 to May 2010

University of California at Davis
Undergraduate Researcher
March 2005 to June 2006

REPRESENTATIVE EXPERIENCE

Ms. McKellar has over 14 years combined consulting, field sampling, database management, data validation, and automated data review experience. Her experience includes performance of automated data validation for major Navy Southwest Division, US Army Corps of Engineers, and Alaska DEC projects as well as data management for commercial and litigation projects. Her field sampling experience includes surface water sampling in both wet and dry weather conditions, and her laboratory experience includes preparation and analysis of samples utilizing HPLC and UV-vis spectrometry, instrument maintenance, and data evaluation.

Specifically, Ms. McKellar has over 6 years of inorganic and organic data validation experience using USEPA functional guidelines, Navy procedures, QAPP, ADEC checklists, and other applicable documents, in addition to more than 3 years of experience working in the environmental compliance field, and over one year working in a research laboratory.

- As chemist with LDC, Ms. McKellar specializes in the data validation and contract compliance screening using LDC's Automated Data Review (ADR) software, and is familiar with a variety of different Electronic Data Deliverable formats, including SEDD and NEDD. She has supervised large data validation projects under the USACE and Navy Southwest Division RAC contracts.

- As an assistant project scientist with D-Max Engineering, Ms. McKellar performed wet and dry weather surface water sampling related to compliance with Regional Water Quality Control Board NPDES Permits. She also maintained large project databases related to stormwater inspection and monitoring programs for various municipalities.

- As an undergraduate researcher at the University of California at Davis, Ms. McKellar conducted an independent atmospheric chemistry research project utilizing HPLC and UV-Vis spectroscopy. She was responsible for the instrument calibration, verifying sample analyses, and routine instrument maintenance.

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RESUME
LINDA TA

EDUCATION

B.S. Geology, 2012
California State University Long Beach

PROFESSIONAL HISTORY

Laboratory Data Consultants, Inc.
Chemist and Project Manager
July 2018 to present

Eurofins Calscience
Project Manager Assistant
02/2014-07/2018

Eurofins Calscience
Chemist
10/2013-02/2014

REPRESENTATIVE EXPERIENCE

Although Ms. Ta has less than one year of experience at LDC, she is proficient in data validation for GC and GCMS methods for Level II and III.

- As a project manager with LDC, Ms. Ta assists the other project managers through project set-up, validation, report review, and writing project data quality assessment reports. Ms. Ta is also in training to perform ADR validation and ERPIMS database tasks. She is also the administrative support specialist for LDC Advantage secure data sharing portal where she assists with project and client set-up.

Ms. Ta has 5 years of experience in an environmental laboratory performing the analysis of organic parameters.

- As a GC/MS chemist at Eurofins Calscience, a full service environmental analytical chemistry facility, Ms. Ta performed GC/MS volatile analyses using various EPA Methods in accordance with standard operating procedures. Ms. Ta utilized Agilent Chemstation and Laboratory Information Management Systems (LIMS) to analyze and report data.

- As a Project Manager Assistant at Eurofins Calscience, Ms. Ta assisted multiple Project Managers to oversee all laboratory functions for various projects. In addition, she managed several minor projects for various Environmental consultants. She served as the secondary point of contact for clients, ensured that Chain of Custodies are accurate and analyses are logged in correctly, directed preparation of bottle orders, scheduled pickups and deliveries, coordinated subcontracted analyses, provided quality control review of project-related documents and compliance to project criteria, worked closely with lab group supervisors and executive managers in planning new projects and managed ongoing analytical work. Ms. Ta evaluated analytical data, prepared project

case narratives and summaries, compiled laboratory reports for external validation, and worked closely with chemists and lab group supervisors in resolving quality assurance and quality control issues. She prepared detailed project billing and generated multiple Electronic Data Deliverables. She was also responsible for training new Project Manager Assistants on various PM tasks, data review and compilation of laboratory Level III/IV QC Data Deliverables.

Below is a partial listing of clients and projects which Ms. Ta has assisted:

-Department of Defense Sites
- Edwards AFB
- George AFB
- Vandenberg AFB

-SSFL NASA
-BP/ARCO
-Aerospace Company

Below is a listing of various database management software which Ms. Ta has extensive training on:

-ERPIMS
-EQUIS
-Envirodata
-NEDD
-ADR
-Geotracker

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Relevant Project Experience

LDC has performed data validation and Quality Assurance services for contaminated sites overseen by AFCEE/AFCEC, Navy Southwest Division, DoE, DoD, EPA Superfund projects overseen by EPA Regions II, III, IV, IX, X, USACE projects reviewed by the Alaska, Baltimore, Louisville, Albuquerque, Seattle, Philadelphia, and Sacramento Districts, and Navy projects reviewed by NFESC.

LDC is the software developer and expert in the use of the Automated Data Review (ADR) software. LDC has been using the ADR.NET version for over 2 years and has the current Version in full implementation. LDC has performed over 1000 ADR projects in the past 10 years' worth over $2,000,000 in revenue. ADR clients include, but are not limited to: Tetra Tech EC, Sealaska, AMEC, EPA, California DTSC, MWH, Trevet, Brown & Caldwell, AECOM, Shaw, ITSI, CDM, Weston Solutions and the San Gabriel Watermaster.

LDC has validated over 1,000,000 samples for analyses such as volatile organics (CLP, EPA Method 8240/8260), semivolatile organics (CLP, EPA Method 8270), organochlorine pesticides/PCBs (CLP, EPA Method 8081/8082), chlorinated herbicides (EPA Method 8151), purgeable halocarbons and aromatics (EPA Method 8021), trace metals (CLP, EPA Method 6010/6020/7000), PAHs by EPA 8310 and 8270,TOC analyses, hexavalent chromium, total petroleum hydrocarbons (EPA Method 8015/CDOHS LUFT), radiochemical constituents including gross alpha/beta, alpha spec, gamma spec, tritium, and uranium, and general minerals.

LDC has met their contractual turnaround time and quality requirements on over 99% of the projects completed.

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Project References/Experience

Name and Address, Contact Person, Telephone	Work Description and Location	Requested Deliverables	Number of samples/ Matrix	Value ($)	Start/Stop
Washington State Department of Transportation Environmental Services Office P.O. Box 47332 Olympia, WA 98504 ATTN: Mr. Brad Archbold ArchboB@wsdot.wa.gov 360-570-6636	WSDOT NPDES Stormwater Monitoring LDC performed Stage2A, 2B and 4 data validation for a full suite of analyses including GCMS, GC, Metals, and Wet Chemistry analyses.	Stage 2A, 2B, and 4 data validation reports. Work conducted under Washington State Department of Transportation Stormwater Monitoring	>3,800 Soil and Water	$48,332	04/2013-07/2016
Leighton Consulting, Inc. 17781 Cowan Irvine, CA 92614 ATTN: Mr. Mark Withrow mwithrow@leightongroup.com cell: 949-394-2194 office: 949-681-4211	San Onofre Nuclear Generating Station (SONGS) Mesa Facility LDC performed EPA Level III and IV equivalent data validation for a full suite of analyses. Analyses included GCMS, GC, Metals, and Wet Chemistry analyses.	EPA Level III and IV data validation reports. Work conducted under USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG).	>3,600 Soil, Water, and Air	$66,225	09/2015-present
Leighton Consulting, Inc. 17781 Cowan Irvine, CA 92614 ATTN: Ms. Julie Harriman jharriman@leightongroup.com Direct : (949) 681-4264 Cell: (949) 572-8129	Aliso Canyon LDC performed EPA Level II equivalent data validation. Analyses included VOA, SVOA, Total Hydrocarbons, Isopropyl Alcohol, Total Dust, and Sulfur Compounds.	EPA Level II data validation reports and PARCC summary report. Work conducted under USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG).	>1,200 Air, Wipe, and Disk	$15,749	07/2016-08/2016
Tetra Tech, EM Inc. 1999 Harrison Street, Suite 500 Oakland, CA 94612 ATTN: Ms. Sara Woolley Sara.Woolley@tetratech.com Direct: 510.302.6311 Main: 510.302.6300	Subcontract 161408 For Various project sites including: EAGLE NEST INVESTIGATION FORT IRWIN GOLD BEACH MILL HPNS MARE ISLAND MOTCO LITIGATION NAF EL CENTRO NWS CONCORD LDC performed Cursory and Full data validation for a full suite of analyses using specified EPA Guidelines, DoD QSM Version 4.2, and Tetra Tech EMI, Inc. validation documents.	TTEMI Format data validation reports and EDD using Tetra Tech's validate program.	>3000 Soil and Water	$39,785	10/2011 – 10/2013

Name and Address, Contact Person, Telephone	Work Description and Location	Requested Deliverables	Number of samples/ Matrix	Value ($)	Start/Stop
GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5342 direct (860) 368-5300 main Jaimie Wargo JWargo@geiconsultants.com	Various NYSDEC sites LDC performed Category B equivalent data validation Analyses included: VOC, SVOC, Pesticide, PCB, Herbicide, Steroids, Metals, Wet Chemistry	Category B data validation and NYSDEC DUSR reports	>1,700 Soil and Water	$72,000	2010-present
TetraTech EC 17885 Von Karman Ave, Suite 500 Irvine, CA 92614 Attn: Lisa Bienkowski (949) 809-5028 Lisa.Bienkowski@tetratech.com	Tetra Tech Hunter's Point CA LDC performed EPA Level III and IV equivalent data validation for a full suite of analyses on more than 50,000 soil and water samples. Analyses included tritium, isotopic thorium, uranium and plutonium, and gross alpha/beta. Expedited turnaround times were included (5 day TAT)	EPA Level III and IV data validation reports. Work conducted under US Navy RAC program, Southwest Div.	>50,000 Soil and Water	$645,733	02/2001-present
AECOM (Earth Tech) 700 Bishop Street Honolulu, HI 96813 Contact: Scott Lewis (808) 523-8874 Scott.Lewis@aecom.com	Data validation per EPA level "3/C" and "4/D" guidelines for volatile organic, semivolatile organic, pesticides/PCBs, herbicides, phenols, phosphorus pesticides, dioxin, radiochemical, and trace metal analyses in soil, water, and tissue matrices. (Navy PACDIV CLEAN, Honolulu, HI)	LDC worksheets and validation reports	>10,000 samples Water/Soil/Air	$750,000	4/98-present
CBI (formerly Shaw E&I) 3347 Michelson Drive, Ste 200 Irvine, CA 92612 Contact: Mr. Dwayne Ishida Phone: (949) 660-7561 Dwayne.Ishida@CBIFederalServices.com	Data validation per EPA level "3" and "4" and AFCEE/AFCEC guidelines for volatile organic, semivolatile organic, pesticides/PCBs, herbicides, phenols, phosphorus pesticides, dioxin, radiochemical, and trace metal analyses in soil, water, and tissue matrices. (Navy Southwest Division RAC, San Diego, CA and various AFCEE/AFCEC projects)	LDC worksheets and validation reports	>5000 samples Water/Soil/Air	$350,000	6/06-present

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Name and Address, Contact Person, Telephone	Work Description and Location	Requested Deliverables	Number of samples/ Matrix	Value ($)	Start/Stop
Santa Clara Pueblo Office of Environmental Affairs 578 Kee Street Espanola, New Mexico, 87532 Ms. Ernestine Naranjo 505-692-6270 phone 505-747-2728 fax enaranjo@santaclarapueblo.org	Data validation per EPA level "III" SCP-OEA-DEPO, Data Validation using ADR For full suite of Organic, Inorganic, and Radiochemical analyses. Radiochemical analyses including Gross alpha & beta, Gamma Spectroscopy, Iodine, Radium-226/228, Strontium-90, Isotopic Pu, Th, and U, Tritium, and Americium by various EPA and GA methods.	Level III validation using ADR	>750 Soil, Water, and Air	$11,987.05	12/2015 - present
Anchor Environmental, LLC 720 Olive Way, Suite 1900 Seattle, WA 98101 Ms. Joy Dunay 206.287.9130, jdunay@anchorqea.com	Data validation per Level “C” Newtown Creek Phase 2: Third Party Data Validation of laboratory results, EDD population, and Data Quality Assessment Reports (DQAR) for various methods Subcontractor	LDC worksheets and validation reports	>63,000 Soil and Water	$743,793.88	6/14-1/16
Tradebe Environmental Services, LLC. 628 South Saratoga Street Cohoes, NY 12047 Attn: Accounts Payable Mr. Tom VanVranken (518) 235-0401 tom.vanvranken@tradebe.com	Norlite MACT Project LDC performed Category B equivalent data validation Analyses included: Metals, Mercury, Heat Content, Ash Content, Chlorine, Density, and Dioxins	Category B data validation and NYSDEC DUSR reports	11 Soil, Air and Water	$2,000.00	9/2013
P.W.Grosser Consulting2015 630 Johnson Ave, Suite 7 Bohemia, NY 11716 Attn: Mr. Derek Ersbak w. 631.589.6353 f. 631.589.8705 dereke@pwgrosser.com	Former Arkansas Chemical Co.Site and Former Ronkonkoma Wallpaper Site 203 Jay St. LDC performed Category B equivalent data validation Analyses included: VOC, SVOC, Pesticide, PCB, Metals, Wet Chemistry	Category B data validation and NYSDEC DUSR reports	>200 Soil and Water	$3,024.00	11/2014-present

Name and Address, Contact Person, Telephone	Work Description and Location	Requested Deliverables	Number of samples/ Matrix	Value ($)	Start/Stop
Amec Foster Wheeler Environment and Infrastructure, Inc. 9210 Sky Park Court, Suite 200 San Diego, CA 92123 Attn: Mr. Rolf Schottle rolf.schottle@amecfw.com Tel +1 (858) 300 4300, Fax +1 (858) 300 4301, Direct +1 (858) 300 4323	Regional Harbor Monitoring Program (RHMP), San Diego, California Third party validation of LDC performed EPA Level III and IV equivalent data validation for a full suite of analyses.	LDC worksheets and validation reports	>200 Water	$9,011.40	3/15–6/16

Note: All above projects were 100% self-performed by LDC