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Via Electronic Mail

October 9, 2023

Justin Starr, P.G.
Assistant Geologist, Remedial Bureau C
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway, Albany, NY 12233-7014

Re: Pre-Design Investigation Work Plan
Buick Dealership/Cleaners/Gas Station Site
NYSDEC Site ID No. C360129

Dear Mr. Starr:

Woodard & Curran Engineering and Geological Services P.A.P.C. (Woodard & Curran), on behalf of White Plains Hospital Medical Center ("WPH") and PY Development Owner LLC ("PY") has revised the attached Pre-Design Investigation Work Plan ("PDI WP") for the Post Road Corridor-White Plains Brownfield Cleanup Program (BCP) Site (herein referred to as the "Site") located at 89 West Post Road, 55 West Post Road, and a portion of 25 West Post Road in the City of White Plains, Westchester County, New York.

This revision is being submitted to the New York State Department of Environmental Conservation (NYSDEC) in response to the letter dated August 11, 2023. The following modifications have been made to the PDI WP as requested:

Comment 1

- Revised and accurately stated the Site tax lot and block numbers in Section 2.1

Comment 2

- The Following Paragraph was added in section 3.2

  "MIHPT boring locations were selected based on previous sample analytical data and relative location to known presence of site related contaminants of concern. Response curve data collected with MIHPT instrumentation will be evaluated and a direct push drill rig will be used to collect samples from locations with elevated response curves to correlate observed MIHPT instrumentation response with analytical laboratory results."

Comment 3

- Additional MIHPT locations were added downgradient from RB-50 and RB-51; See figure 2.

Comment 4

- A Temporary Well point will be installed in the vicinity of RB-50; See figure 2.

WPH is eager and committed to conducting the PDI in support of implementing a permanent groundwater remedy.

We appreciate the NYSDEC's continued assistance and attention to this matter. Should you have any questions, please call me at 914-294-2608.

Sincerely,

WOODARD & CURRAN, INC.

Michael van der Heijden, LSRP
Senior Project Manager

cc: Joe Mannino, WPH
Joshua Strugatz, WPH
Joe Perillo, WPH
Linda Shaw, Knauf Shaw

PN: 214155.11

PRE-DESIGN INVESTIGATION WORKPLAN

Former Buick Dealership, Cleaners, and Gas Station Site

BCP Site No.: C360129

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0214155

White Plains Hospital/PY Development Owner LLC

October 2023

TABLE OF CONTENTS

SECTION **PAGE NO.**

TABLES

FIGURES

APPENDICES

I, Lucas Hellerich, PE, PhD, certify that I am currently a New York State registered professional engineer as defined in 6NYCRR Part 375, and that this Pre-Design Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities will be performed in full accordance with the DER-approved work plan and any DER-approved modifications.

_____P.E.
Lucas Hellerich

October 4, 2023_____Date

It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the expressed written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

1. INTRODUCTION

Woodard & Curran Engineering and Geological Services P.A.P.C. (Woodard & Curran), on behalf of White Plains Hospital Medical Center ("Hospital") and PY Development Owner LLC ("PY"), has prepared the following Pre-Design Investigation Work Plan (PDIWP) for the Brownfield Cleanup Program (BCP) Former Buick Dealership, Cleaners, Gas Station Lot Site No. C360129, located at 25, 55 and 89 West Post Road in the City of White Plains, Westchester County, New York (herein collectively referred to as the "Site" or "Buick BCP Site"). A USGS Topographic Map is presented as Figure 1. The Hospital and PY were added as Volunteers to the Brownfield Cleanup Agreement Index No. C360129-03-13 pursuant to the 3rd BCA Amendment executed on August 19, 2021.

This PDIWP was prepared in general accordance with the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation's Technical Guidance for Site Investigation and Remediation dated May 2010 (DER-10), and is based on proposed interim Site remediation and temporary redevelopment plans, findings of previous remedial investigation activities conducted at the Site, including the 2016 Remedial Investigation Report (RIR), prepared by Roux Associates and Remedial Engineering, P.C. of New York, P.C. (Roux) and the 2022 Supplemental RIR prepared by Woodard & Curran submitted with the BCA Major Amendment Application.

The proposed PDI includes supplemental soil and groundwater sampling, and the collection of hydrogeological data and *in-situ* remedial design parameters, which will support the selection of a remedial alternative and refinement of an *in situ* remedial design to address groundwater contamination at the Site, and which may be emanating off-site at the Site boundary.

1.1 Work Plan Organization

This PDIWP presents the proposed scope, design, implementation plan, quality assurance/quality control requirements, and reporting requirements for the PDI, and is organized as follows:

- Section 1 – Introduction
- Section 2 – Site Background and History
- Section 3 – Scope of Work
- Section 4 – Reporting and Schedule
- Section 5 - Quality Assurance Project Plan
- Section 6 - Community Air Monitoring Plan
- Section 7 – References

1.2 Project Team

The anticipated project team for the PDI is as follows:

- **Justin Starr, PG** – NYSDEC Project Manager
- **Michael van der Heijden, LSRP** – Program Director – Woodard & Curran
- **Lucas Hellerich, PhD, P.E., LEP** – New York State Professional Engineer – Woodard & Curran
- **Derek Matuszewski, PG** - New York State Professional Geologist - Woodard & Curran

- **Evan Trumpatori** – Project Manager – Woodard & Curran
- **Trevor King, P.E. –** Technical Advisor and Remediation Engineer – Woodard & Curran

1.3 Project Schedule

The anticipated project schedule is presented below and is subject to change based on NYSDEC approval of this PDIWP, permitting, and other approvals from local municipalities, including the City of White Plains, NY. Note that the final schedule will be adjusted based on the actual approval dates, permit issuance dates, and contractor mobilization schedule.

Anticipated PDI Schedule	
PDIWP Approval	**November 2023**
Mobilization	**November 2023- December 2023**
PDI Implementation	**January 2024 – March 2024**
PDI Data Evaluation and Reporting	**February 2024 – April 2024**

2. SITE BACKGROUND AND HISTORY

2.1 Site Description and Zoning

The Site is located at 25, 55 and 89 West Post Road in the City of White Plains, County of Westchester, and State of New York. The Site is comprised of three new tax lots identified as Tax Lot No. p/o 130.35-1-1.1, 130.34-5-4.11 and 130.34-5-1.1. A USGS Topographic Map is presented as Figure 1 and a Site Map is presented as Figure 2.

The Site is bordered by Rathbun Avenue to the southwest, West Post Road to the west, Maple Avenue to the east and by an adjoining vacant parcel in the City of White Plains, New York. The Site is approximately 4.6 acres in size. The Site coordinates, as measured from the approximate center of the Site are 41° 1'25.56"N Latitude and 73°46'23.15"W Longitude. The Site elevation is approximately 219 feet above mean sea level (amsl).

2.2 Physical Setting

The Site is located on the Manhattan Prong of New York State and falls within in the New England Highlands physiographic province of the United States. A review of the United States Geological Survey (USGS) 7.5-minute series topographic quadrangle map (White Plains, New York [Figure 1]) indicated that the maximum elevation is approximately 242 feet amsl in the western portion of the Site. The topography of the Site slopes to the northeast until it reaches a low of approximately 214 ft amsl. This represents a change in elevation of approximately 28 feet across the Site. This change in elevation is reflected by a moderate to steep slope on the western portion of the Site with milder slopes towards the east. The elevation on the north side of the Site (along West Post Road) is generally higher than the south side of the Site (i.e., slopes to the south). The Site and surrounding areas were constructed with the use of fill materials. Additional details on Site geology and hydrology are presented in Section 3.

2.3 Surrounding Property Use

As shown on Figure 2, the Site is bordered to the north by West Post Road and beyond West Post Road, a mixed-use residential building, a vacant undeveloped lot, and a grocery store market; to the south by Maple Avenue and beyond Maple Avenue, residential properties; to the west Rathbun Avenue and beyond Rathbun Avenue, an automotive service center (Post Road Service and Tire Center) and retail petroleum station (Mobil); to the east a former automotive sales and service complex.

2.4 Future Use

The proposed near-term interim use of the Site includes a paved surface parking lot with associated facilities and infrastructure. Long-term future use is anticipated to include further redevelopment as a mixed-use commercial/residential property affiliated with the Hospital.

2.5 Site History

Historical Site operations have predominately involved automobile sales and repair for approximately 50 years. The entire Site was utilized for automobile sales, storage and/or repair. Additional historical Site operations included two former gasoline service stations, a bowling alley and a dry cleaner. The two gasoline stations were located at the southeastern corner of the intersection of West Post Road and Brady Place, which had three buried gasoline tanks, and a second gasoline station was located at the southeastern intersection of West Post Road and Rathbun Avenue, with four buried gasoline tanks.

Additionally, city directories reviewed indicated the presence of a dry-cleaning facility at 95 West Post Road in the 1970s, and the potential for auto repair at the same location in the 1980s, with tax cards indicating that this building was heated by oil.

2.6 Site Geology and Hydrogeology

2.6.1 Site Topography and Regional Geology

A review of the USGS 7.5-minute series topographic quadrangle map (White Plains, New York [Figure 1]) indicated that the maximum elevation is approximately 242 ft amsl in the western portion of the Site. The topography of the Site slopes to the northeast until it reaches a low of approximately 214 ft amsl. This represents a change in elevation of approximately 28 feet across the Site. This change in elevation is reflected by a moderate to steep slope from west to east through a series of retaining walls, with milder slopes towards the east. The elevation on the north side of the Site (along West Post Road) is generally higher than the south side of the Site (i.e., slopes to the south).

According to the United States Department of Agriculture's (USDA) Soil Conservation Service, the primary soil type at the Site is Urban Land. Depicted by the New York State Museum and Science Service Geologic Map of New York, Lower Hudson Sheet, the bedrock geology is comprised of the Manhattan formation of the Trenton group in the western portion of the site and the Inwood Marble formation of the Wappinger and Stockbridge group in the eastern portion of the site. The Manhattan formation consists of schist and gneiss composed of garnet, muscovite, biotite, quartz, plagioclase and sillimanite. While the Inwood Marble is composed of dolomite marble, calcschist, granulite, and quartzite, overlain by calcite marble.

The Inwood Marble formation grades into underlying patchy quartzite of Early Cambrian Age. The contact between the Manhattan formation and the Inwood Marble formation on-site is buried and assumed. According to the New York State Geological Survey Surficial Geologic Map of New York, Lower Hudson Sheet, surficial geology at the Site includes glacial till. Glacial till has a variable texture, is relatively impermeable, and has a variable thickness. Surficial geology at the northeastern corner of the Site includes outwash sand and gravel.

Based on previous investigations, historic fill is present beneath the Site at varying thicknesses at depths to eight feet below ground surface (ft bgs). This historic fill consists of fine to coarse sand with varying amounts of silt, gravel, debris and fill material. Below the fill, a native sand layer is encountered underlain by a dense glacial till consisting of a fine to coarse sand with varying amounts of silt, clay and gravel. Depth to refusal on-site ranged from 11 to 32 ft bgs.

2.6.2 Site Hydrogeology

According to water level data collected during the RIs and previous environmental investigations completed by others, the water table at the Site ranges from approximately three ft bgs to approximately 11 ft bgs. Groundwater flow direction was calculated to be in a northeasterly direction.

2.6.3 Water Supply and Groundwater Use

Groundwater in the vicinity of the Site is not used as a potable water source. Westchester County is the public water purveyor in the immediate area. The Site was previously serviced by municipal water.

There are no known public/private potable water supply wells, irrigation, or process water wells within 0.5-mile of the Site.

2.6.4 Surface Water

There are no surface water bodies located on the Site. The nearest major surface water body is the Bronx River, located approximately 0.5-miles to the northwest. Bloomingdale Pond is also located proximal to the subject property, approximately 0.9-miles to the east. The Bronx River flows southwest until it reaches the East River. Storm water either infiltrates directly into the ground or enters the storm drains on-site and on the adjacent roads, which discharge to the municipal storm sewer system.

According to the U.S. Fish and Wildlife Service National Wetlands Inventory, the nearest wetlands are approximately 3,960 feet northwest of the Site and approximately 2,640 feet southeast of the Site.

3. SCOPE OF WORK

The proposed PDI includes the following Scope of Work:

- Utility clearance and survey;
- Membrane Interface Probe/Hydraulic Profiling Tool (MIHPT) investigation; and
- Groundwater sampling.

Additional details are discussed below.

3.1 Utility Clearance and Survey

Prior to initiating any field activities, subsurface features and infrastructures will be located and marked-out to clear proposed drilling locations. Utility clearance will be conducted in two stages. Stage one will be conducted by public utility companies through the Dig Safely New York hotline to assess the Site area. Stage two will be conducted by a private utility locating company to clear proposed drilling locations. Following the completion of the proposed scope of work, soil boring and groundwater monitoring well locations will be surveyed by a New York State Professional Surveyor to determine exact location and elevation.

3.2 MIHPT Investigation

Following the utility clearance and survey, high resolution site characterization will be completed using a combined MIHPT. The MIHPT investigation will refine the conceptual Site model including delineation of contaminants of concern, and assessment of relative hydraulic permeability characteristics, which will support the selection and refinement of an interim *in situ* groundwater remedial alternative.

Based on historic data, Woodard & Curran developed a MIHPT boring location plan, as shown on Figure 3. A total of up to 28 borings will be advanced to a depth of up to approximately 30 ft bgs, depending on the geology in each location.

MIHPT boring locations were selected based on previous sample analytical data and relative location to known presence of site related contaminants of concern. Response curve data collected with MIHPT instrumentation will be evaluated and a direct push drill rig will be used to collect samples from locations with elevated response curves to correlate observed MIHPT instrumentation response with analytical laboratory results.

Soil and/or grab groundwater samples from select locations will be collected using a direct-push drill rig for laboratory analysis of total volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and/or other *in-situ* remediation parameters or geotechnical parameters, including soil oxidant demand, bulk density, grain size, and any other analysis that may support the development and refinement of an *in situ* remedial alternative to address groundwater contamination. If grab groundwater samples are required, samples will be collected by a temporary wellpoint installed within the borehole.

Note that the final number and location of soil and groundwater samples may be adjusted based on field conditions/observations at the time of the investigation. If necessary, additional "step-out" locations may be added to the investigation based on field observations; conversely, if field conditions suggest sufficient information is available, the proposed sampling program may be reduced. The Hospital volunteer entities

and Woodard & Curran will confer with the NYSDEC during the execution of the field investigation and update the proposed sampling program accordingly.

3.3 Groundwater Sampling

Following the MIHPT investigation, synoptic groundwater gauging will be performed, then a groundwater sampling event will be conducted to provide updated ground water conditions at the site. It is anticipated that up to eighteen (18) wells will be purged and sampled via United States Environmental Protection Agency (USEPA) low-flow sampling methodology and in accordance with NYSDEC DER-10 protocols; the proposed groundwater sample locations are presented on Figure 3.

Water quality parameters including pH, temperature, dissolved oxygen, conductivity, turbidity and oxygen-reduction potential will be recorded during sampling. Following water quality parameter stabilization, a sample from each monitoring well will be collected for laboratory analysis. Groundwater samples will be sampled and submitted to the laboratory for analysis of VOCs and select SVOCs that were identified as remedial contaminants of concern in the 2016 and 2022 RIs. Additionally, it is anticipated that select wells will be sampled for additional design parameters to support the refinement of an *in situ* remedial alternative to address groundwater contamination. The Hospital volunteer entities and Woodard & Curran will confer with the NYSDEC during the execution of the field investigation and update the proposed sampling program accordingly.

The proposed laboratory analytical program is outlined on Table 1. QA/QC samples, including field equipment blanks and duplicates, will also be collected for laboratory analysis.

Note that the final number and location of groundwater samples may be adjusted based on field conditions/observations, groundwater monitoring well condition, access at the time of the investigation, and results of the MIHPT investigation. If necessary, additional "step-out" locations, or supplemental analysis may be added based on the laboratory results and/or field observations; conversely the Hospital volunteer entities may reduce the proposed sampling program after consultation with the NYSDEC. The Hospital volunteer entities and Woodard & Curran will confer with the NYSDEC during the execution of the field investigation as appropriate.

3.4 Waste Management

Investigation Derived Waste (IDW), including excess soil/drill cuttings and decontamination fluids, will be collected and stored in 55-gallon drums in a designated storage area pending the collection and analysis of waste characterization samples. Following waste characterization, IDW will be disposed in accordance with applicable local, state, and federal regulations at an off-site disposal facility permitted to accept the waste.

3.5 Health and Safety Plan

All PDI activities will be conducted in accordance with a Site-Specific Health and Safety Plan (HASP). The HASP will be compliant with the requirements of the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations (Standard 1910.120).

4. REPORTING AND SCHEDULE

4.1 Reporting

4.1.1 Periodic Reports

An account of field activities summarizing work performed during active PDI work, community air monitoring alarm data, and planned work for the following week will be provided to the NYSDEC (via email) on an ongoing basis.

4.1.2 Pre-Design Investigation Report

Following completion of activities, all data will be evaluated and interpreted for the purposes of remedial alternatives selection and design. The results will be incorporated into a Pre-Design Investigation Report, which will include the following:

- A general profile of the investigation execution and results;
- A summary of any significant events, observations, or variations which may have influenced sampling procedures or analytical results;
- Results of all analyses, copies of relevant laboratory data sheets, and the required laboratory data deliverables;
- MIHPT and stratigraphic logs including soil physical descriptions, if applicable, and the following information:
    - MIHPT results;
    - Soil classification details;
    - Visual/olfactory observations; and
    - Field instrument readings;
- Sampling Results Summary Table(s), including sample location, media, sample depth, and field and lab identification numbers;
- A summary table of analytical methods and quality assurance indicators;
- Analytical data validation results, including a Data Usability Summary Report (DUSR), if applicable;
- Manifests to document the off-site transport of waste material; and
- Site Figures including, but not limited to the following:
    - Site base maps; and
    - Sample location maps with surveyed or GPS-located sample points with sample information including sample depths and comparison to the applicable standards, criteria, and guidance (or other means of visually presenting the sample results).

Investigation data generated during implementation of the PDI will be submitted in the EQuIS electronic data deliverable format to the NYSDEC, if applicable.

5. QUALITY ASSURANCE PROJECT PLAN

The purpose of this Quality Assurance Project Plan (QAPP) is to ensure that scientific data is acquired according to established methods and procedures designed to obtain results that are objective, true, repeatable and of known accuracy. Specifically, this QAPP provides guidance and specifications to ensure that activities associated with the proposed RI activities at the Site are planned and executed in a manner consistent with the quality assurance objectives stated below:

- Field determinations and analytical results are valid through adherence to NYSDEC field acquisition procedures, NYSDEC-approved analytical protocol, calibration and preventative maintenance of equipment;
- Samples are identified and controlled through chain-of-custody procedures;
- Records are retained as documentary evidence of field activities and observations;
- Generated data are validated in accordance with respective NYSDEC data validation guidelines; and
- Evaluations of the data are accurate, appropriate, and consistent throughout the project.

The content of this QAPP is based on the NYSDEC requirements as stated in NYSDEC DER-10. This QAPP includes discussion of the following:

- Data Quality Objectives;
- Project Organization;
- Sample Acquisition and Field Data Collection Procedures;
- Decontamination Procedures;
- Waste Management;
- Field Data and Notes;
- Field Instrument Calibration and Maintenance;
- Sample Analysis and Laboratory Deliverable Format;
- Sample Quality Assurance; and
- Quality Control Procedures.

5.1 Data Quality Objectives

The overall objective of the PDI is to gather supplemental information to select a remedial alternative and refine the remedial design to address subsurface soil and groundwater contamination. The proposed Data Quality Objectives (DQO) are as follows:

- DQO1 – Refine, through laboratory analysis and high-resolution site characterization, the extent of subsurface soil and groundwater contamination requiring remediation, and collect data to support remedial design.

5.2 Project Organization

The principal personnel for the project are identified in Section 1.2. The New York-certified analytical laboratory and third-party data validator are listed below.

Analytical Laboratory – The analytical laboratory will be Alpha Analytical Laboratories of Westborough Massachusetts, a NYSDEC-certified laboratory.

Independent Data Validation Contractor - The data validation contractor will be Laboratory Data Consultants, Inc., of Carlsbad, California.

Laboratory qualifications are provided in Appendix A.

5.3 Sample Acquisition and Field Data Collection Procedures

Sampling will be conducted in accordance with established NYSDEC and USEPA protocols. Groundwater samples will be collected from permanent and/or temporary monitoring wells utilizing the USEPA low-flow methodology. Soil samples will be collected via dedicated acetate sleeves, and stainless-steel direct-push drilling equipment. High resolution site characterization data will be collected via direct push drilling equipment with appropriate instrumentation and data collection equipment.

5.4 Decontamination Procedures

Drilling and other sampling equipment will be decontaminated prior to collecting the first sample, between samples, and after the final sample. Prior to decontamination, a decontamination line will be set up on polyethylene sheeting. The decontamination line will progress from "dirty" to "clean", with an area for drying decontaminated equipment. Once the decontamination line is established, the following decontamination procedures will be implemented:

- Flush and rinse the equipment with potable water;
- Wash the item thoroughly in a bucket of soapy water (tap water) and use a stiff-bristle brush to dislodge any clinging dirt;
- Rinse the item in a bucket containing clear tap water and replace water as needed;
- Flush and rinse with distilled or deionized water and allow to air dry;
- Containerize decontamination fluids pending subsequent collection and analysis of waste characterization samples; and
- Document that decontamination was performed in the appropriate logbook or sample sheet.

5.5 Waste Management

Wastes, including residual solids and liquids, will be managed in accordance with Section 3.4.

5.6 Field Data and Notes

Field notebooks contain documentary evidence for procedures as performed by field personnel. Hard cover, bound field notebooks will be used because of their compact size, durability and secure page binding. The pages of the notebook will be numbered consecutively and will not be removed.

Entries will be made in waterproof, indelible ink. No erasures will be allowed. If an incorrect entry is made, the information will be crossed out with a single strike mark and the change initialed and dated by the team member making the change.

Each entry will be dated. Entries will be legible and contain accurate and complete documentation of the individual or sampling team's activities or observations made. The level of detail will be sufficient to explain and reconstruct the activity conducted. Each entry will be signed by the person(s) making the entry.

The following types of information will be provided for each sampling task, as appropriate:

- Project name and number;
- Reasons for being on-site or taking the sample;
- Date and time of activity;
- Sample identification number;
- Geographical location of the sampling point with reference to Site (or other) facilities or a map coordinate system. Sketches will be made in the field logbook when appropriate;
- Physical location of the sampling point, such as depth below ground surface;
- Description of the method of sampling including procedures followed, equipment used, and any departure from the specified procedures;
- Description of the sample such as physical characteristics, odor, etc.;
- Results of field measurements such as organic vapors, etc.;
- Readings obtained from health and safety equipment;
- Weather conditions at the time of sampling and previous meteorological events that may affect the representative nature of a sample;
- Photographic information including a brief description of what was photographed, the date and time, and the compass direction of the picture;
- Reference numbers from all serialized forms on which the sample is listed or labels which are attached to the sample (i.e., chain-of-custody forms, air bill numbers, etc.);
- Other pertinent observations such as the presence of other persons on the Site (those associated with the job, tenant personnel, other contractors), actions by others that may affect performance of Site tasks, etc.; and
- Names of sampling personnel and signature of persons making entries.

5.7 Field Instrument Calibration and Maintenance

On-site field calibration activities will include the use of calibration standards and field equipment checks, as appropriate, for the equipment being used, including but not limited to a photoionization detector (PID) and water quality meter. Field calibration and/or checking of each instrument will be accomplished by following the procedures outlined in the operating manual for the equipment. At a minimum, field calibration will occur daily, prior to the initiation of sampling activities. Field calibration will be documented in the field notebook.

Equipment that fails calibration or becomes inoperable during use will be removed from service and segregated to prevent inadvertent use. The equipment will be properly tagged to indicate that it is out of calibration. Such equipment will be repaired and recalibrated to approved standards by qualified personnel. Equipment that cannot be repaired will be replaced.

Results of activities performed using field equipment that failed recalibration will be evaluated by the Project Manager or designee. If the activity results are adversely affected, the results of the evaluation will be documented, appropriate personnel notified, and a decision made as to the validity of the results.

Off-site calibration and maintenance of field instruments will be conducted as appropriate throughout the duration of project activities. All field instrumentation, sampling equipment, and accessories will be maintained in accordance with the manufacturer's recommendations and specifications and established field equipment practice. Off-site calibration and maintenance will be performed by qualified personnel.

5.8 Sample Analysis and Laboratory Deliverable Format

Samples collected during implementation of the PDI will be analyzed by a laboratory certified under the New York State Department of Health's ELAP and approved for solid and hazardous waste. The analytical data measurements will be of sufficient sensitivity to accurately quantify the laboratory results to concentrations at, or below, the NYSDEC Part 375 Soil Cleanup Objectives (SCOs). The analytical methods and details are summarized in Table 1.

Laboratory analytical data will be reported in ASP Category B data deliverables. Following analysis, the laboratory data will be reviewed by an independent data validation contractor to develop a DUSR. In addition, electronic data deliverables (EDDs) for results from samples of environmental media will be submitted in EQuIS™ format utilizing the NYSDEC Environmental Information Management System (EIMS).

5.9 Sample Quality Assurance

5.9.1 Sampling Program

Analytical methods and quality assurance parameters associated with the sampling program are presented in Table 1. Container volume and type, sample preservation, holding times, and other details for the sampling program are also presented in Table 1. The frequency of associated field blanks and duplicates will be in accordance with NYSDEC protocols.

5.9.2 Sample Labeling

Each sample collected will be assigned a unique identification number and placed in an appropriate sample container. Each sample container will have a sample label affixed to the outside with the date, time of sample collection and project name. In addition, this label will contain the sample identification number, analysis required and chemical preservatives, if any.

5.9.3 Sample Handling

The analytical laboratory will provide pre-cleaned and prepared sample containers to collect samples for all matrices. The laboratory will also prepare and supply the required field blank sample containers, reagent preservatives, and trip blank sample containers according to the media to be sampled. Sample bottle containers, including the field blank and trip blank sample containers will be placed into coolers to be sent to the field sampling team.

Samples collected in the field for laboratory analysis will be placed directly into the laboratory-supplied sample containers. Individual sample containers will be sealed by hand-tightening container lids.

Possession of samples collected in the field will be traceable from the time of collection until they are analyzed by the analytical laboratory or disposed. To maintain and document sample possession, chain-of-custody procedures as described in Section 5.9.6 will be followed. Samples will be packaged and shipped as described in Section 5.9.7.

5.9.4 Sample Preservation

Sample preservation measures will be used to mitigate sample decomposition by contamination, degradation, biological transformation, chemical interactions, and other factors during the time between sample collection and analysis. Steps taken to maintain in-situ characteristics may include refrigeration of samples at approximately 4 degrees Celsius (ºC), freezing, pH adjustment, and/or chemical fixation. Samples are preserved according to the requirements of the specific analytical method selected.

The analytical laboratory will add the required preservatives to the appropriate sample containers during preparation of the containers. The sample preservation method for each sample media is provided in Table 1.

5.9.5 Sample Blanks and Duplicates

Field blanks will be collected for soil and groundwater samples and will be obtained by pouring laboratory-supplied water through one of the decontaminated sampling devices and/or dedicated sampling equipment to be used for sample collection that day. As the laboratory water passes over the sampling device, it will be collected in the appropriate container for analysis. A trip blank will accompany all samples during transport to and from the Site to be analyzed for VOCs. In addition, duplicate samples will also be collected and analyzed for quality assurance purposes (Table 1).

5.9.6 Chain-of-Custody Procedures

A program has been established for sample chain-of-custody that will be followed during sample handling activities in both field and laboratory operations. The primary purpose of chain-of-custody procedures is to document the possession of the samples from collection through shipping, storage, and analysis to data reporting and disposal.

Chain-of-custody refers to the actual possession of the samples. Samples are considered to be in custody if they are within sight of the individual responsible for their security or locked in a secure location by that person. Each person who takes possession of the samples, except the shipping courier, is responsible for sample integrity and safekeeping.

Chain-of-custody procedures are provided below:

- Chain-of-custody will be initiated by the laboratory supplying the pre-cleaned and prepared sample containers. Chain-of-custody forms will accompany the sample containers;
- At the time of sample collection, the chain-of-custody form will be completed for the sample collected. The sample identification number, date and time of sample collection, analysis requested and other pertinent information (e.g., preservatives) will be recorded on the form. All entries will be made in waterproof, indelible blue or black ink;

- Field samplers will be responsible for the care and custody of the samples collected until the samples are transferred to another party, dispatched to the laboratory, or disposed. The sampling team leader will be responsible for enforcing chain-of-custody procedures during field work;
- When the form is full or when all samples have been collected that will fit in a single cooler, the sampling team leader will check the form for possible errors and sign the chain-of-custody form. Any necessary corrections will be made to the record with a single strike mark, dated, and initialed; and
- A copy of the chain-of-custody form will be retained by the sampling team for the project file and the original will be sent with the samples.

When transferring custody of the samples, the individuals relinquishing and receiving custody of the samples will verify sample numbers and condition and will document the sample acquisition and transfer by signing and dating the chain-of-custody form. This process documents sample custody transfers from the sampler, usually through an express courier, to the analyst in the analytical laboratory.

Laboratory chain-of-custody will be maintained throughout the analytical processes as described in the laboratory's Quality Assurance Manual. The analytical laboratory will return the original chain-of-custody in the analytical data deliverable package. The chain-of-custody form becomes the permanent record of sample handling and shipment.

5.9.7 Sample Shipment

Samples requiring shipment will be packaged and shipped as environmental samples in accordance with applicable federal and state regulations. Special declarations of type of samples and media will be made on the shipping label.

5.9.8 Packaging

Sample containers and associated blanks will be packed in coolers with appropriate packaging material to minimize breakage and packed with ice in plastic bags and/or ice packs to maintain a temperature of approximately 4ºC during transit. Paperwork will be put in a plastic bag and placed on top of the sample containers/ice or taped to the inside lid of the cooler. The cooler will be taped closed. Laboratory address labels will be placed on top of the cooler, and the cooler will be placed in transit to be received at the laboratory within 24 hours of shipment from the field.

5.9.9 Shipping

Standard procedures to be followed for shipping environmental samples to the analytical laboratory are outlined below.

- All environmental samples collected will be transported to the laboratory by field personnel, by laboratory personnel, by courier, or shipped by overnight service;
- Daily shipments will be sent whenever necessary to meet holding time requirements; and
- The laboratory will be notified to be prepared to receive a shipment of samples. If the number, type, or date of shipment changes due to Site constraints or program changes, the laboratory will be informed.

5.9.10 Sample Storage

Once samples are transported to the laboratory, custodial responsibility of the samples is transferred to the Laboratory Sample Manager to assure that the appropriate procedures and methods are followed. Sample storage procedures will be in accordance with the laboratory's Quality Assurance Manual.

5.10 Quality Control Procedures

Sample quality control consists of those activities specifically conducted to ensure that the quality assurance program described in this QAPP is being implemented according to the specified requirements, to assess the effectiveness of the sample quality assurance program, to identify non-conformances, and to verify that any identified deficiencies are corrected. If any significant deviations from the quality assurance program are documented, corrective measure(s) will be immediately implemented and documented. Sample quality control will consist of data and technical review as described below.

5.10.1 Data Review

The laboratory analytical data will be reviewed by a third-party independent data validation contractor (Laboratory Data Consultants, Inc., of Carlsbad, California) in general accordance with the NYSDEC DUSR guidelines and USEPA Contract Laboratory Program National Functional Data Validation Standard Operating Procedures for Data Evaluation and Validation. Data validation criteria that will be reviewed for representative samples will include: sampling and analysis date, sample custody, holding times, sample handling and preservation procedures, field blank results, field and laboratory duplicate sample results, surrogate recoveries, matrix spike/matrix spike duplicate results, laboratory control standards, laboratory method blanks, lot assignment reports, and miscellaneous observations. Based on these results, data that do not meet performance criteria will be flagged with qualifiers describing the data's usability.

The required precision and accuracy from the analytical method will be applied. Where no guidelines or criteria exist, analytical documentation, report results versus raw data, and quantitative calculations will be verified, and professional judgment will be applied in reviewing the data.

A summary of the analytical program is provided in Table 1.

5.10.2 Technical Review

The reduction and analysis of data obtained through the sampling program along with the conclusions/recommendations reached based on these data will be reviewed to ensure the quality of the data and the validity of the conclusions/recommendations.

To ensure accurate transfer of laboratory data, the accuracy of electronic copies of analytical data provided by the laboratory will be verified by manually checking a minimum of ten percent of the sample data of the hard copy laboratory data package(s). Similarly, data that are reduced into tables and/or electronically reformatted to facilitate data evaluation (e.g., data summary tables highlighting exceedances of cleanup standards) will be verified by manually checking a minimum of ten percent of the sample data. If inaccuracies are detected, additional data will be checked, and appropriate corrective actions will be taken.

Conclusions and/or recommendations will be reviewed by one or more peers of the professional who develops the conclusion/recommendation to ensure their accuracy on the basis of the data that have

been acquired and the analyses that have been conducted. Technical reviews will be performed by professionals who have the necessary knowledge and skill to perform the review.

6. COMMUNITY AIR MONITORING PLAN

6.1 Monitoring Controls

Real-time air monitoring for particulate levels and/or VOCs at the perimeter of the exclusion zone or work area will be necessary when conducting the PDI. VOC and particulate monitoring will be conducted with a PID and a Dust Monitor, respectively.

6.2 Continuous Monitoring

Continuous monitoring for dust and VOCs will be required for all ground intrusive activities. Ground intrusive activities for this project primarily include soil boring advancement and soil sampling.

6.3 Periodic Monitoring

Periodic monitoring for VOCs will be completed during non-intrusive activities such as the collection of soil and/or the gauging and sampling of monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be completed during sampling activities.

6.4 VOC Monitoring, Response Levels and Actions

VOCs will be monitored at the downwind perimeter of the immediate work area (the exclusion zone) on a continuous basis. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work will be performed with a PID. The equipment will be calibrated daily and will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shut down and a re-evaluation of activities and mitigation measures will be initiated.
4. All 15-minute readings will be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded in field notes.

6.5 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter (PM) less than 10 microns (µm) in size (PM10) and will be capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. Readings will be compared to the levels specified below.

1. If the downwind PM10 particulate level is 100 micrograms per cubic meter (µg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques provided that downwind PM10 particulate levels do not exceed 150 µg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
2. If, after implementation of dust suppression techniques, downwind PM10 particulate levels are greater than 150 µg/m^3 above the upwind level, work will be stopped, and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM10 particulate concentration to within 150 µg/m^3 of the upwind level and in preventing visible dust migration.
3. All readings will be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded in field notes.

7. REFERENCES

New York State Department of Environmental Conservation. "DER-10/Technical Guidance for Site Investigation and Remediation, DEC Program Policy." May 2010

Roux Associates. Remedial Investigation Report (RIR). 2016

Woodard & Curran. Supplemental Remedial Investigation Report. 2022

TABLES

Table 1: Summary of Analytical Sampling Program

Table 1
Summary of Analytical Sampling Program
Buick BCP Site PDI Work Plan
89 West Post Road White Plains, NY

Laboratory Analytical Parameters	Laboratory Analytical Method	Shipping and Container Requirements	Preservation Requirements	Holding Time*
Groundwater Matrix				
Volatile Organic Compounds	8260D	40 mL vials	HCL, pH<2, 4° C	14 days
Semi-Volatile Organic Compounds	8270D	2- 1000 mL Amber glass teflon lined	No preservative/ Cool to 4 ° C	14 days
Soil Matrix				
Soil Oxidant Demand*	TBD	TBD	TBD	TBD
Bulk Density/Grain Size	ASTM SM2540G	Ziplock Bag	NA	NA

Notes:

* Holding time begins at time of sample collection

** - Details of the Soil Oxidant Demand will be determined by the analytical laboratory prior to sample collection.

mL - milliliter

C - Celsius; HCl - Hydrochloric acid

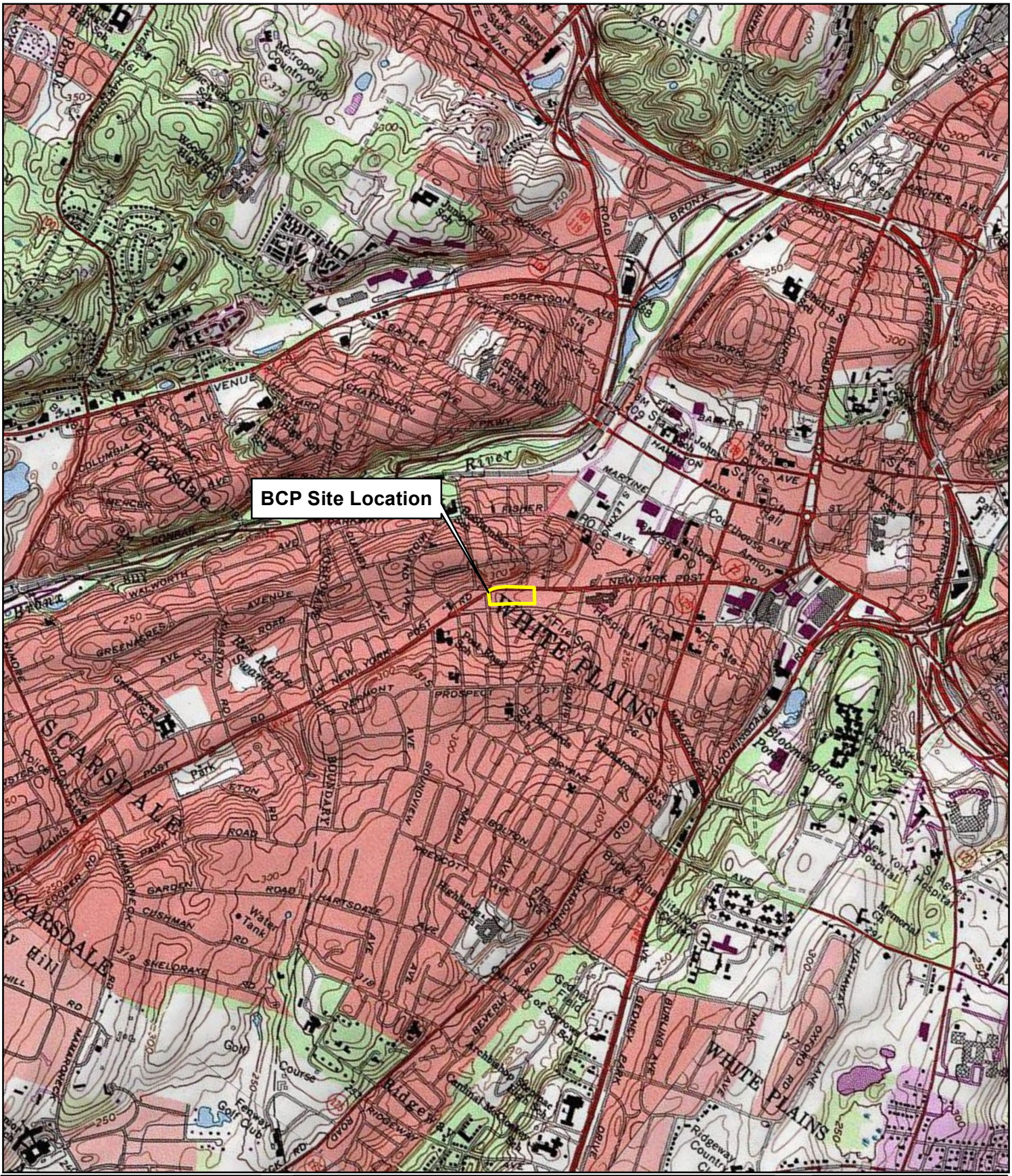
Sampling frequency will be conducted per the requirements of the waste disposal facility.

FIGURES

Figure 1: USGS Topographical Map

Figure 2: Site Map

Figure 3: Proposed Sample Locations



USGS Topographical Map

Figure 1

Legend

Approximate BCP Site Location

0 1,000 2,000 Feet

Woodard & Curran

Project #: 0214155.03
Map Created: July 2023

Figure Exported: 7/10/2023 By: srogacki Using: \\wc\shared\Projects\0214155.04 WP Hospital 25 West Post Rd ESA\wip\GIS\Projects\Project Y\Figure 1 - USGS Topo Map_rev.mxd

Site Map

Figure 2

Legend

Approximate BCP Site Boundary

Note:Boundaries are approximate

0 15 30 60 Feet

Woodard & Curran

Project #: 214155
Map Created: July 2023

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk.

Proposed Sample Locations

Figure 3

West Post Road

Rathbun Avenue

Maple Avenue

PB-13
GW/SB21-26
RW-3
RW-5D
RW-5
RW-21
RW-1
GW/SB21-18
SB-9
GW/SB21-10
RW-10
RW-12
SB-1/MW-1
RB-42
GP-1
RB-36
RB-41
SB-5
SB-11
GP-9
RW-6
SB-4/MW-3
SB-7
RW-22
RW-9
GW/SB21-05
GP-6
RW-14
RB-40
RW-4
WC-MW-01
RB-37
RW-16
RW-23
RW-11
RW-13
GP-4
RW-8
RW-8
RB-51
GW/SB21-13
SB-2/MW-2
RB-38
GP-2
GW/SB21-15
RW-17
RB-50
RB-33
PB-15
GW/SB21-14
RB-39
GW/SB21-23
GW/SB21-03
RW-7
SB-10
RW-15
SB-8
RW-2

Legend

- Approximate BCP Site Boundary
- Proposed MiHPT Locations
- Historic Ground Water Sample
- W&C Well
- Historic Well
- Proposed Groundwater Locations
- Proposed Temp Well Location

0 15 30 60 Feet

Woodard & Curran

Project #: 0214155
Map Created: September 2023

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:**

Figure Exported: 9/7/2023 By: srogacki Using: \\wc\shared\Projects\0214155.04 WP Hospital 25 West Post Rd ESA\wip\GIS\Projects\Project Y\2023 IRM\WP-PD\WP\PD\WP\RD3 Proposed Sample Locations.mxd

APPENDIX A: QUALIFICATIONS

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

Woodard & Curran
800 Westchester Avenue, Suite N507
Rye Brook, NY 10573
Attn: Ms. Stephanie Rogacki, MS, Environmental Scientist 2

February 2, 2023

Subject: LDC General Experience

We would like to highlight the following points:

- LDC has an extensive history of providing data validation and data management services for numerous DoD, USACE, Navy, USEPA (all regions), state & local agency programs for over 30 years.
- LDC is a small business entity under NAICS code 541380, meeting the size standard of less than 15Million USD, and is self-certified with the SBA.
- LDC is a data validation, quality assurance, and data management subcontractor with an impeccable track record for timeliness, quality, technical expertise, and the ability to mitigate complex data quality issues. Our clients will confirm our current and past performance under DoD (including USACE), DoE, and commercial programs. We have experience and a proven track record commensurate with the requirements of this RFP.

Our technical proposal will demonstrate how LDC's qualifications meet and exceed the critical technical and capacity requirements for this data validation subcontract.

Capacity

- LDC has the ability to support a project of this size with a staff of over thirty (30) chemistry professionals. This level of support will allow for appropriate primary and secondary QA/QC review within the critical schedule. Additionally, LDC's capacity allows for flexibility if expedited review is required.

Past Performance

- LDC has performed data validation on a wide variety of projects in our 30+ years in business including Various Passaic NJ sites, NYSDEC programs, more than 200 Army Corps sites, over 180 AFCEE/AFCEC sites, more than 50 EPA and Superfund sites, in support of multiple Navy CLEAN and RAC contracts and commercial client programs. This experience reflects a thorough understanding of multiple validation guidelines including NYSDEC ASP, EPA NFG, DoD QSM and EPA Region-specific and state-specific protocols.

PFAS Experience

- LDC's largest PFAS project to date for data validation is for a Confidential Project Location. The data validation is performed per Level 3 and Level 4 equivalent PFAS in water samples for EPA Method 537 and Laboratory Method. Total billing to date for this project is over $32,000.00.

- LDC's SOP for Table B15 Validation of PFAS is AFCEC and USACE approved.

- LDC has also performed PFAS data validation for other projects including but not limited to Anchor project City of Everett, Arcadis project Joint Base McGuire-Dixon-Lakehurst, Anchor project Duwamish-King County, CAPE project Mather AFB, USACE Seattle project Moses Lake, EA Engineering project Fairchild AFB, and MWH project City of San Diego project. Since March 1, 2018, LDC has validated over 1800 SDGs for PFAS.

ADR Deliverables

- LDC is the software developer and expert in the use of the Automated Data Review (ADR) software. LDC uses the most current version of ADR meeting USACE and current DoD QSM requirements and has performed over 1000 ADR projects in the past 10 years, worth over $2,000,000 in revenue. LDC will provide technical support to the Client as needed for e-QAPP generation or EDD troubleshooting.

EDD Formats

- LDC is able to work with a variety of EDD formats including but not limited to Navy NEDD, USACE SEDD, EQuIS, FUDSChem, and ERPIMS. Any EDD format can be populated with data qualifiers.

LDC Advantage

- LDC Advantage is a 24/7 secure cloud-based portal designed for upload, notification, retrieval, and long term storage of project documents, including lab data packages, emails, validation reports, validated EDD, QCSR/DVSRs, project planning documents (QAPP, FSP, SOPs, etc.), and many others. LDC Advantage is compatible with both desktop and mobile devices. LDC Advantage provides quick and easy access to project status and a convenient way to upload and download project files.

EDMSi Database Hosting (Documents and Data)

- LDC can provide hosting of its EDMSi database for posting, retrieval, reporting and download of both data and documents. The monthly fee includes 99.99% uptime, 24/7 along with distributed site availability and daily backups. Multiple users can all access the EDMSi database without conflict from anywhere in the world via the internet. The monthly hosting fee also includes general maintenance and phone, email or web-conference support via LDC's Technical Support Group.

Subcontractors

- No subcontractors will be used for this project. This will allow for better quality control of the work product. LDC has sufficient staff and resources to handle this project without using subcontractors.

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

LDC Company Information

- Primary NAICS Code 541380 (also 541690 and 541620)
- TIN# 33-0492643
- DUNS# 789643863
- Cage Code 04XK8, UEI# PEK5K6KMDYV1
- MBE (CPUC Certified)
- SBE (Port of Long Beach, California eProcure, and LAUSD Certified) Less than 50 Employees
- Registered in ORCA and SAM
- CA PWCR Registration # 1000047894
- LAUSD Vendor ID# 1000018015
- South Florida Water Management District SBE Vendor 105004
- New York State Vendor ID number 1100182981
- New York City PIP Vendor number VS00046623
- New Jersey State Vendor ID number V00026481

We appreciate the opportunity to support your company on this project and we look forward to working together in the future. Please feel free to call me at (760) 827-1100 if you have any questions after your review.

Sincerely,

Laura Soeten
Executive Administrator
Lsoeten@lab-data.com

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

LDC Company Profile

LDC is a small, minority-owned (SBE/MBE) quality assurance and environmental chemistry company focused on data validation, data quality assessment, database implementation, and data usability. Our primary services include data validation, electronic transfer of data, oversight of quality assurance/quality control (QA/QC) programs, laboratory and field audits, technical support for litigation, and database management. Our corporate office located in Carlsbad, California is directed by Mr. Scott Denzer and Ms. Stella Cuenco, principal chemists with over 50 years of experience between them in the environmental laboratory and data validation industries

LDC is recognized as one of the leaders in the data validation industry through participation on major DoD and commercial projects such as:

- Army Corps of Engineers, DuPont Chambers (Baltimore District)
- Army Corps of Engineers, DuPont Chambers (Philadelphia District)
- Army Corps of Engineers, Various projects (New Mexico)
- Army Corps of Engineers, Camp Navajo (Tetra Tech)
- Army Corps of Engineers, Various projects, 8a Contract (Sacramento District)
- Army Corps of Engineers, Fort Ord (Shaw E&I)
- Las Vegas Wash Henderson Site (ERM)
- DOE NPR-1 Elk Hills (DOE direct and Ahtna)
- Nevada Environmental Response Trust (NERT) Henderson Site (Ramboll Environ)
- NOAA MDRA Mississippi Site (Entrix)
- Stringfellow Superfund Site (DTSC)
- BKK Landfill (Ramboll Environ)
- EPA Region IX ESAT QA Program (ICF)
- AFCEE/AFCEC, Andersen AFB (EA/Shaw)
- AFCEE/AFCEC, Loring/Pease AFB (Bechtel/MWH)
- AFCEE/AFCEC, Mather AFB (MWH)
- AFCEE/AFCEC, Army Corps of Engineers, Travis AFB (CH2M Hill)
- AFCEE/AFCEC, McClellan and Castle AFB (Jacobs Engineering Group)
- AFCEE/AFCEC, Beale AFB (Law/Crandall, Inc.)
- AFCEE/AFCEC, Andrews AFB (URS)
- Navy CLEAN Atlantic Division (EA Engineering)
- Navy CLEAN IV Southwest DIV (AECOM)
- Navy RAC Southwest Division (OHM Remediation/IT Group/Shaw)

LDC has successfully performed thousands of data validation projects worth over 20 million dollars for prime contractors servicing Air Force (AFCEE/AFCEC), Army Corps, Navy, and industrial activities.

LDC has developed well-documented procedures which support all facets of the data validation process. This includes critical steps such as:

- Project tracking
- Peer review for all data validation activities
- Internal training programs
- Internal and external audits
- Strict documentation
- Electronic deliverables

LDC Corporate Resources

LDC personnel have experience and formal training in the areas of data validation, electronic data deliverables and laboratory QA/QC. LDC personnel have performed data validation in all analytical disciplines. These include, but are not limited to, GC/MS volatiles, GC volatiles, GC/MS semivolatiles, GC pesticides, ICP metals, ICP/MS metals, GFAA metals, GC petroleum hydrocarbons, GC/MS dioxins, explosives, radiochemistry, and wet chemistry. This versatility allows our organization to adapt to workload changes and allows for an excellent secondary review system. Our organization is structured to allow direct communication between project managers, data validators, and clerical staff which occurs on a daily basis.

With LDC's 30+ years as a national leader in the data validation industry and extensive experience supporting projects with multiple EPA regions, DoD and DOE facilities, LDC is confident our data validation services will successfully meet all project requirements. The validation group is managed by Ms. Stella Cuenco, principal chemist, who has over 30 years of experience, the software products and services group is managed by Mr. Scott Denzer, who has over 40 years of experience, and the overall operations are directed by Mr. Michael Takaki, president.

The validation group is divided into chemists by discipline, organics (GC/MS, GC and HPLC) and inorganics (wet chemistry, IC, ICP, ICP/MS). All chemists report to senior group leads. A separate group performs data package log-in to the LDC tracking system. Another group performs the EDD population and verification. Judy Ecklund leads this group and has over 13 years of experience in EDD population, preparation, and uploading to various databases.

The majority of the data validation staff at LDC have been employed for over 10 years with some senior staff over 20 years as noted in the attached resumes. This level of stability and experience will ensure project stability and consistency.

In addressing LDC's financial status, LDC has an excellent Dun & Bradstreet report and has been profitable for the past 15 years. LDC has grown at approximately 10% in each of the past 5 years and continues to be a leader in our environmental sector of the data quality business. References are available from our vendors and clients to confirm our business success. Our annual revenue of approximately $4,000,000 per year in data validation work makes LDC one of the largest independent data validation firms in the nation.

LDC will commit the resources and materials to successfully complete this project with the required time period and with a high level of quality.

Project Team Summary

LDC personnel have hands-on experience in the areas of data validation, laboratory QA/QC, CLP SOWs, and environmental laboratory analyses. As documented in the resumes of our staff, the project team has significant experience with USACE and DoD protocols, current technology, SW-846, and all methods stated in the SOW.

LDC is presenting the following staff to perform key roles for this contract. The key staff of the project team and their experience are as follows:

- **Stella Cuenco, Principal Chemist/Operations Manager**
  Project Role: Principal Chemist/Program Manager
  Data Validation Experience: 26 years
  Overall Laboratory and Data Validation Experience: 32 years
  B.S. Chemistry, University of the Philippines, 1991

  Ms. Cuenco has over 32 years of environmental laboratory and data validation experience under DoD and EPA guidelines. Her experience includes performance of data validation in gas chromatography/mass spectrometry for volatile and semivolatile organics and extensive Navy and EPA data review and data verification for all organic and inorganic analyses. Her laboratory experience includes hands-on CLP and SW-846 GC/MS methods.

- **Pei Geng, Senior Chemist/Project Manager**
  Project Role: Senior Organic Data Validator/Project Manager
  Data Validation Experience: 25 years
  Overall Laboratory and Data Validation Experience: 32 years
  M.S. Chemistry, Sam Houston University, 1989

  Ms. Geng will perform the role of day to day Project Manager for this project. She will monitor schedules, compliance of validation to the Required Guidelines, perform routine surveillance activities such as generation of non-conformance reports, validator training and QA reports to management.

  Ms. Geng will perform the role of organic data validator for this project. She will perform data validation for GC/MS and gas chromatography analyses and serve as a peer reviewer in the initial validation review process.

  Ms. Geng has over 31 years of environmental laboratory and data validation experience. Her experience includes performance of data validation in the gas chromatography area for volatile and semivolatile organics and extensive DoD data review and data verification for all organic analyses. Her laboratory experience includes hands-on CLP and SW-846 GC/MS methods.

- **Michael Giangiordano, Chemist/Project Manager**
  Project Role: Project Management Assistance
  Data Validation Experience: 8 years
  Overall Laboratory and Data Validation Experience: 22 years
  B.S. Kinesiology, pending, San Diego State University, San Diego, CA

Mr. Giangiordano has 8 years of experience at LDC and specializes in supporting the company's custom software products. Mr. Giangiordano has a thorough knowledge and understanding of the company's branded software and has led numerous workshops and training sessions for clients ranging from laboratory personnel to consulting firms to USACE. He has extensive experience in electronic data deliverables and electronic data deliverable review and provides database support and management solutions for clients using LDC's custom environmental database management system (EDMSi).

Mr. Giangiordano has 14 years of environmental laboratory. His experience includes Project Manager at EnviroMatrix Analytical, Inc., an accredited full service environmental analytical chemistry facility, Mr. Giangiordano oversaw projects that provided analytical services and support to clients ranging from environmental consulting firms to marine biology firms, in addition to waste and wastewater treatment and disposal firms and municipalities. Mr. Giangiordano was also the Supervisor of the WET Chemistry and Microbiology Departments at EnviroMatrix Analytical, Inc. where he was responsible for all department functions which included overseeing daily operations, training staff, final reporting of analytical data, compliance with method requirements, as well as introducing and developing new methods for additional accreditation.

An Le, Inorganic Chemist
Project Role: Inorganic Data Validator
Data Validation Experience: 5 years
Overall Laboratory and Data Validation Experience: 23 years
B.S. Biological Science, 2000, University of California, Irvine

Ms. Le has over 23 years combined environmental laboratory and data validation experience. Her experience includes performance of data validation using USEPA National Functional Guidelines, client Quality Assurance Program documents, and the Department of Defense QSM depending on the project requirements for the clients.

Ms. Le was a Wet Chemistry Analyst at TestAmerica Laboratories, Ms. Le performed analysis of an extensive list of wet chemistry analyses. Ms. Le also performed volatile organic compounds analysis according and was also responsible for training new analyst employees and performing second level review of data.

Judy Ecklund, EDD Specialist
Project Role: Electronic Data Entry (EDD)
EDD Experience: 14 years

Ms. Ecklund specializes in Electronic Data Deliverables and is familiar with a variety of deliverable formats, including but not limited to NEDD, EQUIS, and SEDD. Ms. Ecklund is also an expert in submitting data to NIRIS the Navy database.

Ms. Ecklund has over 31 years combined environmental laboratory and validation related experience. Her experience includes working with electronic data deliverables (EDDs) as well as performing database uploads.

- **Tony Rommelfanger, Data Control Manager**
  Project Role: Data Custodian

  Mr. Rommelfanger will perform the role of data custodian for this project. He will perform the log-in of all data packages into the LDC tracking system. This system will generate spreadsheets for identifying all samples, their collection date, analysis performed, matrix, and report due date. Upon the completion of each delivery order, he will archive and catalog all reports and data in a secured storage area.

  Mr. Rommelfanger has over 31 years of experience in laboratory and data management experience. He has experience in organizing, logging in, and tracking data packages for technical staff.

Statement of Qualifications

Mansfield Facility

September 2022

Alpha Analytical
8 Walkup Drive
Westborough, MA 01581
508-898-9220

www.alphalab.com

TABLE OF CONTENTS

Introduction

Founded in 1985, Alpha has always been a service–oriented laboratory. Alpha Analytical has two laboratory facilities and we support projects worldwide for a wide range of environmental applications. Our Woods Hole Division, located in Mansfield, Massachusetts has earned a national reputation for analytical excellence supporting hydrocarbon forensics investigations, ecological/human health risk assessment and dredging project applications.

We are known for a unique combination of skills that provide us with the capabilities and capacity to produce a high-quality product in accordance with all applicable regulatory requirements in support of large projects on quick timeframes.

Alpha Analytical is a growing, financially secure, privately held company. Alpha Analytical is the 6th largest environmental testing laboratory and the largest privately family-owned laboratory in the country with more than 50,000 square feet of state-of-the-art laboratory facilities and a reputation of quality and reliability for over 30 years. Alpha invests over 2 million dollars annually in capital improvements and we have no pressure from venture capital firms or outside investors that could compromise our operations or plans.

Alpha Analytical was founded with an absolute commitment to data integrity and the industry's highest ethical and professional standards. Continuing with Alpha's reputation of quality & reliability since 1985 - we get it done right - no exceptions.

Our staff includes more than 500 professionals with wide-ranging scientific and technical expertise. Their experience has helped Alpha pioneer a number of innovative, cost-effective new procedures that have been widely adopted in the industry. Several of our staff members are acknowledged leaders in their fields, serving on various regulatory and oversight bodies that help formulate sound environmental policies.

Alpha Analytical understands the importance of data accessibility and has implemented sophisticated electronic data delivery and archiving technologies. Alpha Analytical's customers can check on the status of their projects and download data directly from our secure server with an Alpha Data Exchange (ADEx) account. Reports in formats that include Excel, GIS Key, EquIS and Acrobat PDF are generated automatically to eliminate transcription errors and are available 24/7.

FACILITY FLOOR PLAN

Alpha Analytical's Mansfield, Massachusetts laboratory is a 25,000 square foot facility that houses separate laboratories to perform Organic, Inorganic, Air, Geophysical and Wet Chemistry sample preparation and analyses. We have a Class 100 area for trace metals samples preparation and a separate laboratory for air analysis. Our analytical capabilities include GC, GC/ MS for organic parameters with ICP/ MS, AF for inorganic parameters.

Flow from sample arrival, to log in custody, to storage happens in the "sample receipt" room. Easy access to the tissue preparatory laboratory and the preparation laboratory allows efficient transfer of samples throughout the laboratory. Samples stored in custody then can be retrieved or delivered to the organics extraction, metals digestion and wet chemistry areas.

Computer terminals are strategically set up to assist the analytical process and the sample stream flow in a continuous path from right to left. The extraction laboratory is set up in a linear fashion to accommodate a particular matrix or process. The forensics area is separated out to include processes and methods that are unique to those samples without interfering with the more routine soil and tissue/sediment work. Double sided hoods that serve both of these areas and are used for cleanup work and liquid extractions.

SAMPLE STORAGE

Due to the nature of Ecological and Human Health risk assessment projects, oftentimes long term frozen sample storage is required to maintain sample integrity and method holding time requirements. Alpha Analytical's expansive facility is equipped to meet both short- and long-term frozen storage demands.

Alpha Analytical's Sample Storage Strategies have been built around the following:

- Sample Storage & Monitoring
- Tracking and Retrieval
- Compliance and Quality Assurance
- Security and Contingency Plans

SAMPLE STORAGE & MONITORING

Sample storage conditions have to be rigorously maintained, and at Alpha Analytical, we have every safeguard in place. Our secure state of the art facility has 10,000 cu/ft. of frozen storage space with capacity to store the equivalent of 90,000 eight-ounce soil jars, down to a temperature of -20 degrees Celsius. Our storage units are equipped with automated monitoring and alert systems, and are supported by emergency back-up generators, onsite maintenance and a full contingency plan to ensure samples are safe at all times.

Details:

- (1) 8x8x10 walk-in freezer= 640 cu/ft.
- (1) 12x20x8 walk-in freezer= 1920 cu/ft.
- (1) 12x35x8 walk-in freezer= 3360 cu/ft.
- (1) 12x35x8 walk-in refrigerator= 3360 cu/ft.
- (8) 18 cu/ft. chest freezers= 144 cu/ft.
- (2) Natural gas back-up generators
- Temperature monitoring system (24/7/365) for all freezers

SAMPLE STORAGE TRACKING & RETRIEVAL

Our Laboratory Information Management System (LIMS) accurately tracks the custody and movement of all samples. This system enables Alpha personnel to quickly trace the location as well as the custody history of each sample or container. Alpha's customized reports from the LIMS provide a comprehensive cradle to grave audit trail of your sample.

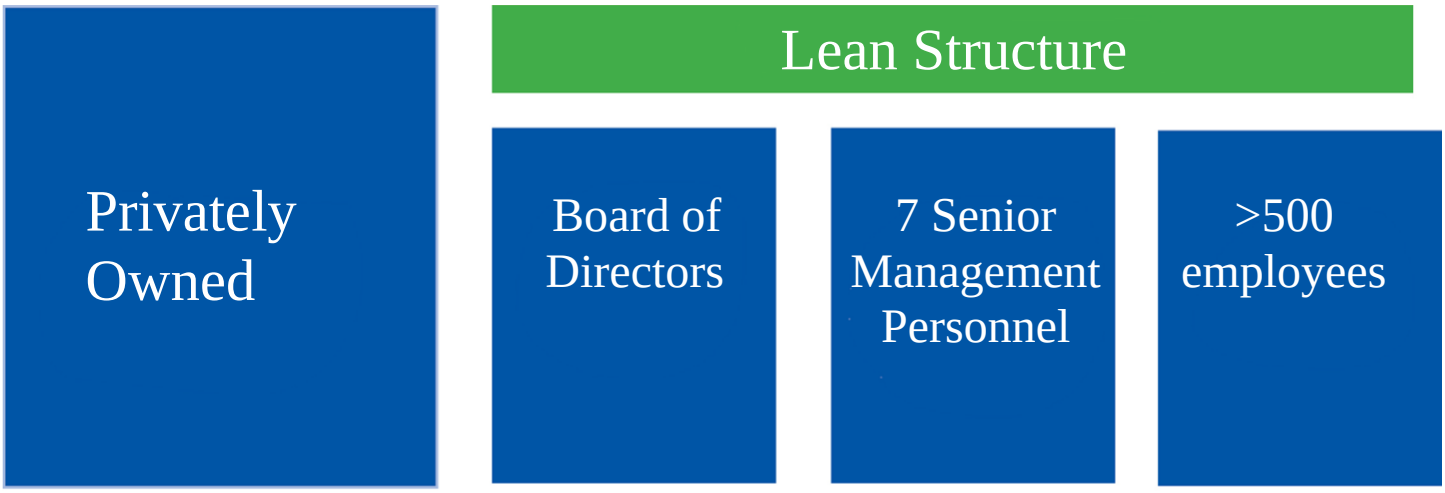
SAMPLE STORAGE QUALITY ASSURANCE

Our sophisticated, most advanced walk-in freezer units ensure absolute sample integrity and the regulatory compliance required when dealing with sensitive Ecological and Human Health risk assessment projects.

Alpha Analytical's long-standing commitment to quality is maintained through our full-time quality assurance team. Alpha's quality assurance team monitors evolving industry regulations and oversees the procedural guidelines that need to be maintained and followed. Our extensive development, management and strict adherence to Standard Operating Procedures (SOPs) reinforces our commitment to providing customers with the highest quality and most trusted sample storage offerings. Alpha Analytical's SOPs are maintained with Qualtrax, a quality assurance document management system.

All sample storage units generate weekly trend reports that display the high, low and average temperatures for the week for each unit so we can proactively identify any possible performance issues with our freezers and have them immediately addressed.

Management Structure



Our staff includes more than 500 professionals with wide-ranging scientific and technical expertise. Their experience has helped Alpha pioneered a number of innovative, cost-effective new procedures that have been widely adopted in the industry. Several of our staff members are acknowledged leaders in their fields, serving on various regulatory and oversight bodies that help formulate sound environmental policies.

Summary of Significant Equipment

ADVANCED MASS SPECTROMETRY	
LC-MS-MS	9
HRMS	1
Microwave Extractor	1
Centrivap	1
Automated Extract Purification System	1
GC/MS	
Semi-Volatile Organics	22
Air/Volatiles	12
GC	
ECD Detectors	10
FID Detectors	8
FID/TCD Detectors	2
HPLC	0
EXTRACTIONS	
Soxhlets	30
Shaker Tables	2
GPC	4
METALS	
ICPMS	4
ICP	6
Mercury Analyzers	5
Microwave Digesters	2
Tissuemizer	9
Centrifuges	4
TOC Analyzer	3

Analytical Services

SEDIMENT AND TISSUE

Alpha's analysis team has developed a comprehensive approach to maximizing performance with sediment and tissue samples based on experience. This approach is focused on the use of Method 3570, Microscale Solvent Extraction (MSE). Alpha has standardized on the MSE procedure for a majority of our sediment and tissue analysis because of the increased performance realized with difficult and challenging sample matrices. The smaller sample size and sequential extraction approach allows for an exhaustive and comprehensive extraction of the contaminants of concern, while minimizing matrix interference.

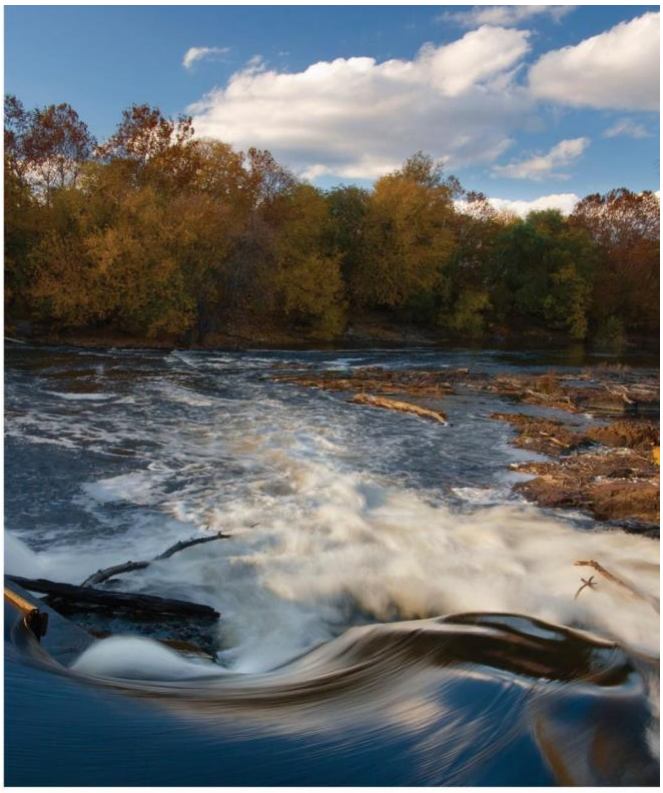
We have found that this extraction method, especially when it is coupled with our cleanup techniques, is most effective with difficult sediment sample matrices. Also, this preparation method utilizes a much smaller volume of solvent creating less waste and a safer laboratory environment. Other extraction procedures can also be utilized based on sample matrix evaluation, regulatory requirements or client preference.

Alpha has a battery of sample extract clean up techniques that we employ based on the parameter of interest and the characteristics of the sediment.

Depending on the degree of difficulty, multiple clean up steps are performed. Commonly used sample clean up steps include gel permeation chromatography (GPC), as well as silica gel, alumina, and florisil columns.

Using the same concept of maximizing sensitivity while minimizing matrix effects, Alpha can also employ large volume injectors (LVI) on some of its instrumentation. This allows us to achieve the same sensitivity without having to further concentrate the sample extract, thereby minimizing interference from the sediment matrix itself.

Alpha Analytical operates in strict compliance with all RCRA and state hazardous waste generator regulations. We have complete cradle to grave documentation of all wastes. There is no possibility that sample containers with client labels on them will turn up anywhere they're not supposed to be.



Lower Passaic River in Fall

Contaminated sediments can present a significant challenge to achieving project-specific detection limits, given the high TOC and moisture content. This can be further exacerbated by high concentrations of both target and non-target analytes.

Tissue samples pose similar, but different challenges associated with the high lipid content. Challenging sample matrices like these require an experienced staff and cutting edge technology to achieve project requirements.

These samples can be the most difficult to analyze, yet have the most stringent regulatory requirements in terms of detection limits and data quality. Alpha has a reputation for exceeding expectations for these projects and we have incorporated intensive method development efforts to acquire the level of sensitivity needed to satisfy project action limits.

TISSUE PREPARATION AND HOMOGENIZATION

Alpha Analytical understands that the preparation, homogenization and/or dissection of tissue samples for ecological or human health risk assessments can be the most important step in the analytical process. Our tissue processing laboratory is a separate room that is designed specifically to handle the processing of various types of tissue samples. We have several tissuemizers and grinders for homogenization along with ceramic, stainless steel and titanium knives that are used for fileting and dissecting. These tools allow for us to be able to handle the processing
of a wide range of sample types from large fish species to small invertebrates as well as plant material.

Fish tissue samples (whole bodies or filets) are weighed and the weights are recorded. Measurements may be taken as needed depending upon the project specifications. The fish may be processed with the skin on or off, depending upon the project specifications. If filets are to be removed and processed separately, this is generally done after the removal of the skin, however filets can be processed with the skin on if requested.

If compositing is required, the identified samples for composite are fileted or skinned prior to compositing homogenization. The carcass of the fish (after removal of the filet) may be maintained for separate homogenization and analysis if requested.

Mammals such as mice, shrew or other rodents, must be prepared in a glove box due to the potential health
hazards associated with mammal tissue. All project specific sample preparation (weighing, skinning, compositing and homogenization) is performed in the glove box. Waste from the processing must be containerized and autoclaved or treated with bleach before disposal. The outside surfaces of the sample containers must be disinfected before removal from the glove box.

Mollusks, crustaceans and other invertebrates are measured and weighed prior to processing. Mollusks must be removed from their shells before processing.

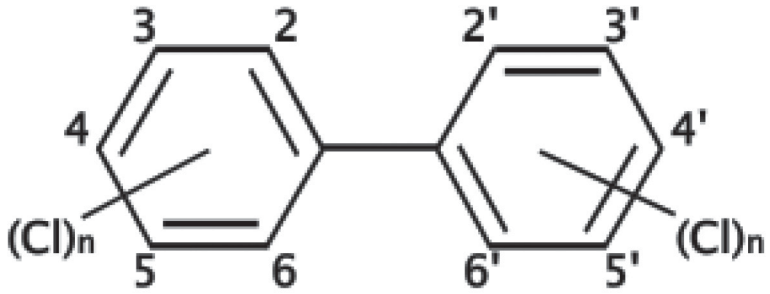
Due to the low weight of a single mollusk, crustacean or invertebrate, these sample types are generally composited with others of the same species and/or sampling area prior to homogenization. Gender determination may need to be performed with larger crustaceans such as lobsters. This is done prior to any processing and recorded.

Additionally, lobsters are usually dissected, and the edible meat (tail and claw) is removed for homogenization. Certain internal organs such as the hepatopancreas may need to be processed separately. If crabs are being processed, the legs, claws and body cavity are generally homogenized together.

Reptiles and amphibians are generally processed as whole-body samples. Depending upon the size, the specimen may need to be cut into small pieces
and processed in part, then re-combined as a single sample. Due to the thickness of the skin of most reptiles, such as frogs, it is recommended that these be processed without the skin. If the skin must be processed, ensure that the grinder or processor blades are sharpened before use. The blades may need to be re-sharpened between every few samples as needed. Turtles must be removed from the shell prior to processing by digging out the head and legs, and as much of the body as feasible.

Macro invertebrates such as worms, eels, insects or benthic biota are generally processed as whole body samples. Depending upon the size, the specimen may need to be cut into small pieces and processed in part, then re-combined as a single sample. Due
to the low weight of a single invertebrate, these sample types are generally composited with others of the same species and/or sampling area prior to homogenization.

Plants are rinsed prior to processing to remove soil, silt, small insects or other debris. Depending upon the size of the plant and the leaves, the sample may be processed mechanically, or may have to
be cut into small pieces by hand. Plants can be processed either wet or dry, depending upon project specifications.



PCB CONGENER AND HOMOLOG ANALYSIS BY LOW RESOLUTION GC/MS

PCBs analyzed by mass spectrometry can remove ambiguity in identification and quantification that arise using GC/ ECD methods. PCBs that are heavily weathered in the environment or metabolically converted may not be identifiable as an aroclor, and go undetected as PCBs in a sample or have significant error in the quantitative analysis.

Standard methods, such as 8082 which utilizes an electron capture detector may over-report or double count PCB concentrations or otherwise not adequately evaluate unknowns, potentially resulting in PCBs present in a sample being under-reported.

Alpha Analytical utilizes a low-resolution GC/MS procedure utilizing selected ion monitoring for enhanced sensitivity based on EPA Method 680. This method is as comprehensive as it is cost effective and Alpha has extensive experience with aqueous, soil, sediment, and tissue sample matrices. Alpha can report all 209 congeners, or subsets thereof, homologous series and aroclors using this method, all from the same analytical extraction/ instrumental analysis. Alpha utilizes matrix-specific cleanups and project- specific preparation factors and we routinely analyze standard reference material sediment and tissue as part of our batch quality control for these analyses. This approach can be a very cost effective solution for applications requiring congener or homolog analysis.

PCB CONGENERS

Analysis of PCBs as congeners provides a more accurate measurement of individual congeners at lower detection limits than Aroclor mixtures. There are 209 possible congeners, but not all of them are found in commercial Aroclor mixtures. One aspect of the greater sensitivity is provided by not having to recognize an Aroclor pattern in the congener analysis.

Congener analyses can serve several applications including the following:

1) PCB residues can be identified and measured at concentrations much lower than Aroclor reporting limits. Also, “Total PCB” can be estimated by summing the NOAA/NS&T 18 congeners and multiplying by 2 (this algorithm was derived from NS&T program data and is generally useful for sediment projects. It should be noted that there are multiple algorithms noted in the literature).

2) Extended lists of congeners may be useful for matching residues with different source mixtures relevant to a particular region or site, especially if specific groups of congeners can be matched to their source Aroclors without significant compositional alterations.

3) The “dioxin-like” coplanar congeners (World Health Organization (WHO) target list) can be measured for use in risk models employing dioxin toxicity equivalent factors for the coplanar congeners. Alpha can also analyze for PCB congeners utilizing GC/ECD, following Method 8082, for the NOAA/WHO congener lists.

PCB HOMOLOGS

GC/MS allows measuring groupings of PCB congeners as a function of their level of chlorination (e.g., all trichloro- substituted congeners), or homolog group. This is because all congeners within a homolog group have nearly identical mass spectral characteristics. This measurement supports risk models that apply toxicity equivalent factors based on level of chlorination, as opposed to individual congeners. Also, summing homolog groups provides a very clear approach to measuring “Total PCB”. Alpha Analytical offers PCB homolog analyses by low-resolution GC/MS (Method 680) with reporting limits on the order of 1 to 10 parts per trillion (ng/L) in water and 1 to 10 parts per billion (µg/Kg) in solid matrices.

ALKYLATED PAH ANALYSIS

Alkylated homologs of the parent PAHs can provide a more complete evaluation of risk, as well as valuable information about the nature of the residue, including potential sources, and can assist with differentiating between PAHs derived from petroleum and PAHs resulting from combustion, or partially combusted organic matter, as well as natural sources. Alpha’s unique expertise with this analysis flows from our nationally recognized petroleum hydrocarbon forensics analytical group.

Using modifications to Method 8270 procedures, two-to six-ringed polynuclear aromatic and sulfur-heterocyclic hydrocarbons and their respective alkyl-substituted homologues, representing more than 200 individual compounds can be measured. For alkylated PAH analysis used in support of ecological risk assessment applications, Alpha typically reports the EPA EMAP 34 list of parent and alkylated PAHs.

PAH ANALYSIS OF SEDIMENT PORE WATER BY SPME GC/MS

Total PAH concentrations in sediment are generally recognized in the literature to be poor predictors of benthic invertebrate toxicity. Pore water analysis would provide a better indication, however the direct measurement of PAH concentrations in pore water has traditionally been very challenging. ASTM Method D7363, “Determination of Parent and Alkyl Polycyclic Aromatics in Sediment Pore Water Using Solid- Phase Microextraction and Gas Chromatography/ Mass Spectrometry in Selected Ion Monitoring Mode" is a viable option in that only minimal pore water volume is required for an aliquot to be obtained under representative conditions from a small amount of sediment. Other advantages of this analytical procedure are:

- Direct analysis of pore water for parent and alkylated PAH
- Can be used to predict benthic invertebrate toxicity
- High sensitivity with reporting limits as low as 0.06 ug/L

ANALYSIS OF METALS IN SALTWATER, SEDIMENTS & TISSUES

Determining metals concentrations in seawater is challenging due to the high total dissolved solids present which interfere with many analyses yielding false positive, false negative or biased results. These interferences can be minimized through sample dilution but then reporting limits would be elevated accordingly. Instead, Alpha has a number of analytical methods to analyze seawater, sediments and tissues which minimize analytical interferences while yielding low reporting limits. These techniques include ICP/MS utilizing either reaction / collision cell technol- ogy, chelate extraction, hydride generation, and low level mercury by cold vapor atomic fluorescence. A number of analytical methods are in place to analyze these challenging sample matrices which minimize analytical interferences while yielding low reporting limits. Special laboratory “clean” methods are required to reduce contamination for ultra- trace level measurements.

CLASS 100 CLEAN CONDITIONS

Our methodologies include membrane filtration under Class 100 conditions, microwave digestion in Teflon-lined vessels with temperature and pressure control, followed by ICP/ MS analysis with reaction / collision cell technology. Analyte ions for certain masses have isobaric (same mass) interferences which, in standard ICPMS may result in false positives/ biased results. The use of a reaction/collision cell focuses the ion beam while adding reaction gas which forms new molecules which can be discriminated out of the ion beam based on kinetic energy or mass. The result is that the analyte mass can be separated from interference resulting in a clean signal for that analyte.

CHELATE ANALYSIS - ICP/MS ANALYSIS

Depending on project requirements and matrix specific conditions, a separatory funnel solvent extraction utilizing two chelating agents is used to extract cadmium, cobalt, copper, iron, lead, nickel, silver, vanadium and zinc. Using this procedure, analytes are completely removed from the sea water matrix prior to analysis thus eliminating any interferences. Sample aliquots from 10 mL to 200 mL are prepared yielding pre-concentrations factors of 1 to 20 prior to analysis by ICP MS. The sensitivity of ICP MS coupled with the pre-concentration factors associated with the extraction produces low detection limits for these analytes without analytical interference.

HYDROGEN GENERATION ATOMIC FLUORESCENCE

Hydride Generation Atomic Fluorescence (HGAF) can also be used for the analysis of arsenic and selenium in seawater. Hydride generation is a technique where volatile derivatives of arsenic and selenium are generated with a strong reductant and then purged from the seawater matrix. These derivatives are then passed through a hydrogen flame and reduced to elemental form for analysis. Atomic fluorescence is an extremely sensitive analytical method which can yield low detection limit, interference free, sample results.

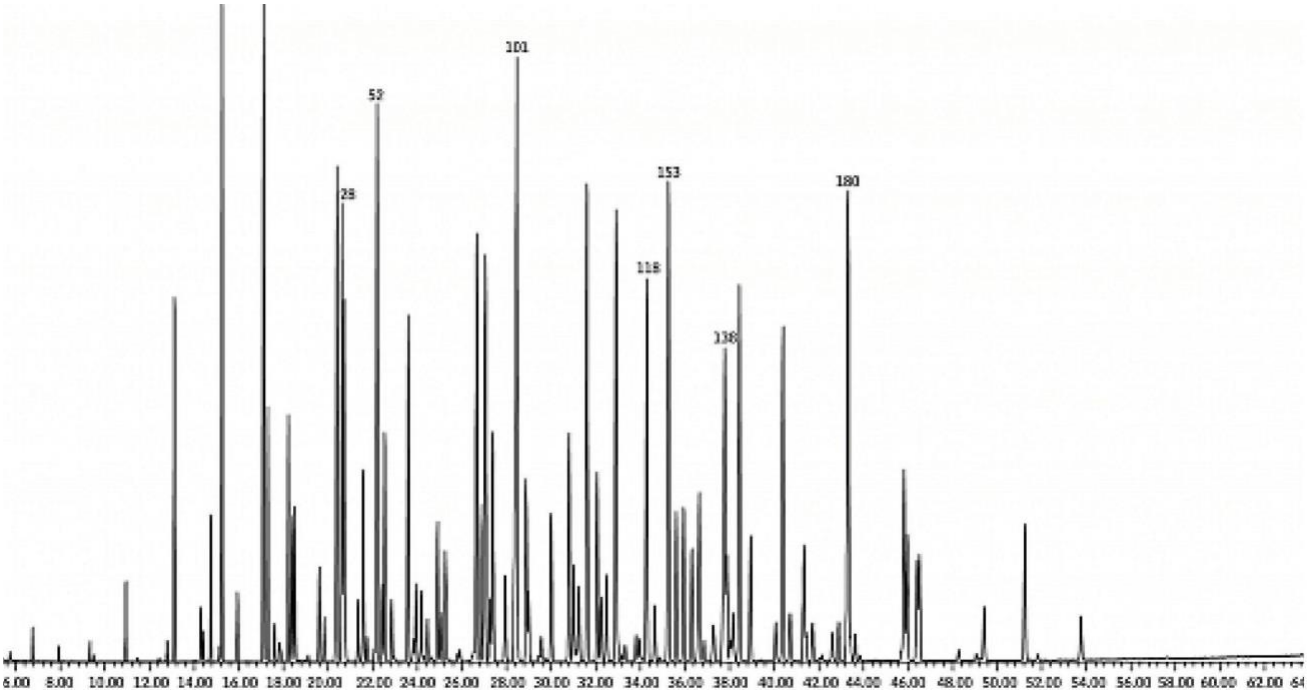
MERCURY BY COLD VAPOR ATOMIC FLUORESCENCE

Atomic fluorescence is an extremely sensitive measurement technique for the analysis of mercury. Mercury in a digested sample is reduced with stannous chloride to elemental mercury and purged from the seawater matrix for analysis. The sensitivity of the analysis can be varied by adjusting the instrumental gain.

ACID VOLATILE SULFIDES & SIMULTANEOUSLY EXTRACTED METALS (AVS/SEM)

The use of total metal sediment concentrations may be inappropriate for characterizing risk due to the tendency for the divalent cationic metals Cd, Cu, Ni, Pb and Zn to form insoluble metal sulfide complexes under anaerobic conditions in the presence of excess sulfide, which can make them inaccessible to the benthic community.

Acid volatile sulfide (AVS) and simultaneously extracted metals (SEM) concentrations can be used to provide a better indication of toxicity because it is measuring the bioavailable fraction of metals present. In this procedure, AVS is generated by the addition of acid and the five divalent metals are co-extracted. Toxicity can be evaluated by calculating the sum of the SEM (umol/g dry wt) divided by the AVS concentration. A ratio of </= predicts no toxicity for metals while a ratio > 1 indicates that the metals may be toxic. Alpha Analytical has analyzed a wide variety of sediments utilizing this procedure.



PETROLEUM HYDROCARBON IDENTIFICATION (PHI)

Except for the simplest fingerprinting applications, standard EPA methods, e.g., Method 8100, 8015, are unsuitable for identifying types and sources of hydrocarbons, especially in complex multi-source cases. Alpha Analytical offers a more sophisticated, multi-faceted approach to hydrocarbon fingerprinting, whether your interest lies with diesel range (and beyond), gasoline-range, or even airborne gaseous-phase hydrocarbons.

Our most basic hydrocarbon fingerprinting method is called PHI. Saturated hydrocarbons (SHCs), encompassing n-alkane hydrocarbons and selected isoprenoids in the C9 through C40 range, provide an initial fingerprint
of materials suspected of being petroleum hydrocarbons. This analysis is performed using high resolution GC/ FID utilizing an 80 minute chromatographic runtime and the most appropriate sample extraction procedure depending on whether the sample is aqueous, soil, sediment, tissue or free product.

Data for 32 individual n-alkanes and five isoprenoids is reported, as well as the total concentrations of saturated and total petroleum hydrocarbons. A qualitative narrative outlines the hydrocarbon range the product elutes in as well as a discussion of what represents the best possible product identification. The identification is based on an
interpretation of the chromatographic data utilizing pattern recognition and boiling point ranges, and the best match between the sample unknown and our extensive product reference library of more than 40 products and materials.
The relative elution range of the sample material based on a carbon number comparison is also provided along with chromatograms of the sample and the closest reference product from our library.

FREE CYANIDE ANALYSIS BY MICRODIFFUSION PREPARATION/SPECTROPHOTOMETRY

The cyanide chemistry associated with MGP residuals in the environment is of particular interest because a wide range of cyanide species can be present, and there can be a significant difference in toxicity observed among the species.
The application of risk-based approaches to characterizing cyanide requires reliable analytical procedures that can delineate the cyanide species into categories associated with their relative toxicities. Alpha offers Method 9016 for the analysis of free cyanide, which provides the selectivity required to isolate and quantify the most toxic cyanide species, which is also generally the lowest percentage of the total cyanides present. *(continued on page 14)*

FREE CYANIDE ANALYSIS BY MICRODIFFUSION PREPARATION/SPECTROPHOTOMETRY

(continued from page 13)

In addition, Alpha can also perform the Physiologically Available Cyanide method, which is a modification of the total cyanide methodology to allow for the determination of free cyanide and weakly complexed cyanide species up to, but not including the iron cyanide complexes.

Alpha Analytical has considerable qualifications and experience working on site characterization and remediation projects involving former MGP operations where the chemical analysis of aqueous, sediment, soil, and air/soil gas samples, as well as free product is required. We have the technical knowledge and experience required to generate the best possible results from difficult sample matrices and potentially highly contaminated samples.

ROUTINE ANALYSIS - TRACE METALS

Alpha currently performs analysis for metals utilizing the most advanced analytical instrumentation. Alpha currently employs Inductively Coupled Plasma Spectrophotometer/ Mass Spectrometer (ICP/MS), Inductively Coupled Plasma Spectrophotometers (ICP), Graphite Furnace Atomic Absorption Spectrophotometer (GFAA), and Cold Vapor Atomic Absorption Spectrophotometers (CVAA). Alpha uses axial torch ICPs for routine trace metals analysis with instruments that are capable of quickly and reliably achieving levels of detection in the low ppb range. The CVAA instruments are used for the analysis of mercury only. The Perkin-Elmer™ FIMS 100 automated analyzer is the primary instrument.

DIOXIN & FURAN ANALYSIS

Polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) can be formed as byproducts of combustion and certain industrial manufacturing processes. They are persistent organic compounds in the environment and can bioaccumulate in the food chain.

Alpha Analytical offers PCDD / PCDF analysis by both EPA methods 8290A and 1613B for the reporting of the 17 dioxin and furan isomers as well as the tetra- thru octachlorinated dioxin and furan homolog series. Applicable sample matrices include aqueous, soil, sediment, and tissues.

Alpha Analytical utilizes thermo high-resolution mass spectrometer (HRMS) instrumentation equipped with dual Model 1310 gas chromatographs. This dual data acquisition configuration greatly increases analytical efficiencies and productivity. A number of different sample extraction and extract clean up protocols are available, depending on the sample media and project specific requirements.

Report formats include total dioxins and furans within a homolog series, as well as total dioxins and furans. Toxic Equivalents (TEQ) are also reported using the Toxic Equivalency Factor (TEF) values specified in a project-specific Quality Assurance Project Plan (QAPP).

EMERGING CONTAMINANTS

Alpha Analytical has been supporting emerging contaminants monitoring programs for over 10 years, starting with the IC/MS/MS analysis of perchlorate in 2004. Alpha developed a GC/MS-SIM isotope dilution procedure for low-level analysis of 1,4-dioxane, as well as an LC/MS/MS procedure for per- and poly-fluorinated alkyl substances (PFAS). This Technical Bulletin discusses these analytical services.

PER- AND POLYFLUORINATED ALKYL SUBSTANCES (PFAS)

PFAS compounds are a class of emerging contaminants that are generating high levels of concern in the environmental community and the public at large. These compounds have a wide range of industrial uses and commercial product applications.

Alpha Analytical has two methodology options that can be used for the analysis of PFAS compounds in environmental samples - EPA Method 537 Rev 1.1 and an isotopic dilution method. Both methods utilize solid phase extraction (SPE) with liquid chromatography and tandem mass spectrometry (LC/MS/MS) and incorporate the EPA Technical Advisory 815-B-16-021 that addresses how linear and branched PFAS isomers are to be quantitated and reported. Which method to use depends on regulatory requirements, the PFAS target compound list and the environmental media being sampled. Analytically, aside from any other considerations, either method can be used to determine the Method 537 14 PFAS target compounds in drinking water or other clean aqueous samples. The isotope dilution method should be used. Alpha Analytical can currently report > 28 PFAs compounds on non-potable, soil and more complex matrices.

LOW LEVEL 1,4 DIOXANE ANALYSIS

1,4-Dioxane is primarily used as a stabilizer for chlorinated solvents or as a solvent for a wide range of products. Historically not included on most laboratory's target compound lists and difficult to analyze, there has not been a lot of interest in 1,4-dioxane until recently. 1,4-Dioxane is completely miscible with water, making it very mobile in the environment and it is not readily biodegradable.

1,4-Dioxane is a probable human carcinogen and it is included in EPA's IRIS. 1,4-Dioxane's high water solubility presents analytical challenges, making it difficult to analyze using traditional techniques. It cannot be easily purged as a volatile compound (Method 8260) or extracted as a semi-volatile compound (Method 8270). Also, due to its use as a chemical stabilizer, the presence of 1,4-dioxane is often suspected at sites contaminated with chlorinated solvents. As dioxane was only a minor constituent in the original solvent mixtures, its concentration in groundwater
at these sites is often orders of magnitude lower than the chlorinated solvents themselves. This condition is especially problematic for purge and trap methodology such as Method 8260 where the high concentrations of solvents present require the samples to be diluted, often substantially, prior to analysis. These dilutions result in very high reporting limits for 1,4-dioxane. Due to its unique chemical properties, Alpha Analytical has developed a 1,4-dioxane-specific analytical procedure based on a modified EPA Method 8270. The method utilizes the isotope-dilution technique for more analytical certainty and can achieve an aqueous reporting limit as low as 0.2 ug/L. Also available is the EPA 522 method designed for drinking water and uses a solid phase extraction and has similar low reporting limits and more reliable data than the 8260 approach.

PERCHLORATE

The occurrence of perchlorate in the environment is due largely to man-made sources; however, it can be present naturally in Chilean caliche soils which are used as fertilizers due to their high nitrate content. In aqueous systems, perchlorate exists as an anion, most commonly associated with ammonium, potassium and sodium salts. Perchlorate is very soluble in water and relatively inert, making it a mobile and persistent contaminant. The production of explosives, blasting agents and rocket propellant are the largest uses for ammonium perchlorate. Perchlorate salts are also used for a wide variety of other applications. Alpha Analytical previously held EPA certification for UCMR1 in 2004 for perchlorate analysis in potable water by EPA Method 314 by Ion Chromatography. However, following side-by-side method comparison studies, Alpha

now utilizes IC/MS/MS methods for perchlorate analysis by EPA Method 332.0
or EPA SW846 6860, depending on the project application. These IC/MS/MS methods greatly increase the analytical sensitivity, remove interferences from other anions, and eliminate the possibility of false positive results.

Air Testing

Alpha Analytical has expanded our specialty services to include a leading air and vapor testing capability. The USEPA Clean Air Act has driven the control of major air pollution sources from industrial and mobile sources. However, exposure concerns have moved to the potential human health risk posed by volatile organic compounds (VOCs) and particulates from RCRA and CERCLA sites. Alpha Analytical has developed an exceptional air testing capability to support the investigation and characterization of the inhalation exposure pathway from these sources. Data defensibility and usability are critical with these investigations as the outcomes can have significant both health and financial impacts.

The methods for determination of VOCs and particulates in ambient air were developed in the 80's & 90's and published by the EPA in Compendium of Methods for the Determination of Toxic Organic Compounds, "TO" Methods. These methods are considered performance based, consensus methods and inherent in consensus methods is that the laboratory can modify to expand method performance. The improvements are demonstrated and must meet the QA/QC requirements for federal, state and certification programs, and where required, the standards in NELAP.

Media	Description	Inventory
Fused Silica Lined Canisters	6.0, 2.7 & 1 liter sizes	Over 3,000
Flow Controllers with Digital Gauge	Critical Orifice: Range 5 min - 24hrs	Over 1,700
PUF Cartridges	Low volume and high volume	Over 400
PM-10 and TSP Filters	8x10 inch	500
Canister Cleaning	Entech 3100A Automated Cleaning System	2 Systems

AIR TESTING STATE CERTIFICATIONS

Alpha Analytical maintains Air Method certifications in States throughout the country including: Massachusetts, New York, New Jersey, Texas, and Florida. In addition, Alpha is NELAC certified and participates in proficiency testing programs for the air methods where those programs are available.

EPA METHOD TO-15: VOLATILE ORGANIC COMPOUNDS (VOCS)

EPA Method TO-15, also referred to as EPA TO-15 and TO-15, documents sampling and analytical procedures for the measurement of subsets of the 97 volatile organic compounds (VOCs) that are included in the 189 hazardous air pollutants (HAPs) listed in Title III of the Clean Air Act Amendments of 1990.

TO-15 Volatile Organics are defined as compounds having a vapor pressure greater than 10-1 Torr at 25EC and 760 mm Hg. The TO-15 target VOCs include the list detailed in EPA's Compendium Method TO-14A and the list in EPA's Contract
Laboratory Program (CLP) document entitled: Statement-of-Work (SOW) for the Analysis of Air Toxics from Superfund Sites.

TO-15 was developed for the sampling and the analysis of VOCs in ambient air. Samples are collected in a certified passivated steel canister that is evacuated to approximately -30 inches Mercury. Samples may be collected either as grab samples or as temporal samples, sampling times from less than one minute to greater than 24 hours, by using a flow restricting device.

In 2009, EPA Method TO-15 was updated for many VOCs allowing a reporting drop from 0.5 ppbv to 0.2 ppbv. TO-15 may be operated in both full scan and Selective Ion Monitoring (SIM) mode, allowing for a further order of magnitude drop in reporting limits. The list of VOCs reported by TO-15 can be expanded by performing a demonstration that they meet the method's performance criteria.

Alpha maintains calibration for an extended list of target VOC's. VOC's are reported based on project specific needs, state specific requirements, and programmatic needs.

EPA METHOD TO-15: HYDROCARBON ANALYSIS

The extension of TO-15 to report an extended hydrocarbon analyte lists requires sophisticated chromatography, detection and quantitation. Alpha Analytical brings world class chemistry to the analysis of hydrocarbons at sub ppbv levels in soil vapor, indoor and ambient air.

MassDEP Aromatic Petroleum Hydrocarbon (APH) Method Alpha Analytical participated in the work group that developed the APH method. Samples are collected in SUMMA Canister and run by a modified TO-15. MassDEP APH is self-declared certification, however, the method must comply with the MassDEP CAM* requirements to be considered method compliant. *Compendium of Quality Control Requirements and Performance Standards for Selected Analytical Protocols (the "CAM").

Paraffins, Iso-Paraffins, Aromatics, Naphthalenes & Olefins (PIANO) lists have been used extensively in the oil industry to assist in the identification of the source of petroleum hydrocarbons in the soils and waters. Alpha provides a vapor phase capability to support vapor phase investigations, for many of these compounds, the vapor phase concentrations will be sub-ppbv. Alpha has a leading edge capability in providing this data to the experienced investigator.

MANUFACTURED GAS PLANT (MGP) MARKER COMPOUNDS

NYSDEC in their MGP cleanup program and other authorities have identified marker compounds that are collectively unique to former MGP sites. These include thiophenes, indian and benzene derivatives. In addition to the PIANO list Alpha reports the MGP markers; these allow the experienced investigator to differentiate between potential sources of hydrocarbons in complex sites.

SULFUR COMPOUNDS ANALYSIS BY MODIFIED TO-15

Alpha Analytical offers sulfur compounds, Hydrogen Sulfide and ~ 20 volatile sulfur containing compounds by Method TO-15. Samples are collected in a Tedlar bag, protected from sunlight and immediately shipped for analysis. Hold Time is 48hrs of sample collection.

POLY-CHLORINATED BI-PHENYLS ANALYSIS PCBS BY METHODS TO-4A & TO-10A

The EPA compendium of methods has two testing methods for total PCBs in air TO-4 and TO-10A. TO-4A for high-flow applications, TO-10A for low-flow applications. Alpha provides the pre-clean sample media for both methods. Alpha Analytical offers both the standard and modified methods that enhance the data quality and usability by offering homologues or congener analysis; the individual constituent Poly-chlorinated bi-phenyls (congeners) or summing congeners by degree of chlorination (homologs).

POLY AROMATIC HYDROCARBONS (PAHS) METHOD TO-13A

Alpha provides pre-cleaned media and sample analysis for PAH's. Alpha in addition to the method target PAHs can report an extended list of semi-volatiles compounds typically reported in EPA Method SW8270C.

PM-10 AND TOTAL SUSPENDED PARTICULATES (TSP)

Particulates are often an issue with perimeter monitoring projects. In addition to providing filters and particulate data, Alpha can provide metals data for an extended
list of elements. Analysis is performed on the filter post particulate by methods EPA 6010/6020.

FIXED GASES- EPA METHOD 3C

Method 3C provides analysis for atmospheric gases, helium may be added to provide in-laboratory analysis to support leak check analysis for Vapor Intrusion investigations.

DISSOLVED GASES –RSK - 175

Using EPA RSKSOP-175 modified Alpha Analytical reports dissolved light hydrocarbons in water by a Headspace Equilibrium Technique in water samples.

Ambient Air Tests and Indoor Quality Tests	
EPA TO-15	Volatile Organic Compounds (VOCs) [TO-15 or TO-14 analyte list] and NJDEP TO-15 List & NJDEP Deliverables
EPA TO-15 SIM	Volatile Organic Compounds (VOCs) via SIM
EPA TO-15 (Modified)	Mercaptans & Sulfides
EPA TO-10A	Polychlorinated Biphenyls (PCBs) - Aroclors
EPA TO-10A (Modified)	Polychlorinated Biphenyls (PCBs) - Homologs & Congeners via EPA 8270D(M)
EPA TO-12	Total Non-Methane Organic Hydrocarbons (TNMOH
EPA TO-13 (Modified)	Polynuclear Aromatic Hydrocarbons (PAHs) - Extended Compound List PAHs can be reported SIM
EPA IO-3.1	PM-10 and Total Suspended Particulates
EPA 6010C/6020A	Particulate Metals Analysis
NIOSH 6009 (Modified)	Mercury in Air
Dissolved Gases in Water	
RSK 175 Modified)	Light Hydrocarbons

Support Capabilities

WWW.ALPHALAB.COM

Alpha's interactive website is a valuable resource for our clients. The site provides customer service and technical support functions as well as online project status and electronic data deliverable capability.

Sample containers and/or sample couriers can be ordered via the website, as well as generalized cost quotations. Laboratory data can also be viewed or downloaded directly from the site by using the optional Alpha Data Exchange (ADEx) service. The website is the online source of environmental laboratory technical support, reference materials, frequently asked questions and links to other important websites of environmental interest.

ALPHA DATA EXCHANGE (ADEx)

Alpha also has sophisticated electronic data deliverable capabilities. Using Alpha Data Exchange (ADEx), our online electronic deliverable service, allows you to check project status and download your data directly from our web site (www.alphalab.com) in a variety of formats including Excel, GIS Key, EquIS, and an Adobe Acrobat PDF file format
of our summary report. These electronic data formats are automatically generated with no manual data entry or manipulation, which can dramatically minimize your office's data reduction and reporting level of effort with a zero tolerance for transcription errors.

ADEx clients have access to their data 24 x 7 via their firm's password protected ADEx account. Laboratory reports and electronic deliverable files are available to our clients via our website as soon as they are finalized (access is through
a password and downloaded directly into client pre-specified report formats). Laboratory reports and data files are available online for a minimum of three years after they are generated. All client laboratory report files are archived for a period of ten years after report generation.

In addition, Alpha has developed new Excel "Criteria Checker" formats for Massachusetts MCP, Connecticut RSR and New York STARS regulatory standards that automatically highlight and summarize results that exceed the applicable criteria. Our website can also be used to order sample containers, schedule a pick up, request a quote as well as a source for additional information.

INFORMATION MANAGEMENT

The key to the seamless transmission of data at Alpha Analytical Labs is our Laboratory Information Management System or LIMS. Alpha is currently using a third generation LIMS system, taking advantage of a client/server technology and an Oracle database. The new LIMS system takes data entry and reporting to new levels of accuracy and productivity. Alpha's LIMS is completely compliant with the EPA's Good Automated Laboratory Procedures (GALP).

The LIMs eliminates the manual data entry issue, by downloading the data, including QC results, directly from the instrument for over 90% of the lab. Upon review and approval by analysts and managers, the data is directly downloaded, including calculations, into the database. This automated data acquisition capability eliminates transcription errors and allows for complete electronic central storage of raw data, calculations and results.

ELECTRONIC DELIVERABLES

Electronic data deliverable (EDD) formats can be generated automatically by the LIMS with no manual intervention. This allows the data files to be prepared with no additional special handling, which greatly reduces the potential for transcription errors and non-agreement between electronic and hard copy reporting. Alpha offers a wide array of standard EDD formats that are available as standard reporting options.

- Certificate of Analysis
- Excel Spreadsheets
- ASCII, Quote Comma Delimited
- Data Management Formats
  - GIS-Key™
  - EQUiS™
  - Envirodata
  - ERPIMS (AFCEE)
- "Criteria Checker"
  - MCP Method 1 standards
  - MCP Reportable Concentration standards
  - Rhode Island regulatory criteria
  - New Hampshire Method 1 standards
  - Vermont Water Limits
  - Connecticut RSR standards
  - New York STARS and NYSDEC standards
  - New Jersey regulatory standards
  - Pennsylvania regulatory standards
  - EPA PRGs

Of particular interest are Alpha's Data Management and "Criteria Checker" formats. Regarding the data management formats, Alpha has the standard file formats online for each product. However, many clients customize their databases with user defined fields (i.e. water levels, temperature, etc.) and Alpha can generate these custom formats as well, as long as an example file is provided as a reference.

Alpha's "Criteria Checker" formats are Excel workbooks with the data arranged in typical spreadsheet format with samples listed across the top in columns and the analytical parameters down the side in rows. The first column con- tains the regulatory standards. The "Criteria Checker" automatically bolds and highlights any result that exceeds the regulatory standard. Any reporting limit that exceeds the regulatory standard is highlighted in a different color. There is also a Summary Spreadsheet that only lists the parameters, result or reporting limit, that exceeded any particular regulatory standard.

PROJECT MANAGEMENT

We strive to first understand our clients' needs and then expand our services accordingly. To that end, we have developed tools that help our clients be more efficient in everyday tasks associated with project planning, sample collection and report preparation. The services we currently offer are aimed at providing clients with a project manager that will serve as a single point of contact to quickly respond to work requests, review requirements for projects, submit daily sample receipt confirmations, schedule couriers & samplers, maintain lab schedules, ensure technical requirements are met, provide technical guidance and ensure data is reported timely and accurately.

HEALTH & SAFETY

This site is comprised of a series of specific analytical testing laboratories, support facilities and managerial offices. This facility is designed to promote a safe working environment that reduces potential chemical, biological and physical risks.

Alpha Analytical's Safety and HazMat Committee recognize the importance of providing all employees, visitors and contractors with a safe and healthy work environment. To meet this end, we require everyone at this facility to adhere to the following principles:

- Safety: We maintain a safe workplace and we plan our work and perform it safely. We take responsibility for the safety of ourselves, co-workers and visitors.
- Compliance: We meet or exceed local, state and federal health and safety rules and regulations as well as Alpha Analytical's internal health and safety guidelines and expectations.
- Risk Management: We incorporate the practice of hazard identification, risk assessment and risk control into all aspects of our operations.
- Accountability: All levels of management and every employee are accountable for carrying out health and safety responsibilities and for maintaining a safe and healthy workplace.
- Continual Improvement: Alpha Analytical's Safety and HazMat Committee is committed to continually improving the performance of our systems and processes.

We believe that enhancing this performance will lead to a safer workplace for Alpha Analytical's employees, contractors and visitors, including choosing the right methods and reporting limits, identifying specific project requirements and communicating these requirements to the operations staff. This team approach ensures your project will be done to your specifications.

SAMPLE CONTAINERS

Sample containers are provided by Alpha as a complementary service to our clients. The containers are provided pre-labeled for each specific analysis and segregated by sample ID as requested by our clients. If the analysis requires that the sample be preserved, as with soils in methanol for volatile organic analysis, or metals in water with acid, Alpha supplies the containers with the proper preservative(s). By pre-labeling the containers, Alpha eliminates the guesswork in the field as to which container is required. In addition, the labels are of a specific manufacture such that they can be written on (in pencil) even when wet and the labels are guaranteed not come off in water.

Typically, we request 24-hour notification of sample container requests, particularly for large sampling projects. This gives Alpha the opportunity to work with our clients to make sure the correct containers are supplied as well as to confirm the amount of field QC samples required and supply those containers. Sample containers can also be ordered online 24 hours/ day via our website. The online menu steps clients through the ordering process by requesting information concerning the number of samples required, the matrix, the analyses required, and the number and type of field QC samples needed.

SAMPLE STORAGE / DISPOSAL

As a service to our clients, Alpha typically stores samples for 21 days after the report is sent to the client. Arrangements can be made in advance for storage periods of up to six months, if required. In addition, Alpha is responsible for the disposal of samples, extracts and digestates according to the appropriate regulatory requirements based on the analysis just completed and extract/digestate chemicals involved in the analysis.

This service is offered at no charge to our clients. If, however, a client would like to have the raw sample returned, arrangements can be made to have the sample returned via the appropriate commercial carrier with the correct packaging for that sample(s).

Alpha has a comprehensive chemical safety and hygiene program including a SOP for the disposal of samples and waste.

COURIER SERVICE

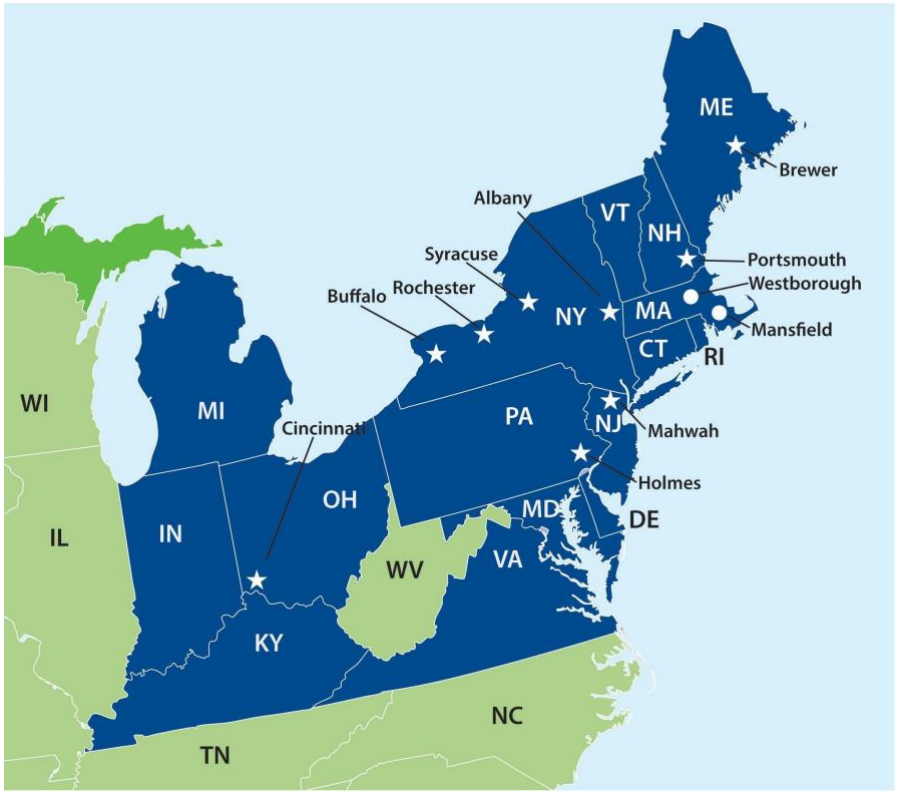
It takes proper planning and a commitment to on-going technological investments to build the best laboratory courier service in the country. Our brand new Ecoline fleet of 80+ fuel efficient vehicles coupled with the Fleetmatics vehicle management system, represents the Alpha Analytical standard of providing you with the highest quality in services and attention.

Alpha Analytical's sophisticated sample management system along with our professional logistical team has the ability to schedule and track sample container requests and sample pick-ups/drop offs.

We always know where your samples are located and how we can best respond to your needs.

- Real-time GPS Vehicle Location
- Technically Trained Courier Staff
- Faster Response Time
- Increased Productivity
- Reliable Scheduling
- Peace Of Mind

Alpha Analytical's Service Center locations and current courier network.



Alpha Analytical Service Center Locations - (indicated with star)

Brewer, ME | Portsmouth, NH | Mahwah, NJ | Albany, NY | Buffalo, NY | Syracuse, NY | Rochester, NY | Holmes, PA Cincinnati, OH

Alpha Analytical Laboratory Locations - (indicated with circle)

Westborough and Mansfield, MA

Quality Assurance Program

The Quality Systems Manual (QSM) of Alpha Analytical describes the quality program in use at the laboratory. This Quality Manual provides employees, clients and accrediting agencies with the necessary information to become familiar with how the quality system operates within Alpha Analytical

The quality program includes quality assurance, quality control, and the laboratory systems including feedback mechanisms for the automated continuous improvement of the laboratory operations to meet client needs. Implementation of the laboratory operations is by documenting procedures, training personnel and reviewing operations for improvement. Written procedures are maintained as Standard Operating Procedures (SOPs). The SOP's are available to the staff. Using QualTrax, our document management system. The provisions of the QSM are binding on all temporary and permanent personnel assigned responsibilities. All laboratory personnel must adhere strictly to the QSM and SOP's. The QSM sections provide overview descriptions of objectives, policies, services, operations and the program defined by the laboratory for quality assurance and quality control activities.

The QSM describes the requirements of the laboratory to demonstrate competency in the operations for performing environmental tests for inorganic, organic, and microbiological testing. The basis for the environmental tests is the methods found in documents published by the United States Environmental Protection Agency (EPA), ASTM, AOAC, APHA/AWWA/WEF and other procedures and techniques supplied by clients.

QUALITY CONTROL

The following general quality control principles apply to all procedures performed at Alpha Analytical.

The manner implemented is dependent on the type of test performed. The laboratory SOP presents the specific quality control checks undertaken for assuring precision, accuracy and sensitivity of each test method.

All quality control measures are assessed and evaluated on an ongoing basis, and quality control acceptance limits are used to determine the usability of the data. Control charts monitor the long-term method performance by analyte, by instrument for water matrices. Routine evaluation and reporting of the control chart performance provides supervisors and management with additional performance measures to ensure data comparability. Control limits are recalculated when trends are observed or at least once per year.

The laboratory specifies in the SOP the acceptance/rejection criteria where no reference method or regulatory criteria exist. The test SOP specifies the QC samples performed per batch of samples. The quality control samples are categorized into the following:

- Method Blank
- Laboratory Duplicate
- Laboratory Control Sample
- Matrix Spike (MS)
- Matrix Spike Duplicate

SYSTEM AUDIT

Laboratory audits, both internal and external, review and examine the operations performed in the laboratory. Internal audits are self-reviews and external audits are reviews by external organizations to evaluate the ability of the laboratory to meet regulatory or project requirements. The QA Officer schedules internal process audits to assure the completion of the annual audit of each operational area.

The process audits are a more detailed review of the operations. Representatives sent by clients and government or accrediting agencies often perform external audits. These audits are most often announced inspections, but sometimes are not announced. The Quality Assurance Officer accompanies the external audit team through the laboratory. The auditors receive a brief overview of company objectives, activities, and facilities. Interviews with essential supervisory staff and technical staff are arranged, along with retrieval of any documentation pertinent to
the audit. Auditors usually provide a report on their findings shortly after the audit. The QA Officer receives the audit report. The QA Officer completes nonconformance action forms in response to any cited deficiencies.

PERFORMANCE AUDIT

Alpha Analytical participates in interlaboratory comparisons and proficiency test programs required by clients and certifying agencies. In addition, the laboratory participates in third party double-blind performance evaluation programs. The performance audits provide information on the data comparability of results generated by the laboratory. Test samples received by the laboratory are handled following routine laboratory procedures. Analysts demonstrate proficiency by analyzing an external proficiency test sample or an internally prepared blind test sample.

CORRECTIVE ACTIONS

The corrective action program at Alpha Analytical uses the Nonconformance Report form to document and follow through the corrective action process. The mechanism for recording, reviewing and acting upon all quality problems is self-explanatory as the form is completed. The process ensures continuous improvement of company performance by preventing the recurrence of quality problems.

EXPERIENCES

Alpha Analytical is operated as a full service, environmental analytical support laboratory. Our staff is very experienced with the engineering and risk assessment applications of environmental data. The laboratory routinely coordinates and adapts its services to meet each client’s individual application needs. Laboratory senior staff is available to work together with project staff on all aspects of the project’s data collection requirements — planning and logistics, sampling and analysis methodologies, data quality objectives, data interpretation and quality assurance. This unique, team approach allows the sampling and analysis component to be completely integrated into the project, which assures that the work will be performed correctly and efficiently.

The laboratory has a wide range of experience working for a diverse group of clients in the areas of drinking water, wastewater and hazardous or solid waste projects. Laboratory clients include major industrial/ commercial facilities and governmental agencies, as well as environmental and geotechnical engineering firms. Laboratory services range from the analysis of conventional water quality parameters to the determination of a full spectrum of priority pollutants and other contaminants of concern in water, soil, and wastes.

PERFORMANCE EVALUATION PROGRAMS

We participate in multiple Water Pollution (WP) Underground Storage Tank (UST) and Soil Proficiency Test Evaluations as well as NIST sponsored intercalibration laboratory comparison studies each year. We achieved National Environmental Laboratory Accreditation Conference (NELAC) accreditation in 2001.

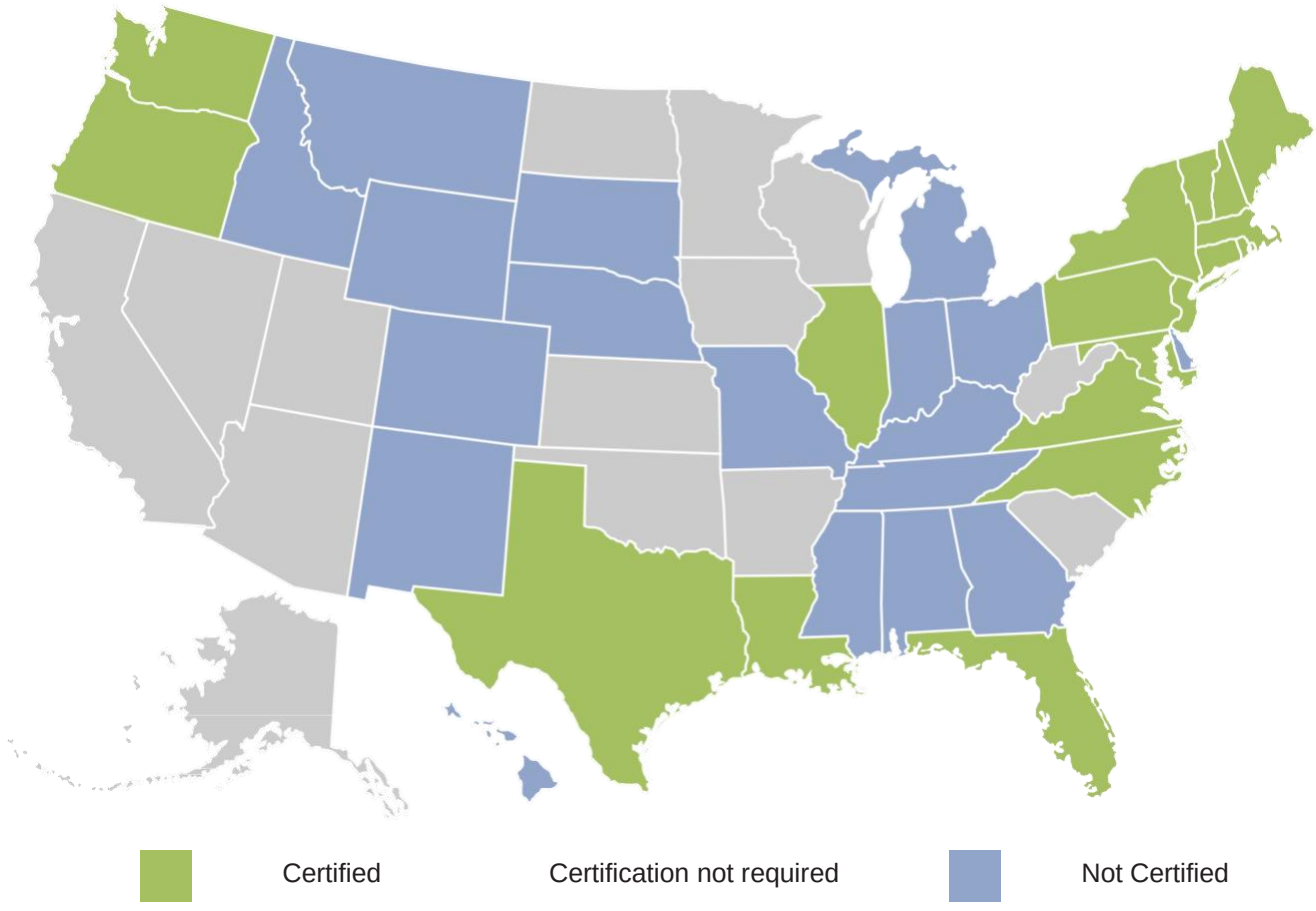
In 1997, we participated in the Massachusetts VPH/EPH Method Round Robin and received a Record of Proficiency for all four categories of VPH/EPH from the Massachusetts Department of Environmental Protection (MassDEP).

Laboratory Certifications

We maintain certifications in many states, including but not limited to the states listed below:

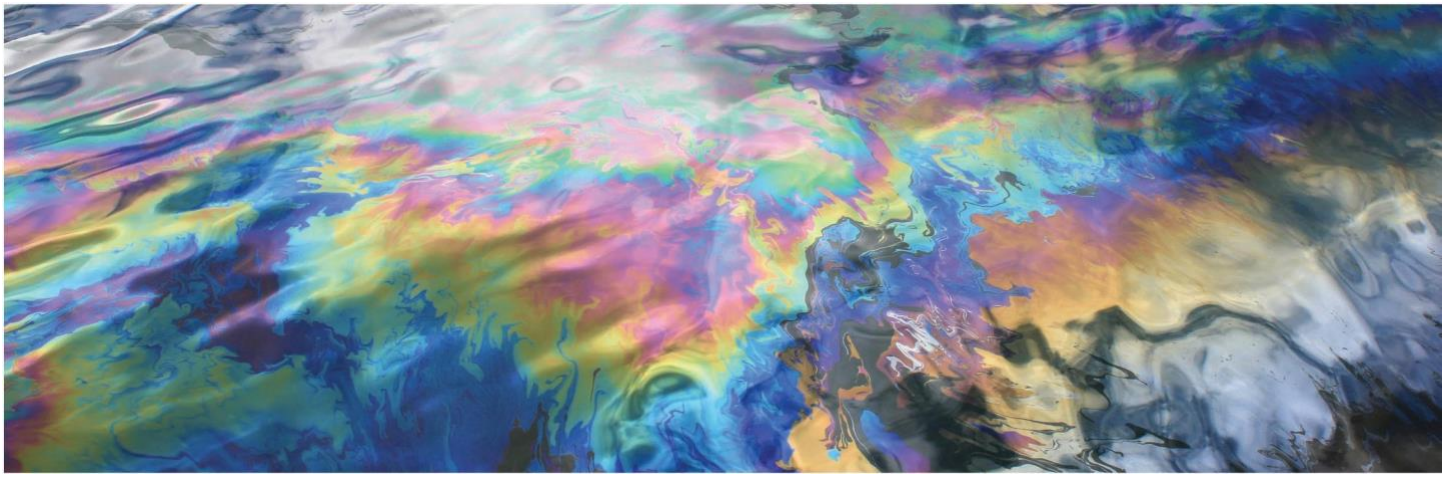
- Connecticut
- Florida
- Illinois
- Louisiana
- Massachusetts
- Maryland
- Maine
- North Carolina
- New Hampshire
- New Jersey
- New York
- Ohio (VAP)
- Oregon
- Pennsylvania
- Texas
- Virginia
- Vermont
- Washington

For an up to date and complete listing of Alpha Analytical's certifications, please visit www.alphalab.com.



Sediment and Tissue Representative Experiences

Alpha Analytical has considerable analytical experience with sediments and tissue matrices; as well as aqueous (fresh and saltwater) and soil matrices. We continue to work on several high-profile projects with demanding quality and sensitivity requirements on extremely challenging sample matrices. Each of the projects listed below are all high profile/high degree of oversight programs. They all have aspects related to ecological and/or human health risk assessment so they all share in requirements of stringent data quality objectives and extremely low reporting limits. In addition, litigation support is a potential for some of these programs. These strict requirements are made even more challenging given the very difficult sample matrices that are sometimes submitted for analysis.

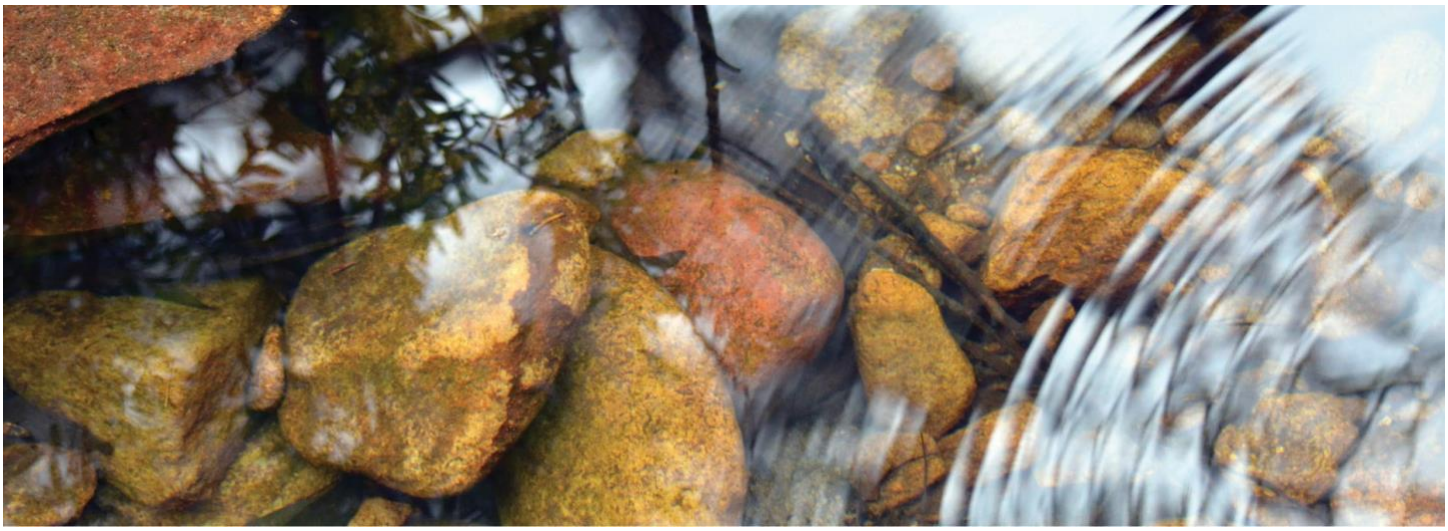


PROJECT NAME:
MISSISSIPPI CANYON 252
(Deep Water Horizon)

Alpha Analytical, working together with Newfields Environmental Forensics, Inc., provided a major analytical con- tribution to the data collection effort in support of a natural resource damage assessment for this Spill of national significance.

Forensic hydrocarbon analysis was conducted on a considerable number of tissue, sediment and seawater samples, at times up to 500 – 700 samples per week. The primary analytes of concern are polycyclic aromatic hydrocarbons (PAHs) including alkyl homologues, saturated hydrocarbons (SHC), total extractable hydrocarbons (TEH), volatile organic compounds and petroleum biomarkers.

Additional analytes of concern are the dispersant agents utilized. Trace metals, TOC and grain size analysis was also conducted on a smaller number of samples. The scope of the laboratory work is two-fold: (1) Generate concentrations of key chemicals used in injury determinations for crude oil releases, and (2) produce more extensive chemical data to use in fingerprinting for source identification. A variety of other sample matrices were also analyzed including vegetation, absorbent materials, oils and oil debris. A truly exceptional laboratory effort was sustained in support of this project due to extreme high profile nature of the work and the considerable number of samples collected and submitted on an ongoing basis.



LOWER PASSAIC RIVER

In support of the Ecological Risk Assessment (ERA) and Human Health Risk Assessment (HHRA) of the Lower Passaic River Study Area (LPRSA)

Alpha Analytical was the primary laboratory for the processing and homogenization of all of the biological tissue samples taken in support of this project. In this role Alpha Analytical took receipt of all samples and stored them in frozen storage (-20 degrees C) pending the sam- ple compositing scheme from Windward Environmental LLC. Based on the compositing scheme Alpha Analytical processed thousands of biological tissue samples under the direction of both Windward Environmental and the US EPA.

The processed samples were subaliquoted at Alpha Analytical and were shipped out to the other contracted laboratories that provided support for this program. This was a large sediment characterization program involv- ing extremely challenging sample matrices to support benthic invertebrate ecological risk assessment; surfi- cial sediment chemical contamination survey; benthic invertebrate toxicity & bioaccumulation evaluation; fish & decapod crustacean chemical contamination and fish community survey. Extraction, clean ups and instrumen- tal analysis were all utilized to maximum effect in order to achieve the program requirements. Alpha Analytical provided analytical support for this program, analyzing for PCB Aroclors, Semi- Volatile Organics GRO, saturated hydrocarbons, TOC Loyd Kahn, herbicides, and Alkylated PAHs. A full data package was provided for each Sample Delivery Group (SDG).-

PROJECT NAME: NEWTOWN CREEK

In support of the Newtown Creek Remedial Investigation/ Feasibility Study (RI/FS) Alpha Analytical provide analytical support on Surface and Sub-Surface sediments and surface water samples. The analytical parameters consisted of Total and Dissolved Metals, Alkylated PAHs, Saturated Hydrocarbons (SHC), Volatile Organic Compounds (VOC), Nutrients, Total Organic Carbon (TOC), Dissolved Organic Carbon (DOC), Particulate Organic Carbon (POC) and Soot. Under this program Alpha Analytical acted as the primary laboratory for the coordination of all specialized subcontracted analyses. Alpha Analytical provided logistical support to the Anchor field staff providing sample container deliveries and pickups at the site 7 days a week during the sam- pling event. A full data package was provided for each Sample Delivery Group along with an ADR EDD format.

PROJECT NAME: PENOBSCOT RIVER / MENDALL MARSH MERCURY STUDY

Alpha Analytical provided analytical support to the Mendall Marsh Mercury Study. The site is located adja- cent to the Penobscot River and downstream of the former HoltraChem plant. The sampling schedule was compressed from three QEA field staff by bringing sam- ple containers directly to and picking up samples from the remote site. The sediment samples were analyzed for grain size, total organic carbon, acid volatile sulfide, mercury, and iron. Select samples were archived in frozen storage for potential future analyses. A full data package and SEDD deliverable were provided for this project.

PROJECT NAME:
PATRICK BAYOU / SUPERFUND SITE

Alpha Analytical provided analytical support for a large characterization program involving the analysis of sediments and surface water from an extremely contaminated water- way located in an industrial area.

Sample matrices were extremely anoxic with high TOC and moisture content. Extreme sample matrix effects were observed and mitigated to the extreme limit of the methodologies and clean ups employed.

Anchor QEA conducted sediment, surface water and tissue sampling at the Patrick Bayou Superfund site located near Deer Park, Texas. The bayou is a tributary of the Houston Ship Channel and has been impacted by regional industrial activity for many years.

During the summer of 2011, Alpha Analytical provided environmental analysis of sediment samples for grain size, moisture content, metals, mercury, PCB aroclors, AVS/SEM, pesticides, low level mercury, and alkylated PAHs.

As part of a Baseline Environmental Risk Assessment (BERA) tissue samples were collected and analyzed for trace metals, mercury, 1,3-Dichlorobenzene, Hexachlorobenzene, alkylated PAHs and percent lipids. Surface water samples were also collected and analyzed for total suspended solids and total organic carbon as well as anions, nitrogen series, total phosphate, and TOC/DOC. Additional sediment and tissue samples were also placed in frozen storage for potential future analyses.

PROJECT NAME:
AREA ECOLOGICAL RISK ASSESSMENT FEDERAL AVIATION ADMINISTRATION (FAA)

Alpha Analytical performed chemical analyses in support of an ecological risk assessment for the Federal Aviation Administration (FAA) at its William J. Hughes Technical Center in New Jersey. Surface water samples were analyzed for metals, cyanide and hardness. Sediment samples were analyzed for metals, cyanide, polynuclear aromatic hydrocar- bons (PAHs), pesticides, polychlorinated biphenyl (PCB) aroclors, and total organic carbon (TOC). Surface soils and
a variety of tissues including invertebrates, frogs, small mammals, bird eggs and feathers, various bat organs and deer muscle were analyzed for total mercury. A method was developed to measure mercury in tree rings. Small fish and large fish were analyzed for total mercury, PCB aroclors, and a select group of pesticides (4,4'-DDT, 4,4'-DDD and 4,4'- DDE). Appropriate analytical methods were utilized to achieve the low detection limits needed to support the ecological risk assessment.

PROJECT NAME:
FLORIDA FISH & WILDLIFE CONSERVATION COMMISSION

Alpha Analytical Laboratory was selected as the primary lab used for analysis of fish tissues and marine sediments supporting an environmental monitoring program conducted by the Florida Fish & Wildlife Conservation Commission for 2004. Both trace organic and metals analyses were conducted for 54 sites along the Florida waterways. Target analytes were similar to the selected Coastal 2000 test lists, which include PCB Congeners, PAHs, Pesticides, Lipid analysis, and 15 individual trace metals. Sediment matrices ranged from mud, sand, and coral hash and totaled 54 stations.
Reporting limits targeted for sediments were: 1 ppb PCB Congeners, 1 ppb Pesticides, and 10 ppb PAHs. Field collections of marine fish including 14 different species were submitted for analysis. Approximately 200 fish were selectively prepared and submitted for edible (filet) tissue and whole body composite trace analyses. Reporting limits targeted for tissues were: 2 ppb PCB Congeners, 2 ppb Pesticides, and 20 ppb PAHs. The lab used several innovative approaches for extraction and analysis for this project. Modified rotary extractions, HPLC clean-up, GC/ MS injection ports utilizing Pre-Column Separation techniques and large volume cold injection technique (LTV). PAH and PCB Congeners were also run simultaneously in a GC/MS (SIM) method enabling more accurate and lower detection limits in both matrices. Since the project's end, pesticide analysis has also been developed for GC/MS (SIM) analysis with similar injection techniques and reporting limits.

Electronic Data Deliverables (EDD) were also delivered at the end of each batch's analysis in the client's requested format for immediate data interpretation.

Air Testing Project Profiles

Client/Contact	Project Description
Teterboto Airport, Teterboro, NJ	Provided Volatile Organics Compound analysis for a one-year ambient monitoring program at the perimeter of the airport. *Analysis performed: EPA TO15*
Logan Airport Air Monitoring Boston, MA	Conducted ambient air analysis for a range of air pollutants including Volatile & Semi-volatile organic compounds, including polyaromatic hydrocarbons, Aldehydes organ for analyses related to taxi-way construction environmental impact study. Project spanned 2 years, Alpha supported all phases of the study; the background baseline study, construction and post-construction. *Analysis performed EPA TO15-SIM, EPA TO-13A , TO-11A, and included particulates by PM 2.5*
Wells G&H Site Woburn, MA	Provided low-level VOC and APH analysis for EPA Superfund Investigation. Project required all media both flow controllers and SUMMA Canisters were individually certified. Timely delivery of media and data assisted in timely project execution. *Analysis performed: EPA TO 15 SIM, MassDEP APH*
Former Manufactured Gas Plants (MGP) in New Jersey	Provided TO-15, metals and particulate via PM-10 filters, and TO-13 analyses for private client conducting fence line monitoring during remediation of MGP sites in northern New Jersey *Analysis performed: EPA TO-15, TO-13, Particulates by PM-10 with metals analysis* Alpha has supported Vapor Intrusion Investigations covering a wide range of contamina- tion providing data to both characterize and differentiate contaminate sources
Private Client, Vapor Intrusion Study, Long Island, NY	A large study requiring analysis of indoor air, sub-slab, and soil vapor samples since 2007 at a Manufactured Gas Plant site. In addition to a typical TO-15 target analyte list, Alpha provided PIANO analyses during initial phases of investigation and a specialized list of analytes specifically related to MGP sites (thiophenes, alkyl-substituted benzenes, naphthalene and methyl-naphthalenes). *Analysis performed: EPA TO 15, Extended Hydrocarbon list PIANO, NYSDEC MGP Markers*
Private Client Vapor Intrusion Investigation Montana	Provided an extended hydrocarbon analysis in soil vapor to support of sub-surface Vapor Intrusion pathway. The contention was that vapors from a deep subsurface fuel oil contamination were impacting the indoor air quality of overlying residences. Using the extended hydrocarbon data to fingerprint the vapors from the source, shallow soil gas, and indoor air the client was able to differentiate the deep source from the indoor hydro-carbon impacts. *Analysis performed: EPA Method TO-15 extended Hydrocarbon list, MassDEP APH, Fixed Gases & Methane*

Statement of Qualifications
Westborough Facility
September 2022

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Walkup Drive
Westborough, MA 01581
508-898-9220

www.alphalab.com

TABLE OF CONTENTS

Introduction

Since 1985, Alpha Analytical has been performing some of the most sophisticated laboratory analysis in the industry, but our mission remains simple: To provide an accurate, high-quality product in accordance with all applicable regulatory requirements in support of large projects on quick timeframes.

Although a lot has changed in the industry over the years in analytical methodologies and the enforcement of regulatory requirements as to what a laboratory “should do.” There is a considerable variation in the level of effort laboratories expend in proportion to their expectation of regulatory scrutiny. There are no grey areas in the work Alpha Analytical does and our reputation supports that fact.
Alpha Analytical was founded with an absolute commitment to data integrity and the industry’s highest ethical and professional standards. Continuing with Alpha’s reputation of quality & reliability since 1985— we get it done right— no exceptions.

Alpha Analytical is a growing, financially secure, privately held company. Alpha Analytical is the 6th largest environmental testing laboratory and the largest privately family-owned laboratory in the country with more than 50,000 square feet of state-of-the-art laboratory facilities and a reputation of quality and reliability for over 30 years. Alpha invests over 2 million dollars annually in capital improvements and we have no pressure from venture capital firms or outside investors that could compromise our operations or plans.

Our two laboratory facilities located in Westborough and Mansfield, Massachusetts are comprised of over 50,000 square feet of smart, sophisticated and modern systems. From our back-up generator systems to our LIMS system, ADEx and DataMerger data delivery tools and Fleetmatics GPS courier management system— Alpha Analytical has invested in making sure our clients’ work is managed with intelligent efficiency.

Alpha Analytical is focused on being responsive to our clients. Responsive service ranging from our network of couriers, whose responsibility it is to be where you need them and when you need them, to our interactive login staff and front office personnel. Our senior staff is readily available to assist you with setting up your project, reviewing your regulatory requirements or helping you interpret your data. Alpha Analytical’s staff is very experienced with the engineering and risk assessment applications of environmental data.

At your discretion, senior laboratory scientists can work together with your project staff on the project's data collection requirement—planning and logistics, sampling and analysis methodologies, data quality objectives, data interpretation and quality assurance. This unique team approach allows the sampling and analysis component to be completely integrated into the project as a whole, which assures that the work will be performed correctly and efficiently with no surprises.

Our laboratory clients include environmental and geotechnical engineering firms; major industrial/ commercial facilities; government agencies; and municipalities.

Management Structure

Privately Owned

Lean Structure

Board of Directors

7 Senior Management Personnel

>500 employees

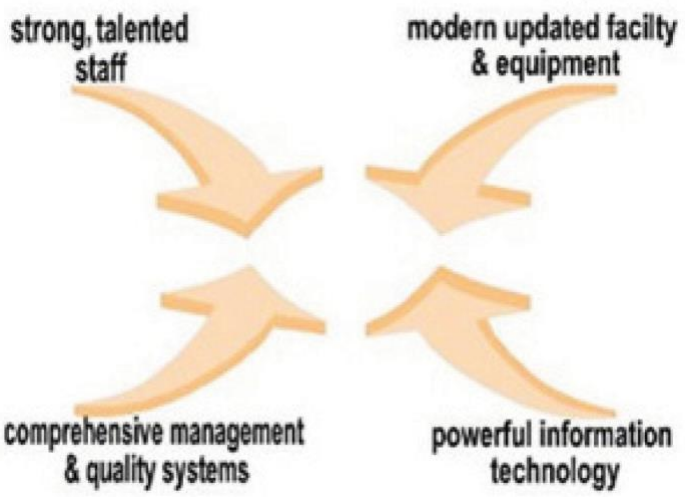
Our staff includes more than 500 professionals with wide-ranging scientific and technical expertise. Their experience has helped Alpha pioneer a number of innovative, cost-effective new procedures that have been widely adopted in the industry. Several of our staff members are acknowledged leaders in their fields, serving on various regulatory and oversight bodies that help formulate sound environmental policies.

Summary of Significant Equipment

GCMS	
Volatile Organics	21
Semi-Volatile Organics	20
GC	
ECD Detectors	15
FID	12
HPLC	1
FID / PID	4
EXTRACTIONS	
Soxhlets	140
Microwave Extractors	3
GENERAL CHEMISTRY	
TOC	3
TOX	1
Auto-Analyzers	3

Analytical Services

At Alpha Analytical, we offer experienced scientific and technical staff and a wide range of risk-based, compliance-based and specialty analyses. Our capabilities include analyses on environmental matrices such as wastewater, water supply, aqueous, soil and air.



TURN AROUND TIME (TAT)

Alpha Analytical is recognized for our high-capacity standard analytical capabilities, with the ability to process large projects quickly and routinely.

We are focused on getting you your data on time when you need it and when we commit it to you. A majority of our work is turned in 5 days, and in many instances less than that.

We know that quick turnarounds help our clients be more effective.

QUALITY

Alpha Analytical's quality philosophy that is second to none. We strive to do it right to ensure our clients the peace of mind in the accuracy and quality of their data. We will always be in a position to defend our analytical work and data.

VOLATILE ANALYSIS

Alpha performs analysis for volatile organic compounds (VOCs) in support of all major regulatory, engineering and industrial project applications. Analyses are performed utilizing state- of-the-art analytical instrumentation employing RCRA, CWA and SDWA methodologies.

All VOC data is acquired utilizing standard chromatography software. The data is then uploaded via the Alpha local area network to the laboratory information management system (LIMS) for additional processing and reporting.

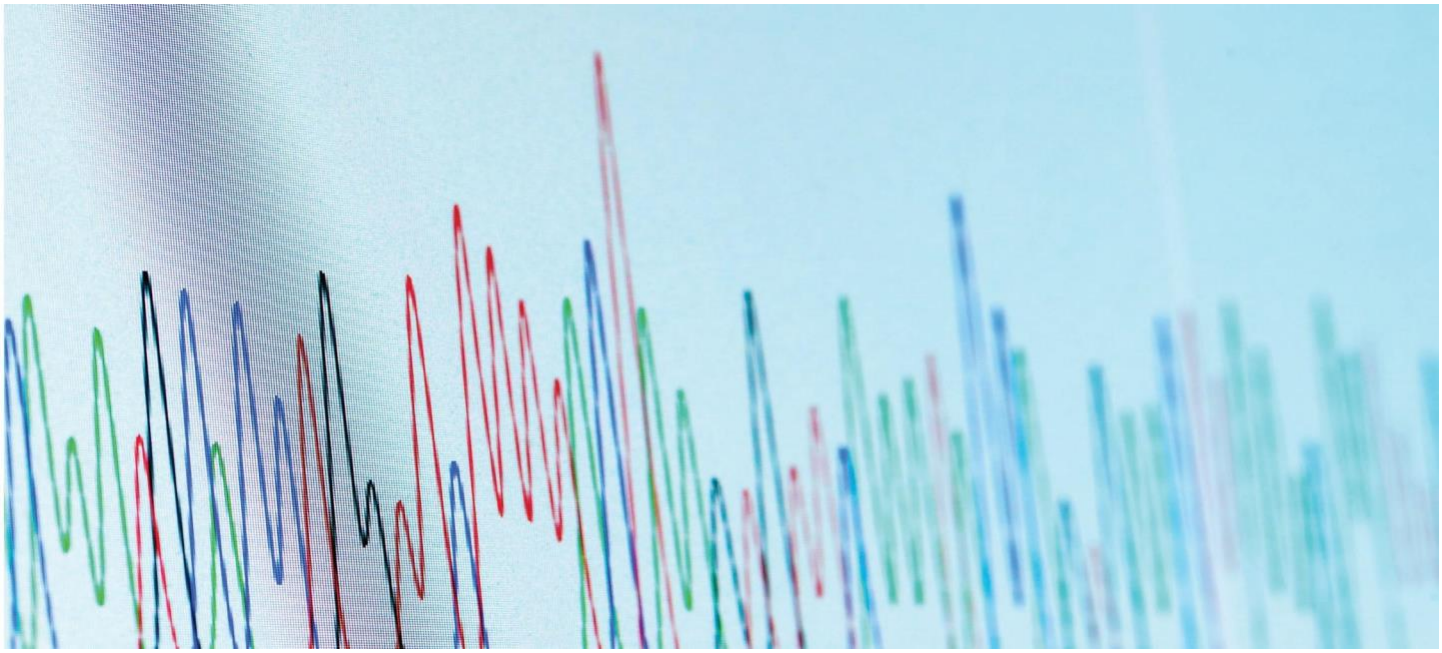
Alpha currently employs gas chromatographs/ mass spectrometers (GC/MS) for the analysis of VOCs by EPA methods 8260, 624 and 524.2.

Alpha also performs EPA method 8260 analysis for soils sampled under EPA 5035 requirements.
In fact, Alpha Analytical Labs was one of the first laboratories in New England to offer VOC analysis of soils by the low level, EPA 5035/8260 procedure.

Our laboratory has considerable experience with the sample collection, preservation and analytical
requirements associated with this method, as well as the high level, methanol preservation technique.

Alpha provides sampling syringes and containers, as well as five sampling SOPs and any associated training that is required.

Alpha has >20 gas chromatographs (GC) for various analyses including volatile petroleum hydrocarbons (VPH).



EXTRACTABLE ORGANIC ANALYSIS

Alpha performs a wide variety of extractable organics analysis. Many parameters, such as semi volatile or Acid/Base Neutral analysis, are performed by Gas Chromatograph/ Mass Spectrometer (GC/MS).

However, other analyses, such as PCBs Aroclors, Pesticides and Herbicides are performed by Gas Chromatograph (GC). All organics data is acquired utilizing standard chromatography software.

The data is then uploaded via the Alpha local area network to the laboratory information management system (LIMS) for additional processing and reporting.

Alpha currently utilizes GC/MS instruments for the semi volatile organic analysis of samples by EPA methods 8270. The instruments are also employed for low-level analysis of polynuclear aromatic hydrocarbons (PAH) by modified EPA Method 8270 – selected ion monitoring (SIM). This technique allows Alpha to achieve the required levels of detection for Massachusetts Contingency Plan GW-1 compliance or any other risk-based regulatory criteria.

Alpha offers extractable and volatile petroleum hydrocarbons (EPH/ VPH), extractable total petroleum hydrocarbons (ETPH), gasoline range and diesel range organics (GRO/ DRO), and TPH by GC-FID to characterize soil and water samples. The laboratory has used these procedures with great success on a countless number of projects. Alpha has been using and evaluating the EPH/VPH procedures since they were released in 1995 and has actively participated in the public comment process as well as both round robin method evaluations. Alpha has also been active in the EPH/ VPH Workgroup which was established by the MADEP to revise and improve the methods based on experience gained from working with the methods since they were released. Alpha has been issued a Record of Proficiency statement by the Massachusetts Department of Environmental Protection that states that the laboratory is competent to perform EPH and VPH analysis on both water and soil sample matrices.

WET CHEMISTRY

Alpha boasts one of the largest wet chemistry laboratory spaces in the region for conventional wet chemistry analysis. Alpha performs a wide variety of wet chemical parameters including RCRA characterization, nutrients, anions, demand series, minerals, and solids. Alpha utilizes auto-analyzers for the analysis of nitrate, nitrate nitrite, cyanide, ammonia-N, total Kjeldahl nitrogen and chloride. One of the Lachat instruments is also equipped with an ion chromatograph for anion analysis. Alpha's new total organic carbon (TOC) instrument, the Dohrmann Phoenix 8000 represents state of the art technology for the determination of low level TOC. Alpha can provide oil and grease analysis by EPA Method 1664. Alpha has considerable experience with cyanide analysis, ranging from the total & amenable cyanide procedures to determinations for reactive, free, physiologically available (PAC), and weak and dissociable cyanides.

PERCHLORATE ANALYSIS

Alpha Analytical offers the following methods for the analysis of Perchlorate: EPA Method 314.0, incorporating all USEPA and MADEP method requirements. Method 314.0 is an ion chromatographic method for which Alpha Analytical has a reporting limit of 1.0 ug/L in water and 40 ug/Kg in soil. Estimated concentrations can be reported to the method detection limit (MDL) of 0.20 ug/L for waters. Alpha Analytical is approved for perchlorate by the USEPA under the UCMR Program and by the MADEP for low-level drinking water analysis.

EPA Method 331.0 (SW846 6850) LC/MS/MS and EPA 332.0 (SW846 6860) IC/MS/MS for the determination of perchlorate in water and soil. Liquid Chromatography or Ion Chromatography coupled with MS/MS detection provides a technology that greatly increases the sensitivity of the analysis. Alpha has achieved reporting limits of 0.05 ug/ L in water and 0.5 ug/Kg in soil. This technology successfully removes interferences from other anions allowing for the identification of perchlorate in samples with conductivity levels greater than 30,000 µS/cm.

MICROBIOLOGICAL ANALYSIS

Alpha currently performs analysis for standard drinking water bacteria. We provide testing for total and fecal coliform by both the membrane filtration and multiple tube fermentation (MPN) methods.

We also employ Colilert® for the analysis of total coliform and E.Coli in drinking water. Alpha recognizes the logistical constraints associated with microbiological analyses and as such, employs a second shift to conduct all microbiological testing within the required holding times.

Vapor Intrusion assessments can be one of the most challenging environment assessments to perform. Every site is different and evaluating exposure pathways can be problematic. When performing these investigations decisions on analytical data collected can have both significant health and financial implications. Confidence in both sample collection and data quality are critical to the decision-making process. Alpha Analytical has built a reputation of industry leading media that consistently performs in the field, delivering data quality that meets stringent regulatory requirements, with standard 5-day turn around data delivery for you to successfully complete your Vapor Intrusion investigation.

Support Capabilities

WWW.ALPHALAB.COM

Alpha's interactive website is a valuable resource for our clients. The site provides customer service and technical support functions as well as online project status and electronic data deliverable capability.

Sample containers and/or sample couriers can be ordered via the website, as well as generalized cost quotations. Laboratory data can also be viewed or downloaded directly from the site by using the optional Alpha Data Exchange (ADEx) service. The website is the online source of environmental laboratory technical support, reference materials, frequently asked questions and links to other important websites of environmental interest.

ALPHA DATA EXCHANGE (ADEx)

Alpha also has sophisticated electronic data deliverable capabilities. Using Alpha Data Exchange (ADEx), our online electronic deliverable service, allows you to check project status and download your data directly from our web site (www.alphalab.com) in a variety of formats including Excel, GIS Key, EquIS, and an Adobe Acrobat PDF file format
of our summary report. These electronic data formats are automatically generated with no manual data entry or manipulation, which can dramatically minimize your office's data reduction and reporting level of effort with a zero tolerance for transcription errors.

ADEx clients have access to their data 24 x 7 via their firm's password protected ADEx account. Laboratory reports and electronic deliverable files are available to our clients via our website as soon as they are finalized (access is through
a password and downloaded directly into client pre-specified report formats). Laboratory reports and data files are available online for a minimum of three years after they are generated. All client laboratory report files are archived for a period of ten years after report generation.

In addition, Alpha has developed new Excel "Criteria Checker" formats for Massachusetts MCP, Connecticut RSR and New York STARS regulatory standards that automatically highlight and summarize results that exceed the applicable criteria. Our website can also be used to order sample containers, schedule a pick up, request a quote as well as a source for additional information.

INFORMATION MANAGEMENT

The key to the seamless transmission of data at Alpha Analytical Labs is our Laboratory Information Management System or LIMS. Alpha is currently using a third generation LIMS system, taking advantage of a client/server technology and an Oracle database. The new LIMS system takes data entry and reporting to new levels of accuracy and productivity. Alpha's LIMS is completely compliant with the EPA's Good Automated Laboratory Procedures (GALP).

The LIMS eliminates the manual data entry issue, by downloading the data, including QC results, directly from the instrument for over 90% of the lab. Upon review and approval by analysts and managers, the data is directly downloaded, including calculations, into the database. This automated data acquisition capability eliminates transcription errors and allows for complete electronic central storage of raw data, calculations and results.

ELECTRONIC DELIVERABLES

Electronic data deliverable (EDD) formats can be generated automatically by the LIMS with no manual intervention. This allows the data files to be prepared with no additional special handling, which greatly reduces the potential for transcription errors and non-agreement between electronic and hardcopy reporting. Alpha offers a wide array of standard EDD formats that are available as standard reporting options.

- Certificate of Analysis
- Excel Spreadsheets
- ASCII, Quote Comma Delimited
- Data Management Formats
  - GIS-Key™
  - EQUiS™
  - Envirodata™
  - ERPIMS (AFCEE)
- "Criteria Checker"
  - MCP Method 1 standards
  - MCP Reportable Concentration standards
  - Rhode Island regulatory criteria
  - New Hampshire Method 1 standards
  - Vermont Water Limits

Of particular interest are Alpha's Data Management and "Criteria Checker" formats. Regarding the data management formats, Alpha has the standard file formats online for each product. However, many clients customize their databases with user defined fields (i.e., water levels, temperature, etc.) and Alpha can generate these custom formats as well, as long as an example file is provided as a reference.

Alpha's "Criteria Checker" formats are Excel workbooks with the data arranged in typical spreadsheet format with samples listed across the top in columns and the analytical parameters down the side in rows. The first column contains the regulatory standards. The "Criteria Checker" automatically bolds and highlights any result that exceeds the regulatory standard. Any reporting limit that exceeds the regulatory standard is highlighted in a different color. There is also a Summary Spreadsheet that only lists the parameters, result or reporting limit, that exceeded any particular regulatory standard.

PROJECT MANAGEMENT

We strive to first understand our clients' needs and then expand our services accordingly. To that end, we have developed tools that help our clients be more efficient in everyday tasks associated with project planning, sample collection and report preparation. The services we currently offer are aimed at providing clients with a project manager that will serve as a single point of contact to quickly respond to work requests, review requirements for projects, submit daily sample receipt confirmations, schedule couriers & samplers, maintain lab schedules, ensure technical requirements are met, provide technical guidance and ensure data is reported timely and accurately.

HEALTH & SAFETY

This site is comprised of a series of specific analytical testing laboratories, support facilities and managerial offices. This facility is designed to promote a safe working environment that reduces potential chemical, biological and physical risks.

Alpha Analytical's Safety and HazMat Committee recognize the importance of providing all employees, visitors and contractors with a safe and healthy work environment. To meet this end, we require everyone at this facility to adhere to the following principles:

- Safety: We maintain a safe workplace and we plan our work and perform it safely. We take responsibility for the safety of ourselves, co-workers and visitors.
- Compliance: We meet or exceed local, state and federal health and safety rules and regulations as well as Alpha Analytical's internal health and safety guidelines and expectations.
- Risk Management: We incorporate the practice of hazard identification, risk assessment and risk control into all aspects of our operations.
- Accountability: All levels of management and every employee are accountable for carrying out health and safety responsibilities and for maintaining a safe and healthy workplace.
- Continual Improvement: Alpha Analytical's Safety and HazMat Committee is committed to continually improving the performance of our systems and processes.

We believe that enhancing this performance will lead to a safer workplace for Alpha Analytical's employees, contractors and visitors including choosing the right methods and reporting limits, identifying specific project requirements and communicating these requirements to the operations staff. This team approach ensures your project will be done to your specifications.

SAMPLE CONTAINERS

Sample containers are provided by Alpha as a complementary service to our clients. The containers are provided pre-labeled for each specific analysis and segregated by sample ID as requested by our clients. If the analysis requires that the sample be preserved, as with soils in methanol for volatile organic analysis, or metals in water with acid, Alpha supplies the containers with the proper preservative(s). By pre-labeling the containers, Alpha eliminates the guesswork in the field as to which container is required. In addition, the labels are of a specific manufacture such that they can be written on (in pencil) even when wet and the labels are guaranteed not come off in water.

Typically, we request 24-hour notification of sample container requests, particularly for large sampling projects. This gives Alpha the opportunity to work with our clients to make sure the correct containers are supplied as well as to confirm the amount of field QC samples required and supply those containers. Sample containers can also be ordered online 24hours/ day via our website. The online menu steps clients through the ordering process by requesting information concerning the number of samples required, the matrix, the analyses required, and the number and type of field QC samples needed.

SAMPLE STORAGE / DISPOSAL

As a service to our clients, Alpha typically stores samples for 21 days after the report is sent to the client. Arrangements can be made in advance for storage periods of up to six months, if required. In addition, Alpha is responsible for the disposal of samples, extracts and digestates according to the appropriate regulatory requirements based on the analysis just completed and extract/digestate chemicals involved in the analysis.

This service is offered at no charge to our clients. If, however, a client would like to have the raw sample returned, arrangements can be made to have the sample returned via the appropriate commercial carrier with the correct packaging for that sample(s).

Alpha has a comprehensive chemical safety and hygiene program including a SOP for the disposal of samples and waste.

COURIER SERVICE

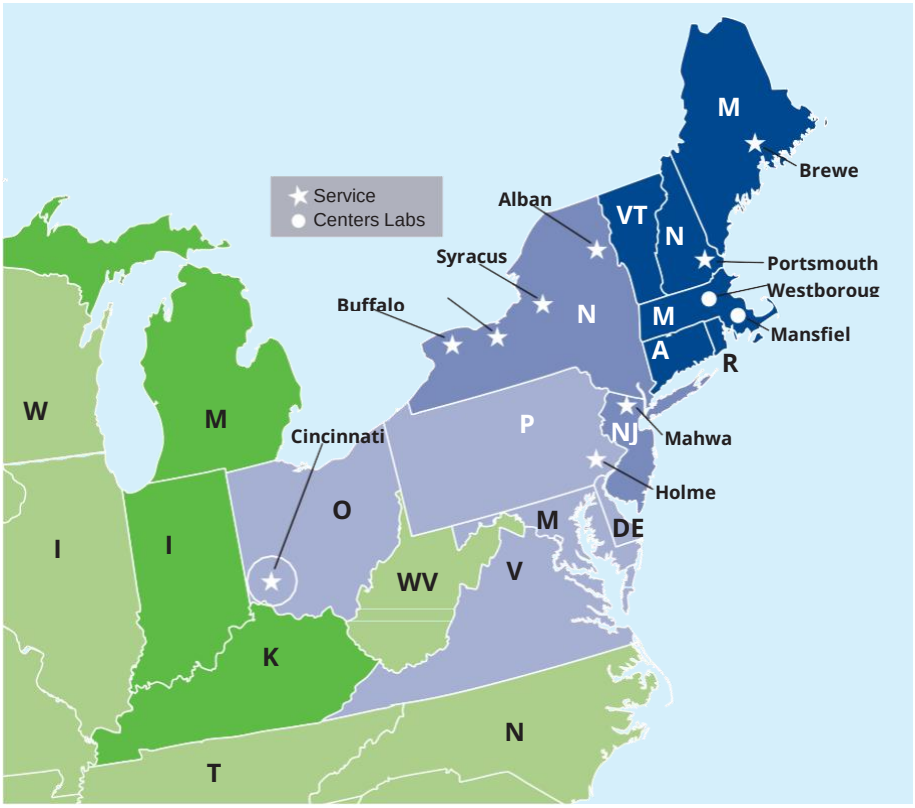
It takes proper planning and a commitment to on-going technological investments to build the best laboratory courier service in the country. Our fleet of 80+ fuel efficient vehicles coupled with a GPS tracking management system, represents the Alpha Analytical standard of providing you with the highest quality in services and attention.

Alpha Analytical's sophisticated sample management system along with our professional logistical team has the ability to schedule and track sample container requests and sample pick-ups/drop offs.

We know at all times where your samples are located and how we can best respond to your needs.

- Real-time GPS Vehicle Location
- Technically Trained Courier Staff
- Faster Response Time
- Increased Productivity
- Reliable Scheduling
- Peace Of Mind

Alpha Analytical's Service Center locations and current courier network.



Alpha Analytical Service Center Locations - (indicated with star)

Brewer, ME | Portsmouth, NH | Mahwah, NJ | Albany, NY | Buffalo, NY | Syracuse, NY | Rochester, NY | Holmes, PA Cincinnati, OH

Alpha Analytical Laboratory Locations - (indicated with circle)

Westborough and Mansfield, MA

Quality Assurance Program

The Quality Systems Manual (QSM) of Alpha Analytical describes the quality program in use at the laboratory. This Quality Manual provides employees, clients and accrediting agencies with the necessary information to become familiar with how the quality system operates within Alpha Analytical.

The quality program includes quality assurance, quality control, and the laboratory systems including feedback mechanisms for the automated continuous improvement of the laboratory operations to meet client needs.
Implementation of the laboratory operations is by documenting procedures, training personnel and reviewing operations for improvement. Written procedures are maintained as Standard Operating Procedures (SOPs). The SOPs are available to the staff using QualTrax, our document management system. The provisions of the QSM are binding on all temporary and permanent personnel assigned responsibilities. All laboratory personnel must adhere strictly to the QSM and SOP's. The QSM sections provide overview descriptions of objectives, policies, services, operations and the program defined by the laboratory for quality assurance and quality control activities.

The QSM describes the requirements of the laboratory to demonstrate competency in the operations for performing environmental tests for inorganic, organic, and microbiological testing. The basis for the environmental tests is the methods found in documents published by the United States Environmental Protection Agency (EPA), ASTM, AOAC, APHA/AWWA/WEF and other procedures and techniques supplied by clients.

QUALITY CONTROL

The following general quality control principles apply to all procedures performed at Alpha Analytical.

The manner implemented is dependent on the type of test performed. The laboratory SOP presents the specific quality control checks undertaken for assuring precision, accuracy and sensitivity of each test method.

All quality control measures are assessed and evaluated on an ongoing basis, and quality control acceptance limits are used to determine the usability of the data. Control charts monitor the long-term method performance by analyte, by instrument for water matrices. Routine evaluation and reporting of the control chart performance provides supervisors and management with additional performance measures to ensure data comparability. Control limits are recalculated when trends are observed or at least once per year.

The laboratory specifies in the SOP the acceptance/rejection criteria where no reference method or regulatory criteria exist. The test SOP specifies the QC samples performed per batch of samples. The quality control samples are categorized into the following:

- Method Blank
- Laboratory Duplicate
- Laboratory Control Sample
- Matrix Spike (MS)
- Matrix Spike Duplicate

SYSTEM AUDIT

Laboratory audits, both internal and external, review and examine the operations performed in the laboratory. Internal audits are self-reviews and external audits are reviews by external organizations to evaluate the ability of the laboratory to meet regulatory or project requirements. The QA Officer schedules internal process audits to assure the completion of the annual audit of each operational area.

The process audits are a more detailed review of the operations. Representatives sent by clients and government or accrediting agencies often perform external audits. These audits are most often announced inspections, but sometimes are not announced. The Quality Assurance Officer accompanies the external audit team through the laboratory. The auditors receive a brief overview of company objectives, activities, and facilities. Interviews with essential supervisory staff and technical staff are arranged, along with retrieval of any documentation pertinent to
the audit. Auditors usually provide a report on their findings shortly after the audit. The QA Officer receives the audit report. The QA Officer completes nonconformance action forms in response to any cited deficiencies.

PERFORMANCE AUDIT

Alpha Analytical participates in interlaboratory comparisons and proficiency test programs required by clients and certifying agencies. In addition, the laboratory participates in third party double-blind performance evaluation programs. The performance audits provide information on the data comparability of results generated by the laboratory. Test samples received by the laboratory are handled following routine laboratory procedures. Analysts demonstrate proficiency by analyzing an external proficiency test sample or an internally prepared blind test sample.

CORRECTIVE ACTIONS

The corrective action program at Alpha Analytical uses the Non-conformance Report form to document and follow through the corrective action process. The mechanism for recording, reviewing and acting upon all quality problems is self-explanatory as the form is completed. The process ensures continuous improvement of company performance by preventing the recurrence of quality problems.

EXPERIENCES

Alpha Analytical is operated as a full service, environmental analytical support laboratory. Our staff is very experienced with the engineering and risk assessment applications of environmental data. The laboratory routinely coordinates and adapts its services to meet each client's individual application needs. Laboratory senior staff are available to work together with project staff on all aspects of the project's data collection requirements—planning and logistics, sampling and analysis methodologies, data quality objectives, data interpretation and quality assurance. This unique, team approach allows the sampling and analysis component to be completely integrated into the project as a whole, which assures that the work will be performed correctly and efficiently.

The laboratory has a wide range of experience working for a diverse group of clients in the areas of drinking water, wastewater and hazardous or solid waste projects. Laboratory clients include major industrial/ commercial facilities and governmental agencies, as well as environmental and geotechnical engineering firms. Laboratory services range from the analysis of conventional water quality parameters to the determination of a full spectrum of priority pollutants and other contaminants of concern in water, soil, and wastes.

PERFORMANCE EVALUATION PROGRAMS

We participate in multiple Water Pollution (WP) Underground Storage Tank (UST) and Soil Proficiency Test Evaluations as well as NIST sponsored intercalibration laboratory comparison studies each year. We achieved National Environmental Laboratory Accreditation Conference (NELAC) accreditation in 2001.

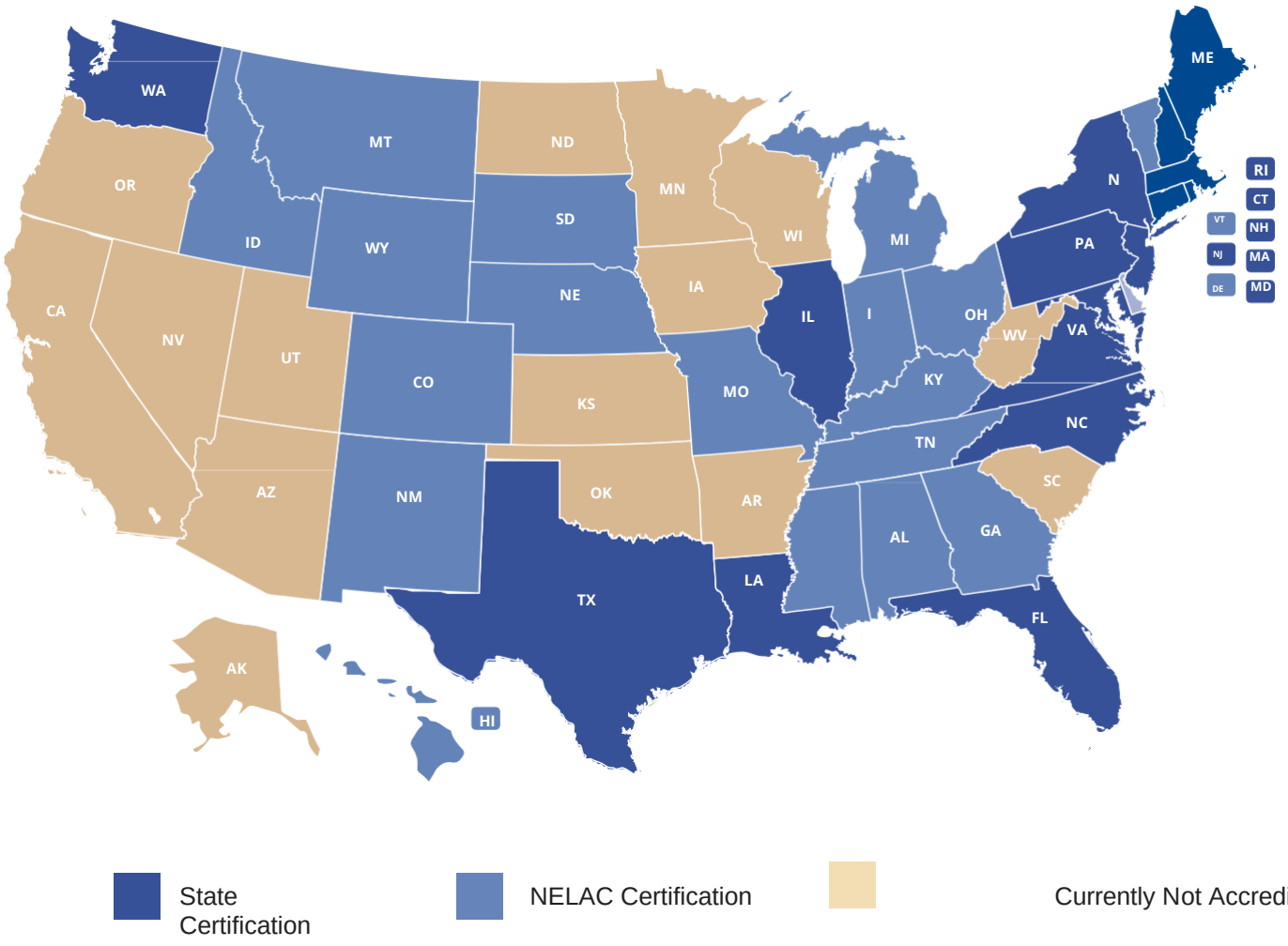
In 1997, we participated in the Massachusetts VPH/EPH Method Round Robin and received a Record of Proficiency for all four categories of VPH/EPH from the Massachusetts Department of Environmental Protection (MADEP).

Laboratory Certifications

We maintain certifications in many states, including but not limited to the states listed below:

- Massachusetts DEP
- State of Maine DES
- Connecticut DOH
- Pennsylvania DEP
- Louisiana DEQ
- Illinois DEP
- New Hampshire DES
- Maryland DEP
- New Jersey DEP
- Florida DEP
- New York DOH
- Texas DOH
- Rhode Island DOH
- Virginia DEP
- Ohio VAP

For an up to date and complete listing of Alpha Analytical's certifications, please visit, www.alphalab.com.



Representative Experiences

COAL GASIFICATION SITE CHARACTERIZATION

Legacies of the “gaslight era”, former manufactured gas plant (MGP) sites have a unique chemical contamination signature and, as they were often located along water-ways in urban areas, can present a significant challenge to remediation. Alpha has a wide array of capabilities applicable to MGP residuals; however, we wish to highlight these specific procedures which can be used to determine the concentration of contaminants of concern that could be considered bioavailable.

PAH ANALYSIS OF SEDIMENT PORE WATER BY SPME GC/MS MIS

Total PAH concentrations in sediment are generally recognized in the literature to be poor predictors of benthic invertebrate toxicity.

Pore water analysis would provide a better indication, however the direct measurement of PAH concentrations in pore water has traditionally been very challenging.

ASTM Method D7363, “Determination of Parent and Alkyl Polycyclic Aromatics in Sediment Pore Water Using Solid- Phase Microextraction and Gas Chromatography/ Mass Spectrometry in Selected Ion Monitoring Mode” is
a viable option in that only minimal pore water volume is required for an aliquot to be obtained under representative conditions from a small amount of sediment. Other advantages of this analytical procedure are:

- Direct analysis of pore water for parent and alkylated PAH
- Can be used to predict benthic invertebrate toxicity
- High sensitivity with reporting limits as low as 0.06 ug/L

BLACK CARBON

It has been shown that organic carbon can influence the bioavailability of PAHs, with the anthropogenic black carbon being an important fraction of the total. Alpha can perform Black carbon determinations as part of our routine sediment characterization suite of methodologies used.

FREE CYANIDE ANALYSIS by MICRODIFFUSION PREPARATION / SPECTROPHOTOMETRY

The cyanide chemistry associated with MGP residuals in the environment is of particular interest because a wide range of cyanide species can be present, and there can be a significant difference in toxicity observed among the species. The application of risk- based approaches to characterizing cyanide requires reliable analytical procedures that can delineate the cyanide species into categories associated with their relative toxicities.

Alpha offers Method 9016 for the analysis of free cyanide, which provides the selectivity required to isolate and quantify the most toxic cyanide species, which is also generally the lowest percentage of the total cyanides present. In addition, Alpha can also perform the Physiologically Available Cyanide method, which is a modification of the total cyanide methodology to allow for the determination of free cyanide and weakly complexed cyanide species up to, but not including the iron cyanide complexes.

Alpha Analytical has considerable qualifications and experience working on site characterization and remediation projects involving former MGP operations where the chemical analysis of aqueous, sediment, soil, and air/ soil gas samples, as well as free product is required. We have the technical knowledge and experience required to generate the best possible results from difficult sample matrices and potentially highly contaminated samples.

TRANSPORTATION

Alpha is also very experienced with transportation projects, ranging from right-of-way clearance and fuel depot remediation to the characterization of highway sweeping materials.

POWER COMPANY PROJECTS

Alpha is experienced with the unique analytical services of interest to utility companies. Alpha has the experience to analyze for dielectric fluids and cable oils in the presence of other interfering hydrocarbon
products, which could be potentially present in an urban environment.

Also, Alpha has considerable experience with the analysis of transformers and other refined oils for PCBs.

SOLID WASTE LANDFILLS

Alpha provides analytical testing services to communities and commercial operators directly as well as through engineering firm project managers for groundwater monitoring programs at active and closed solid waste landfill facilities. Alpha Analytical's staff is familiar with applicable regulations (e.g., 310 CMR 19.132), required methods and data quality objectives associated with the monitoring of groundwater, surface waters, seeps and leachates from landfills.

For a large commercial solid waste landfill, Alpha played a crucial role in the investigation of the production
of acetone from landfill cover material consisting of composited paper pulp material. Alpha also has experience with incinerator waste ash analysis and toxicity testing for disposal. The laboratory is also
experienced with the data deliverable requirements of most data management software programs commonly used for solid waste applications.

PUBLIC WATER SUPPLY MONITORING

Alpha also provides testing services to engineering and consulting firms in their work with various water supplies. These services include testing of raw and finished waters using EPA methods in accordance with primacy state regulations and the reporting of results in the required state format.

WASTEWATER DISCHARGE PERMITS

Alpha Analytical has considerable experience with wastewater analysis and provides regular testing services in support of NPDES permit regulatory requirements.

Testing includes metals, organics and general chemistry parameters. Alpha Analytical also provides services to MWRA permit holders in support of their monitoring requirements.

Alpha is by far the largest provider of testing services for MWRA permit- related applications and our staff is
very familiar with sample collection procedures, method requirements and reporting (via MWRA SMART soft- ware) of data to the Authority.

Alpha has several on-going projects for large manufacturing and healthcare facilities related to the point source identification and minimization of regulated chemical discharges.

MANUFACTURING FACILITIES

Alpha Analytical has considerable experience providing analytical services to manufacturing facilities in general.

Analytical testing of products as well as waste streams for conventional, as well as non-conventional, parameters are routinely conducted. For producers of dairy products, gelatins, soaps and detergents in support of wastewater discharge limitation studies, Alpha analyzed samples where high levels of fats, oil & grease (FOG) as well as oxygen demand (BOD/COD) and TSS were primary concerns.

Project Profiles

Client/Contact	Project Description
Private Client	Alpha was selected for a large Superfund site in Massachusetts to perform volatiles, metals and wet chemistry parameters under a site-specific Quality Assurance Project Plan. The project involved several environmental consultants and was sampled weekly for close to a year generating over $200,000 of testing. Turnaround time was 5 business days for most work with a full CLP-like deliverable following in 3-5 days. Project also involved method development for specific treatment issues that surfaced during the treatment phase.
Federal Contract	A six-year contract was awarded to Alpha in 2006 to perform work at the Massachusetts Military Reservation (MMR) for a remediation phase involving testing for explosives and perchlorates. Over $600,000 analytical work has been processed against strict QA/QC criteria with full CLP-like data packages generated.
Major Railroad Yard Site Characterization and Remediation	Beginning in early 2010 and continuing to the present, Alpha Analytical processed a considerable amount of soil and groundwater samples in support of this project. Parameters included volatile organics, semi volatile organics, pesticides, PCBs, and metals as well as the MassDEP procedures extractable petroleum hydrocarbons (EPH), volatile petroleum hydrocarbons (VPH) and physiologically available cyanide. All analyses were conducted and reported in strict accordance with the Massachusetts Contingency Plan's Compendium of Analytical Methods (CAM). Alpha provided on call rush analyses as well as Saturday/Sunday sample receiving and pickups on an as needed basis. Also, although soil samples were originally submitted for total metals only, Alpha was requested to per- form hexavalent chromium analysis on any sample where the total chromium concentration exceeded the trigger value. In accordance with the CAM, Alpha must analyze all total metal soil samples for pH and oxidation reduction potential within 24 hours if there is the potential for subsequent hexavalent chromium analysis. This requirement caused additional logistical demands on the project team, specifically regarding the weekend work, which was successfully achieved. Signed chain of custodies and sample submittal receipts consisting of a summary listing of samples received and parameters logged in for analysis were sent the following morning for each sample submittal. All data was automatically incorporated into the client's Alpha Data Exchange (ADEx) account which allowed for on-going project status checks and the ability to download data in a wide variety of additional formats. The ADEx deliverable included the "Data Merger" tool, which has the capability to group multiple lab- oratory reports into one electronic file, and the "Criteria Checker" format which automatically summarizes and compares the data to up to 5 sets of the applicable regulatory criteria.

Client/Contact	Project Description
Former Industrial Facility Site Assessment	Beginning in 2007 and continuing to the present, Alpha analyzed soil, groundwater, sediments, porewater, and tissue samples worth approximately $700,000 to date in support of this site characterization, ecological risk assessment and remediation support project. Parameters included volatile organics, semi-volatile organics, low level PAHs, pesticides, PCBs, and metals as well as a wide variety of water quality parameters. Specialized testing was also performed on brackish water samples analyzed for metals which utilized chelation extraction and arsenic / selenium analysis by gaseous hydride ICP/MS. Silica gel, florisil and gel permeation chromatography clean ups were also employed for particularly challenging sediment and tissue sample matrices analyzed for trace organics. Additional logistical support was also provided to facilitate sample pickups in that the project site was in an extremely remote area that was not always conducive to shipping given hold time constraints. Signed chain of custodies and sample submittal receipts consisting of a summary listing of samples received and parameters logged in for analysis were sent the following morning for each sample submittal. Complete CLP-like data deliverables were provided for all sample analyses. All data was automatically incorporated into the client's Alpha Data Exchange (ADEx) account which allowed for on-going project status checks and the ability to download data in a wide variety of additional formats. The ADEx deliverable included the "Data Merger" tool, which has the capability to group multiple laboratory reports into one electronic file, and the "Criteria Checker" format which automatically summarizes and compares the data to up to 5 sets of the applicable regulatory criteria.
Active Industrial Facility Site Assessment and Remediation	Beginning in 2005 and continuing to the present, Alpha analyzed soil and groundwater samples worth approximately $850,000 in support of this site characterization and remediation support project. Parameters included volatile organics, semi volatile organics, low level PAHs, pesticides, PCBs, metals, TCLP, and SPLP as well as explosives, per- chlorate and additional metals not commonly analyzed for. All analyses were conducted and reported in strict accordance with the state of Connecticut's Reasonable Confidence Protocols. Project was characterized by the need for reporting limits to meet stringent, project specific action levels that required the need for additional method development to modify standard procedures.
Environmental Consultant	Performed volatile organic analysis for fortune 500 specialty gas company on quarterly basis at multiple sites throughout New Jersey.
Environmental Consultant	Performed extensive amount of analytical in support of site investigation at a municipal airport in New Jersey. Suite of analyses included volatiles, semi volatiles, metals and various hydrocarbon analyses.
Environmental Consultant	Real Estate Site Development in Long Island, NY - Alpha Analytical supported a full-scale site investigation, remediation end point sampling, insituwaste characterization and vapor point monitoring for soil vapor extraction systems. Project requirements included 24-hour turn around to meet disposal waste hauling schedule and development timelines.

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