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Via Email brian.jankauskas@dec.ny.gov and Regular Mail

February 5, 2019

Mr. Brian Jankauskas

New York State Department of Environmental Conservation

Division of Enviromental Remediation Remedial Bureau A

625 Broadway 12th Floor

Floor Albany NY 12233-1015

RE: Hampton Bays Fire District Remedial Investigation Work Plan Site 152249- Submission of Revised Work Plan and Supporting Documents

Dear Mr. Jankauskas:

As you know, I am general counsel for the Hampton Bays Fire District. Mr. Zeb Youngman will be presenting the revised Remedial Investigation Work Plan and supporting documents in accordance with your most recent request.

In making those revisions he has deleted certain portions which you indicated were of a legal nature stating the Districts position but indicated that could be set forth in a covering letter to accompany the submissions. This letter is presented for that purpose and we request it also be placed on file with all other materials placed in the public repository (library) for inspection.

The Hampton Bays Fire District and its Board of Fire Commissioners remain fully committed to completing the current investigation in the best interests of every resident of the Hampton Bays Fire District and to performing any further work or remediation that may be required for the health ,safety and well -being of all residents and members of the public. That said it is vital to understand that since the cause and extent of groundwater impact onsite has not been fully delineated, The District and its Board of Fire Commissioners full recognize that it may be necessary to perform offsite sampling to complete the next phase which is the Remedial

Investigation. It is undisputed that following the Fire Districts full compliance with the mandatory requirements of the Department of Environmental Conservation regarding initial sampling and testing, and site evaluation, that the source(s) of any groundwater impact have not yet been finally determined.

It is equally clear that up to this point that there has been no requirement imposed upon the Fire District by the Department of Environmental Conservation, or any other agency, to perform offsite sampling and testing of groundwater. It is now anticipated that offsite testing will likely be required as part of the next phase of the investigation .The Fire District has been directed to prepare and go forward with a Remedial Investigation and Feasibility Study which is now presented and set forth in the accompanying plan document and will do so upon approval of this plan by the Department of Environmental Conservation, and in accordance with the plan, and the further directives of the Department of Environmental Conservation.

The need and results of any offsite groundwater sampling will relate to the onsite soil and groundwater data obtained during the Remedial Investigation. However, it is anticipated that all down gradient water quality data to date from the SCDHS investigation and the Hampton Bays Water District and private wells all in proximity to the Fire District site will be reviewed as well. In the event that the Remedial Investigation identifies significant soil and/or groundwater impact on site, the DEC has advised that offsite groundwater sampling is even more important and required to fully assess the extent of impact. In the event offsite sampling is required of the Fire District, it is expected that, in accordance with recognized procedures, the Department of Environmental Conservation will assist the Fire District if and as needed to secure access agreements from the owners of any offsite premises to be involved permitting Fire District access to those premises for the offsite sampling.

If this is the case, it is presently expected that two additional offsite vertical profile wells will be installed down gradient of the Fire District site, on the south side of the LIRR Tracks and Road D. If required, the exact placement of these vertical profile wells will be determined based upon onsite soil and groundwater results and in accordance with the directives of the DEC. Offsite well installation and sampling procedures and methodologies will be performed in accordance to those of the onsite wells.

My client shall await DEC approval of the accompanying Remedial Investigation Work Plan and Feasibility study and supporting documents, and direction to proceed with the next phase of the investigation and evaluation , and thank you for your time and consideration,

Respectfully yours,

Stanley E. Orzechowski

SEO/sr

Cc: Board of Fire Commissioners, Hampton Bays Fire District

HAMPTON BAYS FIRE DISTRICT SITE
69 WEST MONTAUK HIGHWAY
HAMPTON BAYS, NY
DEC SITE: #152249

REMEDIAL INVESTIGATION WORK PLAN

Submitted To:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233-7016

Prepared For:

Hampton Bays Fire District
69 West Montauk Highway
Hampton Bays, NY 11946

Prepared By:

ZEB Environmental Solutions, Inc.
188 West Montauk Highway, Suite E-6
Hampton Bays, New York 11946
Phone: 631-594-5300

FEBRUARY 4, 2019

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Certification

I, Zeb Youngman, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Report [Remedial Investigation Work Plan] was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

1.0 Introduction and Purpose

The Hampton Bays Fire District Site is located at 69 West Montauk Highway in Hampton Bays, New York (**Figure 1**). The Site has recently been identified as a potential source of perflourinated compounds (PFCs) by the New York State Department of Environmental Conservation (NYSDEC).

The purpose of this work plan is to detail the scope of the proposed Remedial Investigation (RI). The RI will obtain additional soil and groundwater quality data that will aid in selecting an appropriate remedy for the Site.

The scope of the RI includes:

- Obtaining information from the Suffolk County Department of Health Services regarding private wells (location and quality) in the vicinity site;
- Sampling of additional stormwater drywells/leaching cesspools to determine if a source of PFC contamination exists in these areas.
- Collection of soil samples in the unpaved area to the south of the maintenance building to evaluate soil quality and to determine if a source of PFC contamination exists in this area.
- Installation of vertical profile/groundwater monitoring wells and the collection of groundwater samples to evaluate groundwater quality, to further delineate the extent of PFC impacts, and to confirm groundwater flow direction.
- Preparation of a Remedial Investigation (RI) report.

2.0 Site Description and History

Past sampling and remediation activities at the site have determined that elevated concentrations of PFCs are present in the groundwater at the southern portion of the property. The extent and source of the contamination has not been thoroughly delineated.

2.1 Site Description

The Hampton Bays Fire District property is 2.07 acres in size and is located on the south side of Montauk Highway, east of Springville Road. A vicinity map showing the location of the Fire District property is contained as **Figure 1**. The property contains two main buildings, which are used by the Fire District. A site plan is included as **Figure 2**.

The two-story firehouse building was constructed in 1930 and additions to the east and west sides were completed in 1967 and 1983. The first floor of this building is used to store fire trucks and fire equipment, and also contains a laundry room. The second floor is used as office and recreational space. No aqueous film forming foam (AFFF) is stored in this building. There is also one floor drain in this building, which appears to discharge to the subsurface. This building is connected to a sanitary system, comprised of septic tank(s) and multiple leaching cesspools located on the south side of the building.

The one-story steel framed building was constructed in 1993 and is utilized as a maintenance building. This building is used to store ancillary fire equipment and vehicles along with AFFF. Currently, 16 5-gallon containers of AFFF are stored on a pallet in the northwestern portion of the building. These containers are full and unopened. Most containers have a date of 2008. This building contains a sanitary system consisting of a septic tank and a leaching cesspool located on the west side of the building.

Small wooden structures exist on the western property boundary. These structures do not have permanent foundations and are utilized as concession stands during community events. These structures contain sinks that are connected to the sanitary system associated with the main firehouse building.

All buildings on the Fire District property are supplied with potable water by the Hampton Bays Water District.

2.2 Site History

This property has been utilized as a fire house since 1930. In 2018 the Hampton Bays Fire District completed a Subsurface Investigation to determine if perfluorinated

compounds (PFCs) are present in the subsurface at the site and to determine whether this site is a contributing source of PFCs detected in down gradient public supply wells.

This Investigation has been undertaken pursuant to the New York State Department of Environmental Conservation (NYSDEC) Order on Consent, dated November 9, 2017 and included:

- storm drain/sanitary system evaluation and sampling;
- vertical profile groundwater sampling;

Results of the investigation did not identify elevated concentrations of PFCs in the storm drain/sanitary system samples collected. However, elevated concentrations were detected in the shallow vertical profile wells (VP-5 and VP-6) located at the southeast property boundary. The data from this investigation is summarized on **Figures 3** and **4** and a complete copy of the Subsurface Investigation Report is contained in **Appendix A**.

2.3 Regional/Site Hydrology

The geologic setting of Long Island is well documented and consists of crystalline bedrock composed of schist and gneiss overlain by layers of unconsolidated deposits. Immediately overlying the bedrock is the Raritan Formation, consisting of the Lloyd sand confined by the Raritan Clay Member. The Lloyd sand is an aquifer and consists of discontinuous layers of gravel, sand, sandy and silty clay, and solid clay. The Raritan Clay is solid and silty clay with: few lenses of sand and gravel; abundant lignite and pyrite; and gray, red or white in color.

Above the Raritan Clay lies the Magothy Formation. The Magothy Aquifer consists of layers of fine to coarse sand of moderate to high permeability, with inter-bedded lenses of silt and clay of low permeability resulting in areas of preferential horizontal flow. Therefore, this aquifer generally becomes more confined with depth. The Upper Glacial Aquifer overlies the Magothy Aquifer. The Upper Glacial Aquifer is the water table aquifer at this location and is comprised of medium to coarse sand and gravel with occasional thin lenses of fine sand and brown clay. This aquifer extends from the land surface to the top of the Magothy and, therefore, is hydraulically connected to the Magothy Aquifer.

Based on information gained as part of this RI, the depth to groundwater is approximately 38 feet below the surface in northern portions of the site and 46 feet below the surface in the southern areas. Groundwater flow beneath the site is generally to the south-southwest.

2.4 Current and Future Site Use

The site is currently utilized as a fire department and has been since 1930. The property will continue to operate as a fire department, with no immediate plans for expansion.

2.4.1 Surrounding Site Uses

The Site is bordered by Montauk Highway followed by an undeveloped parcel of land to the north, commercial retail storefronts to the east and west, Good Ground Road followed by Long Island Railroad property to the south.

3.0 Standards, Criteria, and Guidance (SCGs)

The contaminants of potential concern (COPCs) include perfluoronated compounds (PFCs) and have been identified based on previous sampling activities:

Title 6 NYCRR Part 375 and TOGS 1.1.1 do not provide soil cleanup objectives or groundwater standards for PFCs. However, the USEPA has established a health advisory of 70 parts per trillion for drinking water. The NYSDEC currently utilizes the 70ppt Health Advisory Level as a guidance level for groundwater. Analytical data obtained as part of this RI/FS will be compared to background concentrations and the USEPA health advisory for PFCs in groundwater.

4.0 Objectives, Scope, and Rationale

The objective of this investigation is to determine the presence of a source of PFC contamination at the site and to fully characterize the extent of PFC impacts to groundwater beneath the site.

The scope of the project includes:

- Obtaining information from the Suffolk County Department of Health Services (SCDHS) regarding private wells (location and quality) in the vicinity site;
- Sampling of additional stormwater drywells/leaching cesspools to determine if a source of PFC contamination exists in these areas;
- Collection of soil samples in the unpaved area to the south of the maintenance building to evaluate soil quality and to determine if a source of PFC contamination exists in this area;
- Installation of vertical profile/groundwater monitoring wells and the collection of groundwater samples to evaluate groundwater quality, to further delineate the extent of PFC impacts, and to confirm groundwater flow direction;
- Analysis of select samples (minimum of one groundwater sample [VP-5] and one surface soil sample) for NYSDEC Part 375 parameters, including VOCs, SVOCs, 1,4 dioxane, pesticides, PCBs and metals to verify that no other contamination occurred at the site.
- Preparation of a Remedial Investigation (RI) report.

Prior to intrusive activities, Dig Safely New York (811) will be contacted by the site contractor a minimum of three business days in advance of the work and informed of the intent to perform excavation work at the site. A private on-site utility markout will not be performed, as on-site utility service locations are well documented.

4.1 Private Water Supply Well Search

In order to determine the presence and location of private water supply wells within 0.25 miles of the subject site, a FOIL request will be made to the SCDHS. This request will include the location of each private water supply well in the area, and will include water quality information. An attempt will also be made to obtain laboratory analytical data from the Hampton Bays Water District Supply wells in the area. It is expected that this data will be supplied by the SCDHS, along with private supply well information.

4.2 Storm Drain Evaluation and Sampling

During the Subsurface Investigation, the onsite storm drains and sanitary structures were inspected and samples were collected from those with the greatest potential for impact. Results did not indicate evidence of PFCs in the structures sampled. However, in order to determine if the onsite storm drains are a source of PFC contamination,

storm drains SD1 and SD-2, which are located closest to VP-5 and VP-6 will be sampled. In addition, storm drain SD-3 will be inspected to determine if below grade overflow pools exist. If it is determined that an overflow pool is connected to SD-3, it will be exposed and sampled. Storm drain locations are shown of **Figure 3**.

Soil samples will be collected from the base of each structure using a properly decontaminated stainless steel hand auger or the Geoprobe, if necessary. Soil samples will be analyzed for PFCs by Modified EPA 537 – Full List.

4.3 Soil Sampling

In order to determine if the unpaved area located to the south and west of the maintenance building is a source of PFC contamination, six soil borings are proposed. Soil borings will be performed using Geoprobe technology. At each boring location, soil samples will be collected continuously to a depth of five feet. Soil samples will be screened with a PID and visually characterized. The most impacted soils sample based on visual evidence and PID response, from each boring will be submitted for laboratory analysis. If no evidence of impact is identified, a sample of the soils below the root line to a depth of two inches will be submitted for analysis. Proposed soil boring locations are shown on **Figure 5**.

Soil samples will be analyzed for PFCs by Modified EPA 537 – Full List. Additionally, a minimum of one soil sample will be analyzed for the full NYSDEC Part 375 List of compounds. Analytical methods, preservation, container requirements, holding times, and detection limits are summarized **Table 1**, which is contained in Section 5.2.1. In addition, these details are included as **Appendix B**.

4.4 Groundwater Investigation

Six additional vertical profile wells will be installed at the Site to assess groundwater flow direction and to further delineate the extent of PFCs in groundwater beneath the site. One vertical profile well will be installed to the north and east of the recharge basin, located on the north side of Montauk Highway. Additionally, five vertical profile wells will be installed on the southern portion of the subject site, between VP-3, VP-5 and VP-6. Finally, two vertical profile wells will be installed offsite, south of the railroad tracks, in an attempt to better define the extent of PFC impacts. Proposed vertical profile well locations are shown on **Figure 6**. Vertical profile well installation and groundwater sample collection details are discussed in the following sections.

4.4.1 Vertical Profile Well Installation

A direct-push drill rig (Geoprobe) will be employed to install 1-inch inside diameter PVC wells containing five feet of 10-slot screen. Onsite wells and the offsite wells to the south, will be installed at depths of 75-feet below grade, while the offsite well to the

north will be installed at 70-feet below grade. Following installation, a deep groundwater sample will be collected from each vertical profile well. The wells will then be mechanically raised 20-feet and a shallow groundwater sample will be collected. Vertical profile well sampling is discussed in the following Section.

4.4.2 Vertical Profile Well Sample Collection

Samples from temporary vertical profile wells and the previously installed wells, VP-5 and VP-6, will be collected using HDPE tubing and a stainless steel check valve or a peristaltic pump with silicon tubing. Prior to sampling, each interval will be purged a minimum of 3-5 casing volumes. Additionally groundwater parameters, including temperature, conductivity, and pH will be collected. Groundwater parameters will be included on sample logs. To prevent cross-contamination, new tubing will be used at each sample location and the non-disposable sampling equipment (stainless steel check valve) will be decontaminated using alconox and deionized water rinse.

4.4.3 Groundwater Sample Analyses

A total of fourteen groundwater samples will be collected and analyzed for PFCs by Modified EPA 537 – Full List with equivalent NYSDEC Category B deliverables to allow for independent third-party data usability assessment. Additionally, a minimum of one groundwater sample will be analyzed for the full NYSDEC Part 375 List (including 1-4 dioxane) of compounds. Analytical methods, preservation, container requirements, holding times, and detection limits are summarized **Table 2**, which is contained in Section 5.2.2. In addition, these details are included as **Appendix B**.

4.4.4 Groundwater Flow Evaluation

Each vertical profile well will be completed with a flush-mount manhole cover so that they can be accessed in the future for groundwater elevation monitoring. Groundwater elevation data will be collected during the RI. Water level data from within the existing and newly installed monitoring wells will be collected and used to develop an on-Site groundwater isopotential map. A table that summarizes the well casing and groundwater elevations will be prepared. An isopotential map showing the general direction of groundwater flow will be prepared based on water elevation measurements relative to arbitrary datum.

4.5 Qualitative Exposure Assessments

Qualitative human health and ecological exposure assessments will be performed as discussed below.

4.5.1 Human Health Exposure Assessment

A qualitative human health exposure assessment will be completed for the site. The assessment will include characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport.

The qualitative human health exposure assessment will follow DER-10, Appendix 3B and Section 3.14 (c) 17. The assessment will be provided as part of the RI report and will include an offsite qualitative assessment as well.

4.5.2 Fish and Wildlife Resources Impact Analysis

The purpose of the Fish and Wildlife Resources Impact Analysis (FWRIA) is to identify actual or potential impacts to fish and wildlife resources from site contaminants of ecological concern. The FWRIA provides steps that include decision points for determining when the process is complete and further assessment is unnecessary. The FWRIA will be completed following DER-10 Section 3.10.1. The FWRIA will be included in the RI report.

It is anticipated that the FWRIA evaluation will include appropriate maps detailing topography, drainage, and cover types, including major vegetative communities, wetlands, NYSDEC Significant Habitats, and areas of special concern. A description of fish and wildlife resources at the site will be documented by site reconnaissance and available literature, and qualitative descriptions of fish and wildlife resource values will be provided. A pathway analysis will be performed; if no resources and/or potential pathways are identified, then the analysis will be considered complete. However, if resources and/or potential pathways are identified recommendations will be made for a more detailed Ecological Impact Assessment.

5.0 Quality Assurance Project Plan

This quality assurance project plan (QAPP) presents the objectives, functional activities, methods, and quality assurance / quality control (QA/QC) requirements associated with sample collection and laboratory analysis for characterization activities. The QAPP follows requirements detailed in DER-10, Section 2.

5.1 Project Organization

The investigative efforts defined in this RI work plan will be coordinated by ZEB Environmental Solutions, Inc. on behalf of the Hampton Bays Fire District. The following text identifies the responsibilities of various organizations supporting the RI:

- The NYSDEC Project Manager (Brian Jankauskas) will be responsible for reviewing and approving this work plan, coordinating approval of requested modifications, and providing guidance on regulatory requirements.

- Project Manager (Zeb Youngman) will be responsible for the day to day project management, task leadership, and project engineering support and for the planning and implementation of RI activities. The Project Manager is responsible for ensuring that the requirements of this RI work plan are implemented. The Project Manager will also act as the site Health and Safety Manager (HSM).

- Field Team Leader/SHSO (Kaitlyn Marra) will be responsible for sample collection, oversight of subcontractor personnel, and coordination of daily field activities. Ms. Marra will act as the Site Health and Safety Officer ensuring implementation of the Site Health and Safety Plan (HASP).

- A New York State Department of Health (NYSDOH) ELAP certified laboratory (TestAmerica) will perform required analyses and reporting.

- Subcontractors will perform surveying, drilling, and/or sampling at the direction of the Field Team Leader in accordance with this work plan.

5.2 Laboratory Analysis

Requirements for sample analysis are described below.

5.2.1 Soil Samples

Soil samples will be collected as described in Section 4.1. The soil sampling locations are shown in **Figure 5**. Soil samples will be submitted to a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) certified laboratory.

Analysis will conform to NYSDEC Analytical Services Protocol (ASP). Category B data deliverables will be submitted for all samples analyzed.

Analytical methods, preservation, container requirements, holding times, and detection limits are summarized on **Table 1**. In addition, these details are contained as **Appendix B**.

TABLE 1
ANALYTICAL METHODS
(SOIL)

Sample Matrix	Sample Designations	Sample Type	Parameters	EPA Method	Sample Preservation	Holding Time	Sample Container	Detection Limit
Soil	SB-Soil Borings,	Grab	PFCs (PFOA/PFOS)	Modified 537	Cool to 4°C	14 days	4 oz. wide mouth HDPE	0.25 ug/kg
Soil	SB-Soil Borings,	Grab	VOCs(TCL)	8260	Cool to 4°C	48 hours	Terracore Kit	5.0 ug/kg
Soil	SB-Soil Borings,	Grab	SVOCs (TCL) 1-4 Dioxane	8270 SIM	Cool to 4°C	14 days	4 oz. wide mouth glass	500.0 ug/kg
Soil	SB-Soil Borings,	Grab	TAL Metals	6010	Cool to 4°C	6 months (28 days for Mercury)	4 oz. wide mouth glass	1.0 mg/kg
Soil	SB-Soil Borings,	Grab	Pesticides/PCBs (TCL)	8081/8082	Cool to 4°C	14 days	4 oz. wide mouth glass	5.0/25.0 ug/kg

5.2.2 Groundwater Samples

Groundwater samples will be submitted to an NYSDOH ELAP certified laboratory. Samples will be analyzed for PFCs.

The samples will be analyzed in accordance with NYSDEC ASP methods. Category B data deliverables will be submitted for samples analyzed.

Analytical methods, preservation, container requirements, holding times, and detection limits are shown in **Table 2.** In addition, these details are contained as **Appendix B**.

TABLE 2
ANALYTICAL METHODS
(GROUNDWATER)

Sample Matrix	Sample Designations	Sample Type	Parameters	EPA Method	Sample Preservation	Holding Time	Sample Container	Detection Limits
Groundwater	VP-Vertical Profile Well	Grab	PFCs (PFOA/PFOS)	Modified 537	Cool to 4°C	14 days	250-mil hdpe	2.0 ng/L
Groundwater	VP-Vertical Profile Well	Grab	VOCs (TCL)	8260	Cool to 4°C	7 days	40-mil vials	1.0 ug/L
Groundwater	VP-Vertical Profile Well	Grab	SVOCs (TCL) 1,4-Dioxane	8270 SIM	Cool to 4°C	7 days	1 L Amber glass	1.0 ug/L
Groundwater	VP-Vertical Profile Well	Grab	Pesticides/ PCBs	8081 8082	Cool to 4°C	7 days	1 L Amber glass	1.0 ug/L
Groundwater	VP-Vertical Profile Well	Grab	TAL Metals	6010	HNO3 to pH<2 Cool to 4°C	6 months (28 days for Mercury)	500 ml hdpe	1.0 mg/l

5.3 Field/Laboratory Data Control Requirements

Quality Control (QC) procedures must be followed in the field and at the laboratory to ensure that reliable data are obtained. When performing this field sampling effort, care shall be taken to prevent the cross-contamination of sampling equipment, sample bottles, and other equipment that could compromise sample integrity. QC samples to be collected in the field are provided in **Table 3**.

TABLE 3
FIELD/LABORATORY QC REQUIREMENTS

Sample Type	Frequency	Purpose
Field Duplicate	One duplicate sample, or One per 20 samples of the same matrix.	To evaluate the precision of the field sampling and laboratory analyses.
Equipment Blank	One per type of sampling method used for each batch of sampling equipment. Equipment blanks are collected in the field using analyte-free water supplied by the laboratory.	To assess the cleanliness of the sampling equipment and the effectiveness of the decontamination process.
Matrix Spike	One per 20 samples of same matrix	It is used to measure the efficiency of all steps of the sampling and analytical methods in recovering the target analytes from the sample. It is a sample spiked with known quantities of analytes and subjected to the entire analytical procedure.

Matrix Spike Duplicate	One per 20 samples of same matrix.	To reinforce the matrix spike information. It is a second aliquot of the same sample as the matrix spike.
Trip Blank	One VOA (volatile organic analysis) trip blank per sample cooler that contains site samples to be analyzed for VOAs.	To detect VOC cross-contamination during sample shipping and handling.

5.4 Sample Identification

Sampling rationale is provided in Section 4.0. Multiple samples may be collected from each sampling location.

Each soil sample will be identified with a set of information relating individual sample characteristics (i.e., soil boring, vertical profile, storm drain, etc.). The required information consists of Sample ID, Depth, Date, Time, and Matrix. Examples of sample IDs are shown below.

"SB-1 (4-5)" (subsurface soil sample collected from soil boring SB-1 at a depth of 4-5')
"VP-7 (65-70)" (vertical profile groundwater sample from vertical profile 7 at a depth of 65-70')

However, sample frequency, locations, depths, and nomenclature may change subject to field decisions and professional judgment. Estimated sample numbers are provided on **Table 4**.

TABLE 4
ESTIMATED NUMBER OF SOIL AND GROUNDWATER SAMPLES

Sample Type	Estimated # of samples to be collected	Estimated # of quality control samples to be collected
Soil samples from Soil Borings	6	5*
Soil samples from Storm Drains	3	5*
Groundwater samples	18	5

* - Only one set of QC samples required for each sample medium

5.5 Chain-of-Custody, Sample Packaging, and Shipment

For each day of sampling, a chain-of-custody sheet will be completed and submitted to the laboratory. A copy of the chain-of-custody sheet will also be retained by the Project Manager. The chain-of-custody sheet will include the project name, the sampler's signature, sampling locations, the date and time of sample collection, and analysis parameters requested.

Samples must be packaged and shipped in a manner that maintains sample preservation requirements during transport (i.e., ice to keep samples cool until receipt at the laboratory), ensures that sample holding times can be achieved by the laboratory, and ensures that the samples cannot be tampered with.

If a commercial carrier ships samples, a bill of lading (waybill) may be used as documentation of sample custody. Receipts for bills of lading and other documentation of shipment shall be maintained as part of the permanent custody documentation. Commercial carriers are not required to sign the chain-of-custody as long as it is enclosed in the shipping container and the evidence tape (custody seal) remains in place.

5.6 Data Usability and Validation

The main purpose of the data is for use in defining the extent of contamination at the site, to aid in evaluation of potential human health and ecological exposure assessments, and to support remedial action decisions. Based upon this data use usability and validation will be performed as described below. Complete data packages will be archived in the project files, and if deemed necessary additional validation can be performed using procedures in the following sections. In addition, all analytical data generated during this RI will be submitted to NYSDEC using the appropriate electronic data deliverables (EDD) for entry into the EQuIS database system. Validation of data will be performed by Renee Cohen of Premier Environmental Services. Ms. Cohen's resume is include in **Appendix C**.

5.6.1 Data Usability and Validation Requirements

Data usability and validation are performed on analytical data sets primarily to confirm that sampling and chain-of-custody documentation are complete, that sample numbers can be tied to the specific sampling locations, that samples were analyzed within the required holding times, and that the analyses met the data quality requirements specified in the sampling plan.

5.6.2 Data Usability and Validation Methods

A designee of the Project Manager will complete a data usability evaluation for the data collected during the RI. A data usability summary report (DUSR) will be prepared following guidance in DER-10, Appendix 2B.

Independent third party data validation will be performed on 5% of the sample data or on one sample from each sample delivery group (SDG), whichever is greater. Data validation will be performed by a qualified subcontractor independent of the project.

5.7 Field Equipment Calibration

Equipment will be inspected and approved by the Field Team Leader before being used. Equipment will be calibrated to factory specifications, if required. Monitoring equipment will be calibrated following manufacturer recommended schedules. Daily field response checks and calibrations will be performed as necessary (i.e., PID calibrations) following manufacturer standard operating procedures. Equipment calibrations will be documented in the field logbook.

5.8 Decontamination and Investigation Derived Waste Management

Every attempt will be made to use dedicated sampling equipment during the RI; however, if non-dedicated equipment is required and/or used, the equipment will be decontaminated, at a minimum, with a non-phosphate detergent (i.e., Alconox®) and potable water mixture, rinsed with distilled water, and air-dried before each use. All decontaminated sampling equipment will be kept in a clean environment prior to sample collection. Heavy equipment, such as the drill rig and drilling tools, will be decontaminated via high-pressure steam cleaning on a temporary decontamination pad between grab sample locations, as necessary.

Waste materials generated from field operations may consist of soil cuttings, purge water, and miscellaneous solid materials such as personal protective equipment (PPE) and supplies. Investigation-derived waste (IDW) generated during field operations will be disposed of at properly permitted facilities.

If generated, minor quantities of soil cuttings will be used to backfill each borehole. Purge water generated during field activities will be discharged to an unpaved area on site. However, if visual or olfactory evidence of impact is identified, purge water will be stored in 55-gallon drums. The drums will be labeled to indicate the source of the fluid and will be stored in a designated area on site. Following receipt of the groundwater sampling results, recommendations for disposition of the water will be provided to the NYSDEC. If necessary, additional waste characterization samples will be collected to determine a suitable disposal facility.

5.9 Field Documentation

Documentation will take place on either appropriate file forms or in a site logbook. Permanent black or blue ink will be used to record information in the logbook. Errors in field documentation will be lined through, initialed, dated, and corrected. Forms will be kept by the Field Team Leader during field activities. Field activities will be documented in the field logbook. The logbook will contain waterproof pages that are consecutively

numbered, and will be permanently bound with a hard cover. Upon completion of daily activities, any unused portions of pages will be lined-through and initialed.

The primary purpose of the field logbook is to contain a record of daily field activities and to provide descriptions of each activity. Entries in the field logbook will be recorded and dated by the person making the entry. It should be noted that waterproof "Rite-in-the-Rain" field books may be treated with PFCs. Therefore, field forms or untreated field books will be used during this RI.

6.0 Remedial Investigation Report

The RI Report will incorporate the methods and findings of the RI activities performed as outlined in this work plan. The report will identify specific contamination concentrations throughout each media (e.g. soil, groundwater, storm drains, etc), evaluate potential exposure pathways, and provide conclusions and recommendations for additional investigation and/or remedial action. Electronic copies of the RI Report will be submitted to the NYSDEC along with hard copies. An example table of contents for the RI Report is provided below:

1.0 INTRODUCTION
- 1.1 Site Location and Description
- 1.2 Site History
- 1.3 Previous Investigations

2.0 INVESTIGATION
- 2.1 Field Investigation and Technical Approach
- 2.2 Groundwater Sampling
- 2.3 Soil Sampling
- 2.4 Storm Drain Sampling
- 2.5 Data Analysis
- 2.6 Analytical Results

3.0 HYDROGEOLOGIC ASSESSMENT AND PHYSICAL SETTING
- 3.1 Site Topography
- 3.2 Surrounding Land Use
- 3.3 Regional Geology/Hydrogeology
- 3.4 Site Geology/Hydrogeology

4.0 NATURE AND EXTENT OF CONTAMINATION
- 4.1 Identification of Source Areas
- 4.2 Groundwater Impacts
- 4.3 Qualitative Exposure Assessments

5.0 CONCLUSIONS AND RECOMMENDATIONS
- 5.1 Conclusions
- 5.2 Recommendations

6.0 REFERENCES

If the RI obtains sufficient information to evaluate remedial alternatives, the elements of a Feasibility Study will be included in the RI Report.

6.1 Remedial Investigation Schedule

The field work of the RI is anticipated to begin in January 2019 and be completed by February 2019. A draft RI Report will be submitted to the NYSDEC upon completion.

7.0 Health and Safety

Field operations will be performed in accordance with the health and safety requirements as provided in the attached Health and Safety Plan (HASP) (**Appendix D**). The HASP outlines the requirements for training, medical surveillance, daily tailgate meetings, emergency response, and accident and injury reporting.

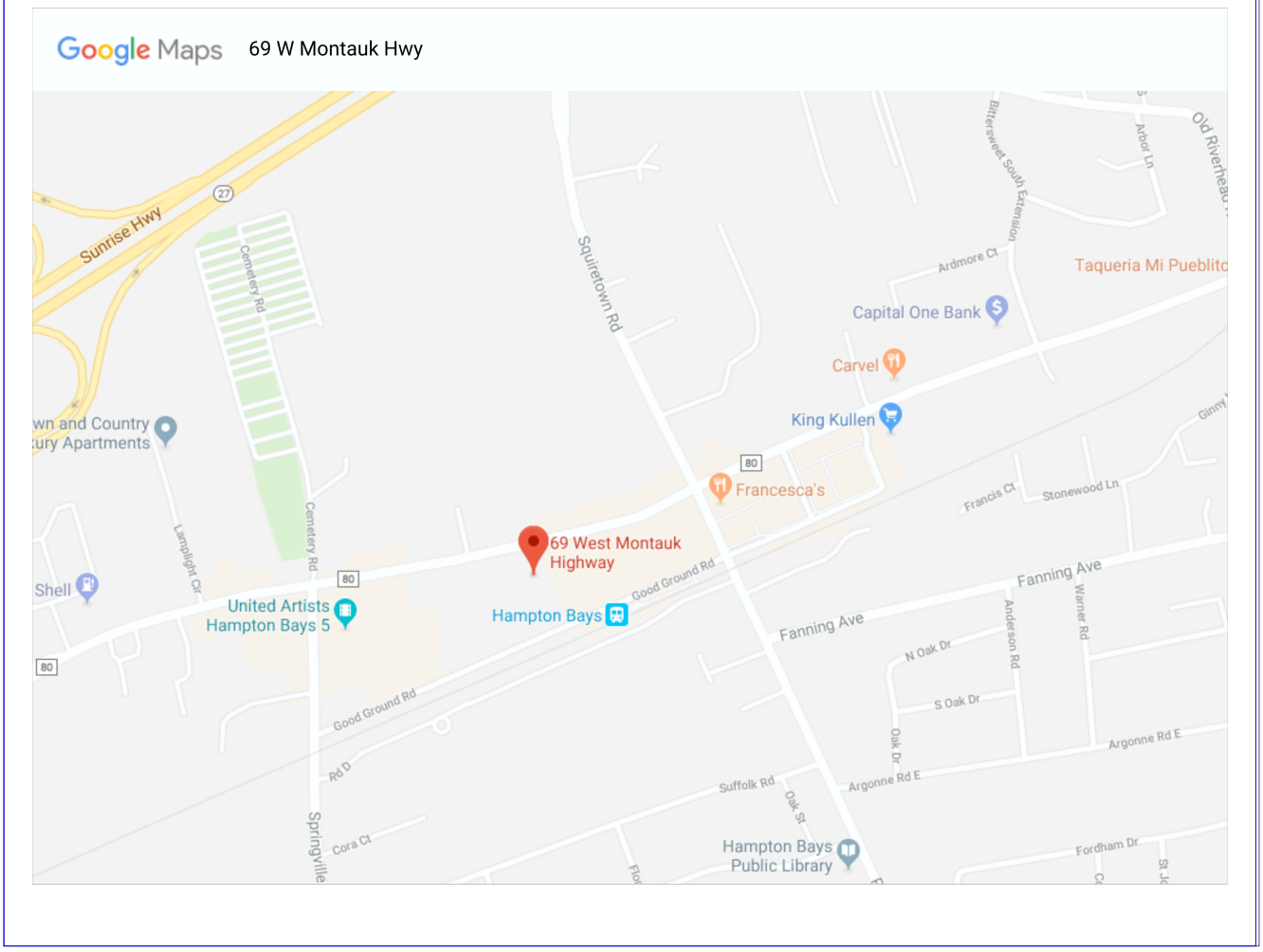
Activity hazard analyses (AHAs) have been completed for the work activities planned for the investigation.

The Field Team Leader will also act as the site health and safety officer (SHSO) and will be responsible for implementing the HASP, completing the daily tailgate safety meetings, and performing necessary Industrial Hygiene (IH) monitoring as specified in the HASP.

8.0 Community Air Monitoring

The Remedial Investigation activities do not warrant the need for community air monitoring. However, if excavation or intrusive activities are required, a community air monitoring plan (CAMP) will be implemented and executed in accordance with 29 CFR 1910.120(h), the New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan, and the New York State Department of Environmental Conservation (NYSDEC) TAGM #4031. In addition, if elevated PID responses (>5ppm) or if visible dust is observed, work will stop and appropriate actions will be taken. These actions may include covering or wetting exposed soil to prevent release of VOCs and/or dust.

FIGURES



N

SITE VICINITY MAP

0 1000 2000

SCALE FEET

ZEB ENVIRONMENTAL SOLUTIONS, INC.
188 WEST MONTAUK HIGHWAY, SUITE E6
HAMPTON BAYS, NY 11946
PH: (516)807-6896
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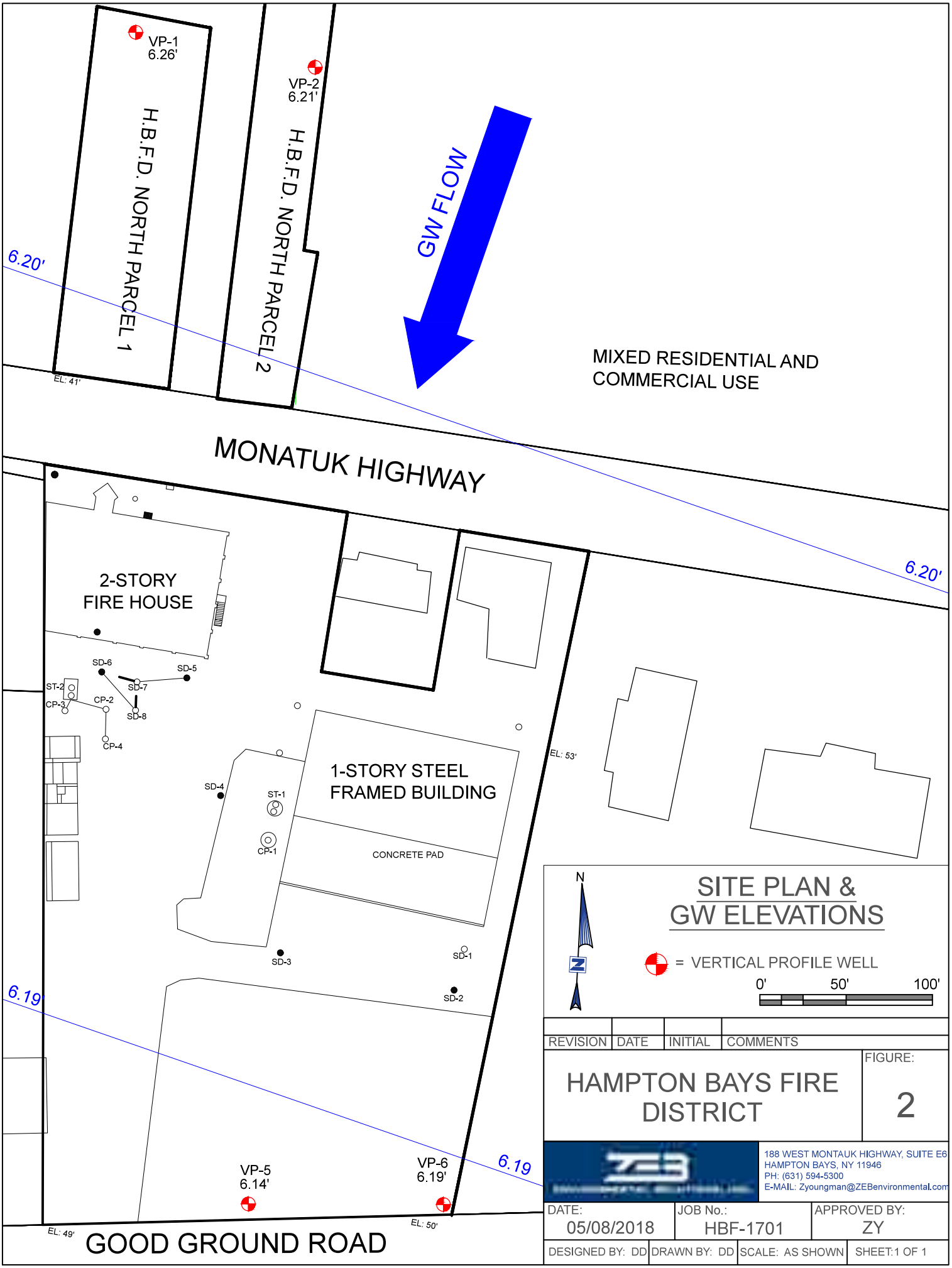
REVISION	DATE	INITIAL	COMMENTS

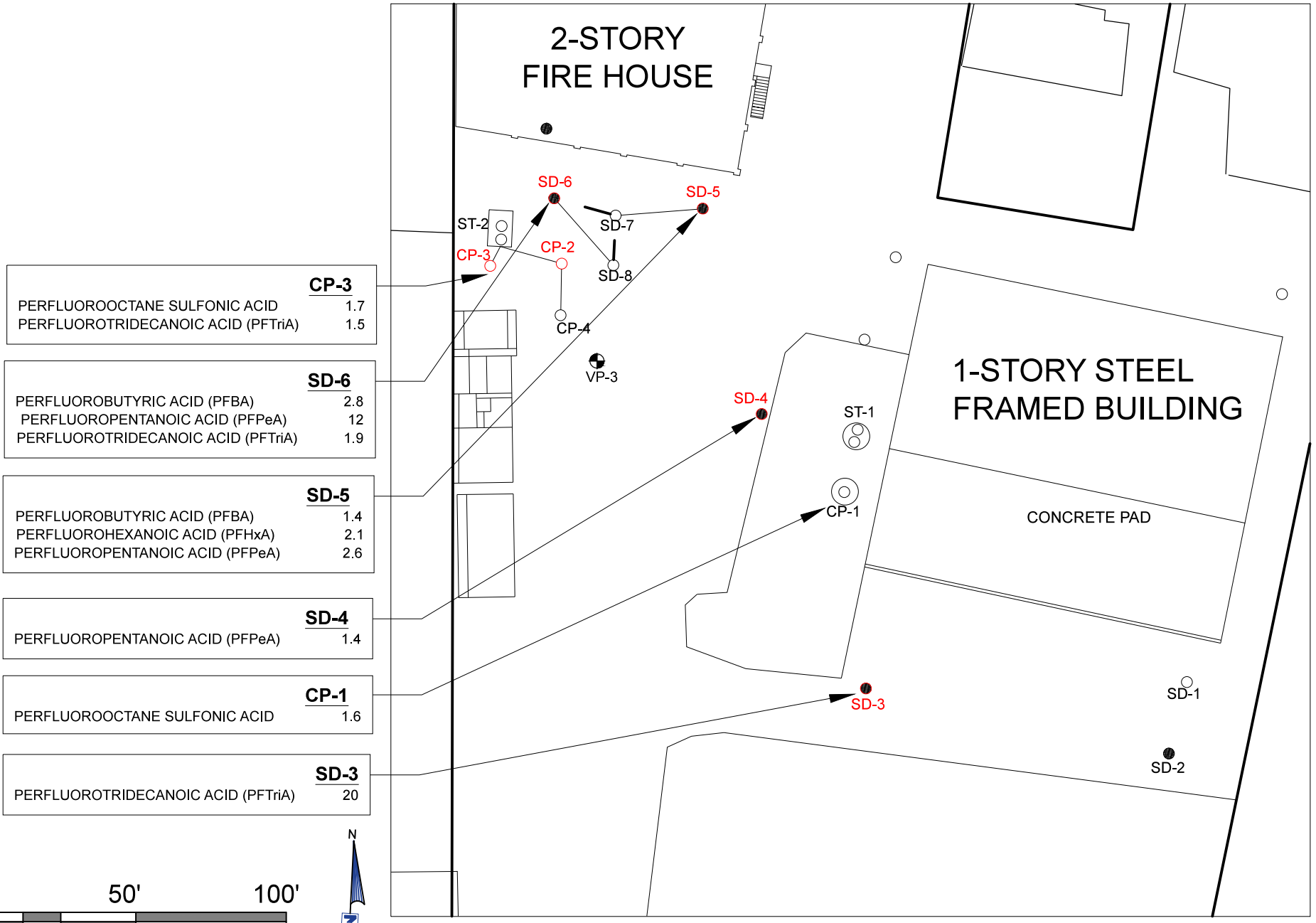
DATE:	JOB No.:	APPROVED BY:	
12/19/18	HBF-1701	ZY	

DESIGNED BY: ZY	DRAWN BY: KM	SCALE: AS SHOWN	SHEET: 1 OF 2

VICINITY MAP
HAMPTON BAYS FIRE DISTRICT
69 W. MONTAUK HWY,
HAMPTON BAYS, NY 11946

FIGURE: 1


VP-1
6.26'
VP-2
6.21'
H.B.F.D. NORTH PARCEL 1
H.B.F.D. NORTH PARCEL 2
GW FLOW
6.20'
EL: 41'
MIXED RESIDENTIAL AND
COMMERCIAL USE
MONATUK HIGHWAY
6.20'
2-STORY
FIRE HOUSE
SD-6
SD-5
SD-7
ST-2
CP-3
CP-2
SD-8
CP-4
1-STORY STEEL
FRAMED BUILDING
SD-4
ST-1
CP-1
CONCRETE PAD
EL: 53'
SD-3
SD-1
SD-2
6.19'
VP-5
6.14'
VP-6
6.19'
6.19
EL: 49'
EL: 50'
GOOD GROUND ROAD
N
SITE PLAN &
GW ELEVATIONS
= VERTICAL PROFILE WELL
0'
50'
100'
REVISION
DATE
INITIAL
COMMENTS
HAMPTON BAYS FIRE
DISTRICT
FIGURE:
2
188 WEST MONTAUK HIGHWAY, SUITE E6
HAMPTON BAYS, NY 11946
PH: (631) 594-5300
E-MAIL: Zyoungman@ZEBenvironmental.com
DATE:
05/08/2018
JOB No.:
HBF-1701
APPROVED BY:
ZY
DESIGNED BY: DD
DRAWN BY: DD
SCALE: AS SHOWN
SHEET:1 OF 1



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SOIL SAMPLE SPIDER MAP

ZEB ENVIRONMENTAL SOLUTIONS, INC.
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69 West Montauk Hwy,
Hampton Bays, NY 11946

DATE:	JOB No.:	FIGURE No.:
05/08/2018	HBF-1701	3

APPROVED BY:	DESIGNED BY:	DRAWN BY:	SCALE:	SHEET
ZY	DD	DD	-	- OF -

VP-1 (45-50)

PERFLUOROOCTANE SULFONIC ACID	230
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130

VP-1 (65-70)

PERFLUOROOCTANE SULFONIC ACID	30
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	140
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	140

VP-1 (85-90)

PERFLUOROHEXANESULFONIC ACID	22
PERFLUORONONANOIC ACID	40
PERFLUOROOCTANE SULFONIC ACID	58
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130

VP-2 (45-50)

PERFLUOROOCTANE SULFONIC ACID	65
PERFLUOROPENTANOIC ACID (PFPeA)	20
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130

VP-2 (70-75)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120

VP-2 (90-95)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	140

VP-3 (45-50)

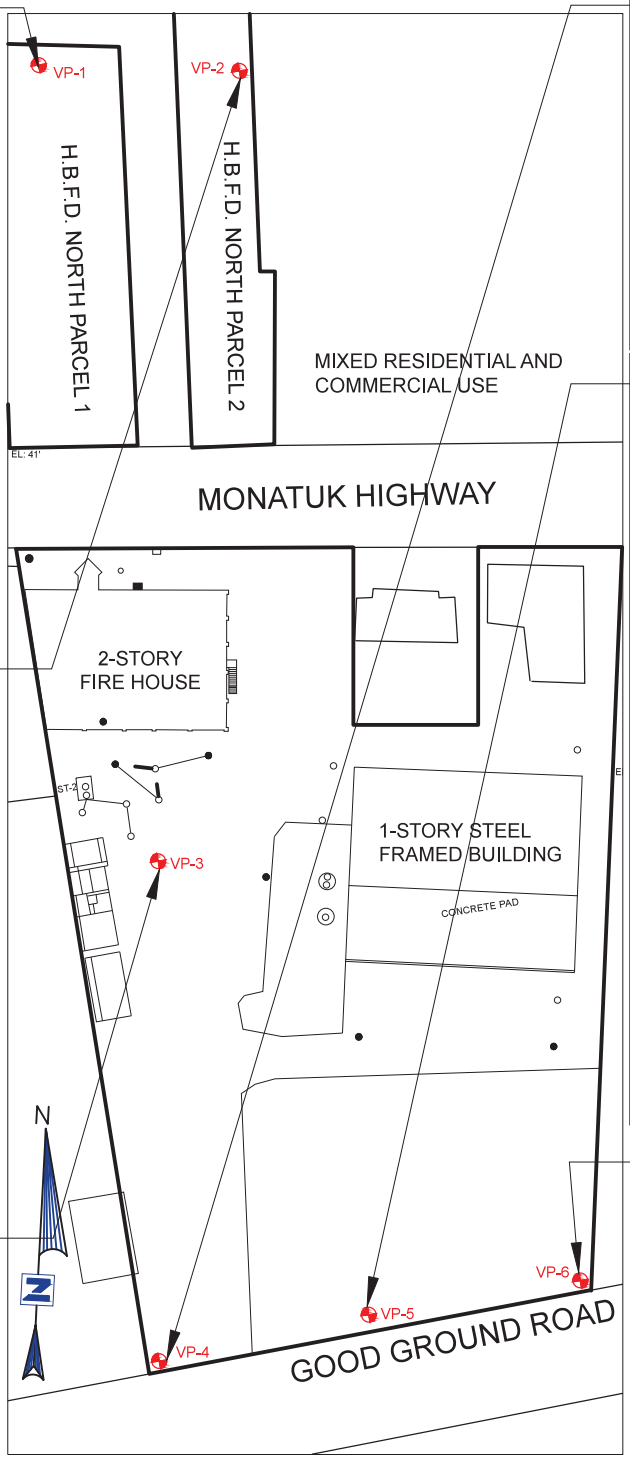
PERFLUOROHEXANOIC ACID (PFHxA)	37
PERFLUORONONANOIC ACID	21
Perfluorooctane Sulfonamide (FOSA)	150
PERFLUOROOCTANE SULFONIC ACID	200
Perfluorooctanoic acid (PFOA)	56
PERFLUOROPENTANOIC ACID (PFPeA)	45
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	210

VP-3 (65-70)

PERFLUOROOCTANE SULFONIC ACID	35
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	100
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	110

VP-3 (65-70)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	110
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	110



GW SPIDER MAP

= VERTICAL PROFILE WELL

(all values are provided in ng/L)

0' 75' 150'

VP-4 (50-55)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130

VP-4 (70-75)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120

VP-4 (90-95)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120

VP-5 (50-55)

Perfluorooctanoic acid	230
Perfluoroheptanoic Acid (PFHpA)	46
PERFLUOROHEXANESULFONIC ACID	61
PERFLUORONONANOIC ACID	21
PERFLUOROOCTANE SULFONIC ACID	2400
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	45

VP-5 (70-75)

Perfluoroheptanoic Acid (PFHpA)	54
PERFLUOROHEXANESULFONIC ACID	250
PERFLUOROHEXANOIC ACID (PFHxA)	56
PERFLUORONONANOIC ACID	40
Perfluorooctane Sulfonamide (FOSA)	87
PERFLUOROOCTANE SULFONIC ACID	580
Perfluorooctanoic acid (PFOA)	250
PERFLUOROPENTANOIC ACID (PFPeA)	44
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	130

VP-5 (90-95)

PERFLUOROOCTANE SULFONIC ACID	69
Perfluorooctanoic acid (PFOA)	78
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120

VP-6 (50-55)

PERFLUOROBUTANOIC ACID	37
PERFLUOROHEPTANOIC ACID	120
PERFLUOROHEXANESULFONIC ACID	470
PERFLUOROHEXANOIC ACID (PFHxA)	96
Perfluorooctanoic acid (PFOA)	25
PERFLUOROPENTANOIC ACID (PFPeA)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130

VP-6 (70-75)

PERFLUOROHEXANESULFONIC ACID	37
PERFLUOROHEXANOIC ACID (PFHxA)	12
PERFLUOROOCTANE SULFONIC ACID	78
Perfluorooctanoic acid (PFOA)	96
PERFLUOROPENTANOIC ACID (PFPeA)	48
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	100
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120

VP-6 (90-95)

PERFLUOROHEXANESULFONIC ACID	31
PERFLUOROOCTANE SULFONIC ACID	76
Perfluorooctanoic acid (PFOA)	52
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	110

188 WEST MONTAUK HIGHWAY, SUITE E6
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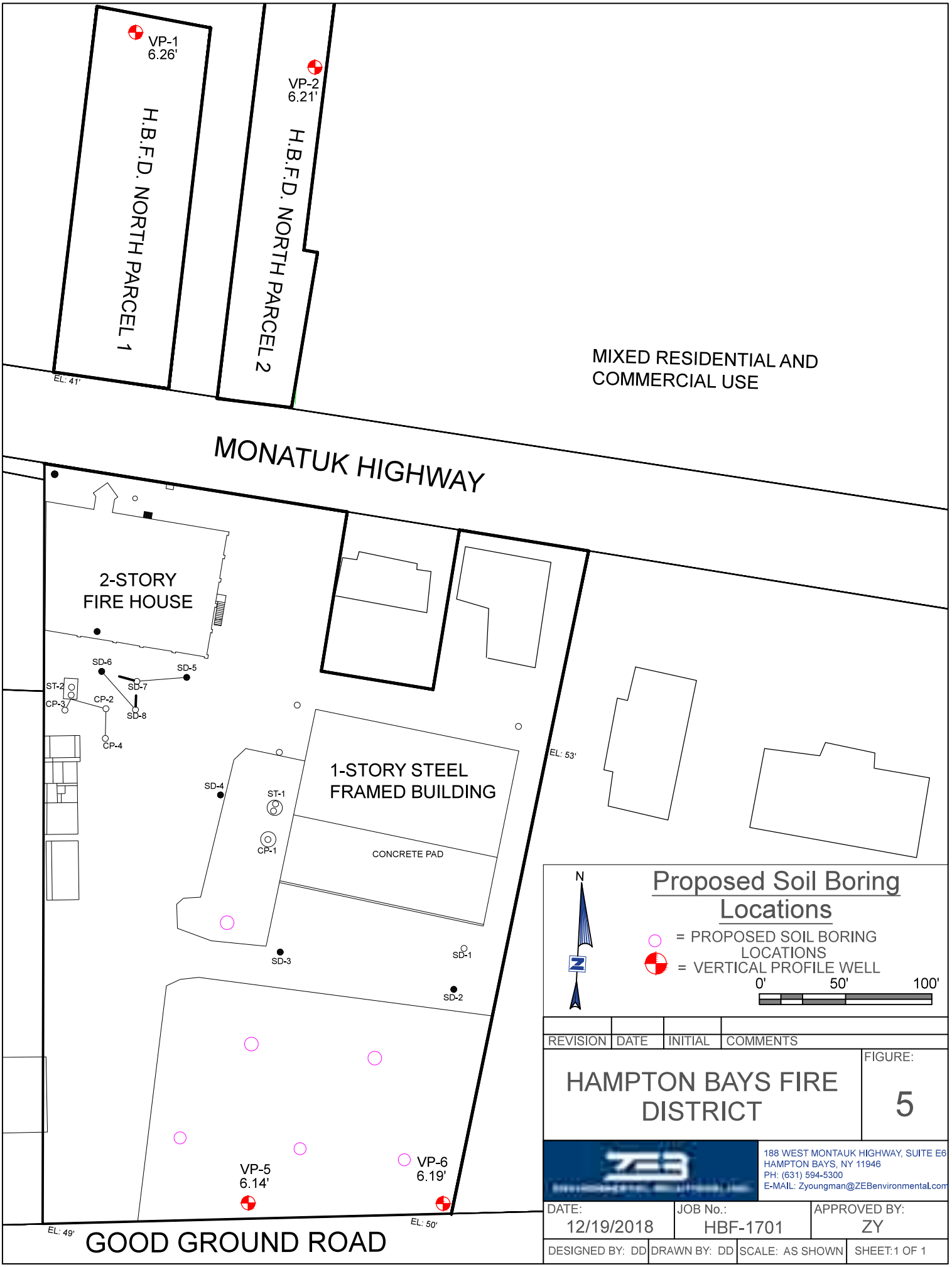
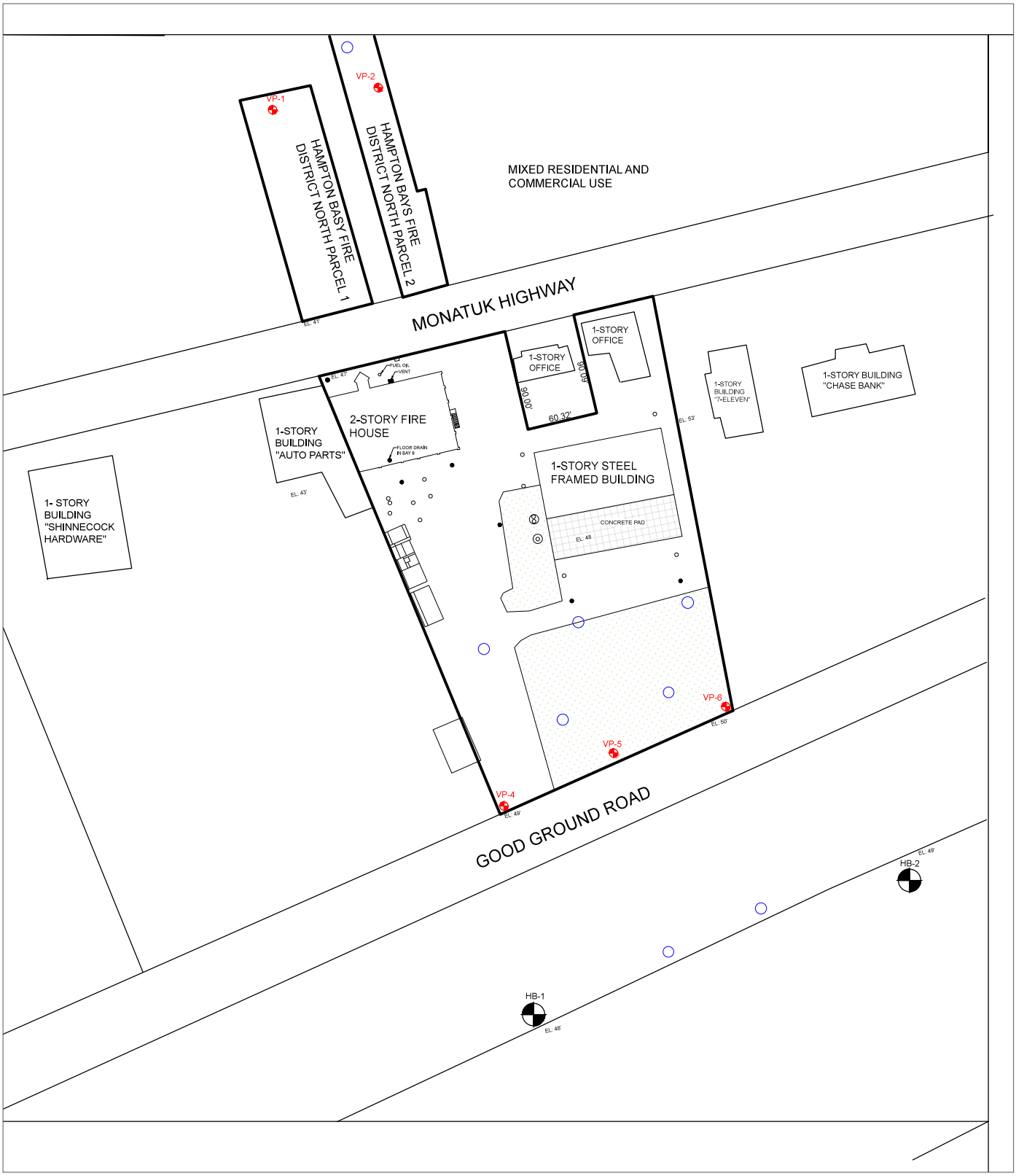
REVISION	DATE	INITIAL	COMMENTS

DATE:	JOB No.:	APPROVED BY:	
2/1/19	HBF-1701	ZY	
DESIGNED BY: DD	DRAWN BY: DD	SCALE: AS SHOWN	SHEET: 1 OF 1

HAMPTON BAYS FIRE DISTRICT

FIGURE: 4


VP-1
6.26'
VP-2
6.21'
H.B.F.D. NORTH PARCEL 1
H.B.F.D. NORTH PARCEL 2
MIXED RESIDENTIAL AND
COMMERCIAL USE
EL: 41'
MONATUK HIGHWAY
2-STORY
FIRE HOUSE
SD-6
SD-5
SD-7
ST-2
CP-3
CP-2
SD-8
CP-4
1-STORY STEEL
FRAMED BUILDING
SD-4
ST-1
CP-1
CONCRETE PAD
EL: 53'
SD-3
SD-1
SD-2
VP-5
6.14'
VP-6
6.19'
EL: 49'
EL: 50'
GOOD GROUND ROAD
N
Proposed Soil Boring
Locations
= PROPOSED SOIL BORING
LOCATIONS
= VERTICAL PROFILE WELL
0'
50'
100'
REVISION
DATE
INITIAL
COMMENTS
HAMPTON BAYS FIRE
DISTRICT
FIGURE:
5
188 WEST MONTAUK HIGHWAY, SUITE E6
HAMPTON BAYS, NY 11946
PH: (631) 594-5300
E-MAIL: Zyoungman@ZEBenvironmental.com
DATE:
12/19/2018
JOB No.:
HBF-1701
APPROVED BY:
ZY
DESIGNED BY: DD
DRAWN BY: DD
SCALE: AS SHOWN
SHEET:1 OF 1



○ Proposed Vertical Profile Well Locations

= VERTICAL PROFILE WELL

= SCDHS WELL LOCATION

0' 120' 240'

188 WEST MONTAUK HIGHWAY, SUITE E6
HAMPTON BAYS, NY 11946
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REVISION	DATE	INITIAL	COMMENTS

DATE:	JOB No.:	APPROVED BY:	
12/19/2018	17LP040	ZY	
DESIGNED BY: DR	DRAWN BY: KM	SCALE: AS SHOWN	SHEET: 2 OF 2

HAMPTON BAYS FIRE DISTRICT
69 W. MONTAUK HWY,
HAMPTON BAYS, NY 11946

FIGURE: 6

APPENDIX A

HAMPTON BAYS FIRE DISTRICT SITE
69 WEST MONTAUK HIGHWAY
HAMPTON BAYS, NY
DEC SITE: #152249

SUB-SURFACE INVESTIGATION REPORT

Submitted To:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233-7016

Prepared For:

Hampton Bays Fire District
69 West Montauk Highway
Hampton Bays, NY 11946

Prepared By:

ZEB Environmental Solutions, Inc.
188 West Montauk Highway, Suite E-6
Hampton Bays, New York 11946
Phone: 631-594-5300

JULY 11, 2018

TABLE OF CONTENTS

Page

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

1.1 Purpose and Scope

ZEB Environmental Solutions, Inc. (ZEB) has prepared the following Sub-Surface Investigation Report on behalf of the Hampton Bays Fire District to document the investigation activities performed at the Hampton Bays Fire Department property located at 69 W Montauk Highway, Hampton Bays, New York (**Figure 1**).

The purpose of this investigation was to determine if perfluorinated compounds (PFCs) are present in the subsurface at the site and to determine whether this site is a contributing source of PFCs detected in downgradient public supply wells. The scope of the investigation is detailed in the NYSDEC approved Subsurface Investigation Work Plan prepared by ZEB in December 2017. ZEB performed the remedial investigation in accordance with the Work Plan beginning in late January 2018, and the results are detailed in this Sub-Surface Investigation Report.

This Investigation has been undertaken pursuant to the New York State Department of Environmental Conservation (NYSDEC) Order on Consent, dated November 9, 2017. By the terms of this Order between the NYSDEC and the Hampton Bays Fire District, such consent is not "(i) to be an admission or finding of liability, fault, wrongdoing, or violation of any law, regulation, permit, order, requirement, or standard of care of any kind whatsoever: (ii) an acknowledgement that there has been a release or threatened release of hazardous waste at or from the site: and/or (iii) an acknowledgement that a release or threatened release of hazardous waste at or rom the site constitutes significant threat to the public health or the environment."

1.2 Site Location and Description

The Hampton Bays Fire District property is 2.29 acres in size and is located on the south side of Montauk Highway, east of Springville Road. A vicinity map showing the location of the Fire District property is contained as **Figure 1**. The property contains three main buildings, two of which are used by the Fire Department and a third that is leased by office tenants. A site plan is included as **Figure 2**.

1.3 Site History

The two-story firehouse building was constructed in 1930 and additions to the east and west sides were completed in 1967 and 1983. The first floor of this building is used to store fire trucks and fire equipment, and also contains a laundry room. The second floor is used as office and recreational space. No aqueous film forming foam (AFFF) is stored in this building. There is also one floor drain in this building, which appears to discharge to the subsurface. This building is connected to a sanitary system, comprised of septic tank(s) and multiple leaching cesspools located on the south side of the building.

The one-story steel framed building was constructed in 1993 and is utilized as a maintenance building. This building is used to store ancillary fire equipment and vehicles along with AFFF. Currently, 16 5-gallon containers of AFFF are stored on a pallet in the northwestern portion of the building. These containers are full and unopened.

Most containers have a date of 2008. This building contains a sanitary system consisting of a septic tank and a leaching cesspool located on the west side of the building.

Small wooden structures exist on the western property boundary. These structures do not have permanent foundations and are utilized as concession stands during community events. These structures contain sinks that are connected to the sanitary system associated with the main firehouse building.

Finally, a one-story office building exists on the northeast corner of the Fire District property. This building was acquired by the Fire District in 1997 and has been occupied by office tenants since this time. All buildings, on the Fire District property are supplied with potable water by the Hampton Bays Water District, including the real estate office, located at 65 West Montauk Highway.

2.0 SUBSURFACE INVESTIGATION

ZEB began the implementation of the Sub-Surface Investigation on January 29, 2018. As required, notification was provided to the NYSDEC before investigation activities began and a NYSDEC representative was onsite for the first two days of investigation activities. Soil and groundwater sampling activities were performed between January 29th and February 2nd 2018.

The Scope of Work, as identified in the approved Sub-Surface Investigation Work Plan, included the following tasks:

1. Storm Drain/Sanitary System Evaluation and Sampling
2. Vertical Profile Groundwater Sampling

These tasks are discussed in detail in the following sections.

2.1 Storm Drain/Sanitary System Evaluation and Sampling

On January 29th, ZEB completed a detailed inspection of each storm drain, sanitary structure and floor drain identified on the site. ZEB then collected samples from three (3) of the onsite sanitary structures and three (3) storm drains that had the greatest potential for impact. Storm drain and sanitary structure locations and observed piping are identified on **Figure 3** and sampling logs are provided in **Appendix E**.

2.1.1 Sampling Protocol

Soil samples were collected from the bases of the sanitary/storm structures using a properly decontaminated stainless steel hand auger. During sampling, sediment at the base of each structure were inspected. No visual or olfactory evidence of impact was observed. Soil samples were analyzed for PFCs by Modified EPA 537 – Full List. Additionally, quality control samples, including an equipment blank, a duplicate, and a matrix spike/matrix spike duplicate were collected.

Samples were packed in coolers with ice and delivered via courier to Test America Laboratories under chain-of-custody seal.

2.1.2 Analytical Results

As shown on **Table 1** and **Figure 3**, PFCs were not detected in the samples collected at concentrations indicative of a historic release or source of contamination. The low concentrations detected in each of the samples collected are likely the results of background contamination that is typical in commercial/industrial storm and sanitary system structures. No soil cleanup objectives (SCOs) or action levels exist for PFCs .

Complete laboratory analytical reports are included as **Appendix A**.

2.2 Groundwater Investigation

As part of the groundwater investigation, vertical profile wells were installed at six locations. Vertical profile well locations are identified on **Figures 2** and **4**.

2.2.1 *Vertical Profile Well Installation*

On January 30, 2018, ZEB and their subcontractor, EnviroDrilling and Contracting (EDC), mobilized to the site to install and sample six vertical profile wells. EDC utilized a Geoprobe drill rig to advance drill rods to the appropriate depths. Vertical profile wells were constructed of one-inch PVC with a 5-foot slotted PVC screen. Due to a significant elevation change at the site, VP-1 through VP-3 were set at 90-feet below grade, while VP-4 through VP-6 were set at 95-feet below grade.

2.2.2 *Vertical Profile Well Sampling*

Sampling of the vertical profile wells was performed between January 30 - February 2, 2018. At each vertical profile well location the deep interval was initially purged a minimum of three casing volumes using a Watera check valve. During purging, the groundwater parameters pH, temperature, turbidity, conductivity, and oxygen reduction potential (ORP) were monitored. Groundwater samples were placed in pre-cleaned laboratory-supplied glassware and packed in a cooler on ice. The vertical profile wells were then pulled up 20 feet and the purge process was repeated. Finally, each well was pulled up another 20 feet and purge, parameter, sampling process repeated. Copies of the groundwater sampling data sheets containing the field parameters recorded and purge volumes for each sampling point are attached in **Appendix B**.

Samples were packed in coolers with ice and shipped via courier service to Test America Laboratories under chain-of-custody seal. Groundwater samples were analyzed for the presence of PFCs by modified EPA Method 537. The vertical profile wells performed in unpaved areas were finished with flush mount covers. These wells represent shallow groundwater table wells and were used to obtain groundwater flow direction. This is discussed below in Section 2.2.4.

2.2.3 *Analytical Results*

As shown on **Table 2 and Figure 4**, PFCs were detected in all of the samples collected. Although, most of these detections appear to be the result of regional groundwater quality, samples collected from VP-5 and VP-6 contain elevated concentration of these contaminants. The shallow sample (50'-55') at VP-5 contains a maximum concentration of perfluorooctane sulfonic acid of 2,400ng/L, while the shallow sample (50-55') at VP-6 contains a maximum concentration of perfluorohexane sulfonic acid of 470ng/L.

Complete laboratory analytical reports are included as **Appendix C**.

2.2.4 *Monitoring Well Survey*

As mentioned in Section 2.2.2, the four vertical profile wells performed in unpaved areas were finished with flush mount covers. These wells represent shallow groundwater table wells and were used to obtain groundwater flow direction. On February 5, 2018 ZEB was onsite to survey these wells. The measuring points on each well casing were marked for future measurements. Well casing elevation data obtained as part of the survey was used to determine relative groundwater table elevations and general groundwater flow direction. As shown on **Figure 2**, groundwater beneath the site flows in a southerly direction.

2.3 Quality Assurance/Quality Control

As stated in the Subsurface Investigation Work Plan, the overall quality assurance/quality control (QA/QC) objective for the field investigation was to develop and implement procedures that provide data of known and documented quality. QA/QC characteristics for data include precision, accuracy, representativeness, completeness, and comparability. The purpose of the QA/QC activities developed for this site was to verify the integrity of the work performed at the site to assure that the data collected were the appropriate type and quality needed for the intended use.

The QA/QC program included the preparation and analysis of field QA/QC samples such as field blanks, field duplicates, and matrix spike duplicates. Third party data validation was performed on 100% of the laboratory results of soil and groundwater samples submitted for analysis.

2.4.1 QA/QC Samples

To assess the adequacy of sample collection and decontamination procedures performed in the field, QA/QC samples were collected and analyzed throughout the field-sampling program. In general, QA/QC samples confirmed that the procedures performed in the field were consistent and acceptable. Reported detections in the equipment blanks did not impact the interpretation of sample data. As specified in the RIWP, QA/QC samples collected for laboratory analysis included field blanks (FB), blind/field duplicates (FD), matrix spike (MS), matrix spike duplicates (MSD), and trip blanks (TB). The FB samples were collected daily for each sampling method that used non-disposable equipment such as the hand auger and peristaltic pump. FD and MS/MSD samples were submitted at a minimum of one each per twenty samples.

Type	Frequency
Equipment Blank	One per sample delivery group per matrix
Blind/Field Duplicate	One per 20 samples per matrix
Matrix Spike/Matrix Spike Duplicate	One per 20 samples per matrix

During the project, a total of two field blanks were collected. Field blanks were collected by pouring laboratory-supplied Ultra-Pure (certified PFC-Free) deionized water over sampling equipment and collecting the water in the appropriate sample container(s). In order to evaluate the precision of the field sampling and laboratory analyses, ZEB collected one soil field duplicate and one groundwater field duplicate.

2.4.2 Data Validation

ZEB retained the services of Premier Environmental, of Merrick, New York to perform validation of data obtained during the RI. Full data validation was performed on Nine (9) samples from the sample delivery group for PFCs in soil samples. In addition, full data validation was performed on twenty (20) samples from the sample delivery group for PFCs in groundwater samples. A copy of the Data Validation Usability Report (DUSR) is included as **Appendix D**.

2.4.3 Data Usability

Based on the review of the results reported by the laboratory, the overall Quality Control data provided in the

laboratory reports and the case narrative; the data is representative of adequate method accuracy and precision with regard to the project objectives. As noted in the full validation report, some of the data points were qualified as estimated (J/UJ) due to laboratory accuracy and precision outliers or potential interferences. The overall quality of the data is acceptable for use and results as qualified and estimated are considered usable.

3.0 HYDROGEOLOGIC ASSESSMENT AND PHYSICAL SETTING

The following section describes site topography, surrounding property use and regional and site geology/hydrogeology.

3.1 Site Topography

In January 2018, ZEB performed a preliminary site inspection. The site is located approximately 44 feet above mean sea level. Topography of the site reflects a gradual upward slope to the south with a total elevation increase of approximately 8.5'. Additionally, areas surrounding the site are generally flat.

No erosion of surface areas was noted. Precipitation drains into the stormwater structures located onsite.

3.2 Surrounding Land Use

The Site is bordered by Montauk Highway followed by an undeveloped parcel of land to the north, commercial retail storefronts to the east and west, Good Ground Road followed by Long Island Railroad property to the south.

3.3 Regional and Site Geology / Hydrogeology

The geologic setting of Long Island is well documented and consists of crystalline bedrock composed of schist and gneiss overlain by layers of unconsolidated deposits. Immediately overlying the bedrock is the Raritan Formation, consisting of the Lloyd sand confined by the Raritan Clay Member. The Lloyd sand is an aquifer and consists of discontinuous layers of gravel, sand, sandy and silty clay, and solid clay. The Raritan Clay is solid and silty clay with: few lenses of sand and gravel; abundant lignite and pyrite; and gray, red or white in color.

Above the Raritan Clay lies the Magothy Formation. The Magothy Aquifer consists of layers of fine to coarse sand of moderate to high permeability, with inter-bedded lenses of silt and clay of low permeability resulting in areas of preferential horizontal flow. Therefore, this aquifer generally becomes more confined with depth. The Upper Glacial Aquifer overlies the Magothy Aquifer. The Upper Glacial Aquifer is the water table aquifer at this location and is comprised of medium to coarse sand and gravel with occasional thin lenses of fine sand and brown clay. This aquifer extends from the land surface to the top of the Magothy and, therefore, is hydraulically connected to the Magothy Aquifer.

Based on information gained as part of this RI, the depth to groundwater is approximately 38 feet below the surface in northern portions of the site and 46 feet below the surface in the southern areas. Groundwater flow beneath the site is generally to the south-southwest.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The following sections discuss the conclusions and recommendations based upon the results obtained during the Sub-Surface Investigation.

4.1 Conclusions

ZEB performed a Subsurface Investigation at the Hampton Bays Fire District site, 69 West Montauk Highway, Hampton Bays, New York. The investigation consisted of a sanitary system/storm drain evaluation and sampling and along with vertical profile groundwater sampling. The purpose of this investigation was to determine if perfluorinated compounds (PFCs) are present in the subsurface at the site and to determine whether this site is a contributing source of PFCs detected in downgradient public supply wells.

Results of the investigation did not identify elevated concentrations of PFCs in the storm drain/sanitary system samples collected. However, elevated concentrations were detected in the shallow vertical profile wells (VP-5 and VP-6) located at the southeast property boundary. Although these concentrations are elevated, they do not appear to be the result of a significant onsite source.

While PFCs are a major component of aqueous film forming foam (AFFF) used to extinguish flammable liquid fires, historical research thus far has not confirmed the use of AFFF on the site for any fire or firematic purpose. PFCs can be introduced to the subsurface from a myriad of possible sources, however the primary source of PFOS contamination in the environment is from AFFF material/use. The Hampton Bays Fire District and the Hampton Bays Fire Department continue to comply with the NYSDEC Order on Consent, while relying upon the provisions of the Order. See Section 1.1 above.

4.2 Recommendations

Based upon the findings of this investigation, ZEB recommends that additional investigation be performed. This investigation should include delineation of PFC impacts in the vicinity of VP-5 and VP-6. The investigation should also include investigation of additional storm/sanitary structures in this area. Finally, this investigation should include soil sampling in the landscaped area to the north of VP-5 and VP-6. These investigation activities will be detailed in a Remedial Investigation Work Plan.

5.0 REFERENCES

- *New York State Department of Environmental Conservation (NYSDEC), 6 NYCRR Part 375 Subparts 375-1 to 375- 4 & 375-6; Restricted Use Soil Cleanup Objectives (RUSCOs) for the Protection of Public Health—Residential, December 2006.*
- *NYSDEC, Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards and Guidance Values; June 1998.*
- *NYSDEC, Draft DER-10 Technical Guidance For Site Investigation and Remediation; December 2002.*
- *ZEB Environmental Solutions, Inc. (ZEB), Subsurface Investigation Work Plan; December 2017.*

TABLES

TABLE 1

SOIL PFC RESULTS BY MODIFIED EPA-537

69 W MONTAUK HWY, HAMPTON BAYS, NY 11946

	CP-1 1/29/18	DUP-01 (CP-2) 1/29/18	CP-2 1/29/18	CP-3 1/29/18	SD-3 1/29/18	SD-4 1/29/18	SD-5 1/29/18	SD-6 1/29/18
PFCs by EPA Method 537 - ug/Kg								
2-(N-methyl perfluorooctanesulfonamido) acetic acid	U	U	U	U	U	U	U	U
N-Ethyl-N-((heptadecafluorooctyl)sulphonyl) glycine	U	U	U	U	U	U	U	U
PERFLUOROBUTANESULFONIC ACID	U	U	0.047 J	U	U	U	U	U
PERFLUOROBUTYRIC ACID (PFBA)	0.072 J	0.25 J	0.25 J	0.33	0.17 J	0.54	1.4	2.8
PERFLUORODECANE SULFONIC ACID	U	U	U	0.093 J	U	U	U	0.16 J
PERFLUORODECANOIC ACID (PFDA)	0.041 J	0.12 J	0.11 J	0.084 J	U	U	U	U
PERFLUORODODECANOIC ACID (PFDoA)	U	0.12 J	0.1 J	0.27	0.17 J	U	U	U
PERFLUOROHEPTANE SULFONATE (PFHpS)	U	U	U	U	U	U	U	U
Perfluoroheptanoic Acid (PFHpA)	U	U	U	U	U	U	U	U
PERFLUOROHEXANESULFONIC ACID	0.11 U	0.19 J	0.18 U	0.24 J	U	U	0.038 U	0.093 U
PERFLUOROHEXANOIC ACID (PFHxA)	U	U	U	U	U	U	2.1	U
PERFLUORONONANOIC ACID	U	0.075 J	0.075 J	0.086 J	0.15 J	U	0.25	0.4
Perfluorooctane Sulfonamide (FOSA)	U	U	U	U	U	U	U	U
PERFLUOROOCTANE SULFONIC ACID	1.6	1.5	1.3	1.7	U	U	U	U
Perfluorooctanoic acid (PFOA)	U	0.12 J	U	UJ	U	U	U	0.48
PERFLUOROPENTANOIC ACID (PFPeA)	U	0.12 J	0.13 J	U	0.12 J	1.4	2.6	**12**
PERFLUOROTETRADECANOIC ACID (PFTeA)	U	0.17 J	0.12 J	0.14 J	0.22 J	U	0.077 J	U
PERFLUOROTRIDECANOIC ACID (PFTriA)	F1	0.75	0.68	1.5	**20**	0.2 J	0.57	1.9
PERFLUOROUNDECANOIC ACID (PFUnA)	0.043 J	0.15 J	0.12 J	0.19 J	0.22 J	0.14 J	0.29	0.57
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	U	U	U	U	U	U	U	U
SODIUM 1H,1H,2H,2H-PERFLUOROOCTANE SULFONATE (6:2)	U	U	U	U	U	U	U	U

LEGEND

< 1 ug/Kg	:	No Highlighting
1 ug/Kg - 2 ug/Kg	:	Yellow
2 ug/Kg- 5 ug/Kg	:	Orange
> 5 ug/Kg	:	Light Red

Qualifier Descriptions

J: Result is less than the the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

F1: The MS and/or MSD Recovery is outside aceptance limits

U: The compound was analyzed for, but not detected above the reported quantitation

TABLE 2

GROUNDWATER PFC RESULTS BY MODIFIED EPA-537
69 W MONTAUK HWY, HAMPTON BAYS, NY 11946
07.05.18

	VP-1			VP-2			DUP-01 VP-3	VP-3			VP-4			VP-5			VP-6		
	(45-50) 1/31/18	(65-70) 1/31/18	(85-90) 1/31/18	(45-50) 1/30/18	(70-75) 1/30/18	(90-95) 1/30/18	(45-50) 2/2/18	(45-50) 2/2/18	(65-70) 2/2/18	(85-90) 2/2/18	(50-55) 2/2/18	(70-75) 2/2/18	(90-95) 2/2/18	(50-55) 2/1/18	(70-75) 2/1/18	(90-95) 2/1/18	(50-55) 2/2/18	(70-75) 2/2/18	(90-95) 2/2/18
PFCs by Modified Method 537 - ng/L																			
PERFLUOROBUTANESULFONIC ACID	2.9	0.94 J	2.2	1.5 J	U	U	18	19	17	2.8	4.9	1.1 J	1.6 J	8.5	9.7	0.89 J	4.3	2.2	1.6 J
PERFLUOROBUTYRIC ACID (PFBA)	6.3	4.4	10	8.6	0.89 J	14	14	14	4.9	0.34 J	6.2	0.97 J	1.8 J	7.1	15	1.8 J	37	19	4
PERFLUORODECANE SULFONIC ACID	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
PERFLUORODECANOIC ACID (PFDA)	1 J	3.5	3.5	2.4	U	0.53 J	3.4	3.3	0.89 J	U	U	U	U	U	2.6	U	U	0.89 J	2.2
PERFLUORODODECANOIC ACID (PFDoA)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
PERFLUOROHEPTANE SULFONATE (PFHpS)	0.84 J	U	0.6 J	0.3 J	U	U	2.1	2	0.64 J	U	U	U	U	8.3	8.2	0.49 J	0.37 J	2.3	1.8 J
Perfluoroheptanoic Acid (PFHpA)	6	3.4	11	15	0.97 J	0.97 J	11	12	3.4	0.33 J	3.8	0.86 J	1.7 J	46	54	4.7	120	8.1	6.7
PERFLUOROHEXANESULFONIC ACID	19 B	6.8 B	22 B	8.5 B	0.54 U	0.65 U	15 B	17 B	8 B	3.5 U	8.5 B	1.6 U	2 U	61 B	250 B	13 B	470 B	37 B	31 B
PERFLUOROHEXANOIC ACID (PFHxA)	9.7	5.1	19	18	U	2.1	38	37	5.4	U	6.8	U	2.4	17	56	5.1	96	12	5.2
PERFLUORONONANOIC ACID	16	9.3	40	13	0.79 J	1.3 J	20	21	11	0.43 J	1 J	0.6 J	0.61 J	21	40	7	1.2 J	9.3	17
Perfluorooctane Sulfonamide (FOSA)	U	U	U	U	U	U	150	150	2.9	5.8	0.54 J	U	U	2.3	87	9.9	0.53 J	0.67 J	U
PERFLUOROOCTANE SULFONIC ACID	230	30	58	65	3.6	5.6	210	200	35	3.8	4.8	3.5	2.2	2400	580	69	5.7	78	76
Perfluorooctanoic acid (PFOA)	11	6.5	15	15	2.7	2.1	53	56	9.5	U	4.6	8	3.8	230	250	78	25	96	52
PERFLUOROPENTANOIC ACID (PFPeA)	6.1	3.8	16	20	1.6 J	U	47	45	6.2	0.5 J	4.2	1.4 J	2.6	11	44	3.2	110	48	5.9
PERFLUOROTETRADECANOIC ACID (PFTeA)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
PERFLUOROTRIDECANOIC ACID (PFTriA)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
PERFLUOROUNDECANOIC ACID (PFUnA)	U	U	U	1.4 J	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120	140	120	120	110	120	110	110	100	110	120	110	110	110	120	120	110	100	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130	140	130	130	120	140 T	130	130	110	110	130	120	120	120	130	120	130	120	110
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	U	U	U	U	U	U	200	210	U	2.8 J	U	U	U	3.1 J	130	11 J	U	6.6 J	U
SODIUM 1H,1H,2H,2H-PERFLUOROOCTANE SULFONATE (6:2)	U	U	U	5.3 J	U	U	6.3 J	5.9 J	U	U	U	U	U	45	17 J	U	U	6.5 J	U

LEGEND

< 25 ng/L	:	No Highlighting
25 ng/L - 50 ng/L	:	Yellow
50 ng/L- 150 ng/L	:	Orange
150 ng/L - 1,000 ng/L	:	Light Red
> 1000 ng/L	:	**Bright Red**

Qualifier Descriptions

J: Result is less than the the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate
B: Compound was found in the blank and sample
U: The compound was analyzed for, but not detected above the reported quantitation limit

FIGURES

/Volumes/Shared/Projects/HBF/Figures/Fig 1- Proposed Well Locations 17.11.20..dwg

SITE VICINITY MAP

0.0 3.0 6.0

SCALE MILES

BASEMAP PROVIDED BY: GOOGLE EARTH

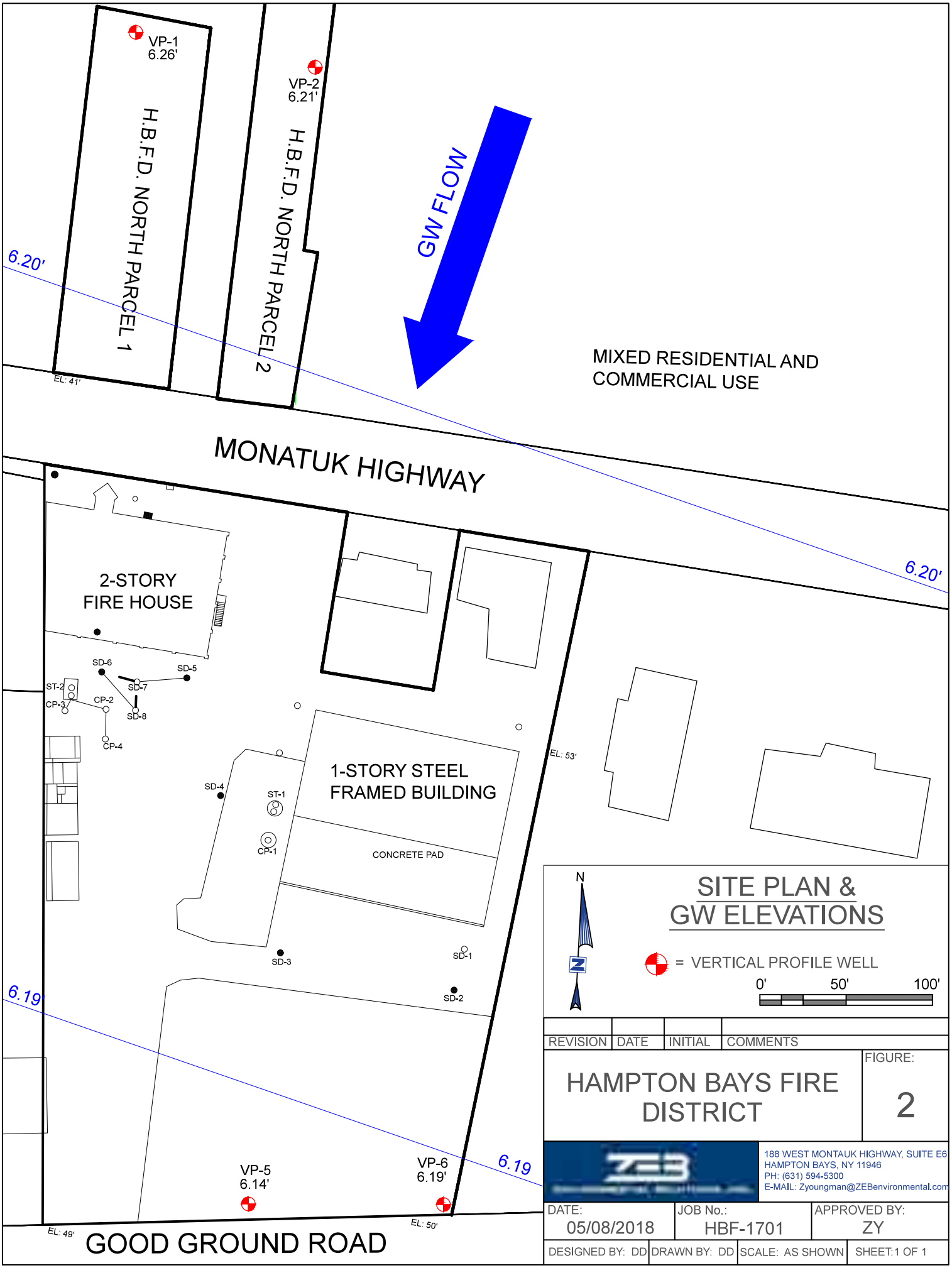
REVISION	DATE	INITIALS	COMMENTS

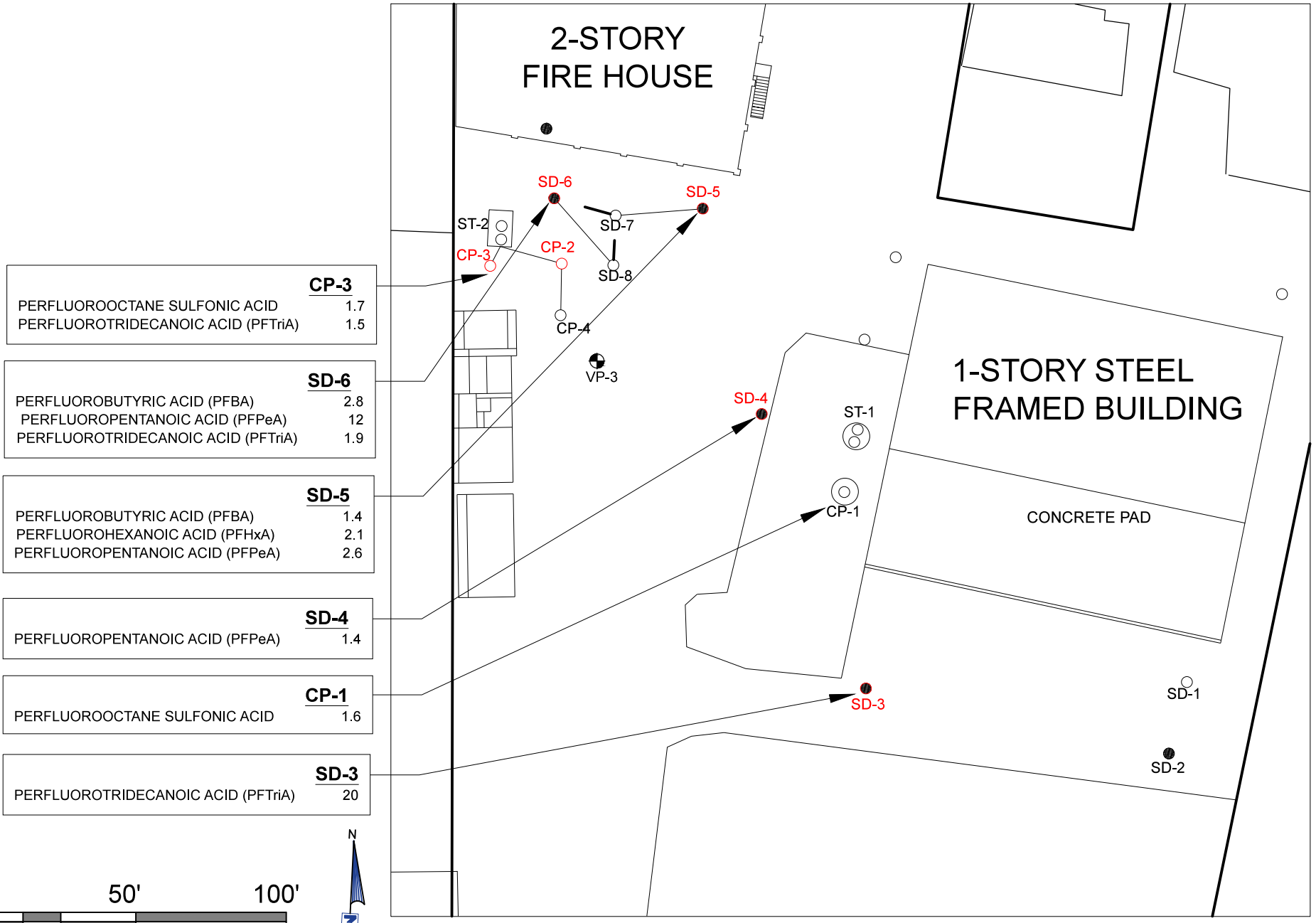
HAMPTON BAYS FIRE DISTRICT
69 W. MONTAUK HWY,
HAMPTON BAYS, NY 11946

188 WEST MONTAUK HIGHWAY, SUITE E6
HAMPTON BAYS, NY 11946
PH: (631) 594-5300
E-MAIL: Zyoungman@ZEBenvironmental.com

DATE:	JOB No.:	FIGURE No.:
11/20/17	HBF-1701	1

APPROVED BY:	DESIGNED BY:	DRAWN BY:	SCALE:	SHEET
ZY	DD	DD	AS SHOWN	1 OF 2


VP-1
6.26'
VP-2
6.21'
H.B.F.D. NORTH PARCEL 1
H.B.F.D. NORTH PARCEL 2
GW FLOW
6.20'
EL: 41'
MIXED RESIDENTIAL AND
COMMERCIAL USE
MONATUK HIGHWAY
6.20'
2-STORY
FIRE HOUSE
SD-6
SD-5
SD-7
ST-2
CP-3
CP-2
SD-8
CP-4
1-STORY STEEL
FRAMED BUILDING
SD-4
ST-1
CP-1
CONCRETE PAD
EL: 53'
SD-3
SD-1
SD-2
6.19'
VP-5
6.14'
VP-6
6.19'
6.19
EL: 49'
EL: 50'
GOOD GROUND ROAD
N
SITE PLAN &
GW ELEVATIONS
= VERTICAL PROFILE WELL
0'
50'
100'
REVISION
DATE
INITIAL
COMMENTS
HAMPTON BAYS FIRE
DISTRICT
FIGURE:
2
188 WEST MONTAUK HIGHWAY, SUITE E6
HAMPTON BAYS, NY 11946
PH: (631) 594-5300
E-MAIL: Zyoungman@ZEBenvironmental.com
DATE:
05/08/2018
JOB No.:
HBF-1701
APPROVED BY:
ZY
DESIGNED BY: DD
DRAWN BY: DD
SCALE: AS SHOWN
SHEET:1 OF 1



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SOIL SAMPLE SPIDER MAP

ZEB ENVIRONMENTAL SOLUTIONS, INC.
188 WEST MONTAUK HIGHWAY, SUITE E6
HAMPTON BAYS, NY 11946
PH: (631) 594-5300
E-MAIL: Zyoungman@ZEBenvironmental.com

69 West Montauk Hwy,
Hampton Bays, NY 11946

DATE:	JOB No.:	FIGURE No.:
05/08/2018	HBF-1701	3

APPROVED BY:	DESIGNED BY:	DRAWN BY:	SCALE:	SHEET
ZY	DD	DD	-	- OF -

VP-1 (45-50)

PERFLUOROOCTANE SULFONIC ACID	230
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130

VP-1 (65-70)

PERFLUOROOCTANE SULFONIC ACID	30
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	140
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	140

VP-1 (85-90)

PERFLUOROHEXANESULFONIC ACID	22
PERFLUORONONANOIC ACID	40
PERFLUOROOCTANE SULFONIC ACID	58
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130

VP-2 (45-50)

PERFLUOROOCTANE SULFONIC ACID	65
PERFLUOROPENTANOIC ACID (PFPeA)	20
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130

VP-2 (70-75)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120

VP-2 (90-95)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	140

VP-3 (45-50)

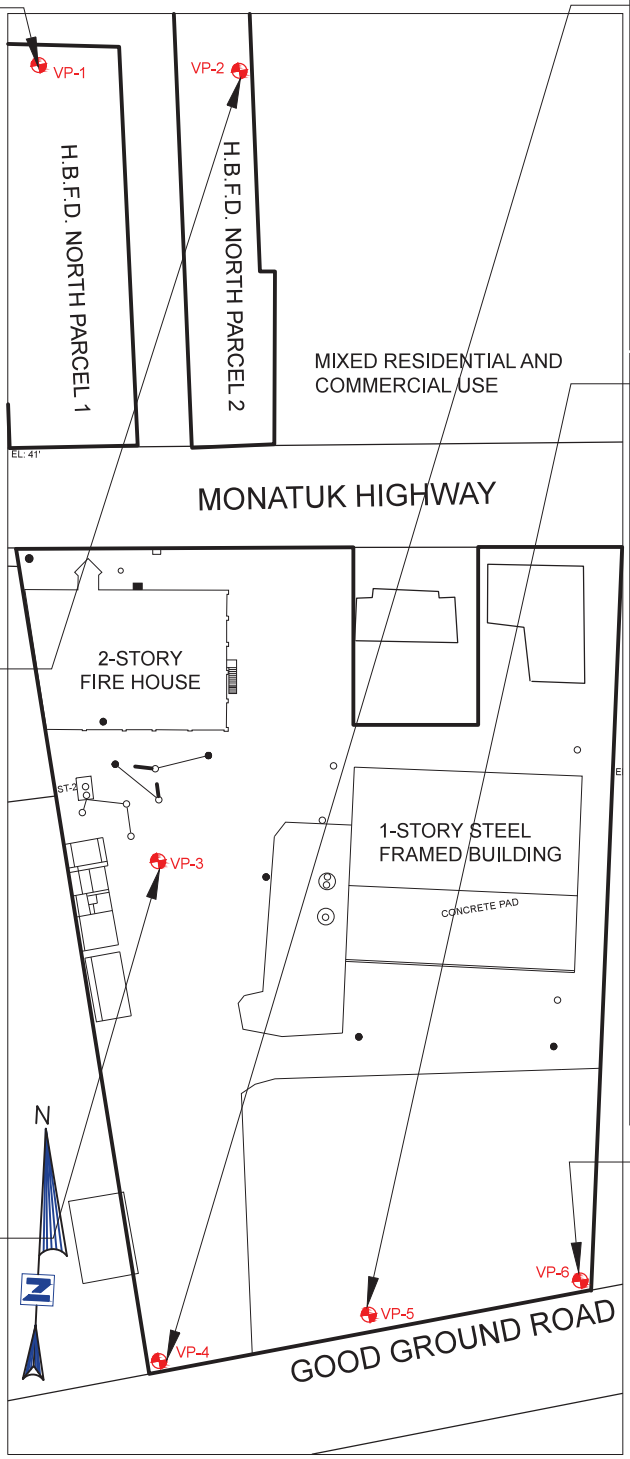
PERFLUOROHEXANOIC ACID (PFHxA)	37
PERFLUORONONANOIC ACID	21
Perfluorooctane Sulfonamide (FOSA)	150
PERFLUOROOCTANE SULFONIC ACID	200
Perfluorooctanoic acid (PFOA)	56
PERFLUOROPENTANOIC ACID (PFPeA)	45
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	210

VP-3 (65-70)

PERFLUOROOCTANE SULFONIC ACID	35
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	100
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	110

VP-3 (65-70)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	110
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	110



GW SPIDER MAP

= VERTICAL PROFILE WELL

(all values are provided in ng/L)

0' 75' 150'

VP-4 (50-55)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130

VP-4 (70-75)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120

VP-4 (90-95)

Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120

VP-5 (50-55)

Perfluorooctanoic acid	230
Perfluoroheptanoic Acid (PFHpA)	46
PERFLUOROHEXANESULFONIC ACID	61
PERFLUORONONANOIC ACID	21
PERFLUOROOCTANE SULFONIC ACID	2400
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	45

VP-5 (70-75)

Perfluoroheptanoic Acid (PFHpA)	54
PERFLUOROHEXANESULFONIC ACID	250
PERFLUOROHEXANOIC ACID (PFHxA)	56
PERFLUORONONANOIC ACID	40
Perfluorooctane Sulfonamide (FOSA)	87
PERFLUOROOCTANE SULFONIC ACID	580
Perfluorooctanoic acid (PFOA)	250
PERFLUOROPENTANOIC ACID (PFPeA)	44
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	130

VP-5 (90-95)

PERFLUOROOCTANE SULFONIC ACID	69
Perfluorooctanoic acid (PFOA)	78
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	120

VP-6 (50-55)

PERFLUOROBUTANOIC ACID	37
PERFLUOROHEPTANOIC ACID	120
PERFLUOROHEXANESULFONIC ACID	470
PERFLUOROHEXANOIC ACID (PFHxA)	96
Perfluorooctanoic acid (PFOA)	25
PERFLUOROPENTANOIC ACID (PFPeA)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	130

VP-6 (70-75)

PERFLUOROHEXANESULFONIC ACID	37
PERFLUOROHEXANOIC ACID (PFHxA)	12
PERFLUOROOCTANE SULFONIC ACID	78
Perfluorooctanoic acid (PFOA)	96
PERFLUOROPENTANOIC ACID (PFPeA)	48
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	100
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	120

VP-6 (90-95)

PERFLUOROHEXANESULFONIC ACID	31
PERFLUOROOCTANE SULFONIC ACID	76
Perfluorooctanoic acid (PFOA)	52
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonate (6:2)	110
Sodium 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonate (6:2)	110

188 WEST MONTAUK HIGHWAY, SUITE E6
HAMPTON BAYS, NY 11946
PH: (631) 594-5300
E-MAIL: Zyoungman@ZEBenvironmental.com

REVISION	DATE	INITIAL	COMMENTS

DATE:	JOB No.:	APPROVED BY:	
05/29/2018	HBF-1701	ZY	

DESIGNED BY: DD	DRAWN BY: DD	SCALE: AS SHOWN	SHEET: 1 OF 1

HAMPTON BAYS FIRE DISTRICT

FIGURE: 4

APPENDIX A

LABORATORY ANALYTICAL REPORTS – SEDIMENT SAMPLES

APPENDIX B

GROUNDWATER SAMPLING LOGS

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-1 (85-90)	SAMPLED BY	DD
DATE SAMPLED	1/31/18	TIME SAMPLED	852
DEPTH TO WATER (feet)	37.56	TOTAL WELL DEPTH (feet)	90
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.12	PURGE TIME (Min)	55
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
852	5.45	0.200	629.0	5.32	8.48	-104	6.4
	5.37	0.20	619.57	5.24	8.35	####	6.32

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-1 (65-70)	SAMPLED BY	DD
DATE SAMPLED	1/31/18	TIME SAMPLED	947
DEPTH TO WATER (feet)	36.65	TOTAL WELL DEPTH (feet)	70
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.09	PURGE TIME (Min)	43
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
947	5.86	0.832	322.0	9.45	8.52	-52	4.1

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-1 (65-70)	SAMPLED BY	DD
DATE SAMPLED	1/31/18	TIME SAMPLED	1030
DEPTH TO WATER (feet)	37.38	TOTAL WELL DEPTH (feet)	50
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.10	PURGE TIME (Min)	15
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1030	5.92	5.870	999.0	9.04	8.10	-112	1.5

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-2 (90-95)	SAMPLED BY	DD
DATE SAMPLED	1/30/18	TIME SAMPLED	1128
DEPTH TO WATER (feet)	37.56	TOTAL WELL DEPTH (feet)	95
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.13	PURGE TIME (Min)	53
SAMPLE APPEARANCE	CLEAR	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1330	5.47	0.221	516.0	5.32	8.51	-101	7.0

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-2 (70-75)	SAMPLED BY	DD
DATE SAMPLED	1/30/18	TIME SAMPLED	1258
DEPTH TO WATER (feet)	36.65	TOTAL WELL DEPTH (feet)	75
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.10	PURGE TIME (Min)	46
SAMPLE APPEARANCE	LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1258	5.44	0.215	999.0	9.04	8.59	-112	4.7

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-2 (45-50)	SAMPLED BY	DD
DATE SAMPLED	1/30/18	TIME SAMPLED	1330
DEPTH TO WATER (feet)	37.83	TOTAL WELL DEPTH (feet)	50
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.10	PURGE TIME (Min)	15
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1330	5.61	0.587	999.0	9.45	8.55	-112	1.5

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-3 (85-90)	SAMPLED BY	DD
DATE SAMPLED	2/2/18	TIME SAMPLED	930
DEPTH TO WATER (feet)	38.61	TOTAL WELL DEPTH (feet)	90
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.10	PURGE TIME (Min)	64
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
930	5.99	0.298	999.0	6.74	8.29	-62	6.3

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-3 (65-70)	SAMPLED BY	DD
DATE SAMPLED	2/2/18	TIME SAMPLED	1000
DEPTH TO WATER (feet)	39.45	TOTAL WELL DEPTH (feet)	70
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.11	PURGE TIME (Min)	35
SAMPLE APPEARANCE	CLEAR	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1000	5.69	0.634	75.4	6.57	6.90	8	3.7

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-3 (45-50)	SAMPLED BY	DD
DATE SAMPLED	2/2/18	TIME SAMPLED	1025
DEPTH TO WATER (feet)	39.72	TOTAL WELL DEPTH (feet)	50
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.10	PURGE TIME (Min)	13
SAMPLE APPEARANCE	CLEAR	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1025	5.87	0.461	244.0	4.43	7.96	-32	1.3

DUP-01 Also collected at 1025

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-4 (90-95)	SAMPLED BY	DD
DATE SAMPLED	2/2/18	TIME SAMPLED	1100
DEPTH TO WATER (feet)	46.71	TOTAL WELL DEPTH (feet)	95
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.10	PURGE TIME (Min)	58
SAMPLE APPEARANCE	LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1100	5.81	0.331	999.0	6.87	6.08	-15	5.9

MS / MSD Sample Also Collected

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-4 (70-75)	SAMPLED BY	DD
DATE SAMPLED	2/2/18	TIME SAMPLED	1127
DEPTH TO WATER (feet)	45.27	TOTAL WELL DEPTH (feet)	75
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.10	PURGE TIME (Min)	38
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1127	5.84	0.386	198.0	7.37	6.65	14	3.6

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-4 (50-55)	SAMPLED BY	DD
DATE SAMPLED	2/2/18	TIME SAMPLED	1146
DEPTH TO WATER (feet)	45.17	TOTAL WELL DEPTH (feet)	55
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.07	PURGE TIME (Min)	18
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1146	5.81	0.331	315.0	8.68	6.69	-13	1.2

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-5 (90-95)	SAMPLED BY	DD
DATE SAMPLED	2/1/18	TIME SAMPLED	1315
DEPTH TO WATER (feet)	50.05	TOTAL WELL DEPTH (feet)	95
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.11	PURGE TIME (Min)	48
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1315	5.29	0.246	999.0	10.91	9.19	-15	5.5

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-5 (70-75)	SAMPLED BY	DD
DATE SAMPLED	2/1/18	TIME SAMPLED	1350
DEPTH TO WATER (feet)	49.68	TOTAL WELL DEPTH (feet)	75
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.08	PURGE TIME (Min)	38
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1350	5.83	0.532	423.0	11.47	8.33	4	3.1

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-5 (50-55)	SAMPLED BY	DD
DATE SAMPLED	2/1/18	TIME SAMPLED	1750
DEPTH TO WATER (feet)	49.11	TOTAL WELL DEPTH (feet)	55
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.05	PURGE TIME (Min)	16
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
1750	5.59	0.358	999.0	12.72	4.96	-1	0.7

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-6 (90-95)	SAMPLED BY	DD
DATE SAMPLED	2/2/18	TIME SAMPLED	810
DEPTH TO WATER (feet)	46.61	TOTAL WELL DEPTH (feet)	95
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.11	PURGE TIME (Min)	55
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
810	5.69	0.751	145.0	9.07	4.07	50	5.9

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-6 (90-95)	SAMPLED BY	DD
DATE SAMPLED	2/2/18	TIME SAMPLED	848
DEPTH TO WATER (feet)	46.25	TOTAL WELL DEPTH (feet)	75
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.10	PURGE TIME (Min)	34
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
848	5.87	7.440	147.0	6.73	5.02	5	3.5

VERTICAL PROFILE WELL SAMPLING LOGS

SITE INFORMATION

SITE ID/PROJECT NUMBER:	69 W MONTAUK HWY, HAMPTON BAYS, NY 11946		
SAMPLING POINT	VP-6 (50-55)	SAMPLED BY	DD
DATE SAMPLED	2/2/18	TIME SAMPLED	910
DEPTH TO WATER (feet)	46.26	TOTAL WELL DEPTH (feet)	55
WELL DIAMETER (inches)	1		

SAMPLING INFORMATION

PURGE METHOD	PURGE 3 WATER VOLUMES	SAMPLE METHOD	WATERA CHECK VALVE
PURGE RATE (GPM)	0.11	PURGE TIME (Min)	10
SAMPLE APPEARANCE	V. LIGHT BROWN	ODORS OBSERVED	NONE
ANALYSIS	MODIFIED EPA 537	LABORATORY	TESTAMERICA LABORATORIES, INC
DATE SHIPPED	2/2/18	SHIPPING METHOD	COURIER

SAMPLING PARAMETERS

Time	pH	Cond. (mS/m)	Turbidity (NTU)	DO mg/L	Temp. (°C)	ORP (mV)	Purge Amount (gallons)
910	6.04	0.456	733.0	6.33	7.17	0	1.1

APPENDIX C

LABORATORY ANALYTICAL REPORTS - GROUNDWATER

APPENDIX B

TestAmerica Edison
777 New Durham Road
Edison, NJ 08817

Prepared for:
Zeb Youngman
Zeb Environmental Solutions Inc
188 West Montauk Highway
E6
Hampton Bays, NY 11946
zyoungman@zebenvironmental.com
Tel: (631) 594-5300

Prepared by	Scott, Aidan J
Date	1/25/2019
Expiration Date	4/24/2019
Est. Start Date	

Project: Hampton Bays Fire District Site *Quote Number: 46028469 - 0*

Soil Samples

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Solid	8260C	TCL VOCs + 10 TICs	1,1,1-Trichloroethane	1.00	0.233	ug/Kg
			1,1,2,2-Tetrachloroethane	1.00	0.214	ug/Kg
			1,1,2-Trichloro-1,2,2-trifluoroethane	1.00	0.301	ug/Kg
			1,1,2-Trichloroethane	1.00	0.178	ug/Kg
			1,1-Dichloroethane	1.00	0.206	ug/Kg
			1,1-Dichloroethene	1.00	0.225	ug/Kg
			1,2,3-Trichlorobenzene	1.00	0.181	ug/Kg
			1,2,4-Trichlorobenzene	1.00	0.0920	ug/Kg
			1,2-Dichloropropane	1.00	0.423	ug/Kg
			1,3-Dichlorobenzene	1.00	0.159	ug/Kg
			1,4-Dichlorobenzene	1.00	0.100	ug/Kg
			1,4-Dioxane	20.0	9.18	ug/Kg
			2-Butanone (MEK)	5.00	1.11	ug/Kg
			2-Hexanone	5.00	0.780	ug/Kg
			4-Methyl-2-pentanone (MIBK)	5.00	0.664	ug/Kg
			Acetone	5.00	3.79	ug/Kg
			Benzene	1.00	0.258	ug/Kg
			Bromoform	1.00	0.425	ug/Kg
			Bromomethane	1.00	0.474	ug/Kg
			Carbon disulfide	1.00	0.266	ug/Kg
			Carbon tetrachloride	1.00	0.181	ug/Kg
			Chlorobenzene	1.00	0.177	ug/Kg
			Chlorobromomethane	1.00	0.281	ug/Kg
			Chlorodibromomethane	1.00	0.194	ug/Kg
			Chloroethane	1.00	0.522	ug/Kg
			Chloroform	1.00	0.319	ug/Kg
			Chloromethane	1.00	0.435	ug/Kg
			cis-1,2-Dichloroethene	1.00	0.152	ug/Kg
			cis-1,3-Dichloropropene	1.00	0.273	ug/Kg
			Cyclohexane	1.00	0.221	ug/Kg
			Dichlorobromomethane	1.00	0.257	ug/Kg
			Dichlorodifluoromethane	1.00	0.338	ug/Kg
			Ethylbenzene	1.00	0.199	ug/Kg
			Ethylene Dibromide	1.00	0.180	ug/Kg
			Isopropylbenzene	1.00	0.126	ug/Kg
			Methyl acetate	5.00	4.30	ug/Kg
			Methyl tert-butyl ether	1.00	0.125	ug/Kg
			Methylcyclohexane	1.00	0.160	ug/Kg
			Methylene Chloride	1.00	0.163	ug/Kg
			m-Xylene & p-Xylene	1.00	0.174	ug/Kg
			o-Xylene	1.00	0.0950	ug/Kg
			Styrene	1.00	0.123	ug/Kg
			Tetrachloroethene	1.00	0.143	ug/Kg

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Prepared by	Scott, Aidan J
Date	1/25/2019
Expiration Date	4/24/2019
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Project: Hampton Bays Fire District SIte *Quote Number: 46028469 - 0*

Soil Samples

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Continued						
			Toluene	1.00	0.625	ug/Kg
			trans-1,2-Dichloroethene	1.00	0.246	ug/Kg
			trans-1,3-Dichloropropene	1.00	0.266	ug/Kg
			Trichloroethene	1.00	0.144	ug/Kg
			Trichlorofluoromethane	1.00	0.406	ug/Kg
			Vinyl chloride	1.00	0.546	ug/Kg
			1,2-Dichloroethane	1.00	0.296	ug/Kg
			1,2-Dichlorobenzene	1.00	0.144	ug/Kg
			1,2-Dibromo-3-Chloropropane	1.00	0.460	ug/Kg
		Surrogate Cpnd				
			1,2-Dichloroethane-d4 (Surr)			
			4-Bromofluorobenzene			
			Dibromofluoromethane (Surr)			
			Toluene-d8 (Surr)			
				RL	MDL	Units
Solid	8270D	TCL BNA +20	1,1'-Biphenyl	330	4.39	ug/Kg
			1,2,4,5-Tetrachlorobenzene	330	4.33	ug/Kg
			2,2'-oxybis[1-chloropropane]	330	5.99	ug/Kg
			2,3,4,6-Tetrachlorophenol	330	22.4	ug/Kg
			2,4,5-Trichlorophenol	330	10.9	ug/Kg
			2,4,6-Trichlorophenol	133	16.7	ug/Kg
			2,4-Dichlorophenol	133	6.99	ug/Kg
			2,4-Dimethylphenol	330	14.5	ug/Kg
			2,4-Dinitrophenol	266	163	ug/Kg
			2,4-Dinitrotoluene	67.0	16.7	ug/Kg
			2,6-Dinitrotoluene	67.0	10.7	ug/Kg
			2-Chloronaphthalene	330	15.3	ug/Kg
			2-Chlorophenol	330	4.64	ug/Kg
			2-Methylnaphthalene	330	4.13	ug/Kg
			2-Methylphenol	330	5.34	ug/Kg
			2-Nitroaniline	330	12.4	ug/Kg
			2-Nitrophenol	330	10.6	ug/Kg
			3,3'-Dichlorobenzidine	133	50.0	ug/Kg
			3-Nitroaniline	330	17.9	ug/Kg
			4,6-Dinitro-2-methylphenol	266	53.7	ug/Kg
			4-Bromophenyl phenyl ether	330	4.28	ug/Kg
			4-Chloro-3-methylphenol	330	5.50	ug/Kg
			4-Chloroaniline	330	23.1	ug/Kg
			4-Chlorophenyl phenyl ether	330	5.22	ug/Kg
			4-Methylphenol	330	5.64	ug/Kg
			4-Nitroaniline	330	12.3	ug/Kg
			4-Nitrophenol	670	53.9	ug/Kg
			Acenaphthene	330	24.1	ug/Kg

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Soil Samples

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Continued						
			Acenaphthylene	330	3.42	ug/Kg
			Acetophenone	330	5.34	ug/Kg
			Anthracene	330	3.70	ug/Kg
			Atrazine	133	8.35	ug/Kg
			Benzaldehyde	330	14.4	ug/Kg
			Benzo[a]anthracene	33.0	11.5	ug/Kg
			Benzo[a]pyrene	33.0	8.81	ug/Kg
			Benzo[b]fluoranthene	33.0	8.56	ug/Kg
			Benzo[g,h,i]perylene	330	9.76	ug/Kg
			Benzo[k]fluoranthene	33.0	6.49	ug/Kg
			Bis(2-chloroethoxy)methane	330	11.4	ug/Kg
			Bis(2-chloroethyl)ether	33.0	4.00	ug/Kg
			Bis(2-ethylhexyl) phthalate	330	17.5	ug/Kg
			Butyl benzyl phthalate	330	15.5	ug/Kg
			Caprolactam	330	19.8	ug/Kg
			Carbazole	330	3.87	ug/Kg
			Chrysene	330	5.59	ug/Kg
			Dibenz(a,h)anthracene	33.0	14.3	ug/Kg
			Dibenzofuran	330	4.65	ug/Kg
			Diethyl phthalate	330	4.79	ug/Kg
			Dimethyl phthalate	330	3.99	ug/Kg
			Di-n-butyl phthalate	330	58.4	ug/Kg
			Di-n-octyl phthalate	330	17.5	ug/Kg
			Fluoranthene	330	4.30	ug/Kg
			Fluorene	330	4.49	ug/Kg
			Hexachlorobenzene	33.0	4.85	ug/Kg
			Hexachlorobutadiene	67.0	7.04	ug/Kg
			Hexachlorocyclopentadiene	330	29.0	ug/Kg
			Hexachloroethane	33.0	5.10	ug/Kg
			Indeno[1,2,3-cd]pyrene	33.0	12.9	ug/Kg
			Isophorone	133	8.70	ug/Kg
			Naphthalene	330	5.72	ug/Kg
			Nitrobenzene	33.0	7.94	ug/Kg
			N-Nitrosodi-n-propylamine	33.0	5.27	ug/Kg
			N-Nitrosodiphenylamine	330	6.33	ug/Kg
			Pentachlorophenol	266	67.8	ug/Kg
			Phenanthrene	330	5.81	ug/Kg
			Phenol	330	4.90	ug/Kg
			Pyrene	330	8.23	ug/Kg
		Surrogate Cpnd				
			2,4,6-Tribromophenol (Surr)			
			2-Fluorobiphenyl			
			2-Fluorophenol (Surr)			
			Nitrobenzene-d5 (Surr)			
			Phenol-d5 (Surr)			

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Soil Samples

Matrix	Method	Test Description		Analyte	RL	MDL	Units
Continued			**Surrogate Cpnd**				
				Terphenyl-d14 (Surr)			
Solid	8081B	TCL Pesticides		4,4'-DDD	6.70	1.14	ug/Kg
				4,4'-DDE	6.70	0.790	ug/Kg
				4,4'-DDT	6.70	1.23	ug/Kg
				Aldrin	6.70	1.01	ug/Kg
				alpha-BHC	2.00	0.680	ug/Kg
				beta-BHC	2.00	0.750	ug/Kg
				Chlordane (technical)	67.0	16.2	ug/Kg
				delta-BHC	2.00	0.410	ug/Kg
				Dieldrin	2.00	0.870	ug/Kg
				Endosulfan I	6.70	1.02	ug/Kg
				Endosulfan II	6.70	1.72	ug/Kg
				Endosulfan sulfate	6.70	0.840	ug/Kg
				Endrin	6.70	0.960	ug/Kg
				Endrin aldehyde	6.70	1.58	ug/Kg
				Endrin ketone	6.70	1.30	ug/Kg
				gamma-BHC (Lindane)	2.00	0.620	ug/Kg
				Heptachlor	6.70	0.790	ug/Kg
				Heptachlor epoxide	6.70	1.00	ug/Kg
				Methoxychlor	6.70	1.53	ug/Kg
				Toxaphene	67.0	24.2	ug/Kg
			Surrogate Cpnd				
				DCB Decachlorobiphenyl			
				Tetrachloro-m-xylene			
Solid	8082A	PCBs		Aroclor 1016	67.0	8.90	ug/Kg
				Aroclor 1221	67.0	8.90	ug/Kg
				Aroclor 1232	67.0	8.90	ug/Kg
				Aroclor 1242	67.0	8.90	ug/Kg
				Aroclor 1248	67.0	8.90	ug/Kg
				Aroclor 1254	67.0	9.20	ug/Kg
				Aroclor 1260	67.0	9.20	ug/Kg
				Aroclor-1262	67.0	9.20	ug/Kg
				Aroclor 1268	67.0	9.20	ug/Kg
				Polychlorinated biphenyls, Total	67.0	9.20	ug/Kg
			Surrogate Cpnd				
				DCB Decachlorobiphenyl			

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Soil Samples

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Solid	6020B	TAL Metals (Price includes Hg)	Silver	1.00	0.618	mg/Kg
			Aluminum	20.0	6.85	mg/Kg
			Arsenic	1.00	0.321	mg/Kg
			Barium	2.00	0.664	mg/Kg
			Beryllium	0.400	0.161	mg/Kg
			Calcium	100	29.7	mg/Kg
			Cadmium	1.00	0.336	mg/Kg
			Cobalt	2.00	0.602	mg/Kg
			Chromium	2.00	0.600	mg/Kg
			Copper	2.00	0.573	mg/Kg
			Iron	60.0	21.0	mg/Kg
			Potassium	100	36.0	mg/Kg
			Magnesium	100	27.8	mg/Kg
			Manganese	4.00	1.22	mg/Kg
			Sodium	100	31.3	mg/Kg
			Nickel	2.00	0.651	mg/Kg
			Lead	0.600	0.189	mg/Kg
			Antimony	1.00	0.293	mg/Kg
			Selenium	5.00	0.290	mg/Kg
			Thallium	0.400	0.125	mg/Kg
			Vanadium	2.00	0.569	mg/Kg
			Zinc	8.00	3.90	mg/Kg

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Solid	7471B	Mercury	Mercury	0.0170	0.0100	mg/Kg

Matrix	Method	Test Description	Analyte	RL	RL	Units
Solid	Moisture	Percent Moisture	Percent Moisture	1.00	1.00	%
			Percent Solids	1.00	1.00	%

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Solid	537 (modified)	PFAS, Standard List (21 Analytes)	Perfluorobutanoic acid (PFBA)	0.200	0.0280	ug/Kg
			Perfluoropentanoic acid (PFPeA)	0.200	0.0770	ug/Kg
			Perfluorohexanoic acid (PFHxA)	0.200	0.0420	ug/Kg
			Perfluoroheptanoic acid (PFHpA)	0.200	0.0290	ug/Kg
			Perfluorooctanoic acid (PFOA)	0.200	0.0860	ug/Kg
			Perfluorononanoic acid (PFNA)	0.200	0.0360	ug/Kg
			Perfluorodecanoic acid (PFDA)	0.200	0.0220	ug/Kg
			Perfluoroundecanoic acid (PFUnA)	0.200	0.0360	ug/Kg

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Soil Samples

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Continued						
			Perfluorododecanoic acid (PFDoA)	0.200	0.0670	ug/Kg
			Perfluorotridecanoic acid (PFTriA)	0.200	0.0510	ug/Kg
			Perfluorotetradecanoic acid (PFTeA)	0.200	0.0540	ug/Kg
			Perfluorobutanesulfonic acid (PFBS)	0.200	0.0250	ug/Kg
			Perfluorohexanesulfonic acid (PFHxS)	0.200	0.0310	ug/Kg
			Perfluoroheptanesulfonic Acid (PFHpS)	0.200	0.0350	ug/Kg
			Perfluorooctanesulfonic acid (PFOS)	0.500	0.200	ug/Kg
			Perfluorodecanesulfonic acid (PFDS)	0.200	0.0390	ug/Kg
			Perfluorooctanesulfonamide (FOSA)	0.200	0.0820	ug/Kg
			N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	0.390	ug/Kg
			N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	0.370	ug/Kg
			6:2 FTS	2.00	0.150	ug/Kg
			8:2 FTS	2.00	0.250	ug/Kg
		Isotope Dilution				
			13C4 PFBA			
			13C5 PFPeA			
			13C2 PFHxA			
			13C4 PFHpA			
			13C4 PFOA			
			13C5 PFNA			
			13C2 PFDA			
			13C2 PFUnA			
			13C2 PFDoA			
			13C2 PFTeDA			
			13C3 PFBS			
			18O2 PFHxS			
			13C4 PFOS			
			13C8 FOSA			
			d3-NMeFOSAA			
			d5-NEtFOSAA			
			M2-6:2 FTS			
			M2-8:2 FTS			

Groundwater Samples

Matrix	Method	Test Description	Analyte

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Groundwater Samples

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Water	8260C	TCL VOCs +10 TICs	1,1,1-Trichloroethane	1.00	0.238	ug/L
			1,1,2,2-Tetrachloroethane	1.00	0.367	ug/L
			1,1,2-Trichloro-1,2,2-trifluoroethane	1.00	0.311	ug/L
			1,1,2-Trichloroethane	1.00	0.433	ug/L
			1,1-Dichloroethane	1.00	0.264	ug/L
			1,1-Dichloroethene	1.00	0.117	ug/L
			1,2,3-Trichlorobenzene	1.00	0.357	ug/L
			1,2,4-Trichlorobenzene	1.00	0.365	ug/L
			1,2-Dichloropropane	1.00	0.353	ug/L
			1,3-Dichlorobenzene	1.00	0.342	ug/L
			1,4-Dichlorobenzene	1.00	0.757	ug/L
			1,4-Dioxane	50.0	28.2	ug/L
			2-Butanone (MEK)	5.00	1.85	ug/L
			2-Hexanone	5.00	2.90	ug/L
			4-Methyl-2-pentanone (MIBK)	5.00	2.73	ug/L
			Acetone	5.00	4.98	ug/L
			Benzene	1.00	0.428	ug/L
			Bromoform	1.00	0.536	ug/L
			Bromomethane	1.00	1.00	ug/L
			Carbon disulfide	1.00	0.155	ug/L
			Carbon tetrachloride	1.00	0.208	ug/L
			Chlorobenzene	1.00	0.377	ug/L
			Chlorobromomethane	1.00	0.412	ug/L
			Chlorodibromomethane	1.00	0.281	ug/L
			Chloroethane	1.00	0.320	ug/L
			Chloroform	1.00	0.326	ug/L
			Chloromethane	1.00	0.143	ug/L
			cis-1,2-Dichloroethene	1.00	0.219	ug/L
			cis-1,3-Dichloropropene	1.00	0.455	ug/L
			Cyclohexane	1.00	0.321	ug/L
			Dichlorobromomethane	1.00	0.343	ug/L
			Dichlorodifluoromethane	1.00	0.121	ug/L
			Ethylbenzene	1.00	0.298	ug/L
			Ethylene Dibromide	1.00	0.498	ug/L
			Isopropylbenzene	1.00	0.336	ug/L
			Methyl acetate	5.00	0.313	ug/L
			Methyl tert-butyl ether	1.00	0.465	ug/L
			Methylcyclohexane	1.00	0.258	ug/L
			Methylene Chloride	1.00	0.315	ug/L
			m-Xylene & p-Xylene	1.00	0.296	ug/L
			o-Xylene	1.00	0.361	ug/L
			Styrene	1.00	0.415	ug/L
			Tetrachloroethene	1.00	0.249	ug/L
			Toluene	1.00	0.379	ug/L

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Project: Hampton Bays Fire District Site *Quote Number: 46028469 - 0*

Groundwater Samples

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Continued						
			trans-1,2-Dichloroethene	1.00	0.235	ug/L
			trans-1,3-Dichloropropene	1.00	0.485	ug/L
			Trichloroethene	1.00	0.314	ug/L
			Trichlorofluoromethane	1.00	0.144	ug/L
			Vinyl chloride	1.00	0.171	ug/L
			1,2-Dichloroethane	1.00	0.430	ug/L
			1,2-Dichlorobenzene	1.00	0.431	ug/L
			1,2-Dibromo-3-Chloropropane	1.00	0.376	ug/L
		Surrogate Cpnd				
			1,2-Dichloroethane-d4 (Surr)			
			4-Bromofluorobenzene			
			Dibromofluoromethane (Surr)			
			Toluene-d8 (Surr)			
				RL	MDL	Units
Water	8270D	TCL BNA + 20 TICs	1,1'-Biphenyl	10.0	1.19	ug/L
			1,2,4,5-Tetrachlorobenzene	10.0	1.24	ug/L
			2,2'-oxybis[1-chloropropane]	10.0	0.629	ug/L
			2,3,4,6-Tetrachlorophenol	10.0	0.746	ug/L
			2,4,5-Trichlorophenol	10.0	0.279	ug/L
			2,4,6-Trichlorophenol	10.0	0.299	ug/L
			2,4-Dichlorophenol	10.0	0.421	ug/L
			2,4-Dimethylphenol	10.0	0.238	ug/L
			2,4-Dinitrophenol	20.0	14.4	ug/L
			2,4-Dinitrotoluene	2.00	0.997	ug/L
			2,6-Dinitrotoluene	2.00	0.390	ug/L
			2-Chloronaphthalene	10.0	1.18	ug/L
			2-Chlorophenol	10.0	0.377	ug/L
			2-Methylnaphthalene	10.0	1.10	ug/L
			2-Methylphenol	10.0	0.259	ug/L
			2-Nitroaniline	10.0	0.474	ug/L
			2-Nitrophenol	10.0	0.747	ug/L
			3,3'-Dichlorobenzidine	10.0	1.43	ug/L
			3-Nitroaniline	10.0	0.962	ug/L
			4,6-Dinitro-2-methylphenol	20.0	13.3	ug/L
			4-Bromophenyl phenyl ether	10.0	0.745	ug/L
			4-Chloro-3-methylphenol	10.0	0.575	ug/L
			4-Chloroaniline	10.0	1.88	ug/L
			4-Chlorophenyl phenyl ether	10.0	1.28	ug/L
			4-Methylphenol	10.0	0.235	ug/L
			4-Nitroaniline	10.0	0.543	ug/L
			4-Nitrophenol	20.0	0.689	ug/L
			Acenaphthene	10.0	1.08	ug/L
			Acenaphthylene	10.0	0.823	ug/L

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Groundwater Samples

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Continued						
			Acetophenone	10.0	0.790	ug/L
			Anthracene	10.0	0.634	ug/L
			Atrazine	2.00	1.35	ug/L
			Benzaldehyde	10.0	0.592	ug/L
			Benzo[a]anthracene	1.00	0.592	ug/L
			Benzo[a]pyrene	1.00	0.405	ug/L
			Benzo[b]fluoranthene	2.00	1.14	ug/L
			Benzo[g,h,i]perylene	10.0	1.43	ug/L
			Benzo[k]fluoranthene	1.00	0.674	ug/L
			Bis(2-chloroethoxy)methane	10.0	0.239	ug/L
			Bis(2-chloroethyl)ether	1.00	0.295	ug/L
			Bis(2-ethylhexyl) phthalate	2.00	1.70	ug/L
			Butyl benzyl phthalate	10.0	0.854	ug/L
			Caprolactam	10.0	0.684	ug/L
			Carbazole	10.0	0.679	ug/L
			Chrysene	2.00	0.907	ug/L
			Dibenz(a,h)anthracene	1.00	0.720	ug/L
			Dibenzofuran	10.0	1.10	ug/L
			Diethyl phthalate	10.0	0.976	ug/L
			Dimethyl phthalate	10.0	0.766	ug/L
			Di-n-butyl phthalate	10.0	0.840	ug/L
			Di-n-octyl phthalate	10.0	4.75	ug/L
			Fluoranthene	10.0	0.842	ug/L
			Fluorene	10.0	0.912	ug/L
			Hexachlorobenzene	1.00	0.396	ug/L
			Hexachlorobutadiene	1.00	0.780	ug/L
			Hexachlorocyclopentadiene	10.0	1.72	ug/L
			Hexachloroethane	2.00	1.19	ug/L
			Indeno[1,2,3-cd]pyrene	2.00	1.29	ug/L
			Isophorone	10.0	0.798	ug/L
			Naphthalene	10.0	1.13	ug/L
			Nitrobenzene	1.00	0.567	ug/L
			N-Nitrosodi-n-propylamine	1.00	0.430	ug/L
			N-Nitrosodiphenylamine	10.0	0.891	ug/L
			Pentachlorophenol	20.0	1.45	ug/L
			Phenanthrene	10.0	0.580	ug/L
			Phenol	10.0	0.292	ug/L
			Pyrene	10.0	1.64	ug/L
		Surrogate Cpnd				
			2,4,6-Tribromophenol (Surr)			
			2-Fluorobiphenyl			
			2-Fluorophenol (Surr)			
			Nitrobenzene-d5 (Surr)			
			Phenol-d5 (Surr)			
			Terphenyl-d14 (Surr)			

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Prepared by	Scott, Aidan J
Date	1/25/2019
Expiration Date	4/24/2019
Est. Start Date	

Project: Hampton Bays Fire District Site *Quote Number: 46028469 - 0*

Groundwater Samples

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Water	8270D SIM ID	1,4-Dioxane (GC/MS SIM / Isotope Dilution)	1,4-Dioxane	0.200	0.0160	ug/L
		Isotope Dilution				
			1,4-Dioxane-d8	0.400		
		Surrogate Cpnd				
			Terphenyl-d14			
			2-Fluorobiphenyl (Surr)			
			Nitrobenzene-d5		0.00100	
			1,2-Dichlorobenzene-d4			
Water	8081B	TCL Pesticides	4,4'-DDD	0.0200	0.00600	ug/L
			4,4'-DDE	0.0200	0.00200	ug/L
			4,4'-DDT	0.0200	0.00400	ug/L
			Aldrin	0.0200	0.00300	ug/L
			alpha-BHC	0.0200	0.00700	ug/L
			beta-BHC	0.0200	0.00400	ug/L
			Chlordane (technical)	0.500	0.0550	ug/L
			delta-BHC	0.0200	0.00500	ug/L
			Dieldrin	0.0200	0.00300	ug/L
			Endosulfan I	0.0200	0.00200	ug/L
			Endosulfan II	0.0200	0.00400	ug/L
			Endosulfan sulfate	0.0200	0.00600	ug/L
			Endrin	0.0200	0.00400	ug/L
			Endrin aldehyde	0.0200	0.00800	ug/L
			Endrin ketone	0.0200	0.00800	ug/L
			gamma-BHC (Lindane)	0.0200	0.0120	ug/L
			Heptachlor	0.0200	0.00300	ug/L
			Heptachlor epoxide	0.0200	0.00500	ug/L
			Methoxychlor	0.0200	0.00400	ug/L
			Toxaphene	0.500	0.110	ug/L
		Surrogate Cpnd				
			DCB Decachlorobiphenyl			
			Tetrachloro-m-xylene			
Water	8082A	PCBs	Aroclor 1016	0.400	0.119	ug/L
			Aroclor 1221	0.400	0.119	ug/L
			Aroclor 1232	0.400	0.119	ug/L
			Aroclor 1242	0.400	0.119	ug/L
			Aroclor 1248	0.400	0.119	ug/L

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Project: Hampton Bays Fire District Site *Quote Number: 46028469 - 0*

Groundwater Samples

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Continued						
			Aroclor 1254	0.400	0.107	ug/L
			Aroclor 1260	0.400	0.107	ug/L
			Aroclor-1262	0.400	0.107	ug/L
			Aroclor 1268	0.400	0.107	ug/L
			Polychlorinated biphenyls, Total	0.400	0.119	ug/L
		Surrogate Cpnd				
			DCB Decachlorobiphenyl			
				RL	MDL	Units
Water	6020B	TALMetals (Price includes Hg)	Silver	2.00	0.591	ug/L
			Aluminum	40.0	18.8	ug/L
			Arsenic	2.00	0.734	ug/L
			Barium	4.00	1.16	ug/L
			Beryllium	0.800	0.245	ug/L
			Calcium	200	98.8	ug/L
			Cadmium	2.00	0.808	ug/L
			Cobalt	4.00	1.60	ug/L
			Chromium	4.00	2.30	ug/L
			Copper	4.00	1.99	ug/L
			Iron	120	51.1	ug/L
			Potassium	200	86.7	ug/L
			Magnesium	200	73.7	ug/L
			Manganese	8.00	2.88	ug/L
			Sodium	200	128	ug/L
			Nickel	4.00	2.36	ug/L
			Lead	1.20	0.552	ug/L
			Antimony	2.00	0.399	ug/L
			Selenium	10.0	5.35	ug/L
			Thallium	0.800	0.157	ug/L
			Vanadium	4.00	1.11	ug/L
			Zinc	16.0	11.1	ug/L
				RL	MDL	Units
Water	7470A	Mercury (CVAA)	Mercury	0.200	0.115	ug/L
				RL	MDL	Units
Water	537 (modified)	PFAS, Standard List (21 Analytes)	Perfluorobutanoic acid (PFBA)	2.00	0.350	ng/L
			Perfluoropentanoic acid (PFPeA)	2.00	0.490	ng/L
			Perfluorohexanoic acid (PFHxA)	2.00	0.580	ng/L
			Perfluoroheptanoic acid (PFHpA)	2.00	0.250	ng/L

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Groundwater Samples

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Continued						
			Perfluorooctanoic acid (PFOA)	2.00	0.850	ng/L
			Perfluorononanoic acid (PFNA)	2.00	0.270	ng/L
			Perfluorodecanoic acid (PFDA)	2.00	0.310	ng/L
			Perfluoroundecanoic acid (PFUnA)	2.00	1.10	ng/L
			Perfluorododecanoic acid (PFDoA)	2.00	0.550	ng/L
			Perfluorotridecanoic acid (PFTriA)	2.00	1.30	ng/L
			Perfluorotetradecanoic acid (PFTeA)	2.00	0.290	ng/L
			Perfluorobutanesulfonic acid (PFBS)	2.00	0.200	ng/L
			Perfluorohexanesulfonic acid (PFHxS)	2.00	0.170	ng/L
			Perfluoroheptanesulfonic Acid (PFHpS)	2.00	0.190	ng/L
			Perfluorooctanesulfonic acid (PFOS)	2.00	0.540	ng/L
			Perfluorodecanesulfonic acid (PFDS)	2.00	0.320	ng/L
			Perfluorooctanesulfonamide (FOSA)	2.00	0.350	ng/L
			N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	20.0	3.10	ng/L
			N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	20.0	1.90	ng/L
			6:2 FTS	20.0	2.00	ng/L
			8:2 FTS	20.0	2.00	ng/L
		Isotope Dilution				
			13C4 PFBA			
			13C5 PFPeA			
			13C2 PFHxA			
			13C4 PFHpA			
			13C4 PFOA			
			13C5 PFNA			
			13C2 PFDA			
			13C2 PFUnA			
			13C2 PFDoA			
			13C2 PFTeDA			
			13C3 PFBS			
			18O2 PFHxS			
			13C4 PFOS			
			13C8 FOSA			
			d3-NMeFOSAA			
			d5-NEtFOSAA			
			M2-6:2 FTS			
			M2-8:2 FTS			

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Project: Hampton Bays Fire District SIte ***Quote Number: 46028469 - 0***

Analytical Sample Information

Analysis Method	Matrix	Preservative	Client Sub List Desc Container	Volume Required	Holding Time
Fluorinated Alkyl Substances			PFAS, Standard List (21 Analytes)		
PFC_IDA	Solid	None	Soil Jar 4oz Plastic	30 g	14 Days
Mercury (CVAA)			Mercury		
7471B	Solid	None	Soil jar 4oz	25 g	28 Days
Metals (ICP/MS)			TAL Metals (Price includes Hg)		
6020B	Solid	None	Soil jar 4oz	10 g	180 Days
Organochlorine Pesticides (GC)			TCL Pesticides		
8081B	Solid	None	Soil jar 4oz	60 g	14 Days
Percent Moisture			Percent Moisture		
Moisture	Solid	None	No Container	0 NONE	180 Days
Polychlorinated Biphenyls (PCBs) by Gas Chromatography			PCBs		
8082A	Solid	None	Soil jar 4oz	60 g	14 Days
Semivolatile Organic Compounds (GC/MS)			TCL BNA +20		
8270D	Solid	None	Soil jar 4oz	60 g	14 Days
Volatile Organic Compounds by GC/MS			TCL VOCs + 10 TICs		
8260C	Solid	Methanol	VOA Terracore Kit - Edison	1 NONE	48 Hours
Fluorinated Alkyl Substances			PFAS, Standard List (21 Analytes)		
PFC_IDA	Water	None	Plastic 250ml - unpreserved	500 mL	14 Days
Mercury (CVAA)			Mercury (CVAA)		
7470A	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	60 mL	28 Days
Metals (ICP/MS)			TALMetals (Price includes Hg)		
6020B	Water	Nitric Acid	Plastic 250ml - with Nitric Acid	100 mL	180 Days
Organochlorine Pesticides (GC)			TCL Pesticides		
8081B	Water	None	Amber Glass 250ml - unpreserved	500 mL	7 Days
Polychlorinated Biphenyls (PCBs) by Gas Chromatography			PCBs		
8082A	Water	None	Amber Glass 250ml - unpreserved	500 mL	7 Days
Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)			1,4-Dioxane (GC/MS SIM / Isotope Dilution)		
8270D_SIM_MS_ID	Water	None	Amber Glass 250ml - unpreserved	500 mL	7 Days
Semivolatile Organic Compounds (GC/MS)			TCL BNA + 20 TICs		
8270D	Water	None	Amber Glass 250ml - unpreserved	500 mL	7 Days
Volatile Organic Compounds by GC/MS			TCL VOCs +10 TICs		
8260C	Water	Hydrochloric Acid	Voa Vial 40ml - Hydrochloric Acid	120 mL	14 Days

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Hold Times listed above represent the minimum allotted time between sampling and lab extraction, prep or analysis.

Multiple analyses may be consolidated into fewer containers. Please contact your Project Manager for clarification when requesting sample containers.

Except for some special tests, all samples should be kept cold at 6 degrees C.

APPENDIX C

RENEE G. COHEN
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EXPERIENCE

PREMIER ENVIRONMENTAL SERVICES, Merrick, New York

1993-Present Perform organic and inorganic data validation according to the various protocols from the USEPA EPA CLP, NYS ASP and USEPA Test Methods for the Evaluation of Solid Waste, Methods for the Chemical Analysis of Water and Waste and the Federal Register. Use the USEPA National Functional Guidelines for Organic and Inorganic Data Validation (where applicable) as well as State (NYS DEC ASP/DUSR) and EPA Region requirements to report on laboratory data quality and data usability. Review and write Quality Assurance Project Plans using Regional and State guidelines for Remedial Investigations, Ground Water Monitoring programs and Superfund Programs. Review data and work plans as they relate to project data quality objectives. Conducts seminars on client specific topics. Perform on-site laboratory QA/QC audits as required by the client and site-specific work plans. Has performed ASTM Phase 1 Assessments for engineering firms when requested.

ENVIRONMENTAL QUALITY SERVICES, INC., Farmingdale, New York

1/2011-8/11 QA Manager
(25 hrs/wk) Perform the data review and report compilation of organic and inorganic data for report preparation. Review data for compliance with method as well as data quality objectives for specific client work plans. Perform departmental audits in compliance with NELAC and internal lab mandates. Revise laboratory logbooks for bench chemists. Revised/updated laboratory SOP's for method compliance. Participate in on-site audits by both state representatives and commercial clients. Coordinate PT studies for analyte certification for laboratory certifications. Insure analyte certification for client project requirements. Responsible for the review of new and/or updated method and implementation of these methods within the laboratory.

ENVIRONMENTAL TESTING LABORATORIES, Farmingdale, New York

8/2010-12/2010 QA Manager
(25-30 hrs/wk) Perform the data review and report compilation of organic and inorganic data for report preparation. Perform departmental audits in compliance with NELAC and internal lab mandates. Revise laboratory logbooks for bench chemists. Revised/updated laboratory SOP's for method compliance. Participate in on-site audits by both state representatives and commercial clients. Coordinate PT studies for analyte certification for laboratory certifications. Insure analyte certification for client project requirements.

SOUTH MALL ANALYTICAL LABORATORIES, Plainview, New York

10/2004-12/2009 QA Manager (Part Time)
(10 hrs/wk) Responsible for the overall QA program at the laboratory. Revised, updated and prepared SOP's for method compliance. Wrote and prepared the annual updates to laboratory Quality Assurance Manual. Perform audits of laboratory systems and methods. Prepare corrective action reports and follow-up to audit deficiencies. Oversee client and agency on-site audits. Contact with clients to discuss sampling plans, regulations, and required analyses. Perform the data review and report compilation of organic and inorganic data for reporting. Revised all laboratory logbooks and methods to comply with EPA and method guidelines. Handled document control of logbooks, SOP's, QAPP's. Performed annual data integrity and ethics seminars for all employees. Report directly to senior management.

ENVIRONMENTAL TESTING LABORATORIES, Farmingdale, New York

5/2002-10/2003 QA Specialist

(20-24 hrs/wk) Performed the data review and report compilation of organic and inorganic data for report preparation. Performed departmental audits in compliance with NELAC and internal lab mandates. Helped to revise laboratory logbooks for bench chemists. Revised/updated laboratory SOP's for method compliance. Participated in on-site audits by both state representatives and commercial clients.

KEYSPAN LABORATORY SERVICES, Brooklyn, New York

2/1999-5/2002 Consultant

Developed laboratory QAPP (in accordance with NELAC) and Chemical Hygiene Plan. Modified and updated laboratory SOP's. Perform audits in the different work areas. Maintained the NYS DOH proficiency program for analytes of interest. Review data for completeness and QC criteria. Implemented client inquiry system. Performed QC training and method training for bench and field chemists. Developed protocols and documentation for field PCB wipe sampling. Responsible for update/maintenance of laboratory state certifications and approvals.

NYTEST ENVIRONMENTAL INC., Port Washington, New York

1994-1998 Quality Assurance Officer

Responsible for the overall quality program at the laboratory. This included the auditing test methods, systems and data reporting. Performed the review of 10% of all data reports prior to submission to client. Oversaw the training program of new employees. Maintain the documentation of the training records. Review and maintain state certification paperwork and SOP files. Update and file annual MDL datum. Worked with sales and customer service to insure that client needs are met. Respond to client data inquires. Work with state and federal auditors for review of laboratory to receive certification. Successfully lead the laboratory to an Army Corp of Engineer validation.

1989-1993 **ENSECO EAST, Somerset, New Jersey**

QA/QC Scientist - Performed organic and inorganic audits of the laboratory. Performed and coordinated corrections and revisions to data reports. Wrote and reviewed laboratory Quality Assurance Project plans (QAPjP's) for client specific projects. Developed and led seminars for both client and employees on a number of topics including; data quality objectives, data review vs. data validation and laboratory QC. Interacted with clients, project managers and state personnel for regulatory concerns and data/lab issues. Performed lab audits for method compliance and project specific requirements. Acted as the Technical Representative for Ensecos EPA 3/90 Organic CLP Contract.

1988-1989 **INTECH BIOLABS, East Brunswick, New Jersey**

QA/QC Manager - Responsible for the review of all organic and inorganic data. Performed general laboratory and safety audits. Recorded and charted all QA/QC data. Reviewed and assembled all CLP organic data reports.

1986-1988 **INTERNATIONAL TECHNOLOGIES CORPORATION, Edison, New Jersey**
Central Laboratory Chemist - REAC and EERU Contract for the Emergency Response Branch (ERB) of the USEPA. Responsible for the organic and inorganic extraction of environmental samples according to EPA Methods. This included both metals digestion as well as organic extraction's for semivolatiles, pesticides and PCB's. Performed Volatile Organic analyses using Gas Chromatography, Total Petroleum Hydrocarbon Analysis by IR, Metal Analyses by both Graphite Furnace AA and ICP. Field experience included s on site analyses for both metals and GC volatiles.

1985-1986 **U.S. TESTING COMPANY, Hoboken, New Jersey**
Chemist - Responsible for the digestion and analysis of both soil and aqueous samples for metals according to USEPA CLP and SW 846 protocols. Responsible for the analysis of sample digestates using the Varian Graphite Furnace Atomic Absorption Spectrophotometer and a Jerall Ash ICP-61.

Education

B.S. Environmental Science, December 1984
B.S. Biology, May 1984
Old Dominion University, Norfolk, Virginia

20 hours of Chemistry coursework

Graduate Coursework - Rutgers University, New Brunswick, New Jersey
Long Island University at C.W. Post, Glen Cove, New York

Continuing Education

Good Laboratory Practice (GLP) - June 1992, Center for Professional Development, East Brunswick, New Jersey

40 Hour Course, Region II-Edison, NJ (1987)
24 Hour Refresher Course (1988, 1989, 1991)

References

Available upon request.

APPENDIX D

HAMPTON BAYS FIRE DISTRICT SITE
69 WEST MONTAUK HIGHWAY
HAMPTON BAYS, NY
DEC SITE: #152249

REMEDIAL INVESTIGATION HEALTH AND SAFETY PLAN

Submitted To:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233-7016

Prepared For:

Hampton Bays Fire District
69 West Montauk Highway
Hampton Bays, NY 11946

Prepared By:

ZEB Environmental Solutions, Inc.
188 West Montauk Highway, Suite E-6
Hampton Bays, New York 11946
Phone: 631-594-5300

DECEMBER 29, 2018

HEALTH AND SAFETY PLAN
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STATEMENT OF COMMITMENT

This Health and Safety Plan (HASP) has been prepared to ensure that workers are not exposed to chemical, biological, and physical hazards during the planned Remedial Investigation (RI) activities to be performed at the Hampton Bays Fire Department site in Hampton Bays, New York. ZEB Environmental Solutions, Inc.'s (ZEB's) policy is to minimize the possibility of work-related exposure through awareness and qualified supervision, health and safety training, medical monitoring, use of appropriate personal protective equipment, and the following activity specific safety protocols contained in this HASP. ZEB has established a guidance program to implement this policy in a manner that protects personnel to the maximum reasonable extent.

This HASP, which applies to persons present at the site who are actually or potentially exposed to safety or health hazards, describes emergency response procedures for actual and potential physical, biological and chemical hazards. This HASP is also intended to inform and guide personnel entering the work area or exclusion zone. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy.

1.0 INTRODUCTION

1.1 Purpose

This Health and Safety Plan (HASP) addresses the minimum health and safety practices that will be employed by site workers participating in RI activities at the project site located at 69 West Montauk Highway in Hampton Bays, New York.

The HASP takes into account the specific hazards inherent to the site and presents the minimum requirements which are to be met by ZEB Environmental Solutions, Inc. (ZEB), its subcontractors, and other on-site personnel in order to avoid and, if necessary, protect against health and/or safety hazards. ZEB sub-contractors will have the option of adopting this HASP or developing their own site-specific document. If a subcontractor chooses to prepare their own HASP, it must meet the minimum requirements as detailed in this HASP and must be made available to ZEB.

Activities performed under this HASP will comply with applicable parts of Occupational Safety and Health Administration (OSHA) Regulations, primarily 29 CFR Parts 1910 and 1926 and all other applicable federal, state, and local regulations. Modifications to the HASP may be made with the approval of the PWGC Health and Safety Manager (HSM) and/or Project Manager (PM). A copy of this HASP will be maintained on-site during all work activities.

Refusal to comply with the HASP or violation of any safety procedures by field personnel may result in their immediate removal from the site following consultation with the HSM and the Field Team Leader (FTL)/Site Health and Safety Officer (SHSO).

1.2 Scope

This HASP addresses the potential hazards related to the RI activities. The primary RI activities include the following:

- Site Mobilization/Demobilization;
- Drilling, and;
- Soil and Groundwater Sampling

The potential hazards associated with this scope are listed below and are discussed in more detail in this HASP after the project organization and responsibilities section.

- Chemical Hazards
- Biological Hazards
- Physical Hazards

1.3 Application

The HASP applies to all personnel involved in the above tasks who wish to gain access to active work areas, including but not limited to:

- ZEB employees and subcontractors;
- Client representatives; and
- Federal, state, or local representatives.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section specifies the project organization and responsibilities.

2.1 Project Manager

- Participates in major incident investigations;
- Ensures that the HASP has all of the required approvals before site work is conducted; and
- Has the overall project responsibility for project health and safety.

2.2 Field Team Leader (FTL)/ Site Health and Safety Officer (SHSO)

- Ensures that the HASP is implemented in conjunction with the Health and Safety Manager (HSM);
- Ensures that field work is scheduled with adequate equipment to complete the job safely;
- Enforces site health and safety rules;
- Ensures that proper personal protective equipment is utilized;
- Ensures that the HSM is informed of project changes that require modifications to the HASP;
- Ensures that the procedure modifications are implemented;
- Investigates incidents;
- Conducts the site safety briefing;
- Reports to HSM to provide summaries of field operations and progress; and
- Acts as Emergency Coordinator.

2.3 Health and Safety Manager

- Provides for the development of the HASP;
- Serves as the primary contact to review health and safety matters that may arise;
- Approves individuals who are assigned SHSO responsibilities;
- Coordinates revisions of this HASP with field personnel; and
- Assists in the investigation of major accidents.

2.4 Site Personnel

- Report any unsafe or potentially hazardous conditions to the FTL/SHSO;
- Maintain knowledge of the information, instructions and emergency response actions contained in this HASP; and
- Comply with rules, regulations and procedures as set forth in this HASP and any revisions.

3.0 SITE HISTORY AND PROJECT DESCRIPTION

3.1 Project Background

This property has been utilized as a fire house since 1930. In 2018 the Hampton Bays Fire District completed a Subsurface Investigation to determine if perfluorinated compounds (PFCs) are present in the subsurface at the site and to determine whether this site is a contributing source of PFCs detected in downgradient public supply wells.

This Investigation has been undertaken pursuant to the New York State Department of Environmental Conservation (NYSDEC) Order on Consent, dated November 9, 2017 and included:

- storm drain/sanitary system evaluation and sampling;
- vertical profile groundwater sampling;

Results of the investigation did not identify elevated concentrations of PFCs in the storm drain/sanitary system samples collected. However, elevated concentrations were detected in the shallow vertical profile wells (VP-5 and VP-6) located at the southeast property boundary. Although these concentrations are elevated, they do not appear to be the result of a significant onsite source.

3.2 Site Location and Description

The Hampton Bays Fire District property is 2.07 acres in size and is located on the south side of Montauk Highway, east of Springville Road.

4.0 POTENTIAL HAZARDS OF THE SITE

This section presents an assessment of the chemical, biological, and physical hazards that may be encountered during the tasks specified under Section 1.0. Additional information can be found in **Appendix A** – Health and Safety Information - PFCs or in **Appendix B** - Activity Hazard Analyses.

4.1 Chemical Hazards

Review of historical information from the site indicates that elevated concentrations of perfluorinated compounds (PFCs), including PFOS and PFOA, have been identify in the shallow groundwater at the southern portion of the site. Based on the past Subsurface Investigation, PFC, are the only contaminant of concern at the site.

Specific information on PFCs and environmental health risks is contained in Appendix A.

4.2 Biological Hazards

Portions of the site are currently overgrown with small shrubs, trees, and grasses/weeds, during the course of the project, there is potential for workers to come into contact with biological hazards such as animals, insects and plants. The Activity Hazard Analyses found in **Appendix B** includes specific hazards and control measures for each task, if applicable.

4.2.1 Animals

The Site is located in a predominantly residential/commercial area. However, it is possible that, raccoon, dogs, cats, rats and mice may be present. Workers shall use discretion and avoid all contact with animals.

4.2.2 Insects

Insects, such as mosquitoes, ticks, bees and wasps may be present during certain times of the year. Workers will be encouraged to wear repellents and PPE, if deemed necessary, when working in areas where insects are expected to be present.

During the months of April through October, particular caution must be exercised to minimize exposure to deer ticks and the potential for contracting Lyme disease. Specific precautionary work practices that are recommended include the following:

- Cover your body as much as possible. Wear long pants and long sleeved shirts. Light color clothing makes spotting of ticks easier.

- Try to eliminate possible paths by which the Deer Tick may reach unprotected skin. For example, tuck bottoms of pants into socks or boots and sleeves into gloves. (Duct tape may be utilized to help seal cuffs and ankles). If heavy concentrations of ticks or insects are anticipated

or encountered, Tyvek coveralls may be utilized for added protection when the potential for heat stress is not a concern.

- Conduct periodic and frequent, (e.g., hourly), surveys of your clothing for the presence of ticks. Remove any tick, save it and report to the clinic with the tick.

- Use insect /tick repellents that contain the chemical DEET (n,n-Diethyltoluamide). Apply repellents in accordance with manufacturers' recommendations. These repellents are readily available and include such brands as Deep Woods OFF and Maximum Strength OFF.

4.2.3 Plants

Poison ivy, sumac and oak may be present on site. The FTL/SHSO should identify the susceptible individuals. Worker shall avoid all contact with these plants.

4.3 Physical Hazards

Most safety hazards are discussed in the Activity Hazard Analyses (AHA) in **Appendix B** for the different phases of the project. In addition to the AHAs, general work rules and other safety procedures are described in Section 10 of this HASP.

4.3.1 Temperature Extremes

Heat Stress
Heat stress is a significant potential hazard, which is greatly exacerbated with the use of PPE in hot environments. The potential hazards of working in hot environments include dehydration, cramps, heat rash, heat exhaustion, and heat stroke.

Cold Stress
At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia as well as slippery surfaces, brittle equipment, and poor judgment.

Heat/Cold Stress Protocols are specified in **Appendix C**.

4.3.2 Steam, Heat and Splashing

Exposure to steam/heat/splashing hazards can occur during steam cleaning activities. Splashing can also occur during well development and sampling activities. Exposure to steam/heat/splashing can result in scalding/burns, eye injury, and puncture wounds.

4.3.3 Noise

Noise is a potential hazard associated with the operation of heavy equipment, drill rigs, pumps and engines. Workers will wear hearing protection while in the work zone when these types of machinery are operating.

4.3.4 Fire and Explosion

When conducting excavation or drilling activities, the opportunity of encountering fire and explosion hazards may exist from encountering underground utilities, from the use of diesel engine equipment, and other potential ignition sources. During dry periods there is an increased chance of forest and brush fires starting at the job site. If these conditions occur no smoking will be permitted at the site and all operations involving potential ignition sources will be monitored continuously (fire watch).

4.3.5 Manual Lifting/Material Handling

Manual lifting of heavy objects may be required. Failure to follow proper lifting technique can result in back injuries and strains. Back injuries are a serious concern as they are the most common work place injury, often resulting in lost or restricted work time, and long treatment and recovery periods.

4.3.6 Slips, Trips, and Falls

Working in and around the site will pose slip, trip and fall hazards due to slippery surfaces that may be oil covered, or from rough terrain, surfaces that are steep inclines, surfaced debris, or surfaces which are wet from rain or ice. Falls may result in twisted ankles, broken bones, head trauma or back injuries.

4.3.7 Heavy Equipment Operation

A backhoe excavator will be used to remove USTs and site soils and a Geoprobe will be used to perform soil borings. Working with or near heavy equipment poses many potential hazards, including electrocution, fire/explosion, being struck by or against, or pinched/caught/crushed by, and can result in serious physical harm.

4.3.8 Electrocution

Encountering underground utilities may pose electrical hazards to workers. Additionally, overhead electrical lines can be a concern during drilling operations. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death.

5.0 ACTIVITY HAZARD ANALYSES

The Activity Hazard Analysis (AHA) is a systematic way of identifying the potential health and safety hazards associated with major phases of work on the project and the methods to avoid, control and mitigate those hazards. The AHAs will be used to train work crews in proper safety procedures during phase preparatory meetings.

AHAs have been developed for the following phases of work:

1. Site Mobilization/Demobilization;
2. Soil and Groundwater sampling;
3. Decontamination

Copies of these AHAs are included in **Appendix B** of this HASP.

6.0 PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment (PPE) specified in **Table 6-1** represents the hazard analysis and PPE selection required by 29 CFR 1910.132. Specific information on known potential hazards can be found under Section 4.0 and **Appendix B** - Activity Hazard Analyses. For the purposes of PPE selection, the HSM and FTL/SHSO are considered competent persons. The signatures on the approval page of the HASP constitute certification of the hazard assessment. For activities not covered by **Table 6-1**, the FTL/SHSO will conduct the hazard assessment, select the PPE, and document changes in the appropriate field logs. PPE selection will be made in consultation with the HSM.

Modifications for initial PPE selection may also be made by the FTL/SHSO in consultation with the HSM and changes documented accordingly. If major modifications occur, the HSM will notify the PM.

PPE Abbreviations

HEAD PROTECTION
HH = Hard Hat

HEARING PROTECTION
EP = ear plugs
EM = ear muffs

HAND PROTECTION
Cot = cotton
But = Butyl
WG = Leather Work Gloves
Neo = Neoprene
Nit = Nitrile
Sur = Surgical

EYE/FACE PROTECTION
APR = Full Face Air Purifying Respirator
MFS = Mesh Face shield
PFS =Plastic Face shield
SG = ANSI approved safety glasses with side shields

BODY PROTECTION
WC = work clothes
Cot Cov = Cotton Coveralls
Poly = Polyethylene coated Tyvek® coveralls
Saran = Saranex coated coveralls
Tyvek® = Uncoated Tyvek® coveralls

FOOT PROTECTION
Neo = Neoprene
OB = Overboot
Poly = polyethylene coated boot
Rub = rubber slush boots
STB = Leather work boots with steel toe

RESPIRATORY PROTECTION
APR = Full-face air purifying respirator with organic vapor cartridges
ASR = Full face air supplied respirator with escape bottle
SCBA = Self-contained breathing apparatus

6.1 Hazard Assessment for Selection of Personal Protective Equipment

The initial selection of personal protective equipment for each task was done by performing a hazard assessment taking into consideration the following:

- Potential chemical and physical hazards present;
- Work operations to be performed;
- Potential routes of exposure;

- Concentrations of contaminants present; and
- Characteristics, capabilities and limitations of PPE and any hazard that the PPE presents or magnifies.

A review of the analytical data from previous sampling events indicates that PFCs identified in **Table 4-1** are the primary contaminants of concern.

The exposure routes for these chemicals are inhalation, skin absorption, skin/eye contact and ingestion. Chemical protective gloves will be required for all activities that involve sample handling and the likelihood for skin contact. The proper use of PPE and strict adherence to decontamination and personal hygiene procedures will effectively minimize skin contact and ingestion as potential routes of exposure.

Table 6-1
Personal Protective Equipment Selection

TASK	HEAD	EYE/FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR
Mobilization/ Demobilization	HH	SG	STB	WG	WC	None	None
Excavation/USTs	HH	SG	STB	WG	WC	EM or EP	None initially APR if action levels exceeded
Drilling Activities	HH	SG	STB	WG	WC	EM or EP	None initially APR if action levels exceeded
Soil/GW sampling	HH	SG	STB	WG, Nit & Sur as needed	WC, Tyvek® as needed	None	None initially APR if action levels exceeded
Decontamination	HH	SG	STB	Nit + Sur	WC, Tyvek® as needed	None	None initially APR if action levels exceeded

6.2 Respirator Cartridge Change-Out Schedule

A respirator cartridge change-out schedule has been developed in order to comply with 29 CFR 1910.134. If the use of respirators is necessary, the respirator cartridge change-out schedule for this project will be as follows:

1. Cartridges shall be removed and disposed of at the end of each shift, when cartridges become wet or wearer experiences breakthrough, whichever occurs first; and
2. If the humidity exceeds 85%, then cartridges shall be removed and disposed of after 4 hours of use.

Respirators shall not be stored at the end of the shift with contaminated cartridges left on. Cartridges shall not be worn on the second day, no matter how short of time period they were used the day before.

7.0 AIR MONITORING

Air monitoring is not expected to be required during remedial investigation activities. However, if intrusive investigation activities appear to be generating dust or organic vapors, an air monitoring program will be implemented for protection for on-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from remedial investigation activities at the site. Air monitoring will be used to help to confirm that the remedial investigation work will not spread contamination off-site through the air. The primary concerns for this site are dust particulates. Although no VOCs are expected at the site, monitoring with a photo-ionization detector (PID) will be performed during any invasive activities.

Real-time monitoring for dust and VOCs will be conducted both within the work area, and along the site perimeter, during intrusive activities such as excavation and drilling activities.

Level D level of protection will be utilized unless dust monitoring exceeds concentrations greater than 150 μg/m3 over daily background or PID readings in excess of 5.0 ppmv in the breathing zone are detected.

Detailed information on the types, frequency and location of real-time monitoring and community air monitoring requirements are provided in the Community Air Monitoring Plan prepared for this project.

8.0 ZONES, PROTECTION AND COMMUNICATION

8.1 Site Control

Site zones are intended to control the potential spread of contamination throughout the site and to assure that only authorized individuals are permitted into potentially hazardous areas. A three-zone approach will be utilized, as appropriate. It shall include an Exclusion Zone (EZ), Contamination Reduction Zone (CRZ) and a Support Zone (SZ). Specific zones shall be established on the work site when operations begin.

The zones are based upon current knowledge of proposed site activities. It is possible that the zone configurations may be altered or reduced due to work plan revisions. Should this occur, the work zones will be adjusted accordingly, and documented in the field logbook.

The following shall be used for guidance in revising these preliminary zone designations, if necessary.

Support Zone - The SZ is an uncontaminated area that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

Contamination Reduction Zone - The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides for an area for decontamination of personnel and portable hand-held equipment, tools and heavy equipment. A personnel decontamination area will be prepared at each exclusion zone. The CRZ will be used for EZ entry and egress in addition to access for heavy equipment and emergency support services.

Exclusion Zone - All activities, which may involve exposure to site contaminants, hazardous materials and/or conditions, should be considered an EZ. The FTL/SHSO may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the site FTL/SHSO allowing adequate space for the activity to be completed, field members and emergency equipment.

8.2 Contamination Control

Decontamination areas will be established for the following activities.

- Drilling Activities
- Sampling activities

8.2.1 Personnel Decontamination Station

All personnel and portable equipment used in the EZ shall be subject to a thorough decontamination process, as deemed necessary by the FTL/SHSO. Sampling equipment shall be decontaminated. As necessary, all boots and gloves will be decontaminated using soap and water solution and scrub brushes or by simple removal and disposal. All used respiratory protective equipment will be decontaminated daily and sanitized with appropriate sanitizer solution.

All drums generated as a result of sampling and decontamination activities will be marked and stored at a designated area at the site until the materials can be property disposed of off-site. All non-expendable sampling equipment will be decontaminated. This usually entails the use of Alconox, solvent and distilled/deionized water rinses to eliminate contaminants.

8.3 Communication

- Each team member will have a Nextel cell phone/radio for communication with the PM, FTL/SHSO and other team members during field activities.
- Hand Signals - Hand signals shall be used by field teams, along with the buddy system. The entire field team shall know them before operations commence and their use covered during site-specific training. Typical hand signals are the following:

SIGNAL	**MEANING**
Hand gripping throat	Out of air, can't breathe
Grip on a partner's wrist or placement of both hands around a partner's waist.	Leave the area immediately, no debate.
Hands on top of head	Need assistance
Thumbs up	Okay, I'm all right, I understand.
Thumbs down	No, negative.

9.0 MEDICAL SURVEILLANCE PROCEDURES

All contractor and subcontractor personnel performing field work where potential exposure to contaminants exists at the site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f).

10.0 SAFETY CONSIDERATIONS

10.1 General Health and Safety Work Practices

A list of general health and safety work practices is included as an included in **Appendix D**. The work rules will be posted in a conspicuous location at the site.

10.2 The Buddy System

At a minimum, employees shall work in groups of two in such a manner that they can observe each other and maintain line-of-sight for each employee within the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

10.3 Sample Handling

Personnel responsible for the handling of samples should wear the prescribed level of protection. Samples should be identified as to their hazard and packaged as to prevent spillage or breakage. Sample containers shall be decontaminated in the CRZ or EZ before entering a clean Support Zone area. Any unusual sample conditions, odors, or real-time readings should be noted. Laboratory personnel should be advised of sample hazard level and the potential contaminants present. This can be accomplished by a phone call to the lab coordinator and/or including a written statement with the samples reviewing lab safety procedures in handling, in order to assure that the practices are appropriate for the suspected contaminants in the sample.

10.4 Drill Rigs

When conducting drilling activities, the opportunity of encountering fire and explosion hazards exists from underground utilities and gases. The locations of underground utilities will be verified prior to performing any intrusive activities. Additionally, because of the inherently hazardous nature of drilling operations, safety and accident prevention are crucial when drilling operations are performed. Most drilling accidents occur as a direct result of lack of training and supervision, improper handling of equipment, and unsafe work practices. Hazards include: assembling and disassembling rigs, rotary and auger drilling, and grouting. The drilling contractor shall perform drilling in accordance with its own Health & Safety Program for Drill Rig Safety.

10.4.1 Safety During Drilling Operations

- Safety requires the attention and cooperation of every worker and site visitor.
- Do not drive the drill rig from hole to hole with the mast (derrick) in the raised position.
- Before raising the mast (derrick), look up to check for overhead obstructions.
- Maintain a minimum of 15 feet clearance from all overhead electric lines.

- Before raising the mast (derrick), all drill rig personnel (with the exception of the operator) and visitors shall be cleared from the areas immediately to the rear and the sides of the mast. All drill rig personnel and visitors shall be informed that the mast is being raised prior to raising it.

- Before the mast (derrick) of a drill rig is raised and drilling is commenced, the drill rig must first be leveled and stabilized with leveling jacks and/or solid cribbing. Lower the mast (derrick) only when the leveling jacks are down and do not raise the leveling jack pads until the mast (derrick) is lowered completely.

- The operator of a drill rig shall only operate a drill rig from the position of the controls.

- Throwing or dropping tools shall not be permitted. All tools shall be carefully passed by hand between personnel or a hoist line shall be used.

- Do not consume alcoholic beverages or other depressants or chemical stimulants prior to starting work on a drill rig or while on the job.

- All unattended boreholes must be adequately covered or otherwise protected to prevent drill rig personnel, site visitors, or animals form stepping or falling into the hole.

- Terminate drilling operations during an electrical storm and move the entire crew away from the drill rig.

10.5 Excavation

Excavations greater than 4-feet will be conducted in accordance with the requirements contained in 29 CFR 1926, Subpart P-Excavations. It provides for the designation of a "Competent Person" and general requirements for safe excavating practices. The program also incorporates company standards for the monitoring of potentially hazardous atmospheres; protection from water hazards; analyzing and maintaining the stability of adjacent structures; daily competent person inspections; soil classification; sloping and benching; protective systems; and training.

The Competent Person will be the FTL or other designee with appropriate training and experience. The Competent Person will be assisted in his/her duties by other technical personnel such as the HSM, geologists, structural engineers and soils engineers.

11.0 DISPOSAL PROCEDURES

All discarded materials, waste materials or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard or causing litter to be left on site.

All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary, labeled and segregated for disposal. All non-contaminated materials will be collected and bagged for appropriate disposal as non-hazardous solid waste. Additional waste disposal procedures may be developed as applicable.

12.0 EMERGENCY RESPONSE PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly, and require an immediate response; therefore, contingency planning and advanced training of staff is essential. Specific elements of emergency support procedures which are addressed in the following subsections include communications, local emergency support units, and preparation for medical emergencies, first aid for injuries incurred on site, record keeping, and emergency site evacuation procedures.

12.1 Responsibilities

12.1.1 Health and Safety Manager (HSM)

The HSM oversees and approves the Emergency Response/Contingency Plan and performs audits to determine that the plan is in effect and that all pre-emergency requirements are met. The HSM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

12.1.2 Field Team Leader/Site Health and Safety Officer (FTL/SHSO)

The FTL/SHSO is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The FTL/SHSO is required to immediately notify the HSM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the HSM can ensure that OSHA is notified within the required time frame. The HSM will be notified of all OSHA recordable injuries, fires, spills, releases or equipment damage in excess of $500 within 24 hours.

12.1.3 Emergency Coordinator

The Emergency Coordinator for the project is the FTL/SHSO.

The emergency coordinator will locate emergency phone numbers and identify hospital routes prior to beginning work on site. The emergency coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator will implement the Emergency Response/Contingency Plan whenever conditions at the site warrant such action.

12.1.4 Site Personnel

Site personnel are responsible for knowing the Emergency Response/Contingency Plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a site emergency.

12.2 Communication

A variety of communication systems may be utilized during emergency situations. These are discussed in the following sections.

12.2.1 Hand Signals

Downrange field teams will employ hand signals where necessary for communication during emergency situations. Hand signals are found in Section 8.3.

12.2.2 Field Radios and Cell Phones

ZEB field personnel are provided cellular phones for site communication and emergency use.

12.3 Local Emergency Support Units

A route map from the site to the nearest hospital can be found in **Appendix E**. This map will be placed with the above emergency telephone numbers in all on-site vehicles.

12.4 Emergency Medical Treatment

The procedures and rules in this HASP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it will be reported to the FTL/SHSO immediately. First aid equipment will be available on site at the following locations:

First Aid Kit: Support Zone (or designated by FTL/SHSO upon arrival)

During site-specific training, project personnel will be informed of the location of the first aid station(s) that has been set up. Unless they are in immediate danger, severely injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics, before an emergency-response squad arrives at the site or before the injured person can be transported to the hospital, will be followed closely.

Only in non-emergency situations will an injured person be transported to the hospital by means other than an ambulance. **A map and directions to the hospital can be found in Appendix E.**

Table 12-1
Emergency Telephone Numbers

Contact	Firm or Agency	Telephone Number
Police		911
Fire		911
Hospital	Stony Brook/Southampton	(631) 726-8200
Ambulance		911
Project Manager/Health and Safety Manager	Zeb Youngman ZEB Environmental	(631) 594-5300
Health & Safety Officer	Kaitlyn Marra ZEB Environmental	(631) 594-5300
NYSDEC Site Contact	Brian Jankauskas	(518) 402-9626
NYSDOH Site Contact	Steve Berninger	(518) 402-7860
Poison Control Center		(800) 962-1253
Chemtrec(for spills)		(800) 424-9300

12.5 Emergency Site Evacuation Routes and Procedures

In order to mobilize the manpower resources and equipment necessary to cope with a fire or other emergency, a clear chain of authority will be established. The EC will take charge of all emergency response activities and dictate the procedures that will be followed for the duration of the emergency. The EC will report immediately to the scene of the emergency, assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive. At his/her discretion, the EC also may order the closure of the site for an indefinite period.

All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs,

including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, the EC will notify site personnel. All heavy equipment will be shut down and all personnel will evacuate the work areas and assemble at the evacuation meeting point, which will be determined upon arrival at the site by the FTL/SHSO, prior to work beginning. This will then be conveyed to all crew members during the site-specific briefing.

The EC will give directions for implementing whatever actions are necessary. Any project team member may be assigned to be in charge of emergency communications during an emergency. He/she will attend the site telephone specified by the EC from the time the alarm sounds until the emergency has ended.

The EC will remain at the site to provide any assistance requested by emergency-response squads as they arrive to deal with the situation.

12.6 Fire Prevention and Protection

In the event of a fire or explosion, procedures will include immediately evacuating the site (air horn will sound for a single continuous blast), and notification of local fire and police departments. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

12.6.1 Fire Prevention

Adhering to the following precautions will prevent fires:

- Good housekeeping and storage of materials;
- Storage of flammable liquids and gases away from oxidizers;
- No smoking in the exclusion zone or any work area;
- No hot work without a properly executed hot work permit;
- Shutting off engines to refuel;
- Grounding and bonding metal containers during transfer of flammable liquids;
- Use of UL approved flammable storage cans;
- Fire extinguishers rated at least 10 pounds ABC located on all heavy equipment, in all trailers and near all hot work activities; and
- Monthly inspections of all fire extinguishers.

12.7 Overt Chemical Exposure

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the Material Safety Data Sheet or recommended by the Corporate Medical Consultant will be followed, when necessary.

SKIN AND EYE CONTACT: Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, and then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination. Skin should also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs.

INHALATION: Move to fresh air. Decontaminate and transport to hospital or local medical provider.

INGESTION: Decontaminate and transport to emergency medical facility.

PUNCTURE WOUND OR LACERATION: Decontaminate and transport to emergency medical facility.

12.8 Decontamination during Medical Emergencies

If emergency life-saving first aid and/or medical treatment is required, normal decontamination procedures may need to be abbreviated or postponed. The FTL/SHSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed on-site, a plastic barrier placed between the injured individual and clean surfaces should be used to help prevent contamination of the inside of ambulances and/or medical personnel. Outer garments may then be removed at the medical facility. No attempt will be made to wash or rinse the victim if his/her injuries are life threatening, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the normal decontamination procedures will be followed.

12.9 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone:

- Health and Safety Manager;
- Project Manager; and
- The employer of any injured worker.

Written confirmation of verbal reports are to be completed by the FTL/SHSO using the Incident Report Form and submitted within 24 hours. The incident report and investigation form is found in **Appendix G**. If the employee involved is not a ZEB employee, his employer will receive a copy of the report.

12.10 Adverse Weather Conditions

In the event of adverse weather conditions, the FTL/SHSO will determine if work can continue without potentially risking the safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries;
- Potential for cold stress and cold-related injuries;

- Treacherous weather-related working conditions (hail, rain, snow, ice, high winds);
- Limited visibility (fog);
- Potential for electrical storms;
- Earthquakes; and
- Other major incidents.

Site activities will be limited to daylight hours, or when suitable artificial light is provided, and acceptable weather conditions prevail. The FTL/SHSO will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

12.11 Spill Control and Response

All small hazardous spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the MSDS will be consulted to assist in determining the best means of containment and cleanup. For small spills, sorbent materials such as sand, sawdust or commercial sorbents should be placed directly on the substance to contain the spill and aid recovery. Any acid spills should be diluted or neutralized carefully prior to attempting recovery. Berms of earthen or sorbent materials can be used to contain the leading edge of the spills. Drains or drainage areas should be blocked. All spill containment materials will be properly disposed. An exclusion zone of 50 to 100 feet around the spill area should be established depending on the size of the spill. The following seven steps should be taken by the Emergency Coordinator:

- Determine the nature, identity and amounts of major spill components;
- Make sure all unnecessary persons are removed from the spill area;
- Notify appropriate response teams and authorities;
- Use proper PPE in consultation with the FTL/SHSO;
- If a flammable liquid, gas or vapor is involved, remove all ignition sources and use non-sparking and/or explosive proof equipment to contain or clean up the spill (diesel only vehicles, air operated pumps, etc.);
- If possible, try to stop the leak with appropriate material; and,
- Remove all surrounding materials that can react or compound with the spill.

12.12 Emergency Equipment

The following minimum emergency equipment shall be kept and maintained on-site:

- Industrial first aid kit; and
- Fire extinguishers (one per work area);

13.0 TRAINING

13.1 General Health and Safety Training

In accordance with corporate policy, and pursuant to 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations unless otherwise noted in the above reference. At a minimum, the training shall have consisted of instruction in the topics outlined in the standard. Personnel who have not met the requirements for initial training shall not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical).

13.1.1 Three Day Supervised On the Job Training

In addition to the required initial hazardous waste operations training, each employee shall have received three days of directly supervised on-the-job training. This training will address the duties the employees are expected to perform.

13.2 Annual Eight-Hour Refresher Training

Annual eight-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The training will cover a review of 1910.120 requirements and related company programs and procedures.

13.3 Site-Specific Training

Prior to commencement of field activities, all field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the site operations. It will include site and facility layout, hazards and emergency services at the site, and will highlight all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

13.4 On-Site Safety Briefings

Project personnel and visitors will be given on-site health and safety briefings daily by the FTL/SHSO to assist site personnel in safely conducting their work activities. A copy of the Daily Briefing Sign-In Sheet is contained in **Appendix F**. The briefings will include information on new operations to be conducted, changes in work practices or changes in the site's environmental conditions, as well as periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety inspections. The meetings will also be an opportunity to periodically update the crews on monitoring results. Prior to starting any new activity, a training session using the Activity Hazard Analysis will be held for crew members involved in the activity.

13.5 First Aid and CPR

The HSM will identify those individuals requiring first aid and CPR training to ensure that emergency medical treatment is available during field activities. It is anticipated that a minimum of one field person on-site at any one time will have first aid and CPR training. The training will be consistent with the requirements of the American Red Cross Association or American Heart Association. If none are available on-site, then the HSM shall be notified.

13.6 Supervisory Training

Supervisors and health and safety personnel shall have completed an additional eight hours of specialized training in accordance with 29 CFR 1910.120.

14.0 LOGS, REPORTS, AND RECORDKEEPING

Changes to the HASP will be documented in the Health and Safety log book and as appropriate, the HSM and/or PM will be notified. Daily tailgate meetings will be documented in the H&S log book as well as personnel on-site.

14.1 Medical and Training Records

Copies or verification of training (40-hour, 8-hour, supervisor, site-specific training and documentation of three day OJT) and medical clearance for hazardous waste site work and respirator use will be maintained on-site. Records for all subcontractor employees will also be kept on-site.

14.2 Incident Report and Investigation Form

The incident report and investigation form is to be completed for all accidents and incidents, including near misses. The form can be found in **Appendix G**.

14.3 Health and Safety Logbooks

The FTL/SHSO will maintain a logbook during site work. The daily site conditions, personnel, monitoring results and significant events will be recorded. The original logbooks will become part of the exposure records file.

15.0 FIELD PERSONNEL REVIEW

This form serves as documentation that field personnel have read, or have been informed of, and understand the provisions of the HASP. It is maintained on site by the FTL/SHSO as a project record. Each field team member shall sign this section after site-specific training is completed and before being permitted to work on site.

I have read, or have been informed of, the Health and Safety Plan and understand the information presented. I will comply with the provisions contained therein.

Name (Print and Sign)	***Date***

APPENDIX A

PFCs – Environmental Health and Safety Information

Perfluorinated Chemicals (PFCs)

Unlike many other persistent chemicals, PFCs are not stored in body fat. However, PFCs are similar sy ys f fu us ns a M hu s MM or the amount of time it takes for 50% of the a My M v s ha n y p yf ua y these chemicals, is several years. This slow elimination time makes it difficult to determine how changes in lifestyle, diet, or other exposure-related factors influence blood levels.

The National Institute of Environmental Health Sciences and the National Toxicology Program are supporting research to better understand the potential health effects of exposure to PFCs.

PO Box 12233 • Research Triangle Park, NC 27709
Phone: 919-541-3345 • **www.niehs.nih.gov**

National Institutes of Health
U.S. Department of Health and Human Services

July 2016

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In animal studies, some PFCs disrupt normal [illegible] adverse effects on multiple organs, including the [illegible] problems in rodent offspring exposed in the womb. [illegible] that PFCs may also have effects on human health, while other studies have failed to find conclusive links. Additional research in animals and in [illegible] potential adverse effects of PFCs for human health.

[illegible] by NIEHS in-house researchers, dating back to the 1980s.[5] Today, researchers continue to study the adverse effects of PFCs in animal models. For example, a 2011 report found that prenatal exposure to PFOA delays mammary gland development in mice. NIEHS is working hard to [illegible] might be causing these and other effects.

PFCs being studied by NTP	
Name	**Acronym**
Perfluorobutane sulfonate	PFBS
Perfluorohexane sulfonate	PFHxS
Perfluorohexanoic acid	PFHxA
Perfluorooctanoic acid	PFOA
Perfluorooctane sulfonate	PFOS
Perfluorononanoic acid	PFNA
Perfluorodecanoic acid	PFDA
8+2 Fluorotelomer alcohol	8:2 FTOH

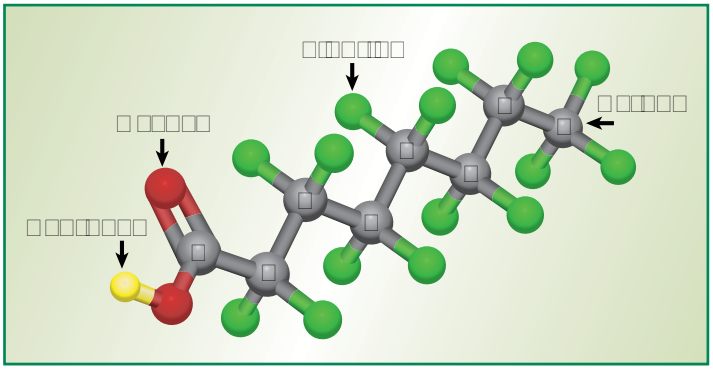
[illegible]

The U.S. Environmental Protection Agency (EPA) nominated the PFC class to the NTP for study, [illegible]

- Widespread exposure to humans

[illegible]

- Observed toxicity in animal models
- Insufficient information to properly assess human health risk across the entire [illegible]



[illegible]

One thing that differentiates each PFC is the size [illegible] number of carbon atoms in its chemical make-up. For example, PFOA has 8 carbons, which is why it is sometimes referred to as C8.

The NTP is studying PFCs as a class, due to [illegible] toxicity. The scientists will be able to compare [illegible] relationship between chain length and toxicity, and work toward understanding a common basis for toxicity.

The NTP research involves a variety of short-term and long-term rodent toxicology studies, using [illegible] exposure to effects. The entire research program is multifaceted.

[illegible]

- of cells to look at potential toxicity of PFCs, [illegible] are being conducted. These include a study [illegible] to evaluate the potential for PFOS, PFOA, [illegible] and PFBS to be neurotoxic, or affect brain [illegible] effects of some PFCs in human blood cells [illegible] and studies evaluating mitochondrial toxicity for 16 PFCs. Additionally, through a collaboration between NTP, other U.S. [illegible] agencies, and EPA, known as Tox21, [illegible] a number of PFCs are being tested for toxicity in human and animal cells at the Tox21 robotics high-throughput screening facility. [illegible] A complete list of the 10,000 compound [illegible] www.epa.gov/ncct/dsstox/sdf_tox21s.html.

[illegible]

[illegible]
of different chain lengths are distributed throughout the body and excreted over time, known as toxicokinetic studies, are being conducted for PFBS, PFDA, PFHxA, PFHxS, PFOA, PFOS, and 8:2 FTOH in male and female young adult rats.

- Short-term, 28-day toxicity studies are being conducted for PFBS, PFDA, PFHxA, PFHxS, PFNA, PFOA, and PFOS in male and female young adult rats.
- A 28-day immunotoxicity study is also being conducted for PFDA in female rats.
- A two-year study is being conducted on PFOA, to evaluate its potential to cause cancer and other toxic effects. This study evaluates the effect of exposure to PFOA, [illegible] through adulthood, in male and female rats.
- The NTP is also planning to conduct studies in rats and mice to determine the effects of [illegible] the offspring, including puberty.

[illegible]

In addition to the NTP's effort, NIEHS-funded grantees across the country are researching PFCs. For example, some are exploring a potential link [illegible] attention deficit hyperactivity disorder, [illegible] risks of PFCs and other chemicals on [illegible]
function. For example, a 2012 NIEHS-funded human study found that elevated PFC exposures [illegible] vaccine-induced immune protection in children.[10]

Collectively, the NTP and NIEHS-funded studies will help determine the toxicity of these chemicals [illegible] health effects. Such data will be of value to regulatory agencies and policymakers who will use the information to protect the public's health. The information will also help members of the public make informed decisions.

[illegible]

Some progress has been made in reducing PFCs. The EPA has been working with companies since 2000 to phase out PFOA and PFOS, and to reduce [illegible] other PFCs.[illegible] Also, some state agencies are reviewing current PFC research findings from NIEHS and others, to help assess and evaluate the [illegible] their communities.[illegible]

Different types of scientists may f□□f□sv□s□□u□a □□Mu□v□□□a □□M by different names. This is often the case for PFCs. Some commonly hu□□s□fa u□yf□□□us□□s□pyh a □□s□ya □□□fyu□n□M□□

- Perfluorinated chemicals
- Perfluorochemicals
- Perfluoroalkyls
- Perfluorinated alkyl acids
- Polyfluorinated chemicals
- Polyfluorinated compounds
- Polyfluoroalkyl substances

Where can I go for more information?

Agency for Toxic Substances and Disease Registry
http://www.atsdr.cdc.gov/PHS/PHS.asp?id=1115&tid=237

Centers for Disease Control and Prevention
http://www.cdc.gov/biomonitoring/PFCs_FactSheet.html

National Toxicology Program
http://ntp.niehs.nih.gov

U.S. Environmental Protection Agency
http://www.epa.gov/fedfac/pdf/emerging_contaminants_pfos_pfoa.pdf

[1] CDC (Centers for Disease Control and Prevention). 2009. Fourth National Report on Human Exposure to Environmental Chemicals. Atlanta, GA: Centers for Disease Control and Prevention. Available: http://www.cdc.gov/exposurereport/pdf/FourthReport.pdf [accessed 18 July 2012].

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[3] □ □s□□□□□nsyn□□□□ n□u□□ 2011. Endocrine disrupting properties of perfluorooctanoic acid. J Steroid Biochem Mol Biol 127(1-2):16-26.

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[11] EPA (Environmental Protection Agency). 2012. Perfluorooctanoic Acid (PFOA) and Fluorinated Telomers. Available: http://www.epa.□yv□y s□ □y□□ [accessed 18 July 2012].

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APPENDIX B

ACTIVITY HAZARD ANALYSES

Project Identification Hampton Bays Fire Dept.	**Location** Hampton Bays, NY	**Estimated Dates** TBD
Phase of Work Mobilization/ Demobilization	**Page 1 of 1**	**Analysis Approved by** Zeb Youngman, PG
TASKS	**HAZARDS**	**CONTROL MEASURES**
1. Mobilization and demobilization of equipment site tools, personnel	Slips/trips/falls	• Maintain alertness to slip/trip/fall hazards; • Maintain good housekeeping; • Walk, do not run; • Wear footwear with soles that grip; • Unloading areas should be on even terrain; and • Mark and repair if possible tripping hazards.
	Manual lifting and material handling	• Instruct personnel on proper lifting techniques; • Use proper lifting techniques; and • Team lifting will be used for heavy loads or use mechanical lifting devices.
	Temperature extremes	• Drink plenty of fluids: • Train personnel of signs/symptoms of heat/cold stress; • Monitor air temperatures when extreme weather conditions are present; and • Stay in visual and verbal contact with your buddy.
	Vehicular traffic	• Spotters will be used when backing up trucks and heavy equipment and when moving equipment.
	Overhead hazards	• Personnel will be required to wear hard hats that meet ANSI Standard Z89.1; • All ground personnel will stay clear of suspended loads; • All equipment will be provided with guards, canopies or grills to protect the operator from falling or flying objects; and • All overhead hazards will be identified prior to commencing work operations.
	Noise	• Ear plugs or ear muffs shall be worn for operations that exceed 85 decibels.
	Electrocution	• Equipment will be equipped with GFCI; • A licensed electrician will conduct all electrical work; • All equipment will stay a minimum of 15 feet from overhead-energized electrical lines (50 kV). This distance will increase .4 inches for each 1 kV above 50 kV.
	Biological hazards	• Be alert to the presence of biological hazards; • Wear insect repellent; • Follow procedures in Section 4.2.2 for tick bites; • FTL/SHSO should be aware of on-site personnel with allergic reactions in insect bites and stings.

Project Identification Hampton Bays Fire Dept	**Location** Hampton Bays, NY	**Estimated Dates** TBD
Phase of Work Excavation/Drilling	**Page 1 of 2**	**Analysis Approved by** Zeb Youngman, PG
TASKS	**HAZARDS**	**CONTROL MEASURES**
1. Excavate soils. 2. Backfill excavations. 3. Drill to required depths and install wells.	Chemical hazards	• Wear appropriate PPE per Table 6-1; • Perform air monitoring per Community Air Monitoring Plan; • Practice contamination avoidance; • Follow proper decontamination procedures; and • Wash hands/face before eating, drinking or smoking.
	Hand and power tool usage	• Equip all electrical equipment with GFCI's; • Inspect all electrical equipment and tools prior to use; • Daily inspections will be performed; • Remove broken or damaged tools from service; • Use the tool for its intended purpose; • Use in accordance with manufacturer instructions; and Tag and remove defective equipment.
	Temperature extremes	• Drink plenty of fluids: • Train personnel of signs/symptoms of heat/cold stress; • Monitor air temperatures when extreme weather conditions are present; and, • Stay in visual and verbal contact with your buddy.
	Manual lifting and material handling	• Instruct personnel on proper lifting techniques; • Use proper lifting techniques; and • Team lifting will be used for heavy loads or use mechanical lifting devices.
	Fire/Explosion	• ABC type fire extinguishers shall be readily available; • No smoking in work area.
	Biological hazards	• Be alert to the presence of biological hazards; • Wear insect repellent; • Follow procedures in Section 4.2.2 for tick bites; • FTL/SHSO should be aware of on-site personnel with allergic reactions in insect bites and stings.
	Heavy equipment	• Ground personnel will stay clear of all suspended loads; • Ground personnel will stay out of the swing radius; • Eye contact with operators will be made before approaching equipment; • Equipment will not be approached on blind sides; • All equipment will be equipped with backup alarms or spotters shall be used.
	Slips/Trips/Falls	• Maintain alertness to slip/trip/fall hazards; • Maintain good housekeeping; • Walk, do not run; • Wear footwear with soles that grip; • Unloading areas should be on even terrain; and mark and repair if possible tripping hazards are present.

Project Identification Hampton Bays Fire Dept	**Location** Hampton Bays, NY	**Estimated Dates** TBD
Phase of Work Excavation/Drilling	**Page 2 of 2**	**Analysis Approved by** Zeb Youngman, PG
TASKS	**HAZARDS**	**CONTROL MEASURES**
	Noise	• Hearing protection mandatory at or above 85 dBA. • Instruct personnel how to properly wear heating protective devices. •Disposable ear plugs or other hearing protection required when working near noisy equipment..
	Steam/Heat/Splashing	• Use face shield and safety glasses or goggles; • Stay out of the splash/steam radius; • Do not direct steam at anyone; • Do not hold objects with your foot and steam area near it; • Ensure that the direction of spray minimizes spread of constituents of concern; and • Use shielding as necessary.
	Excavation hazards	• Follow 29 CFR 1926 Subpart P.
	Overhead hazards	• Personnel will be required to wear hard hats that meet ANSI Standard Z89.1; • All ground personnel will stay clear of suspended loads; • All equipment will be provided with guards, canopies or grills to protect the operator from falling or flying objects; and • All overhead hazards will be identified prior to commencing work operations.

Project Identification Hampton Bays Fire Dept	**Location** Hampton Bays, NY	**Estimated Dates** TBD
Phase of Work Soil/Groundwater Sampling	**Page 1 of 1**	**Analysis Approved by** Zeb Youngman

TASKS	HAZARDS	CONTROL MEASURES
1.Collect soil/groundwater samples.	Chemical hazards	• Wear appropriate PPE per Table 6-1; • Practice contamination avoidance; • Follow proper decontamination procedures; and • Wash hands/face before eating, drinking or smoking.
	Temperature extremes	• Drink plenty of fluids: • Train personnel of signs/symptoms of heat/cold stress; • Monitor air temperatures when extreme weather conditions are present; and • Stay in visual and verbal contact with your buddy.
	Manual lifting and material handling	• Site personnel will be instructed on proper lifting techniques; mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available.
	Slips/Trips/Falls	• Maintain alertness to slip/trip/fall hazards; • Maintain good housekeeping; • Walk, do not run; • Wear footwear with soles that grip; • Unloading areas should be on even terrain; and • Mark and repair if possible tripping hazards.

Project Identification Hampton Bays Fire Dept	**Location** Hampton Bays, NY	**Estimated Dates** TBD
Phase of Work Decontamination	**Page 1 of 1**	**Analysis Approved by** Zeb Youngman PM
TASKS	**HAZARDS**	**CONTROL MEASURES**
1.Decontaminate equipment	Chemical hazards	• Wear appropriate PPE per Table 6-1; • Practice contamination avoidance; • Follow proper decontamination procedures; and • Wash hands/face before eating, drinking or smoking.
	Temperature extremes	• Drink plenty of fluids: • Train personnel of signs/symptoms of heat/cold stress; • Monitor air temperatures when extreme weather conditions are present; and • Stay in visual and verbal contact with your buddy.
	Manual lifting and material handling	• Site personnel will be instructed on proper lifting techniques; mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available.
	Slips/Trips/Falls	• Maintain alertness to slip/trip/fall hazards; • Maintain good housekeeping; • Walk, do not run; • Wear footwear with soles that grip; • Unloading areas should be on even terrain; and • Mark and repair if possible tripping hazards.

APPENDIX C

HEAT/COLD STRESS PROTOCOLS

HEAT STRESS

Heat Stress (Hyperthermia)
Heat stress is the body's inability to regulate the core temperature. A worker's susceptibility to heat stress can vary according to his/her physical fitness, degree of acclimation to heat, humidity, age and diet.

1. Prior to site activity, the field team leader may make arrangements for heat stress monitoring (i.e., monitoring heart rate, body temperature, and body water loss) during actual site work if conditions warrant. In addition, the FTL is to ensure that each team member has been acclimatized to the prevailing environmental conditions, that personnel are aware of the signs and symptoms of heat sickness, that they have been adequately trained in first aid procedures, and that there are enough personnel on-site to rotate work assignments and schedule work during hours of reduced temperatures. Personnel should not consume alcoholic or caffeinated beverages but rather drink moderate levels of an electrolyte solution and eat well prior to commencing site work.

2. Although there is no specific test given during a baseline physical that would identify a person's intolerance to heat, some indicators are tobacco or medication use, dietary habits, body weight, and chronic conditions such as high blood pressure or diabetes.

3. *Heat cramps*, caused by profuse perspiration with inadequate fluid intake and salt replacement, most often afflict people in good physical condition who work in high temperature and humidity. Heat cramps usually come on suddenly during vigorous activity. Untreated, heat cramps may progress rapidly to heat exhaustion or heat stroke. First aid treatment: remove victim to a cool place and replace lost fluids with water.

4. Thirst is not an adequate indicator of heat exposure. Drinking fluid by itself does not indicate sufficient water replacement during heat exposure. A general rule, the amount of water administered should replace the amount of water lost, and it should be administered at regular intervals throughout the day. For every half pound of water lost, 8 ounces of water should be ingested. Water should be replaced by drinking 2 – 4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink split 50/50 with water.

5. *Heat exhaustion* results from salt and water loss along with peripheral pooling of blood. Like heat cramps, heat exhaustion tends to occur in persons in good physical health who are working in high temperatures and humidity. Heat exhaustion may come on suddenly as dizziness and collapse. Untreated, heat exhaustion may progress to heat stroke.

6. *Treatment for heat exhaustion*: Move the victim to a cool environment (e.g. air-conditioned room/car), lay victim down and fan him/her. If the air-conditioning is not available, remove the victim to a shaded area, remove shirt, and fan. If symptoms do not subside within an hour, notify 911 to transport to hospital.

7. *Heat stroke* results from the body's inability to dissipate excess heat. A true medical emergency that requires immediate care, it usually occurs when one ignores the signs of heat exhaustion and continues strenuous activities. Working when the relative humidity exceeds 60% is a particular problem. Workers in the early phase of heat stress may not be coherent of they will be confused, delirious or comatose. Changes in behavior, irritability and combativeness are useful early signs of heat stroke.

8. *Treatment of heat stroke*: Move the victim to a cool, air-conditioned environment. Place victim in a semi-reclined position with head elevated and strip to underclothing. Cool victim as rapidly as possible, applying ice packs to the arms and legs and massaging the neck and torso. Spray victim with tepid water and constantly fan to promote evaporation. Notify 911 to transport to hospital as soon as possible.

TABLE 1

SYMPTOMS OF HEAT STRESS

Heat cramps are caused by heavy sweating with inadequate fluid intake. Symptoms include;

- Muscle cramps
- Cramps in the hands, legs, feet and abdomen

Heat exhaustion occurs when body organs attempt to keep the body cool. Symptoms include;

- Pale, cool moist skin
- Core temperature elevated 1-2^{o}
- Thirst
- Anxiety
- Rapid heart rate
- Heavy sweating
- Dizziness
- Nausea

Heat stroke is the most serious form of heat stress. Immediate action must be taken to cool the body before serious injury and death occur. Symptoms are;

- Red, hot, dry skin
- Lack of perspiration
- Seizures
- Dizziness and confusion
- Strong, rapid pulse
- Core temperature of 104^{o} or above
- Coma

COLD STRESS

Cold stress (Hypothermia)
In hypothermia the core body temperature drops below 95^{o}F. Hypothermia can be attributed to a decrease in heat production, increased heat loss or both.
Prevention
Institute the following steps to prevent overexposure of workers to cold:

1. Maintain body core temperature at 98.6^{o}F or above by encouraging workers to drink warm liquids during breaks (preferably not coffee) and wear several layers of clothing that can keep the body warm even when the clothing is wet.

2. Avoid frostbite by adequately covering hands, feet and other extremities. Clothing such as insulated gloves or mittens, earmuffs and hat liners should be worn. To prevent contact frostbite (from touching metal and cold surfaces below 20^{o}F), workers should wear gloves. Tool handles should be covered with insulating material.

3. Adjust work schedules to provide adequate rest periods. When feasible, rotate personnel and perform work during the warmer hours of the day.

4. Provide heated shelter. Workers should remove their outer layer(s) of clothing while in the shelter to allow sweat to evaporate.

5. In the event that wind barriers are constructed around an intrusive operation (such as drilling), the enclosure must be properly vented to prevent the buildup of toxic or explosive gases or vapors. Care must be taken to keep a heat source away from flammable substances.

6. Using a wind chill chart such as the one in Table 3, obtain the equivalent chill temperature (ECT) based on actual wind speed and temperature. Refer to the ECT when setting up work warm-up schedules, planning appropriate clothing, etc. Workers should use warming shelters at regular intervals at or below an ECT of 20^{o}F. For exposed skin, continuous exposure should not be permitted at or below an ECT of -25^{o}F.

Frostbite
Personnel should be aware of symptoms of frostbite/hypothermia. If the following symptoms are noticed in any worker, he/she should immediately go to a warm shelter.

1. *Frostnip* is the incipient stage of frostbite, brought about by direct contact with a cold object or exposure of a body part to cool/cold air. Wind chill or cold water also can be major factors. This condition is not serious. Tissue damage is minor and the response to care is good. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostnip.

2. *Treatment of frostnip*: Care for frostnip by warming affected areas. Usually the worker can apply warmth from his/her bare hands, blow warm air on the site, or, if the fingers are involved, hold them in the armpits. During recovery, the worker may complain of tingling or burning sensation, which is normal. If the condition does not respond to this simple care, begin treatment for frostbite.

3. *Frostbite*: The skin and subcutaneous layers become involved. If frostnip goes untreated, it becomes superficial frostbite. This condition is serious. Tissue damage may be serious. The worker must be transported to a medical facility for evaluation. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostbite. The affected area will feel frozen, but only on the surface. The tissue below the surface must still be soft and have normal response to touch. *DO NOT* squeeze or poke the tissue. The condition of the deeper tissues can be determined by gently palpating the affected area. The skin will turn mottled or blotchy. It may also be white and then turn grayish-yellow.

4. *Treatment of frostbite*: When practical, transport victim as soon as possible. Get the worker inside and keep him/her warm. Do not allow any smoking or alcohol consumption. Thaw frozen parts by immersion, re-warming in a 100$_{o}$F to 106$_{o}$F water bath. Water temperature will drop rapidly, requiring additional warm water throughout the process. Cover the thawed part with a dry sterile dressing. Do not puncture or drain any blisters.

NOTE: Never listen to myths and folk tales about the care of frostbite. *Never* rub a frostbitten or frozen area. *Never* rub snow on a frostbitten or frozen area. Rubbing the area may cause serious damage to already injured tissues. Do not attempt to thaw a frozen area if there is any chance it will be re-frozen.

5. *General cooling/Hypothermia*: General cooling of the body is known as systemic hypothermia. This condition is not a common problem unless workers are exposed to cold for prolonged periods of time without any shelter.

6. *Treatment of hypothermia*: Keep worker dry. Remove any wet clothing and replace with dry clothes, or wrap person in dry blankets. Keep person at rest. Do not allow him/her to move around. Transport the victim to a medical facility as soon as possible.

APPENDIX D

GENERAL HEALTH AND SAFETY WORK PRACTICES

GENERAL HEALTH AND SAFETY WORK PRACTICES

1. All site personnel must attend each day's Daily Briefing and sign the attendance sheet.

2. Any individual taking prescribed drugs shall inform the FTL/SHSO of the type of medication. The FTL/SHSO will review the matter with the HSM and the Corporate Medical Consultant (CMC), who will decide if the employee can safely work on-site while taking the medication.

3. The personal protective equipment specified by the FTL/SHSO and/or associated procedures shall be worn by all site personnel. This includes hard hats and safety glasses which must be worn at all times in active work areas.

4. Facial hair (beards, long sideburns or mustaches) which may interfere with a satisfactory fit of a respirator mask is not allowed on any person who may be required to wear a respirator.

5. Personnel must follow proper decontamination procedures and shower as soon as possible upon completion of work shift.

6. Eating, drinking, chewing tobacco or gum, smoking and any other practice that may increase the possibility of hand-to-mouth contact is prohibited in the exclusion zone or the contamination reduction zone. (Exceptions may be permitted by the HSM to allow fluid intake during heat stress conditions).

7. All lighters, matches, cigarettes and other forms of tobacco are prohibited in the Exclusion Zone.

8. All signs and demarcations shall be followed. Such signs and demarcation shall not be removed, except as authorized by the FTL/SHSO.

9. No one shall enter a permit-required confined space without a permit and appropriate training. Confined space entry permits shall be implemented as issued.

10. All personnel must follow Hot Work Permits as issued.

11. All personnel must use the Buddy System in the Exclusion Zone.

12. All personnel must follow the work-rest regimens and other practices required by the heat stress program.

13. All personnel must follow lockout/tagout procedures when working on equipment involving moving parts or hazardous energy sources.

14. No person shall operate equipment unless trained and authorized.

15. No one may enter an excavation greater than four feet deep unless authorized by the Competent Person. Excavations must be sloped or shored properly. Safe means of access and egress from excavations must be maintained.

16. Ladders and scaffolds shall be solidly constructed, in good working condition, and inspected prior to use. No one may use defective ladders or scaffolds.

17. Fall protection or fall arrest systems must be in place when working at elevations greater than six feet for temporary working surfaces and four feet for fixed platforms.

18. Safety belts, harnesses and lanyards must be selected by the Supervisor. The user must inspect the equipment prior to use. No defective personal fall protection equipment shall be used. Personal fall protection that has been shock loaded must be discarded.

19. Hand and portable power tools must be inspected prior to use. Defective tools and equipment shall not be used.

20. Ground fault interrupters shall be used for cord and plug equipment used outdoors or in damp locations. Electrical cords shall be kept out walkways and puddles unless protected and rated for the service.

21. Improper use, mishandling, or tampering with health and safety equipment and samples is prohibited.

22. Horseplay of any kind is prohibited.

23. Possession or use of alcoholic beverages, controlled substances, or firearms on any site is forbidden.

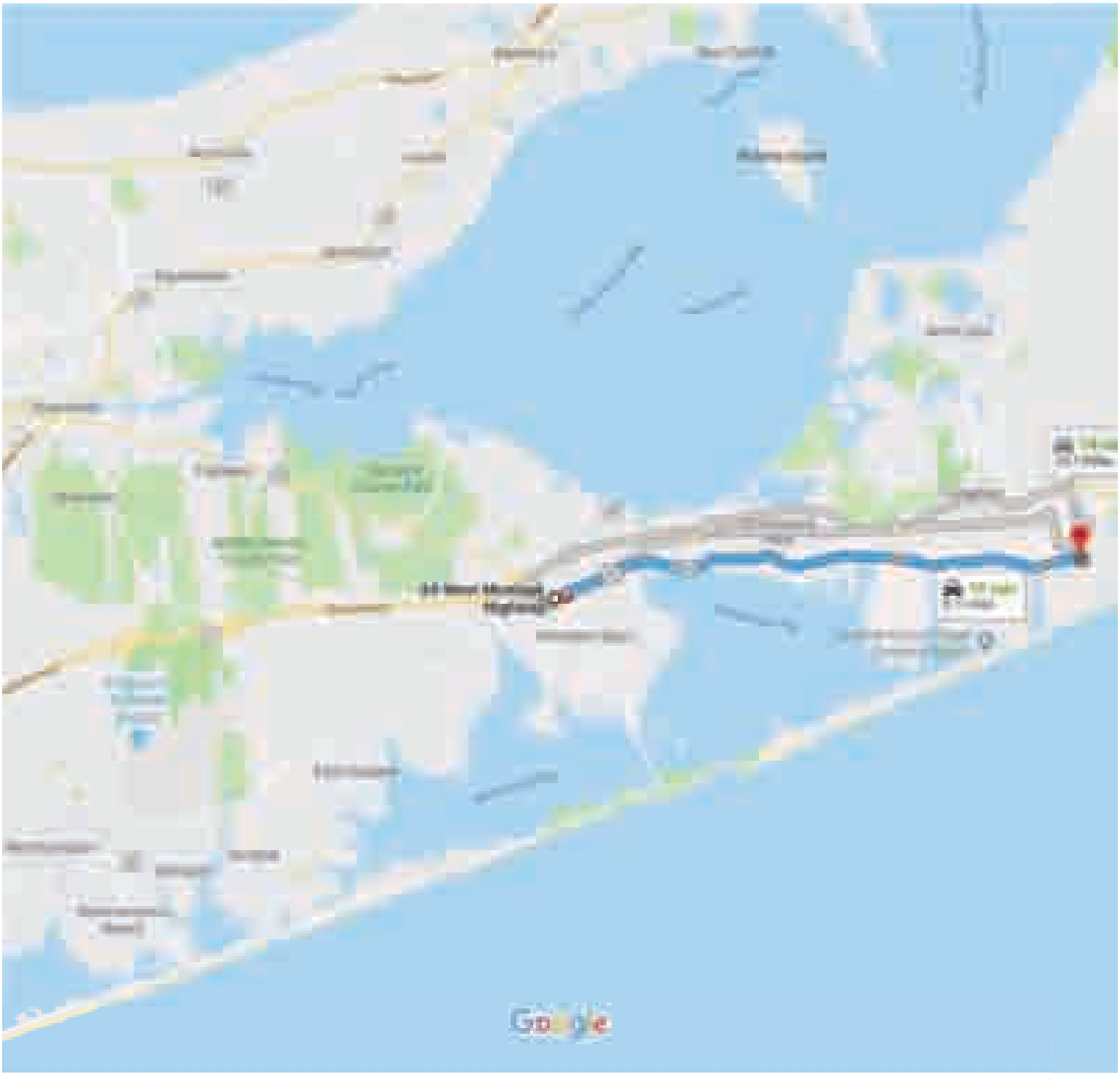
24. All incidents, no matter how minor, must be reported immediately to the Supervisor.

25. All personnel shall be familiar with the Site Emergency Response Plan, which is contained in Section 12 of the HASP.

The above Health and Safety Rules are not all inclusive and it is your responsibility to comply with all regulations set forth by OSHA, the client, PWGC Supervisors, and the FTL/SHSO.

APPENDIX E

HOSPITAL ROUTE MAP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APPENDIX F

DAILY BRIEFING SIGN-IN SHEET

DAILY BRIEFING SIGN-IN SHEET

Date: _____ Project Name/Location: _____

Person Conducting Briefing:_____

1. AWARENESS (topics discussed, special safety concerns, recent incidents, etc.)

_____
_____
_____

2. OTHER ISSUES (HASP changes, attendee comments, etc.)

_____
_____
_____

3. ATTENDEES (Print Name):

1.	21.
2.	22.
3.	23.
4.	24.
5.	25.
6.	26.
7.	27.
8.	28.
9.	29.
10.	30.
11.	31.
12.	32.
13.	33.
14.	34.
15.	35.
16.	36.
17.	37.
18.	38.
19.	39.
20.	40.

APPENDIX G

INCIDENT REPORT FORM / INVESTIGATION FORM

INCIDENT / NEAR MISS REPORT AND INVESTIGATION - PAGE 1 OF 2		
TYPE OF INCIDENT - CHECK ALL THAT APPLY		
☐ INJURY/ILLNESS ☐ VEHICLE DAMAGE ☐ PROPERTY DAMAGE ☐ FIRE ☐ SPILL/RELEASE ☐ PERMIT EXCEEDENCE ☐ NEAR MISS ☐ OTHER		
GENERAL INFORMATION		
PROJECT NAME:	DATE OF REPORT:	REPORT NO.:
DATE OF INCIDENT:	TIME:	DAY OF WEEK:
LOCATION OF INCIDENT:		
WEATHER CONDITIONS:	ADEQUATE LIGHTING AT SCENE? ☐ YES ☐ NO ☐	
DESCRIBE WHAT HAPPENED (STEP BY STEP - USE ADDITIONAL PAGES IF NECESSARY)		
AFFECTED EMPLOYEE INFORMATION		
NAME:	EMPLOYEE: ☐ YES ☐ NO	
HOME ADDRESS:		
SOCIAL SECURITY NO.:	HOME PHONE NO.:	
JOB CLASSIFICATION:	YEARS IN JOB CLASSIFICATION:	
HOURS WORKED ON SHIFT PRIOR TO INCIDENT:	AGE:	
DID INCIDENT RELATE TO ROUTINE TASK FOR JOB CLASSIFICATION? ☐ YES ☐ NO		
INJURY/ILLNESS INFORMATION		
NATURE OF INJURY OR ILLNESS:		
OBJECT/EQUIPMENT/SUBSTANCE CAUSING HARM:		
FIRST AID PROVIDED? ☐ YES ☐ NO		
IF YES, WHERE WAS IT GIVEN: ☐ ON-SITE ☐ OFF-SITE		
IF YES, WHO PROVIDED FIRST AID:		
WILL THE INJURY/ILLNESS RESULT IN: ☐ RESTRICTED DUTY ☐ LOST TIME ☐ UNKNOWN		

INCIDENT / NEAR MISS REPORT AND INVESTIGATION - PAGE 2 OF 2 REPORT NO.
MEDICAL TREATMENT INFORMATION
WAS MEDICAL TREATMENT PROVIDED? ☐ YES ☐ NO
IF YES, WAS MEDICAL TREATMENT PROVIDED: ☐ ON-SITE ☐ DR.'S OFFICE ☐ HOSPITAL
NAME OF PERSON(S) PROVIDING TREATMENT:
ADDRESS WHERE TREATMENT WAS PROVIDED:
TYPE OF TREATMENT:
VEHICLE AND PROPERTY DAMAGE INFORMATION
VEHICLE/PROPERTY DAMAGED:
DESCRIPTION OF DAMAGE:
SPILL AND AIR EMISSIONS INFORMATION:
SUBSTANCE SPILLED OR RELEASED: FROM WHERE: TO WHERE:
ESTIMATED QUANTITY/DURATION:
CERCLA HAZARDOUS SUBSTANCE? ☐ YES ☐ NO
REPORTABLE TO AGENCY? ☐ YES ☐ NO SPECIFY:
WRITTEN REPORT: ☐ YES ☐ NO TIME FRAME:
RESPONSE ACTION TAKEN:
PERMIT EXCEEDENCE
TYPE OF PERMIT: PERMIT #:
DATE OF EXCEEDENCE: DATE FIRST KNOWLEDGE OF EXCEEDENCE:
PERMITTED LEVEL OR CRITERIA:
EXCEEDENCE LEVEL OR CRITERIA:
REPORTABLE TO AGENCY? ☐ YES ☐ NO SPECIFY:
WRITTEN REPORT: ☐ YES ☐ NO TIME FRAME:
RESPONSE ACTION TAKEN:
NOTIFICATIONS
NAMES OF PERSONNEL NOTIFIED: DATE/TIME:
CLIENT NOTIFIED: DATE/TIME:
AGENCY NOTIFIED: DATE/TIME:
CONTACT NAME:
PERSONS PREPARING REPORT
EMPLOYEE'S NAME:(PRINT) SIGN:
SUPERVISOR'S NAME:(PRINT) SIGN:

INVESTIGATIVE REPORT

DATE OF INCIDENT: DATE OF REPORT: REPORT NUMBER:

INCIDENT COST: ESTIMATED: $_____ ACTUAL: $_____

OSHA RECORDABLE(S): ☐ YES ☐ NO # RESTRICTED DAYS ____ # DAYS AWAY FROM WORK

CAUSE ANALYSIS

IMMEDIATE CAUSES - WHAT ACTIONS AND CONDITIONS CONTRIBUTED TO THIS EVENT?

BASIC CAUSES - WHAT SPECIFIC PERSONAL OR JOB FACTORS CONTRIBUTED TO THIS EVENT?

ACTION PLAN

REMEDIAL ACTIONS - WHAT HAS AND OR SHOULD BE DONE TO CONTROL EACH OF THE CAUSES LISTED?

ACTION	PERSON RESPONSIBLE	TARGET DATE	COMPLETION DATE

PERSONS PERFORMING INVESTIGATION

INVESTIGATOR'S NAME: (PRINT) SIGN: DATE:

INVESTIGATOR'S NAME: (PRINT) SIGN: DATE:

INVESTIGATOR'S NAME: (PRINT) SIGN: DATE:

MANAGEMENT REVIEW

PROJECT MANAGER: (PRINT) SIGN: DATE:

COMMENTS:

H&S MANAGER: (PRINT) SIGN: DATE:

COMMENTS:

Examples of Immediate Causes

Substandard Actions

1. Operating equipment without authority
2. Failure to warn
3. Failure to secure
4. Operating at improper speed
5. Making safety devices inoperable
6. Removing safety devices
7. Using defective equipment
8. Failure to use PPE properly
9. Improper loading
10. Improper placement
11. Improper lifting
12. Improper position for task
13. Servicing equipment in operation
14. Under influence of alcohol/drugs
15. Horseplay

Substandard Conditions

1. Guards or barriers
2. Protective equipment
3. Tools, equipment, or materials
4. Congestion
5. Warning system
6. Fire and explosion hazards
7. Poor housekeeping
8. Noise exposure
9. Exposure to hazardous materials
10. Extreme temperature exposure
11. Illumination
12. Ventilation
13. Visibility

Examples of Basic Causes

Personal Factors

1. Capability
2. Knowledge
3. Skill
4. Stress
5. Motivation

Job Factors

1. Supervision
2. Engineering
3. Purchasing
4. Maintenance
5. Tools/equipment
6. Work Standards
7. Wear and tear
8. Abuse or misuse

Management Programs for Control of Incidents

1. Leadership and administration
2. Management training
3. Planned inspections
4. Task analysis and procedures
5. Task observation
6. Emergency preparedness
7. Organizational rules
8. Accident/incident analysis
9. Personal protective equipment
10. Health control
11. Program audits
12. Engineering controls
13. Personal communications
14. Group meetings
15. General promotion
16. Hiring and placement
17. Purchasing controls