SITE CHARACTERIZATION WORK PLAN

SULLIVAN COUNTY INTERNATIONAL AIRPORT
TAX MAP/PARCEL NOS.: 18.-1-16.1, 18.-1-18.3, and 24.-1-1
75 COUNTY ROAD 183A
SWAN LAKE, NEW YORK 12783

EnSafe Project Number:
0888821949

Revision: 1

Prepared for:

Sullivan County Division of Public Works
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June 2018

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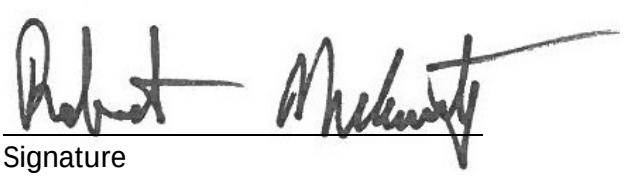
QUALIFIED ENVIRONMENTAL PROFESSIONAL'S CERTIFICATION

In accordance with NYSDEC DER-10 Section 1.5 (b)2:

I, Robert McCarthy, certify that I am currently a Qualified Environmental Professional and that this Site Characterization 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).



Signature

June 19, 2018
Date Signed

Robert McCarthy
Printed Name

Environmental Engineer
Title

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EXECUTIVE SUMMARY

EnSafe Inc. has prepared a Site Characterization Work Plan (SCWP) for Sullivan County International Airport (SCIA) at 75 County Road 183A, in Swan Lake, New York. The SCWP was prepared in general accordance with the New York State Department of Environmental Conservation (NYSDEC) Technical Guidance for Site Investigation and Remediation (DER-10) (NYSDEC, 2010, May 3).

The SCWP is a requirement of the Consent Order issued by NYSDEC to Sullivan County, and executed on December 21, 2017. The December 2017 Consent Order was issued in response to the discovery of per- and polyfluoroalkyl substances (PFAS) in a non-potable water supply well located on SCIA, and in a potable supply well located on the adjacent commercial property to the west (13 County Road 183B — Silk City Textile Machine Company). Two specific PFAS compounds, perfluorooctanoic acid and perfluoroctane sulfonic acid, either individually or in sum, were detected at concentrations above the United States Environmental Protection Agency drinking water Health Advisory guidance level of 70 nanograms per liter in samples collected from these two supply wells. The presence of these PFAS compounds is suspected to be related to aqueous film forming foam, which is used and stored at the SCIA. The NYSDEC issued Site No. 353016 on April 18, 2017, to track response and investigation activities related to the presence of PFAS in groundwater.

The purpose of this SCWP is to outline the investigation approach for each of the 17 Areas of Concern (AOCs) identified in the Records Search Report (EnSafe, 2018, January 30) completed for the SCIA. The AOCs were identified based on a known or suspected presence of PFAS, or other contaminants that fall into the scope of the Comprehensive Environmental Response, Compensation, and Liability Act, and petroleum products. In preparation of the SCWP, additional information was evaluated that has led to a recommendation of No Further Action for one AOC not originally concluded in the Records Search Report. Additionally, responses to historic information requests to the NYSDEC and Sullivan County are still pending, which has limited the ability to determine if further action is required for five AOCs. The site-specific investigation plan for each of the remaining 11 AOCs, as well as a summary of status for the other six AOCs, is presented in this SCWP.

LIST OF ACRONYMS

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
AFFF	Aqueous Film Forming Foam
AOC	Area of Concern
ARFF	Aircraft Rescue and Fire Fighting
AST	Aboveground Storage Tank
bgs	below ground surface
CPP	Citizen Participation Plan
CR	County Road
CVI	Cablevision
DER-10	Technical Guidance for Site Investigation and Remediation
ELAP	Environmental Laboratory Approval Program
FBO	Fixed-Base Operations
FOIL	Freedom of Information Law
FTA	Firefighting Training Area
GPR	Ground Penetrating Radar
HA	Health Advisory
HASP	Health and Safety Plan
ID	Identification
IPaC	Information for Planning and Consultation
NFA	No Further Action
ng/L	nanograms per liter
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCB	Polychlorinated Biphenyl
PID	Photo-Ionization Detector
PFAS	Per- and Polyfluoroalkyl Substances
PFBS	Perfluorobutane Sulfonate
PFOA	Perfluorooctanoic Acid
PFOS	Perfluoroctane Sulfonic Acid
ppm	parts per million
QAPP	Quality Assurance Project Plan
QC	Quality Assurance/Quality Control
RSR	Records Research Report

SCETA	Sullivan County Emergency Training Area
SCIA	Sullivan County International Airport
SCWP	Site Characterization Work Plan
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
USCS	Unified Soil Classification System
U.S. EPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

1.0 INTRODUCTION

EnSafe Inc. was retained by Sullivan County Division of Public Works to develop a Site Characterization Work Plan (SCWP) for Sullivan County International Airport (SCIA), at 75 County Road (CR) 183A, in Swan Lake, New York. This SCWP is a requirement of the New York State Department of Environmental Conservation (NYSDEC) Consent Order, executed on December 21, 2017, which was issued in response to the detections of per- and polyfluoroalkyl substances (PFAS) in both potable and non-potable supply wells at, and in the vicinity of, SCIA. NYSDEC issued Site No. 353016 on April 18, 2017, to track response and investigation activities related to the presence of PFAS in groundwater at SCIA.

1.1 Per- and Polyfluoroalkyl Substances Background

PFAS are anthropogenic fluorinated organic chemicals; the 3M Company was the first to provide manufacturing-scale production in 1949 (3M Company, 1999, February 5). PFAS have been used in a variety of products including firefighting foams, plating mist-suppressant solutions, non-stick cookware, textiles and leather, paper and packaging, semiconductors, herbicides, insecticides, greases, lubricants, photograph imaging solutions, adhesives, rubber and plastics, aviation hydraulic fluids, and personal care products (3M, 1999, February 5; Minnesota Pollution Control Agency, 2010, June 30).

With respect to SCIA, a primary source of PFAS at airports includes the use, storage, and handling of aqueous film forming foam (AFFF) for firefighting activities. PFAS-based AFFF was first developed in the early 1960s to improve aviation safety (United States Naval Research Laboratory, no date) and by the mid- to late-1960s, AFFF was in widespread use.

The United States Environmental Protection Agency (U.S. EPA) has established a drinking water Health Advisory (HA) guidance level of 70 nanograms per liter (ng/L) for two PFAS: perfluorooctanoic acid (PFOA) and perfluoroctane sulfonic acid (PFOS). The U.S. EPA also recommends that when both PFOA and PFOS are present in a same sample, that the sum of PFOA and PFOS (combined PFOA+PFOS) also be compared to the HA (U.S. EPA, May 2016a,b). In 2016/2017, the New York State Department of Health (NYSDOH) performed well sampling for PFAS at, and in the vicinity of, the SCIA based on the potential use of AFFF. The NYSDOH sampled a total of 17 wells; the locations of which are provided on Figure 1. The NYSDOH sampling activities identified PFOA concentrations above the U.S. EPA HA in the onsite non-potable Well #3. Additionally, the combined PFOA+PFOS concentration at the offsite potable well located at 13 CR 183B (incorrectly identified as 22 CR 183B

by the NYSDOH) also exceeded the HA. The discovery of the onsite and offsite U.S. EPA HA exceedances prompted the Consent Order.

In response to the HA exceedances, the SCIA removed Well #3 from operation via lock-out at the electrical panel and began providing bottled water to 13 CR 183B (on-going). Potable water is provided to SCIA from a supply well, identified as Well #5, which is located on an abutting parcel of land owned by Sullivan County (Figure 1). Well #5 is a regulated supply well (SV 3663) and was sampled by the NYSDOH for PFAS in October 2016, and again in January 2017. Analytical results from both sampling events at Well #5 indicted that PFOA was present at concentrations below the HA and PFOS was absent.

1.2 Objectives

This SCWP has been developed based on information presented in the Records Search Report (RSR) (EnSafe, 2018, January 30), and from observations made during a February 13, 2018, site visit. The RSR identified 17 Areas of Concern (AOCs), following criteria outlined in NYSDEC DER-10/Technical Guidance for Site Investigation and Remediation, dated May 3, 2010 (DER-10). The 17 AOCs were subsequently grouped into those specific for PFAS (PFAS AOCs) and those specific to contaminants that fall under the scope of Comprehensive Environmental Response, Compensation, and Liability Act and petroleum products (Preliminary AOCs). Both the PFAS AOCs and the Preliminary AOCs identified for SCIA will be addressed in this SCWP.

The activities outlined in this SCWP are intended to provide data to complete the following objectives:

- Determine if PFAS or other contaminants are present in onsite soil, groundwater, or surface water.
- Evaluate onsite geological conditions and complete a preliminary assessment of groundwater flow.
- Preliminary evaluation of whether groundwater may be a transport mechanism for offsite migration of PFAS or other contaminants.
- Assess potential PFAS impacts to offsite receptors.
- Fulfill the site characterization requirements listed in DER-10.
- Provide sufficient data to evaluate the necessity for further action.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description

The site, home to the SCIA, is an irregularly shaped parcel consisting of the three tax map parcels totaling approximately 603 acres, identified in the NYSDEC Consent Order executed on December 21, 2017 (Tax Map/Parcel Nos.: 18.-1-16.1, 18.-1-18.3, and 24.-1-1). A topographic map depicting the site is provided as Figure 2, an aerial photograph of the site is provided as Figure 3. As a result of the site's use as an airport, it is mostly cleared land with trees along the property boundaries, where the land slopes downward. There is a paved, 6,300-foot-long runway and parallel taxiway that runs northwest to southeast through the center portion of the property and a gravel roadway runs along the perimeter of the cleared portion of the property.

CR 183 (formerly known as North Road) travels along the western side of SCIA from which there are two access roads to the SCIA. The northern access road, identified as CR 183A, travels east and terminates at an oval, where the SCIA terminal building is located. The southern access road, identified as Industrial Park Road, is located approximately 900 feet south of CR 183A and travels east towards the hangar area (Figure 4).

Potable water is provided to SCIA from a supply well (Well #5) located on an abutting parcel of land owned by Sullivan County (Figure 1). As noted in Section 1.1, the NYSDOH sampled Well #5 for PFAS in 2016 and 2017, and analytical results from both sampling events did not identify the presence of either PFOS or PFOA above the HA. Domestic wastewater generated at SCIA is managed through an onsite septic system and leach field (Figure 4). Two un-named ponds are located on the site: one is west of the southern end of the runway and the other is at the northwest corner of the site (Figure 3). There are two streams adjacent to the property — Lybolt Brook to the west, which originates at the un-named pond on the site, and West Branch Mongaup River to the east.

Much of the surrounding area is wooded, with some cleared land that appears to be used for agricultural purposes. Other surrounding land uses include residential and limited light commercial. The Sullivan County Industrial Park is located along the western property boundary with the SCIA, and includes three commercial structures that are accessed via the dead-end roads CR 183B (two structures) and CR 183C (one structure).

The three commercial business in the Sullivan County Industrial Park are:

- Silk City Textile Machine Company (13 CR 183B), which manufactures textile machines. The NYSDOH sampling identified that the combined PFOA and PFOS concentration at the potable supply well located on this property was above the U.S. EPA HA.

- International Contractors Corporation (46 CR 183B), which provides sheet metal manufacturing, roofing, and crane services.

- Hudson Valley Foie Gras, LLC (22 CR 183C) utilizes this property for cold storage related to poultry agriculture (Lubniewski, 2018, February 13). The main facility, which includes the poultry farm, is located along CR 183 and adjoins the SCIA along the southwestern property boundary. Historically, 22 CR 183C was occupied by Sutphen East, who maintained fire engines at this location.

One property that abuts the SCIA to the north is the Sullivan County Emergency Training Area (SCETA), used as a training facility by Sullivan County first responders. According to a 2016 Class B Foam Usage Survey completed by Sullivan County for the SCETA property and provided to NYSDEC, 30 5-gallon containers of AFFF were present at the SCETA, at that time (NYSDEC, May 15, 2018). Reportedly, activities conducted at SCETA include firefighting training. However, according to Mr. John Hauschild, the Fire Coordinator for the Sullivan County Bureau of Fire, AFFF has not been utilized during firefighting training activities at the SCETA property and the stock of AFFF stored onsite is for emergency response use, only (Mall, C., June 11, 2018). A water supply well is present on the SCETA property and the NYSDOH performed PFAS sampling at this location in February 2017. Analytical results indicated that both PFOA and PFOS were absent in the February 2017 sample collected at the SCETA. Further north of the SCIA is the Town of Bethel former landfill and active transfer station (Figure 3).

2.2 Physical Setting

Table 1 summarizes information obtained from review of physical setting sources and other sources (EnSafe, January 2018).

Table 1
Physical Setting

Topography	
Elevation (feet above mean sea level)	1,300 – 1,400
Topography	Generally flat throughout the cleared area of the airport, sloping downward in all directions at the wooded boundaries.
Evidence of landfilling or excavation	Fill material brought from an offsite source and spread over the area north of the runway.

Table 1 Physical Setting	
Adjoining — higher elevation	None
Adjoining — lower elevation	North, south, east, and west
Surface Water and Site Drainage	
Onsite surface water features	Un-named pond at the northwest corner and one un-named pond at the south end of the site.
Adjoining surface water features	The Western Branch Mongaup River, Lybolt Brook
Nearest water body	Lybolt Brook
Direction and approximate distance to nearest water body	Lybolt Brook originates at the un-named pond at the northwest corner of the site.
Storm water management	Storm water catch basins along western portion of property convey storm water west, to a drainage channel along North Road. Storm water catch basins in the central portion convey storm water east, under the runway, to a drainage channel that ultimately discharges to the Western Branch of the Mongaup River. Surface flow and infiltration in unpaved areas.
Geology	
Soil types (and estimated depths/thickness)	Topsoil ranging from 1 to 2 feet below ground surface (bgs) underlain by glacial till consisting of mostly sand with varying amounts of silt, gravel, and clay from 1-20 feet bgs.
Bedrock (depth and type)	Shale bedrock encountered from as shallow as 2.5 to 20 feet bgs. Siltstone and sandstone interbedded with the shale.
Hydrogeology	
Onsite Wells	One non-potable well (formerly potable), currently not in service. Two former potable wells, both out of service. Four test wells.
Approximate depth to groundwater	Groundwater not present in glacial till overlaying bedrock. Primary aquifer is fractured bedrock. Approximate static water level at 100 feet bgs.
Reported direction of groundwater flow	West-northwest
Relevant surrounding property wells	Surrounding properties presumed to be on private potable wells. Static depth to groundwater 40-150 feet.

2.2.1 Fish and Wildlife Resources

The airport runway is interspersed with maintained grasses, and the surrounding area consists of mixed deciduous upland forest. Both of these terrestrial areas may support herbivorous, omnivorous, and carnivorous bird and mammal species. Lybolt Brook flows from a freshwater emergent wetland in the northwest of the site, which is bordered by Sullivan County Industrial Park. The brook passes through freshwater forested/shrub wetland as it flows south. A tributary to West Branch flows from the airfield to the northeast. A freshwater pond is also present along the southern border of the site adjacent to the active firefighting training area. Aquatic wildlife may utilize these areas for foraging or shelter. A preliminary review of the United States Fish and Wildlife Service Information for Planning and Consultation (IPaC) website was conducted to identify federally listed threatened or endangered species, or critical habitat that may be present at the site (U.S. Fish and Wildlife Service, 2018, April 18). Two species of concern were identified: the threatened Northern Long-eared Bat (*Myotis septentrionalis*) and endangered Dwarf Wedgemussel (*Alasmidonta heterodon*). Both of these

species may be present at the site. No critical habitat has been designated for either species. In addition, certain birds are protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The IPaC report identified 14 migratory birds that may be present at the site for a portion of the year.

A preliminary assessment of fish and wildlife resources that may be present at SCIA, including information from a complete IPaC report, will be included with the Site Characterization report

2.3 Current Use and Site History

SCIA was opened on the site in 1970 and has been in continuous operation since that time. The SCIA is currently a public, non-commercial, airport owned and operated by Sullivan County. SCIA air traffic consists of private aircraft for personal use, as well as charter flights; commercial flights do not currently operate out of SCIA.

Prior to 1970, the site was characterized as mostly cleared land used for agricultural purposes. Several small buildings were present on the site and presumably used as either residences or related to agricultural activities. North Road (currently identified as CR 183) previously ran through the center of the site but was re-routed west during development of SCIA. A surface water body, identified as "Zieglers Pond," was located in the approximate center of the SCIA boundary; however, it appears to have been backfilled to allow for construction of the taxiway, hangars, and tarmac areas.

The SCIA was originally developed with two structures and over time additional structures have been added as airport operations increased; currently there are 15 structures present at SCIA, and include:

- Terminal Building
- Aircraft Rescue and Fire Fighting Building
- Utility Building
- Pump House
- Hangars (8) owned by Sullivan County, four of which are leased to private tenants
- E911 Building
- Snow Removal Equipment Building
- Generator Shed

2.4 Areas of Concern

The focus of this SCWP is to address the 17 AOCs identified in the RSR (EnSafe, 2018, January 30). Eleven of the 17 AOCs have been identified for further investigation, one is recommended for

No Further Action (NFA), and the remaining five require additional information before a determination can be made concerning a recommended path forward.

2.4.1 Areas of Concern with Proposed Sampling

The SCIA is located at a higher elevation than the surrounding landscape. As shown in Table 1, bedrock is present from approximately 2.5 feet below ground surface (bgs) to 20 feet bgs. Groundwater is present at a depth of approximately 100 feet bgs and reportedly flows in a west-northwesterly direction (O'Brien & Gere Engineers, Inc., June 1999). Due to shallow bedrock, combined with deep groundwater, site characterization activities for each AOC outlined in this SCWP will be primarily focused on identifying soil impacts in potential source areas. Groundwater PFAS impacts are known to be present around AOC 2 and therefore, additional steps are proposed to further evaluate groundwater PFAS impacts at AOC 2.

The location of each AOC is presented in Figure 5. Table 2 presents a summary of each AOC to be investigated under this SCWP, media requiring further sampling, and rationale. Additional details regarding specific samples, field procedures, sampling protocols, and analytical analyses are provided in Section 4.

Table 2
Sampling Rationale

Area of Concern	Name	Site Activities	Media	Rationale
AOC 1	Active Firefighting Training Area	• Active FTA since 2008 • Semiannual training • AFFF use known • Accelerant use suspected • Water used during training, including AFFF-laden water, allowed to infiltrate ground surface	Surface Soil	Investigate surface soil in area immediately downslope of the mock fuselage for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs
			Subsurface Soil	Investigate subsurface soil downslope of mock fuselage to assess for presence of PFAS and VOCs
			Surface Water	Investigate potential presence of PFAS in un-named pond approximately 250 feet downslope of AOC 1
AOC 2	Former Firefighting Training Area	• Former FTA (1970-2008) • Accelerant use known • AFFF use known • Water used during training, including AFFF-laden water, allowed to infiltrate ground surface • PFAS detections above U.S. EPA HA in nearby wells	Surface Soil	Sampling of surface soil is not planned due to regrading and presence of top soil / grass in this area
			Subsurface Soil	Investigate subsurface soil at, and directly downslope of, the former burn pit area to assess for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs
			Surface Water	Investigate potential presence of PFAS in un-named pond approximately 1,400 feet downslope of AOC 2
			Groundwater	Investigate groundwater across SCIA (6 wells) and downgradient of the burn pit for presence of PFAS and VOCs
			Offsite Drinking Water	Investigate presence of PFAS in the 3 potable water supply wells at Sullivan County Industrial Park
AOC 3	Snow Removal Equipment Building	• Used for heavy equipment storage • Two active 285-gallon ASTs (gasoline and diesel) • Semiannual AFFF-deployment testing • AFFF-laden water allowed to disperse with rainfall	Surface Soil	Investigate surface soil within the eastern drainage channels for presence of PFAS
			Subsurface Soil	Investigate subsurface soil within the eastern drainage channel to assess for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs
AOC 4	Aircraft Rescue and Fire Fighting	• Storage of AFFF in 5-gallon buckets and SCIA fire truck • AFFF handling equipment periodically washed out along exterior; rinse water allowed to disperse with rainfall • AFFF handling equipment periodically washed out in utility sink	Surface Soil	Investigate surface soil at grass area along western edge of tarmac at north end by the ARFF Building garage bay for presence of PFAS
			Subsurface Soil	Investigate subsurface soil in grass area at the north corner of the ARFF Building and the tarmac to assess for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs
AOC 5	Terminal Building	• Former storage of AFFF in 5-gallon buckets and the SCIA fire truck • AFFF handling equipment periodically washed out along exterior; rinse water allowed to disperse with rainfall	Surface Soil	Investigate surface soil along grass area and drainage area adjacent to the Terminal garage bay for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs
			Subsurface Soil	Investigate subsurface soil in the grass area off the north side and northeast corner of the Terminal garage bay to assess for presence of PFAS
AOC 6	Leach Field	• Receives AFFF-laden rinse water from utility sink at ARFF building (AOC 4) • Potential to receive waste fluids from other buildings connected to the leach field	Subsurface Soil	Investigate subsurface soil directly beneath the edges of the active leaching field for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs
AOC 7	Hangar 71 Propane Fire	• Potential discharge of AFFF in August 1998 to address propane fire from exterior UST at Hangar 71 • AFFF-laden water would have followed surface topography to drainage swale located south of Hangar 71	Surface Soil	Investigate surface soil within drainage channel downslope of propane UST for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs
AOC 8	Former Leach Fields	• Potential to receive waste fluids generated at the FBO Hangar • Presumed taken out of service in 1982; FBO Hangar currently connected to SCIA septic system	Subsurface Soil	Investigate subsurface soil directly beneath each former leaching field for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs
AOC 13	Fill Area – North End of Runway	• Material was not certified clean prior to placement at the site • Fill material from the Resorts World Catskills Casino development in Monticello, New York	Subsurface Soil	Investigate subsurface fill material at the north end of the runway for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs
AOC 14	Solid Waste Accumulation Area	• Staging area for SCIA-generated solid waste • Partially-filled 275-gallon waste oil tank and an empty, unlabeled 55-gallon drum recently stored at AOC 14	Surface Soil	Investigate surface soil directly beneath the 275-gallon waste oil tank and 55-gallon drum for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs
			Subsurface Soil	Investigate subsurface soil beneath the 275-gallon waste oil tank and 55-gallon drum for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs
AOC 15	Western Storm Water Drainage Channels	• Receives storm water from western portion of SCIA • Utility building floor drains connected to storm sewer; outfall by terminal • Hangar 71 floor drains connected to storm sewer; outfall by hangars	Surface Soil	Investigate surface soil directly downslope of the discharge piping at each drainage channel for presence of PFAS, VOCs, SVOCs, pesticides, metals, and PCBs

Notes:

AOC	Area of Concern	U.S. EPA	United States Environmental Protection Agency	SCIA	Sullivan County International Airport	PFAS	per- and polyfluoroalkyl substances
FTA	firefighting training area	HA	Health Advisory	ARFF	Aircraft Rescue and Fire Fighting	PCBs	polychlorinated biphenyls
AFFF	aqueous film forming foam	SVOCs	semivolatile organic compounds	FBO	Fixed-Base Operations	VOCs	volatile organic compounds
AST	aboveground storage tank	UST	underground storage tank				

2.4.2 Areas of Concern Recommended for No Further Action

One AOC has been identified for NFA.

AOC 12: Cablevision Hangar

An active 12,000-gallon jet fuel UST, installed on November 1, 1989, is located on the southeast exterior corner of the Cablevision (CVI) Hangar. The lessee of the CVI Hangar manages the UST under Petroleum Bulk Storage Certificate No. 3-496472, issued to Cablevision Air Facility, Inc. (expiration December 8, 2019). A Notice of Violation letter was issued by the NYSDEC on August 9, 2011, related to a failure of the tank owner to maintain monitoring records for leak detection inspections. No other violations were noted in the August 9, 2011, NYSDEC letter. The NYSDEC has completed two subsequent inspections of the CVI Hangar UST: June 17, 2014 and October 21, 2016, and no violations were reported. A copy of the current Petroleum Bulk Storage Certificate, August 9, 2011, Notice of Violation letter, and the cover letters associated with the June 2014 and October 2016 inspections issued to the UST owner are provided in Appendix A.

Based on the NYSDEC compliance documentation that has not identified any further violations following the August 9, 2011, finding and that there are no reported releases related to Petroleum Bulk Storage Certificate No. 3-496472, AOC 12 CVI Hangar UST is recommended for NFA.

2.4.3 Areas of Concern Requiring Further Information

The following five AOCs require further information before a determination of the recommended path forward can be made:

- AOC 9: Former Fuel Farm
- AOC 10: Utility Building — Former UST
- AOC 11: Fixed-Base Operations Hangar — Former UST
- AOC 16: NYSDEC Site No. 9706633
- AOC 17: NYSDEC Site No. 0212684

A Freedom of Information Law (FOIL) request was submitted to the NYSDEC inquiring about tank closure records for AOCs 9, 10, and 11. According to a February 23, 2018, email response from the NYSDEC, it does not appear any tank closure documents were identified in the NYSDEC project file. Additional queries will be made with Sullivan County regarding copies of tank closure reports. If additional queries are unsuccessful in identifying tank closure reports or other useful records concerning the closure of tanks at AOCs 9, 10, or 11, then a sampling plan may be developed for

those specific AOCs, as needed. If the FOIL request returns records confirming the tank closure was performed properly at the AOC(s), then the AOC(s) will be recommended for NFA, as appropriate.

A FOIL request was submitted to the NYSDEC for spill records related to SCIA; According to a February 23, 2018 response, spill report forms with a brief summary of spill conditions, immediate response actions, and closure dates were provided. If any further records are identified that indicate an unresolved source area of contamination may exist a sampling plan may be developed for one or more of these AOCs, as needed. If the FOIL request returns records confirming all response actions were complete and no residual source areas exist at the AOC(s) then the AOC(s) will be recommended for NFA, as appropriate.

3.0 SCREENING CRITERIA

The primary purpose of this SCWP is to investigate PFAS-related impacts at the SCIA; however, the presence of other contaminants that fall under Comprehensive Environmental Response, Compensation, and Liability Act and petroleum products will also be investigated. A summary of the screening criteria that will be utilized to evaluate these contaminants is provided below.

3.1 Per- and Polyfluoroalkyl Substances Screening Criteria

Currently, there are no promulgated clean-up standards for PFAS, including PFOA and PFOS, in environmental media (NYSDEC or U.S. EPA). Additionally, with the exception of drinking water, the State of New York does not have established screening criteria for PFAS in environmental media. Although the State of New York does not have established PFAS screening criteria, human health screening levels can be derived for PFOS, PFOA, and perfluorobutane sulfonate (PFBS) for different media types based on U.S. EPA's chronic reference dose of 2E-5 milligrams per kilogram per day for PFOA and PFOS (U.S. EPA, 2016a,b) and U.S. EPA's Provisional chronic reference dose for PFBS of 2E-02 milligrams per kilogram per day (U.S. EPA, 2014, July 17). Toxicity values are not available for other PFAS; therefore, screening levels for those constituents are not available.

It should be noted that while screening criteria can be developed, they are non-statutory and are not enforceable standards required to be used as cleanup goals. For the purpose of this SCWP, human health screening criteria have been calculated for each environmental media-type utilizing the U.S. EPA's Regional Screening Level Calculator, and are being provided for presentation purposes only. Reported concentrations above these PFAS screening criteria should be reviewed to determine if further evaluation is warranted.

If, in the future, the NYSDOH develop or the NYSDEC provide guidance on PFAS screening criteria for environmental media, then the PFAS analytical results from environmental media obtained during performance of this SCWP should be compared against those specific screening criteria.

3.1.1 Soil

Soil screening levels were calculated for a residential exposure scenario using the U.S. EPA Regional Screening Level Calculator and are based on a target hazard quotient of 0.1 to account for cumulative effects per target organ. Soil screening levels utilize U.S. EPA default exposure assumptions for a residential soil exposure scenario; soil screening levels are provided below in micrograms per kilogram (µg/kg).

- PFOA 126 µg/kg
- PFOS 126 µg/kg
- PFBS 160,000 µg/kg

3.1.2 Groundwater

Based on the presence of potable wells, both at SCIA (since removed from service) and on surrounding properties, the screening criteria outlined for drinking water is being conservatively applied to groundwater samples. For PFOA and PFOS, groundwater screening levels protective of a residential drinking water pathway are equal to the U.S. EPA HAs (U.S. EPA 2016a,b). The U.S. EPA recommends that the HAs be applied to the total detected PFOA and PFOS groundwater concentrations, when both compounds are detected in the same sample. For PFBS, the groundwater screening level was calculated using the U.S. EPA Regional Screening Level Calculator utilizing U.S. EPA default exposure assumptions for a residential tap water exposure scenario and a target hazard quotient of 0.1. A target hazard quotient of 0.1 was utilized to be protective of cumulative effects of multiple constituents with the same or similar target organ given that U.S. EPA has set the HA for PFOS and PFOA as a combined value based on the presumption of cumulative effects. Groundwater screening levels are provided below in ng/L.

- PFOA 70 ng/L
- PFOS 70 ng/L
- PFBS 3,800 ng/L

3.1.3 Surface Water

Surface water screening levels protective of a recreational child exposure scenario were derived using the U.S. EPA Regional Screening Level Calculator based on an exposure frequency of 104 days/year, an exposure time of 2 hours/day, and an ingestion rate of 0.01 liters/hour, and a target hazard quotient of 0.1 to account for cumulative effects per target organ. Other exposure assumptions are equal to U.S. EPA default values in the U.S. EPA Regional Screening Level Calculator. Surface water screening levels are provided below in µg/L.

- PFOA 5.26 µg/L
- PFOS 5.26 µg/L
- PFBS 1,140 µg/L

3.2 Screening Criteria for Other Contaminants

3.2.1 Soil

Soil analytical data for contaminants other than PFAS will be compared to the following soil cleanup objectives (NYSDEC, 2016, December 14):

- Residential
- Restricted Residential
- Commercial
- Industrial
- Protection of Ecological Resources
- Protection of Groundwater

3.2.2 Groundwater

Groundwater analytical data for contaminants other than PFAS will be compared to NYSDEC Ambient Water Quality Standards and U.S. EPA Maximum Contaminant Levels, as applicable.

3.2.3 Surface Water

Surface water analytical data for contaminants other than PFAS will be compared to NYSDEC Ambient Water Quality Standards.

4.0 SITE CHARACTERIZATION SCOPE OF WORK

4.1 Pre-Investigation Activities

4.1.1 Permits and Authorizations

Permits are not required from Sullivan County or Town of Bethel for this investigation. Access to the SCIA property has been granted by Sullivan County Department of Public Works and SCIA. Field personnel will check in/out with appropriate airport personnel prior to start of work each day and upon completion of daily field activities.

4.1.2 Utility Survey and Ground Penetrating Radar

Field personnel will mobilize to the site to verify site conditions and mark proposed sample locations shown in Figure 6. Once site conditions and proposed sample locations are verified, a request for public utility markouts will be submitted to Dig Safely New York, the one-call center that services New York State. Upon completion of public utility markouts, field personnel and a private utility survey company will verify public utilities and mark additional utilities on the site. The utility survey company will utilize ground penetrating radar (GPR) to clear proposed subsurface sample locations of subsurface structures and anomalies. Updated figures including site utilities, subsurface structures, and anomalies will be provided to field personnel prior to the start of work. Field personnel will review proposed sample locations with respect to utilities, subsurface structures, and anomalies and adjust proposed sample locations as necessary.

4.1.3 Site Meeting

Prior to the start of work, after completion of the utility survey and GPR, EnSafe will hold a meeting including the project manager, field personnel, subcontractors, and county personnel. The meeting will include a discussion of site access, health and safety, equipment staging and decontamination, work hours, sample locations, waste management, and other relevant topics. Upon completion of the meeting and resolution of identified concerns, equipment and personnel will mobilize to the site to begin field investigation activities.

4.1.4 Site Preparation

The drilling subcontractor will perform site preparation activities which are expected to include: establishment of work zones, support facilities, and decontamination facilities.

4.2 Field Investigation Sampling and Analysis

4.2.1 Surface Soil Sampling

A total of 24 discrete surface soil samples will be collected from the AOCs for laboratory analysis;

sample locations are shown on Figure 6. Sample information, including identifications (IDs), sampling depths, and analyses are shown in Table 3. Additional detail on required field quality control (QC) samples is provided in Section 4.3.

Surface soil samples will be collected from across two distinct layers: the 0 to 2 inch portion directly beneath the vegetative cover, and from the underlying 2 to 6 inch interval. Surface soil samples will be obtained using stainless steel sampling instruments (e.g., hand auger or trowels), stainless steel bowls, and disposable TerraCore samplers. The surface soil samples will be field-screened for organic vapors utilizing a photo-ionization detector (PID) or comparable hand held device, and characterized utilizing the Unified Soil Classification System (USCS).

Surface soil samples will be collected in laboratory-supplied sample jars and placed in ice-filled coolers. Samples will be shipped under chain of custody to a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory for analysis. All surface soil samples collected from across the 0-2 inch interval will be analyzed for PFAS. Following review of the 0-2 inch PFAS analytical results, three surface soil samples will be submitted from the deeper 2-6 inch interval for PFAS analysis from those locations that underlie the highest total reported PFAS concentrations reported in the 0-2 inch interval. If the PFAS analytical results from the deeper PFAS surface soil samples indicate an increasing trend with depth, than additional surface soil samples from across the 2-6 inch interval may be also be submitted for PFAS analysis. In addition, at each AOC identified for surface soil sampling, one soil sample will also be submitted for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, polychlorinated biphenyls (PCBs), and pesticides, as presented in Section 4.2.10. Analytical requirements for each surface soil sample are shown in Table 3.

Stainless steel bowls and sampling instruments will be decontaminated prior to sampling and between sample locations. Decontamination will consist of a water rinse station to remove gross contamination (if needed), followed by a non-phosphate detergent (e.g., Liquinox) water rinse, and a rinse with de-ionized water. Detailed decontamination procedures are discussed in Section 4.2.11 and the Health and Safety Plan (HASP) (Appendix C).

Table 3
Sampling Plan and Field Quality Control Samples

Area of Concern	Name	Sampling Details											
		Location Type	Samples	Location	Boring Depth	Sample ID	Sample Depth	PFAS	VOC	SVOC	TAL Metals	PCBs	Pest
AOC 1	Active Firefighting Training Area	Surface Soil	6	SCIA-SS01	NA	SCIA-SS01(0-2")-YYYYMMDD	0-2 in	X	X	-	-	-	-
					NA	SCIA-SS01(2-6")-YYYYMMDD	2-6 in	X	X	-	-	-	-
				SCIA-SS02	NA	SCIA-SS02(0-2")-YYYYMMDD	0-2 in	X	X	X	X	X	X
					NA	SCIA-SS02(2-6")-YYYYMMDD	2-6 in	X	X	-	-	-	-
				SCIA-SS03	NA	SCIA-SS03(0-2")-YYYYMMDD	0-2 in	X	X	-	-	-	-
					NA	SCIA-SS03(2-6")-YYYYMMDD	2-6 in	X	X	-	-	-	-
		Soil Boring	Up to 4	SCIA-SB01	Refusal	SCIA-SB01(0-2")-YYYYMMDD	0-2 in	X	X	-	-	-	-
						SCIA-SB01(2-6")-YYYYMMDD	2-6 in	X	X	-	-	-	-
						SCIA-SB01-Depth-YYYYMMDD	Above Bedrock	X	X	-	-	-	-
						SCIA-SB01-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
		Surface Water	1	SCIA-SW01	NA	SCIA-SW01-YYYYMMDD	NA	X	-	-	-	-	-
AOC 2	Former Firefighting Training Area	Soil Boring	Up to 10	SCIA-SB02	Refusal	SCIA-SB02-Depth-YYYYMMDD	Above Bedrock	X	X	X	X	X	X
						SCIA-SB02-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
				SCIA-SB03	Refusal	SCIA-SB03-Depth-YYYYMMDD	Above Bedrock	X	X	-	-	-	-
						SCIA-SB03-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
				SCIA-SB04	Refusal	SCIA-SB04-Depth-YYYYMMDD	Above Bedrock	X	X	-	-	-	-
						SCIA-SB04-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
				SCIA-SB05	Refusal	SCIA-SB05-Depth-YYYYMMDD	Above Bedrock	X	X	-	-	-	-
						SCIA-SB05-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
				SCIA-SB06	Refusal	SCIA-SB06-Depth-YYYYMMDD	Above Bedrock	X	X	-	-	-	-
						SCIA-SB06-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
		Surface Water	1	SCIA-SW02	NA	SCIA-SW02-YYYYMMDD	NA	X	-	-	-	-	-
		Groundwater	6	TW-1*	NA	SCIA-TW1-YYYYMMDD	TBD	X	-	-	-	-	-
				TW-2*	NA	SCIA-TW2-YYYYMMDD	TBD	X	-	-	-	-	-
				TW-3*	NA	SCIA-TW3-YYYYMMDD	TBD	X	-	-	-	-	-
				MW-01	NA	SCIA-MW01-YYYYMMDD	TBD	X	X	-	-	-	-
				Well #1*	NA	SCIA-W1-YYYYMMDD	TBD	X	X	-	-	-	-
				Well #3*	NA	SCIA-W3-YYYYMMDD	TBD	X	X	-	-	-	-
		Offsite Drinking Water	3	13 CR 183*	NA	SCIA-13CR183-YYYYMMDD	Tap	X	-	-	-	-	-
				46 CR 183B*	NA	SCIA-46CR183B-YYYYMMDD	Tap	X	-	-	-	-	-
				22 CR 183C*	NA	SCIA-22CR183C-YYYYMMDD	Tap	X	-	-	-	-	-
AOC 3	Snow Removal Equipment Building	Surface Soil	4	SCIA-SS04	NA	SCIA-SS04(0-2")-YYYYMMDD	0-2 in	X	-	-	-	-	-
					NA	SCIA-SS04(2-6")-YYYYMMDD	2-6 in	X	-	-	-	-	-
				SCIA-SS05	NA	SCIA-SS05(0-2")-YYYYMMDD	0-2 in	X	-	-	-	-	-
					NA	SCIA-SS05(2-6")-YYYYMMDD	2-6 in	X	-	-	-	-	-
		Soil Boring	Up to 4	SCIA-SB07	Refusal	SCIA-SB07(0-2")-YYYYMMDD	0-2 in	X	X	X	X	X	X
						SCIA-SB07(2-6")-YYYYMMDD	2-6 in	X	-	-	-	-	-
						SCIA-SB07-Depth-YYYYMMDD	Above Bedrock	X	-	-	-	-	-
						SCIA-SB07-Depth-YYYYMMDD	TBD	X	-	-	-	-	-
AOC 4	Aircraft Rescue and Fire Fighting Building	Surface Soil	2	SCIA-SS06	NA	SCIA-SS06(0-2")-YYYYMMDD	0-2 in	X	-	-	-	-	-
					NA	SCIA-SS06(2-6")-YYYYMMDD	2-6 in	X	-	-	-	-	-
		Soil Boring	up to 4	SCIA-SB08	Refusal	SCIA-SB08(0-2")-YYYYMMDD	0-2 in	X	X	X	X	X	X
						SCIA-SB08(2-6")-YYYYMMDD	2-6 in	X	-	-	-	-	-
						SCIA-SB08-Depth-YYYYMMDD	Above Bedrock	X	-	-	-	-	-

Table 3
Sampling Plan and Field Quality Control Samples

Area of Concern	Name	Sampling Details											
		Location Type	Samples	Location	Boring Depth	Sample ID	Sample Depth	PFAS	VOC	SVOC	TAL Metals	PCBs	Pest
						SCIA-SB08-Depth-YYYYMMDD	TBD	X	-	-	-	-	-
AOC 5	Terminal Building	Surface Soil	4	SCIA-SS07	NA	SCIA-SS07(0-2")-YYYYMMDD	0-2 in	X	X	X	X	X	X
					NA	SCIA-SS07(2-6")-YYYYMMDD	2-6 in	X	-	-	-	-	-
				SCIA-SS08	NA	SCIA-SS08(0-2")-YYYYMMDD	0-2 in	X	-	-	-	-	-
					NA	SCIA-SS08(2-6")-YYYYMMDD	2-6 in	X	-	-	-	-	-
		Soil Boring	Up to 8	SCIA-SB09	Refusal	SCIA-SB09(0-2")-YYYYMMDD	0-2 in	X	-	-	-	-	-
						SCIA-SB09(2-6")-YYYYMMDD	2-6 in	X	-	-	-	-	-
						SCIA-SB09-Depth-YYYYMMDD	Above Bedrock	X	-	-	-	-	-
						SCIA-SB09-Depth-YYYYMMDD	TBD	X	-	-	-	-	-
				SCIA-SB10		SCIA-SB10(0-2")-YYYYMMDD	0-2 in	X	-	-	-	-	-
						SCIA-SB10(2-6")-YYYYMMDD	2-6 in	X	-	-	-	-	-
						SCIA-SB10-Depth-YYYYMMDD	Above Bedrock	X	-	-	-	-	-
						SCIA-SB10-Depth-YYYYMMDD	TBD	X	-	-	-	-	-
AOC 6	Leach Field	Soil Boring	Up to 12	SCIA-SB11	Beneath IB	SCIA-SB11-Depth-YYYYMMDD	Directly Beneath IB	X	X	-	-	-	-
						SCIA-SB11-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
				SCIA-SB12	Beneath IB	SCIA-SB12-Depth-YYYYMMDD	Directly Beneath IB	X	X	X	X	X	X
						SCIA-SB12-Depth-YYYYMMDD	TBD	X	X	X	X	X	X
				SCIA-SB13	Beneath IB	SCIA-SB13-Depth-YYYYMMDD	Directly Beneath IB	X	X	-	-	-	-
						SCIA-SB13-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
				SCIA-SB14	Beneath IB	SCIA-SB14-Depth-YYYYMMDD	Directly Beneath IB	X	X	X	X	X	X
						SCIA-SB14-Depth-YYYYMMDD	TBD	X	X	X	X	X	X
				SCIA-SB15	Beneath IB	SCIA-SB15-Depth-YYYYMMDD	Directly Beneath IB	X	X	-	-	-	-
						SCIA-SB15-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
				SCIA-SB16	Beneath IB	SCIA-SB16-Depth-YYYYMMDD	Directly Beneath IB	X	X	-	-	-	-
						SCIA-SB16-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
AOC 7	Hangar 71 Propane Fire	Surface Soil	4	SCIA-SS09	NA	SCIA-SS09(0-2")-YYYYMMDD	0-2 in	X	X	X	X	X	X
					NA	SCIA-SS09(2-6")-YYYYMMDD	2-6 in	X	-	-	-	-	-
				SCIA-SS10	NA	SCIA-SS10(0-2")-YYYYMMDD	0-2 in	X	-	-	-	-	-
					NA	SCIA-SS10(2-6")-YYYYMMDD	2-6 in	X	-	-	-	-	-
AOC 8	Former Leach Field	Soil Boring	Up to 8	SCIA-SB17	Beneath IB	SCIA-SB17-Depth-YYYYMMDD	Directly Beneath IB	X	X	X	X	X	X
						SCIA-SB17-Depth-YYYYMMDD	TBD	X	X	X	X	X	X
				SCIA-SB18	Beneath IB	SCIA-SB18-Depth-YYYYMMDD	Directly Beneath IB	X	X	-	-	-	-
						SCIA-SB18-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
				SCIA-SB19	Beneath IB	SCIA-SB19-Depth-YYYYMMDD	Directly Beneath IB	X	X	X	X	X	X
						SCIA-SB19-Depth-YYYYMMDD	TBD	X	X	X	X	X	X
				SCIA-SB20	Beneath IB	SCIA-SB20-Depth-YYYYMMDD	Directly Beneath IB	X	X	-	-	-	-
						SCIA-SB20-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
AOC 13	Fill Area – North End of Runway	Soil Boring	Up to 4	SCIA-SB21	Native Soil	SCIA-SB21-Depth-YYYYMMDD	Above Native Soil	X	X	X	X	X	X
						SCIA-SB21-Depth-YYYYMMDD	TBD	X	X	X	X	X	X
				SCIA-SB22	Native Soil	SCIA-SB22-Depth-YYYYMMDD	Above Native Soil	X	X	X	X	X	X
						SCIA-SB22-Depth-YYYYMMDD	TBD	X	X	X	X	X	X
AOC 14	Solid Waste Accumulation Area	Soil Boring	Up to 4	SCIA-SB23	Refusal	SCIA-SB23(0-2")-YYYYMMDD	0-2 in	X	X	X	X	X	X
						SCIA-SB23(2-6")-YYYYMMDD	2-6 in	X	X	-	-	-	-
						SCIA-SB23-Depth-YYYYMMDD	Above Bedrock	X	X	-	-	-	-

Table 3
Sampling Plan and Field Quality Control Samples

Area of Concern	Name	Sampling Details											
		Location Type	Samples	Location	Boring Depth	Sample ID	Sample Depth	PFAS	VOC	SVOC	TAL Metals	PCBs	Pest
						SCIA-SB23-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
AOC 15	Western Storm Water Drainage Channels	Surface Soil	4	SCIA-SS11	NA	SCIA-SS11(0-2")-YYYYMMDD	0-2 in	X	X	-	-	-	-
					NA	SCIA-SS11(2-6")-YYYYMMDD	2-6 in	X	X	-	-	-	-
				SCIA-SS12	NA	SCIA-SS12(0-2")-YYYYMMDD	0-2 in	X	X	X	X	X	X
					NA	SCIA-SS12(2-6")-YYYYMMDD	2-6 in	X	X	-	-	-	-
TB	Trip Blank	Surface Soil	One Per Cooler (VOCs Only)	NA	NA	SCIA-TB01-YYYMMDD	NA	-	X	-	-	-	-
		Soil Boring						-	X	-	-	-	-
		Groundwater						-	X	-	-	-	-
DUP	Field Duplicate	Surface Soil	1 per 20 samples	TBD	TBD	SCIA-SO-DUP01-YYYYMMDD	0-2 in	X	X	X	X	X	X
				TBD	TBD	SCIA-SO-DUP02-YYYYMMDD	0-2 in	X	-	-	-	-	-
		Soil Boring		TBD	TBD	SCIA-SO-DUP03-YYYYMMDD	TBD	X	X	X	X	X	X
				TBD	TBD	SCIA-SO-DUP04-YYYYMMDD	TBD	X	X	-	-	-	-
				TBD	TBD	SCIA-SO-DUP05-YYYYMMDD	TBD	X	-	-	-	-	-
		Groundwater		Well #3	NA	SCIA-GW-DUP01-YYYYMMDD	TBD	X	X	-	-	-	-
		Offsite Drinking Water		13 CR 183B	NA	SCIA-DW-DUP02-YYYYMMDD	Tap	X	-	-	-	-	-
MS/MSD	Matrix Spike / Matrix Spike Duplicate	Surface Soil	1 per 20 samples	TBD	TBD	SCIA-SO-MSMSD-TBD-Depth-YYYYMMDD	0-2 in	X	X	X	X	X	X
				TBD	TBD	SCIA-SO-MSMSD-TBD-Depth-YYYYMMDD	0-2 in	X	-	-	-	-	-
		Soil Boring		TBD	TBD	SCIA-SO-MSMSD-TBD-Depth-YYYYMMDD	TBD	X	X	X	X	X	X
				TBD	TBD	SCIA-SO-MSMSD-TBD-Depth-YYYYMMDD	TBD	X	X	-	-	-	-
				TBD	TBD	SCIA-SO-MSMSD-TBD-Depth-YYYYMMDD	TBD	X	-	-	-	-	-
		Groundwater		Well #3	NA	SCIA-GW-MSMSD-MW01-YYYYMMDD	TBD	X	X	-	-	-	-
		Offsite Drinking Water		13 CR 183B	NA	SCIA-DW-MSMSD-46CR183B-YYYYMMDD	Tap	X	-	-	-	-	-
EB	Equipment Blank	Surface Soil Equipment	1 per 20 samples	TBD	TBD	SCIA-EB01-YYYYMMDD	0-2 in	X	X	X	X	X	X
				TBD	TBD	SCIA-EB02-YYYYMMDD	0-2 in	X	-	-	-	-	-
		Soil Boring Sample Equipment		TBD	TBD	SCIA-EB03-YYYYMMDD	TBD	X	X	X	X	X	X
				TBD	TBD	SCIA-EB04-YYYYMMDD	TBD	X	X	-	-	-	-
				TBD	TBD	SCIA-EB05-YYYYMMDD	TBD	X	-	-	-	-	-
		Groundwater Equipment		Well #3	NA	SCIA-EB06-YYYYMMDD	TBD	X	X	-	-	-	-

Notes:

QA/QC	Quality Assurance/Quality Control	DUP	Duplicate / Field Duplicate
PFAS	Per- and Polyfluoroalkyl Substances by EPA Method 537 Modified, as applicable	MS/MSD	Matrix Spike/Matrix Spike Duplicate
VOC	Volatile Organic Compounds by EPA Method 8260B	EB	Equipment Blank
SVOC	Semivolatile Organic Compounds by EPA Method 8270D	NA	Not Applicable
TAL Metals	Target Analyte List Metals by EPA Method 6020A	IB	Infiltration Bed
PCBs	Polychlorinated Biphenyls by EPA Method 8082A	YYYYMMDD	Year, Month, Day
Pest	Pesticides by EPA Method 8081B	in	Inch
*	Existing Well		
TBD	To be determined, Sample will be collected only if there are visual/olfactory indicators of contamination or a PID response, from the interval exhibiting the highest degree of these impacts.		

4.2.2 Soil Boring Installation and Subsurface Soil Sampling

A total of 23 soil borings will be installed in the AOCs; proposed soil boring locations are shown on Figure 6. The final locations of the proposed soil borings may be adjusted based on the results of the utility markouts, GPR survey, or field conditions. From these 23 soil borings, up to 56 discrete soil samples are proposed to be collected for laboratory analysis. Sample information, including IDs, sampling depths, and analyses are shown in Table 3. Additional detail on required field QC samples is provided in Section 4.3.

Each soil boring location will be cleared with hand tools or vacuum methods to a depth of approximately 5 feet bgs, or 1 foot below the estimated depth of any known nearby utility after the surface soil samples are collected as described below. Soil borings will be advanced using a direct push technology drill rig (GeoProbe or equivalent) equipped with a MacroCore sampling device or equivalent lined with Teflon-free disposable polyvinyl chloride sampling sleeves. Soil will be collected continuously in each soil boring, characterized using the USCS and screened for organic vapors utilizing a PID or equivalent hand held device. Upon completion, drill cuttings that do not exhibit visual/olfactory evidence of contamination or a PID response greater than 25 parts per million (ppm) will be returned to their boring of origin as backfill to within 12 inches of the surface, and completed flush to grade with either loam or asphalt cold-patch. Drill cuttings that exhibit evidence of contamination will be transferred into a 55-gallon drum and handled as described in Section 4.2.13.

Soil samples will be collected using stainless steel sampling instruments (e.g., hand auger or trowels), stainless steel bowls, and disposable TerraCore samplers. Both surface and subsurface soil samples will be collected from soil borings installed in AOCs 1, 3, 4, 5, and 14. Similar to Section 4.2.1, surface soil samples will be obtained across two distinct layers: the 0 to 2 inch portion directly beneath the vegetative cover, and from the underlying 2 to 6 inch interval. Surface soil samples will be collected prior to hand clearing and subsurface soil samples will be collected from the 2-foot interval directly above bedrock. Due to the 2008 regrading of surface topography at AOC 2 to create a drainage channel, only subsurface soil samples will be collected from this AOC. For soil borings installed in AOCs 6 and 8, soil samples will be collected from directly beneath the leach field infiltration bed. For AOC 13, subsurface soil samples will be obtained from the 2-foot interval above where native soil is encountered. At all proposed boring locations, a second subsurface soil sample may be collected if there are visual/olfactory indicators of contamination or an elevated PID response; a decision to collect additional subsurface soil samples from any given AOC will be biased to the interval exhibiting the highest degree of contamination.

Subsurface soil samples will be collected in laboratory-supplied sample jars and placed in ice-filled coolers. Samples will be shipped under chain of custody to an NYSDOH ELAP certified laboratory for analysis. Similar to the approach discussed in Section 4.2.1, all surface soil samples obtained from soil borings and collected from across the 0-2 inch interval will be analyzed for PFAS. Following review of the 0-2 inch PFAS analytical results, two surface soil samples from the deeper 2-6 inch interval will be subsequently submitted for PFAS analysis from those locations that underlie the highest total reported PFAS concentrations in the 0-2 inch interval. If the PFAS analytical results from the deeper PFAS surface soil samples indicate an increasing trend with depth, then additional surface soil samples from across the 2-6 inch interval may be also be submitted for PFAS analysis. In addition, at each soil boring identified for surface soil sampling, one soil sample will also be submitted for VOCs, SVOCs, TAL metals, PCBs and pesticides as presented in Section 4.2.10. Analytical requirements for individual samples are shown in Table 3.

The drilling equipment used to advance the soil borings, including the MacroCore sampling device, will be decontaminated prior to sampling and between sample locations. Decontamination will consist of a water rinse station to remove gross contamination (if needed), followed by a non-phosphate detergent (e.g., Liquinox) water rinse, and a rinse with de-ionized water. Detailed decontamination procedures are discussed in Section 4.2.11 and the HASP (Appendix C).

4.2.3 Surface Water Sampling

Two surface water samples will be collected; one from the unnamed pond downslope of the Active Firefighting Training Area (FTA) (AOC 1) and one from the pond to the west of CR 183C (AOC 2), as shown on Figure 6. Sample information, including IDs, sampling depths, and analyses are shown in Table 3. Additional detail on required field QC samples is provided in Section 4.3.

Surface water samples will be collected in laboratory-supplied sample jars and placed in ice-filled coolers. Samples will be shipped under chain of custody to an NYSDOH ELAP certified laboratory for analysis of PFAS. Because surface samples will be collected directly into the laboratory-supplied jars, no sampling equipment or subsequent decontamination is required.

4.2.4 Monitoring Well Installation

One permanent groundwater monitoring well (MW-01) will be installed in bedrock at the Former FTA (AOC 2); the location of which will be based on the AOC 2 soil sampling results. The monitoring well will be installed in proximity to, and hydraulically downgradient of, the location exhibiting the highest soil impacts. The preliminary location of MW-01 is shown on Figure 6.

The monitoring well location will be cleared with hand tools or vacuum methods to a depth of approximately 5 feet bgs, or 1 foot below the estimated depth of any known nearby utility. The MW-01 boring will be installed in general accordance with 10 NYCRR Part 5 Subpart 5-1 Section 5-B.3 (NYSDOH, 2018, January 17). The MW-01 boring will be advanced through the overburden and continuous soil samples will be collected down to the bedrock surface. Soil samples will be characterized utilizing USCS and field-screened for the presence of organic vapors utilizing a PID or similar hand-held device. Upon reaching bedrock, an outer casing will be set and the borehole will be advanced into the bedrock. The borehole is expected to be advanced by either air rotary or sonic methods to a depth approximately 20 feet below apparent groundwater (anticipated to be approximately 100 to 150 feet bgs based on well logs from surrounding wells). The MW-01 monitoring well will then be completed with schedule 40 PVC screen (40 feet long) and casing that will be set within the boring using a sand filter pack, bentonite seal, and grout. The screen section will be installed at a depth intended to straddle the water table and the well will be finished at grade with a steel stick-up set in concrete. The final construction details (screen depth and length) will be determined based on observed field conditions.

4.2.5 Monitoring Well Development

No sooner than 24 hours after installation, MW-01 will be developed to remove drilling water and rock fragments, and to establish a hydraulic connection between the well and the aquifer. It is anticipated that the well will be developed using a combination of surging, then pumping. Monitoring well MW-01 will be developed until turbidity is equal to or less than 50 nephlometric turbidity units, if possible. If this turbidity level cannot be achieved, development will continue until turbidity readings are stable (three consecutive readings within 10%), or three standing well volumes or two hours of well development has elapsed, whichever occurs first. Development water will be containerized within 55-gallon drums or holding tanks in a secure area. Once sampled, the containerized water generated during development will be stored pending receipt of laboratory results and will be properly disposed, as described in Section 4.2.13.

4.2.6 Surveying

The horizontal locations (northing and easting) of all sample locations, including the locations of the offsite drinking water supply wells, will be obtained using hand-held Global Positioning System technology. The elevation for each monitoring/test well will be established at both the top of the monitoring well's permanent casing (this elevation point will be designated by a permanent ink mark) and at ground surface. The elevation of each monitoring/test well and Well #1 will be surveyed by a New York licensed surveyor with an accuracy of ±0.01 feet. Horizontal locations will be relative to

the New York State Plane coordinate system; the vertical elevations will be related to the North American Vertical Datum 1988.

4.2.7 Groundwater Elevation Measurements

A synoptic round of water level measurements will be collected from the newly installed monitoring well MW-01, from the existing test wells TW-1, TW-2, and TW-3, and Well #1, prior to initiating groundwater sampling activities. The synoptic water levels will be measured on the same day in the shortest time span possible and not during or immediately following a large rain event. Static water levels measurements will be obtained relative to the surveyed elevation mark on the well casing with an electronic water level indicator with a weighted core that is accurate to 0.01 feet. The well name, date, time, depth to water, total depth, and any other well details (e.g., well condition) will be recorded in the field logbook or appropriate field form.

During gauging activities, if any dedicated equipment is discovered in an existing test well or Well #1, the dedicated equipment will be removed and the well will be subsequently developed following the procedure outlined in Section 4.2.5. This re-development will help ensure that any PFAS present in groundwater due to the dedicated equipment is sufficiently removed, prior to sampling, and a representative groundwater sample is subsequently collected.

4.2.8 Groundwater and Offsite Drinking Water Sampling

No sooner than seven days after well development, a round of groundwater samples will be collected from monitoring well MW-01, test wells TW-1 through TW-3, Well #1, and Well #3. Samples will also be collected from the three offsite potable water supply wells located in the Sullivan County Industrial Park at 13 CR 183B, 46 CR 183B, and 22 CR 183C. All samples will be analyzed for PFAS; samples from MW-01, Well #1, and Well #3 will be further analyzed for VOCs. Sample information, including IDs and depths, are shown in Table 3.

Groundwater samples collected from MW-01, TW-1, TW-2, TW-3, and Well #1 will be obtained with bladder pumps (or other submersible type pump) utilizing low-flow sampling procedures outlined in U.S. EPA Region 1 Low-Stress (Low-Flow) EQASOP-GW001 (U.S. EPA, January 19, 2010). Groundwater will be measured in the field for pH, specific conductivity, turbidity, temperature, dissolved oxygen, and oxidation-reduction potential to determine purge stabilization. After the field parameters meet stabilization criteria, in-line field measurement equipment will be disconnected and samples will be collected into laboratory-prepared glassware.

During groundwater sampling, only the stainless steel tip of the water level meter should come into contact with the water and care shall be taken to prohibit the plastic tape of the water level meter to become immersed into the well water. No Teflon bladders or tubing will be used during sampling activities. See Section 4.2.9 for additional field precautions with respect to PFAS sampling.

Well #3, and the three offsite water supply wells, will each be purged for approximately 20 minutes prior to sample collection to flush water that may be present in the supply lines. The samples will each be collected from the same sampling ports utilized by the NYSDOH. All offsite drinking water samples will be submitted for PFAS analysis only. Due to the known presence of PFAS above the HA, purge water generated at Well #3 and at 13 CR 183B will be containerized for proper disposal as outlined in Section 4.2.13.

Sample information, including IDs, sampling depths, and analyses are shown in Table 3. Additional detail on required field QC samples is provided in Section 4.3.

Groundwater and drinking water samples will be collected in laboratory-supplied sample jars and placed in ice-filled coolers. Samples will be shipped under chain of custody to an NYSDOH ELAP certified laboratory for analysis. Samples will be analyzed for PFAS and VOCs, as presented in Section 4.2.10. Not all samples will receive all analyses; analytical requirements for each groundwater sample are shown in Table 3.

Disposable or dedicated groundwater sampling equipment will be used where possible. Decontamination of non-disposable, non-dedicated sampling equipment will consist of a water rinse station to remove gross contamination (if needed), followed by a non-phosphate detergent (e.g., Liquinox) water rinse, and a rinse with de-ionized water. Detailed decontamination procedures are discussed in Section 4.2.11 and the HASP (Appendix C).

4.2.9 Field Precautions to Minimize Per- and Polyfluoroalkyl Substances Cross-Contamination

Table 4 outlines measures, to the extent practicable, which will be taken at locations designated for PFAS analysis to avoid potential sample cross-contamination.

Table 4 Prohibited and Acceptable Items for PFAS Sample Collection	
Prohibited Items	**Acceptable Items**
Field Equipment	
Teflon containing materials	High-density polyethylene materials
Low density polyethylene materials	Acetate liners
Paper towels containing recycled materials	Silicon tubing
Waterproof field books	Loose paper
Plastic clipboards, binders, or spiral hard cover notebooks	Masonite or aluminum clipboards
Sharpies or markers	Pens
Post-It Notes	Loose paper
Chemical (blue) ice packs	Regular ice
Field Clothing and Personal Protective Equipment	
New cotton clothing or synthetic water resistant, waterproof, or stain-treated clothing, clothing containing Gore-Tex	Well laundered clothing made of natural fibers (preferable cotton)
Clothing laundered using fabric softener	No fabric softener
Boots containing Gore-Tex	Boots made with polyurethane and polyvinyl chloride
Tyvek	Cotton clothing
No cosmetics, moisturizers, hand cream, or other related products as part of personal cleaning/showering routine on the morning of sampling	100% natural sunblock and insect repellent
Sample Containers	
Low density polyethylene or glass containers	High-density polyethylene or polypropylene
Teflon-lined caps	Unlined polypropylene caps
Rain Events	
Waterproof or resistant rain gear	Gazebo tent that is only touched or moved prior to and following sampling activities
Equipment Decontamination	
Decon 90	Alconox or Liquinox
Water from an onsite well	Potable water from municipal drinking water supply
Food Considerations	
All food and drink, with exceptions noted on the right	Bottled water and hydration drinks (i.e. Gatorade and Powerade) to be brought and consumed only in the staging area

4.2.10 Analytical Methods

Samples collected during this investigation will be analyzed for PFAS, VOCs, SVOCs, metals, PCBs and pesticides as presented in Table 3. The analytical methods to be utilized for these compounds are listed below.

Surface / Subsurface Soil

- PFAS U.S. EPA Method 537 modified
- VOCs U.S. EPA Method 8260B
- SVOCs U.S. EPA Method 8270D
- TAL Metals U.S. EPA Method 6020A

- PCBs U.S. EPA Method 8082A
- Pesticides U.S. EPA Method 8081B

Surface Water/Groundwater

- PFAS U.S. EPA Method 537 modified
- VOCs U.S. EPA Method 8260B
- SVOCs U.S. EPA Method 8270D

Drinking Water

- PFAS International Organization for Standardization Method 25101

4.2.11 Equipment Decontamination Procedures

EnSafe and its subcontractor(s) shall perform proper personnel and equipment decontamination activities to prevent cross-contamination from work areas to public areas (i.e., highways, roads, vehicles, etc.). This plan does not replace the decontamination procedures outlined in the Quality Assurance Project Plan (QAPP) and HASP, included as Appendices B and C, respectively. This plan provides additional guidelines on decontamination locations, necessary equipment, and procedures.

A field decontamination/cleanup area will be available onsite. Personal protective equipment will be disposed of in a drum or large plastic garbage bag. Additional details for personnel decontamination are presented in the HASP contained in Appendix C.

Equipment decontamination will take place in a wash basin and/or decontamination pad when feasible. Water for decontamination of larger equipment will be acquired from a clean water source, while de-ionized water will be used for smaller equipment. Decontamination activities shall include the removal of contaminated soil, debris, and other miscellaneous materials from all drilling equipment and tools that have come in contact with contamination. Other drilling equipment, sampling equipment, hand tools, and small equipment that come in contact with impacted soil or groundwater will be decontaminated in the wash basin and/or decontamination pad using de-ionized water and a non-phosphate detergent (e.g., Liquinox).

A sufficient supply of materials/equipment required to implement decontamination procedures will be maintained, including, but not limited to, the following items:

- Large plastic garbage bags
- Wash basins and/or decontamination pad

- Liquinox detergent
- Hand pump sprayers
- Long handled soft bristle brushes
- Large sponges
- Steam generator, if needed
- Paper towels
- Supplies/equipment to construct the decontamination pads
- De-ionized water
- All necessary hosing, connections, etc., to collect and transport decontamination fluids to its respective container

4.2.12 Community Air Monitoring Plan

During all ground intrusive activities, continuous perimeter air monitoring and work zone monitoring will be conducted in accordance with the Community Air Monitoring Plan (Appendix D). Air monitoring stations will be placed upwind of, downwind of, and at the work zone and will include monitoring for total organic vapors and particulates. All readings will be reordered and available for NYSDEC and NYSDOH personnel; any readings used for decisions purposes will also be recorded. Pertinent action levels are summarized in Appendix D.

Dust Management

If necessary based on air monitoring data, the subcontractor shall implement dust control measures to minimize the potential for dust generation during investigation activities. Dust control measures will include wetting the ground and limiting dust generating activities during periods of high winds. These measures will be implemented as appropriate for the site condition.

Vapor/Odor Management

If necessary, although considered unlikely, the subcontractor shall implement odor control measures to minimize the potential exposure to nuisance odors, including containerizing or covering impacted soil. Large stockpiles of soil will not be generated during investigation activities, so it is unlikely that foam odor suppressant will be necessary.

4.2.13 Investigation Derived Waste

Soil cuttings produced during the installation of soil borings and not exhibiting visual/olfactory evidence of contamination or a PID response greater than 25 ppm will be placed back in the borehole from which they came. The soil will be backfilled to within 12 inches of the surface at each respective

borehole and surface restoration will be completed by placing cohesive, compacted soil to the surface for unpaved areas, and to a sufficient depth to allow restoration for any paved surfaces. Drill cuttings from the bedrock monitoring well, from soil borings that exhibit visual/olfactory evidence of contamination or a PID response greater than 25 ppm, or solids generated during decontamination activities will be containerized within 55-gallon drums or bedrock core boxes in a secure area. A representative sample of the cuttings will be collected for waste characteristic laboratory analyses. The drill cuttings will be properly disposed, based upon the laboratory results.

Liquid waste produced during the investigation is expected to include development water, groundwater sampling purge water, and equipment decontamination water. These liquid wastes will be containerized within 55-gallon drums or holding tanks in a secure area and will be sampled for waste characteristic analysis. The liquid wastes will be properly disposed, based upon the laboratory results.

Personal protective equipment and disposable sampling equipment generated during investigation activities will be placed in large plastic garbage bags and disposed as general refuse.

4.2.14 Water Supply Well Survey

There are no known water distribution systems surrounding SCIA and it is presumed that developed properties in the immediate vicinity of SCIA have onsite water supply wells. Therefore, a survey will be completed to identify properties surrounding SCIA that have water supply wells. Information to be obtained during the water supply well survey will include well construction details, regulatory status (regulated or private), and results of any previous PFAS sampling. Given the overall size of SCIA, the properties identified for inclusion in the water supply well survey will be biased towards those in a presumed downgradient direction of any AOCs identified during Site Characterization work that have elevated PFAS concentrations. Findings from the water supply well survey will be presented in the forthcoming Site Characterization report.

4.3 Quality Assurance / Quality Control and Data Validation

A QAPP has been prepared in accordance with DER-10 and is included as Appendix B. The QAPP describes the quality assurance and quality control policies and procedures to be utilized during implementation of investigation activities as specified in this work plan and data validation procedures that will be utilized following receipt of laboratory data. The requirements of the QAPP apply to all subcontractor activities as appropriate for the task being performed.

Table 3 presents the list of required field QC samples and corresponding parent samples, if known at this time. For field QC samples without a parent sample listed, the sample should be collected from a parent sample that will receive the full suite of analyses for that specific matrix. A total of seven sets of field QC samples will be collected during implementation; a "set" of field QC samples is defined as one duplicate, one matrix spike/matrix spike duplicate, and one equipment blank. Three of these sets will be collected from subsurface soil, two sets will be collected from surface soil, and one set each from groundwater, and offsite drinking water.

4.4 Health and Safety

All work will be performed in accordance with the HASP provided in Appendix C (EnSafe, February 2018). The HASP details the following:

- Hospital directions and map
- Roles and responsibilities
- Site hazards
- Personal protective equipment
- Job tasks
- Air monitoring requirements
- Decontamination
- Sanitary facilities and lighting requirements
- Qualifications and training
- Job hazard analyses

An Emergency Action Plan is included in Appendix B of the HASP, provided in Appendix C. The Emergency Action Plan details the procedures to be followed in the event that an unpredictable event occurs, including but not limited to: physical injury to onsite personnel, chemical exposure, or fire.

5.0 PROJECT TEAM AND SCHEDULE

Key project team members are listed in Table 5; resumes for the key members are provided in Appendix E.

Table 5
Key Team Personnel

Name	Title	Contact Number	Responsibility
Robert McCarthy	Project Manager	(860) 920-5898	Primary point of contact for EnSafe. Oversees project implementation including financials, schedule, and technical aspects
David Farrell	Corporate Health and Safety Manager	(724) 470-4481	Oversees EnSafe's Health and Safety Program
Dana Miller	Project Chemist	(972) 865-4857	Prepares laboratory scopes of work and coordinates laboratory-related functions. Performs data quality reviews.
Marshall Gibson	Field Team Lead	(603) 505-8964	Supervises, coordinates, and performs field activities.
John Bender	Field Team Member	(401) 256-0681	Performs field activities

The anticipated project schedule is provided below.

Table 6
Preliminary Schedule

Task	Start Date	End Date
Site Characterization Work Plan Approval	March 2, 2018	July 2, 2018
Procure Subcontractors	July 2, 2018	July 20, 2018
Private Utility Markouts and Survey	July 23, 2018	July 27, 2018
Site Meeting	July 23, 2018	July 27, 2018
Sampling and Soil Boring Installation	July 30, 2018	Aug 3, 2018
Monitoring Well Installation and Development (pending soil boring data)	Aug 13, 2018	Aug 17, 2018
Monitoring Well Sampling (2 weeks after development)	Aug 27, 2018	Aug 31, 2018
Site Characterization Report (30 days from receipt of lab data)	Sept 17, 2018	Oct 17, 2018

This schedule assumes final SCWP approval will be received by early July. Field work is scheduled to begin in late July

NYSDEC will be notified at least 7 business days prior to deployment for field efforts. NYSDEC coordination during field implementation is required if any of the soil boring or monitoring well locations need to be moved significantly from their proposed locations due to site conditions or laboratory analytical results. Any proposed changes to the project schedule will be submitted to NYSDEC for approval.

A Site Characterization Report will be prepared, in accordance with DER-10 and in conformance to the NYSDEC template, to document implementation of the SCWP. The Site Characterization Report will follow the guidelines in DER-10 and include the following:

- Background and Site Description
- Physical Setting
- Results of Site Characterization
  - Boring Logs
  - Monitoring Well Construction
  - Well Development Logs
  - Field Sampling Data and Observations
  - Site Characterization Investigation Data Summary
  - Results Analysis
  - Validated Laboratory Data Sheets
  - Laboratory Data Deliverables
- Waste Disposal Documentation
- Potable Well Survey
- Preliminary Evaluation of Fish and Wildlife Resources
- Findings And Recommendations
- Supplemental Site Investigation and Remedial Action Goals
- Tables
- Figures
- Photo Log

A Draft Citizen Participation Plan (CPP) for SCIA was prepared and issued in January 2018 pursuant to the Consent Order. The results of the Site Characterization will determine further actions that may be required and if updates to the CPP may be necessary. A final version of the Site Characterization Report will be available to the public via the NYSDEC and a copy will be placed at the local document repository (public library) indicated in the CPP.

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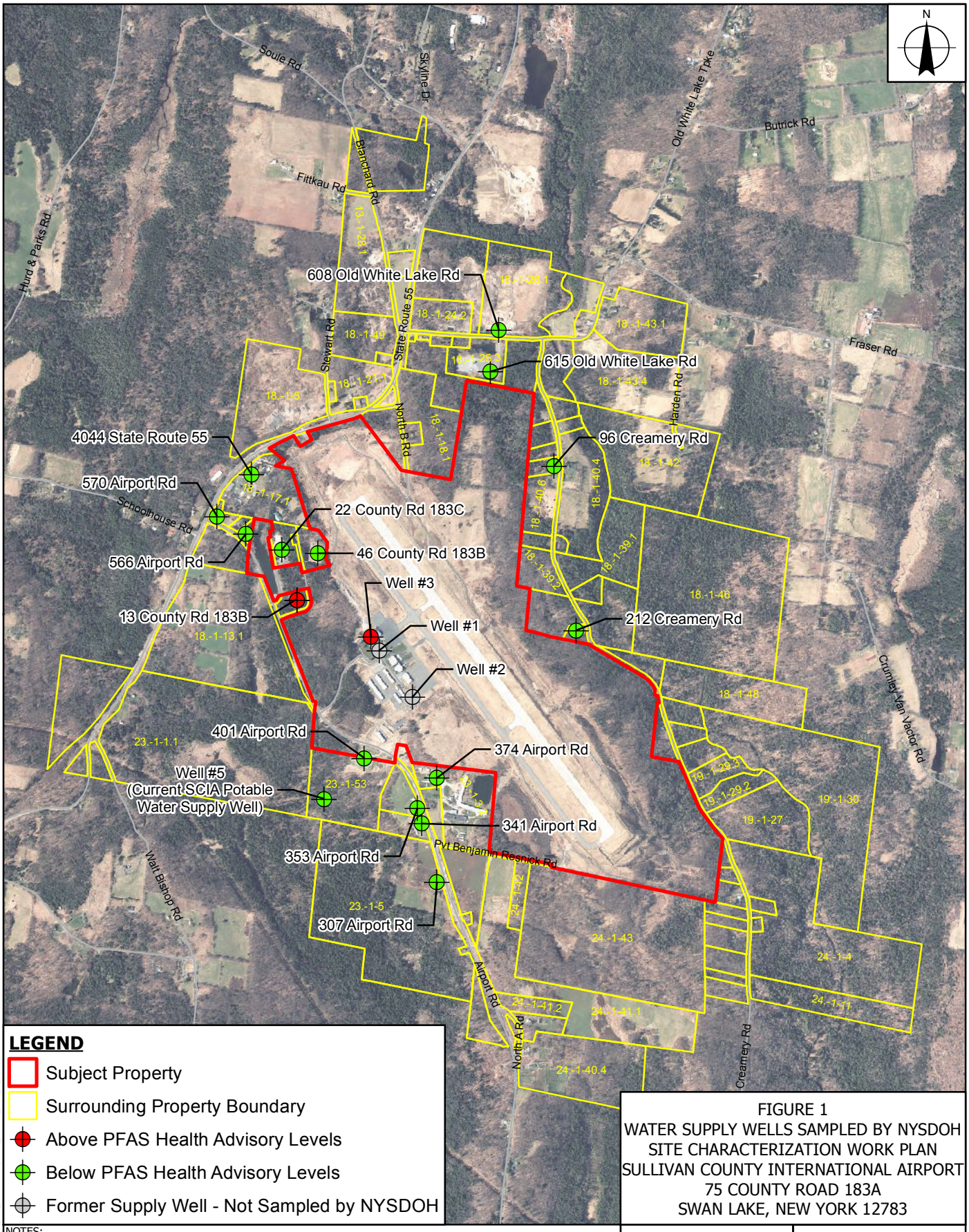
Figures



LEGEND

- Subject Property
- Surrounding Property Boundary
- Above PFAS Health Advisory Levels
- Below PFAS Health Advisory Levels
- Former Supply Well - Not Sampled by NYSDOH

FIGURE 1
WATER SUPPLY WELLS SAMPLED BY NYSDOH
SITE CHARACTERIZATION WORK PLAN
SULLIVAN COUNTY INTERNATIONAL AIRPORT
75 COUNTY ROAD 183A
SWAN LAKE, NEW YORK 12783

NOTES:
NYSDOH - NEW YORK STATE DEPARTMENT OF HEALTH
SCIA - SULLIVAN COUNTY INTERNATIONAL AIRPORT
PFAS - PERFLUOROALKYL SUBSTANCES
24.-1-40.4 - TAX MAP AND PARCEL ID

0 2,000 4,000
SCALE IN FEET

COORDINATE SYSTEM: NAD 1983
STATE PLANE NEW YORK EAST FEET

REQUESTED BY:	MG
DRAWN BY:	VV
DATE:	6/18/2018
PROJECT:	0888821949

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DATA SOURCES:

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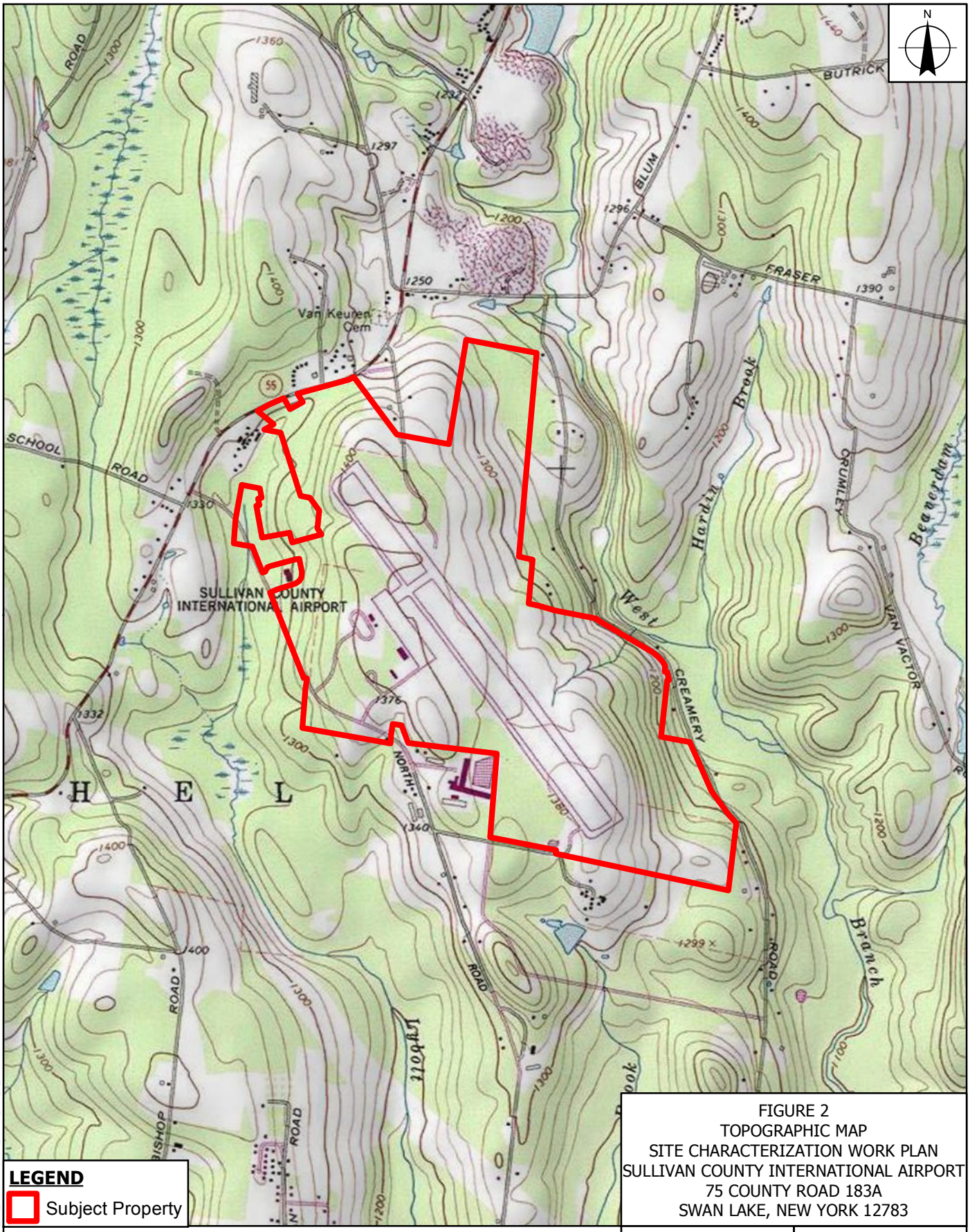

LEGEND

Subject Property

0 2,000 4,000

SCALE IN FEET

COORDINATE SYSTEM: NAD 1983
STATE PLANE NEW YORK EAST FEET

FIGURE 2
TOPOGRAPHIC MAP
SITE CHARACTERIZATION WORK PLAN
SULLIVAN COUNTY INTERNATIONAL AIRPORT
75 COUNTY ROAD 183A
SWAN LAKE, NEW YORK 12783

REQUESTED BY:	MZ
DRAWN BY:	VV
DATE:	6/18/2018
PROJECT:	0888821949

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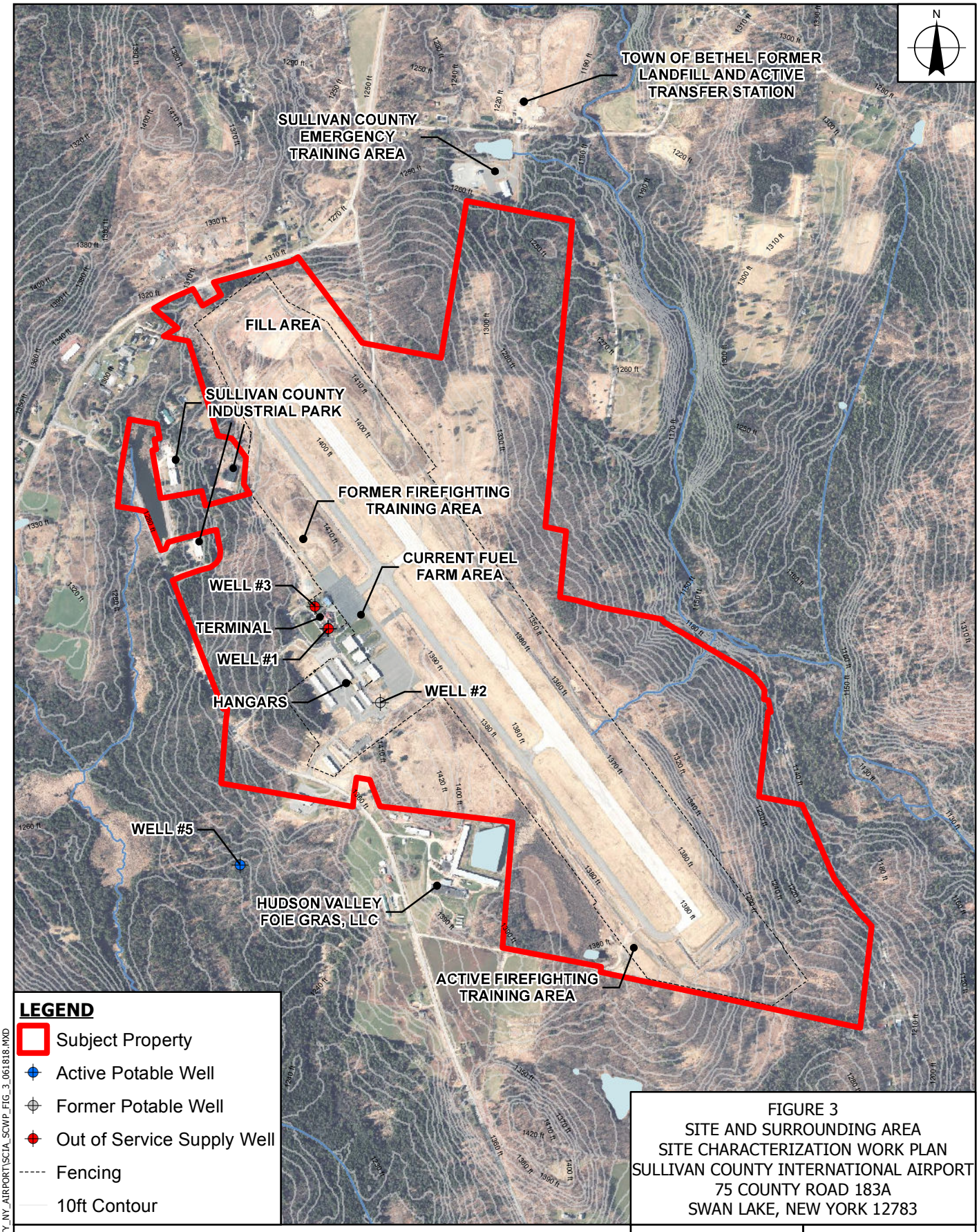

FIGURE 3
SITE AND SURROUNDING AREA
SITE CHARACTERIZATION WORK PLAN
SULLIVAN COUNTY INTERNATIONAL AIRPORT
75 COUNTY ROAD 183A
SWAN LAKE, NEW YORK 12783

REQUESTED BY:	RM
DRAWN BY:	VV
DATE:	6/18/2018
PROJECT:	0888821949

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DATA SOURCES: SOURCE: USGS, EPA

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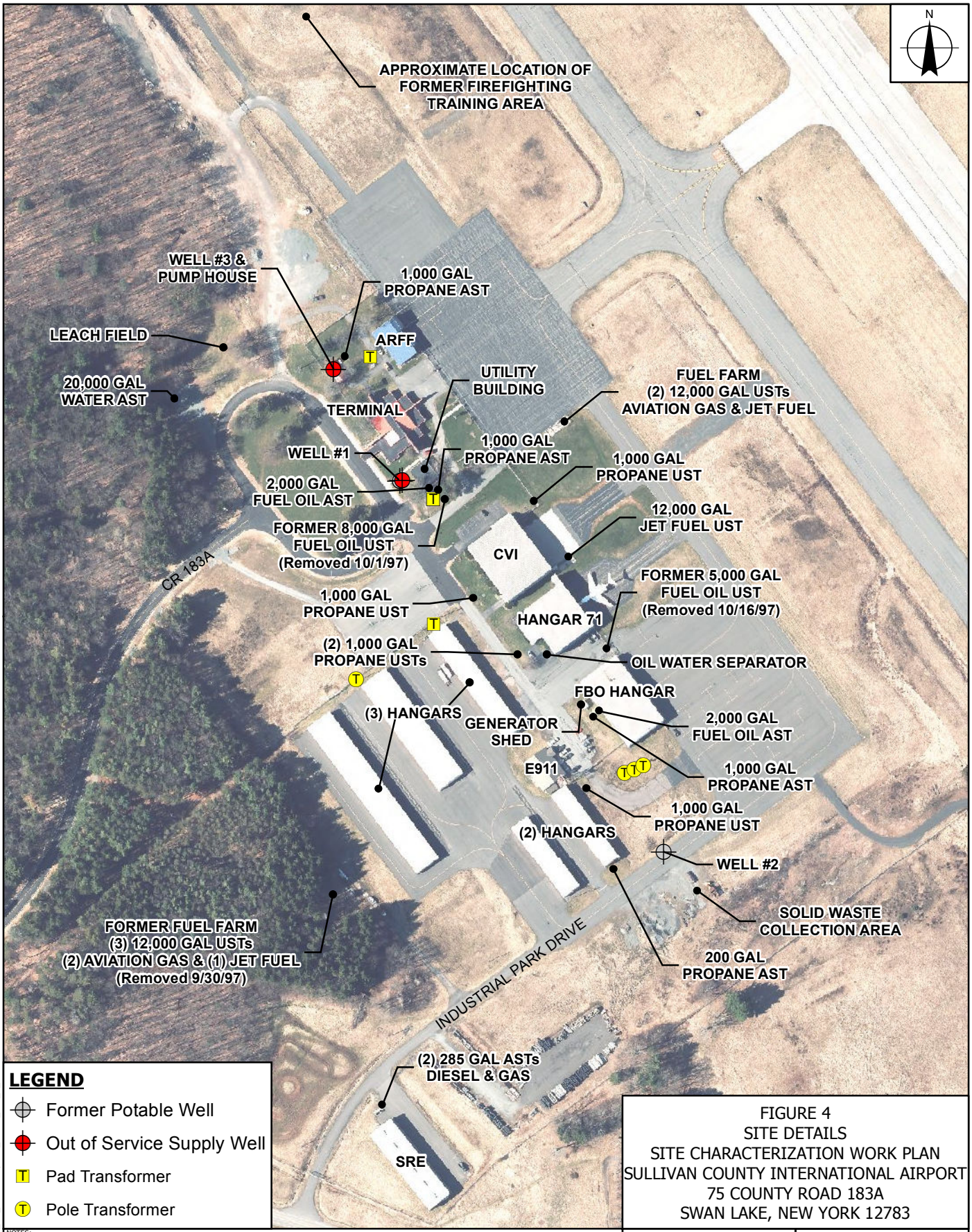

NOTES:
AST - ABOVEGROUND STORAGE TANK
UST - UNDERGROUND STORAGE TANK
FBO - FIXED BASE OPERATION
ARFF - AIRPORT RESCUE AND FIRE FIGHTING BUILDING
SRE - SNOW REMOVAL EQUIPMENT BUILDING
GAL - GALLON
CVI - CABLEVISION

0 250 500
SCALE IN FEET

COORDINATE SYSTEM: NAD 1983
STATE PLANE NEW YORK EAST FEET

FIGURE 4
SITE DETAILS
SITE CHARACTERIZATION WORK PLAN
SULLIVAN COUNTY INTERNATIONAL AIRPORT
75 COUNTY ROAD 183A
SWAN LAKE, NEW YORK 12783

REQUESTED BY:	MZ
DRAWN BY:	VV
DATE:	6/18/2018
PROJECT:	0888821949

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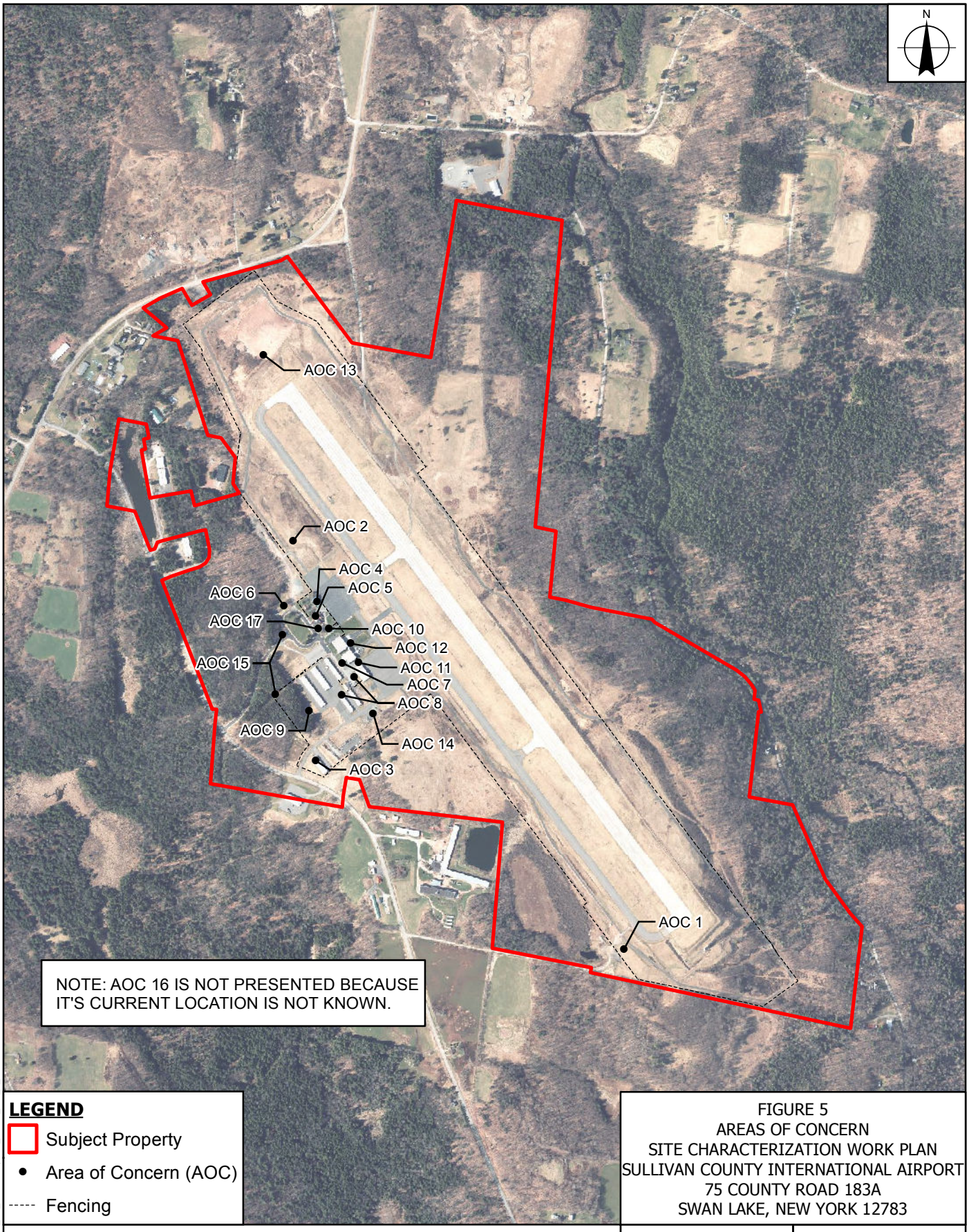
DATA SOURCES:

X:\SULLIVAN_COUNTY_NY_AIRPORT\SCIA_SCWP_FIG_4_061818.MXD



LEGEND

- Subject Property
- Area of Concern (AOC)
- Fencing

FIGURE 5
AREAS OF CONCERN
SITE CHARACTERIZATION WORK PLAN
SULLIVAN COUNTY INTERNATIONAL AIRPORT
75 COUNTY ROAD 183A
SWAN LAKE, NEW YORK 12783

0 2,000 4,000
SCALE IN FEET

COORDINATE SYSTEM: NAD 1983
STATE PLANE NEW YORK EAST FEET

REQUESTED BY:	MZ
DRAWN BY:	VV
DATE:	6/18/2018
PROJECT:	0888821949

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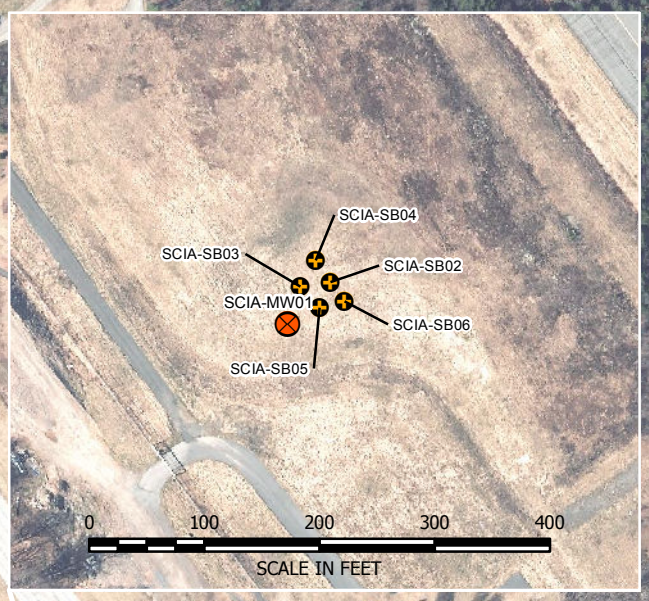
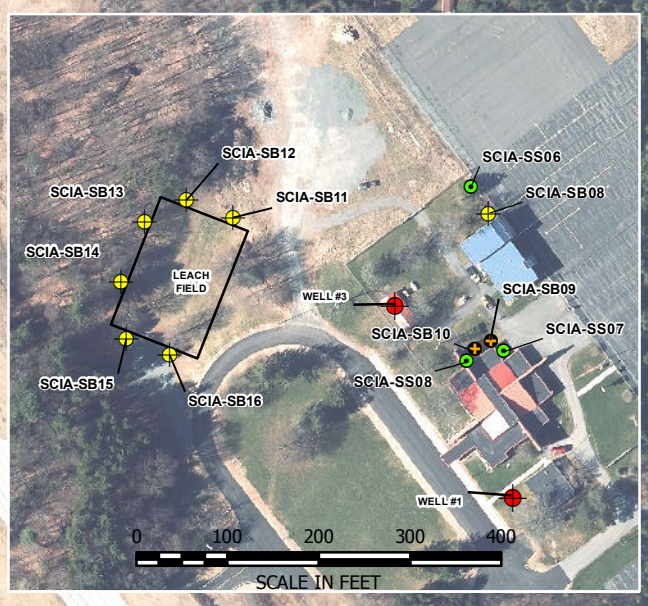
DATA SOURCES:

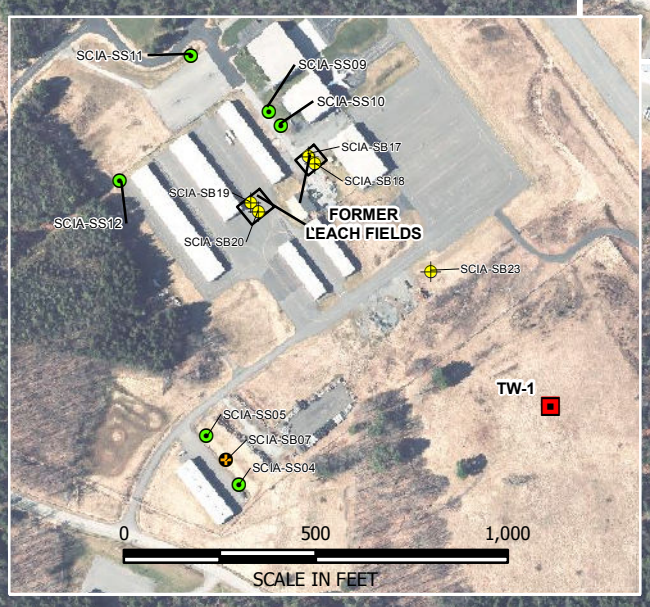
X:\SULLIVAN_COUNTY_NY_AIRPORT\SCIA_SCWP_FIG_5_061818.MXD

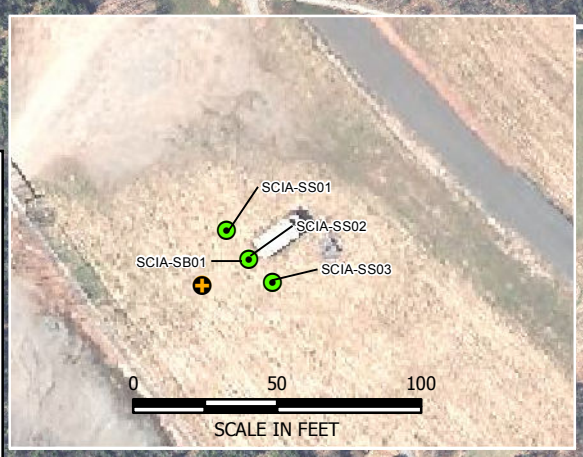
N

TW-3
TW-2
SCIA-SB22
SCIA-SB21
AOC 13: FILL AREA
22 CR 183C
46 CR 183B
SW02
13 CR 183B
BEDROCK MONITORING WELL
AOC 2: FORMER FIREFIGHTING TRAINING AREA
WELL #3
AOC 4: ARFF
AOC 6: LEACH FIELD
AOC 5: TERMINAL
AOC 15: WESTERN STORM WATER DRAINAGE CHANNELS
AOC 7: HANGAR 71
AOC 8: FORMER LEACH FIELDS
AOC 14: SOLID WASTE ACCUMULATION AREA
TW-1
AOC 3: SRE
AOC 1: ACTIVE FIREFIGHTER TRAINING AREA
SW01









LEGEND

- Site Boundary
- Proposed Subsurface Sample
- Proposed Surface Soil Sampling Location
- Proposed Combined Surface & Subsurface Sample Location
- Proposed Surface Water Sampling Location
- Potable Well to be Sampled
- Approximate Location of Proposed Bedrock Monitoring Well
- Existing Test Well to be Sampled
- Out of Service Supply Well to be Sampled

NOTES:
Number of soil samples and/or locations may be modified based on field observations.

0 500 1,000 1,500 2,000
SCALE IN FEET

COORDINATE SYSTEM: NAD 1983
STATE PLANE NEW YORK EAST FEET

FIGURE 6
SAMPLE LOCATION MAP
SITE CHARACTERIZATION WORK PLAN
SULLIVAN COUNTY INTERNATIONAL AIRPORT
75 COUTNY ROAD 183A
SWAN LAKE, NEW YORK 12783

REQUESTED BY:	MZ
DRAWN BY:	VV
DATE:	6/18/2018
PROJECT:	0888821949

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DATA SOURCES:

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Appendix A
Cablevision Air Facility, Inc.
Petroleum Bulk Storage Compliance Information

PBS Number
3-496472

New York State Department of Environmental Conservation
PETROLEUM BULK STORAGE CERTIFICATE

625 Broadway, 11th Floor, Albany, NY 12233-7020 Phone: 518-402-9553

Region 3 NYSDEC - PBS Unit
21 South Putt Corners Road
New Paltz, NY 12561-1696
(845) 256-3022

TANK NUMBER	TANK LOCATION	DATE INSTALLED	TANK TYPE	PRODUCT STORED	CAPACITY (GALLONS)
1	Underground including vaulted with no access for inspection	11/01/1989	Fiberglass Coated Steel	jet fuel	12,000

* Aboveground tanks require monthly visual inspections and may need documented internal inspections as described in 6 NYCRR Section 613-4.3

FACILITY NAME AND ADDRESS :
CABLEVISION AIR FACILITY INC.
SULLLIVAN CO. AIRPORT
COUNTY ROAD 183
WHITE LAKE, NY 12786

Class B (Daily On-Site) Op: BRENT CLARKE
Class A (Primary) Operator: BRENT CLARKE
Emergency Contact Name: BOB DEIMA
Emergency Contact Phone Number: (845) 295-2415

ISSUED BY: Commissioner
Basil Seggos
PBS NUMBER: **3-496472**
DATE ISSUED: 11/19/2014
EXPIRATION DATE : 12/08/2019
FEE PAID: [redacted]

FACILITY (PROPERTY) OWNER:
SULLIVAN COUNTY /SULLIVAN COUNTY
100 N. STREET P.O. BOX 5012
MONTICELLO, NY 12701

Tank Owner Name:
CABLEVISION AIR FACILITY, INC.

Facility Phone Number
(845) 583-5152

MAILING CORRESPONDENCE:
JOE GILARDI
CABLE AIR
PO BOX 311
LIBERTY, NY 12754

As the owner of this facility and/or the tanks at this facility, the receipt, posting, and use of this certificate is an acknowledgement that I am responsible to the extent required by law for ensuring that this facility is in compliance with all regulations for the bulk storage of petroleum including those regarding equipment requirements, inspections, handling procedures, recordkeeping, registration requirements, providing advanced notice to the Department of major changes to a tank system, spill reporting, and all other applicable requirements. Violations may be punishable as a criminal offense and/or a civil violation in accordance with applicable state and federal law.

This registration certificate must be kept current and conspicuously posted at this facility at all times. Posting must be at the tank, at the entrance of the facility, or the main office where the storage tanks are located.

Spills must be reported to the DEC within two hours (1-800-457-7362).

Signature of Facility Owner/Authorized Representative Date

Printed Name and Title of Facility Owner/Authorized Representative

Print Date: 10/26/2016

THIS REGISTRATION CERTIFICATE IS NON -TRANSFERABLE

New York State Department of Environmental Conservation
Division of Environmental Remediation
21 South Putt Corners Road, New Paltz, NY 12561-1696
Phone: 845-256-3121
Website: www.dec.ny.gov

Joe Martens
Commissioner

NOTICE OF VIOLATION

8/29/2011

HAND DELIVERED ON-SITE
RAMON B. GONZALEZ
BOX 311
LIBERTY, NY 12754

Re: Petroleum Bulk Storage (PBS) Program Site
Inspection -6NYCRR Parts 612-614
PBS# 3-496472, Inspection#
CABLEVISION AIR FACILITY INC.
SULLLIVAN CO. AIRPORT
BETHEL, NY 12786

Dear : RAMON B. GONZALEZ

On Thursday, August 11, 2011, Eric Rosenzweig inspected the CABLEVISION AIR FACILITY INC. facility to determine compliance with New York State's PBS regulations. The following violations were identified during that inspection and need your immediate attention to bring your facility into compliance. Citations to the applicable regulations are noted in brackets and pertain to the tank(s) that is listed. A copy of the inspection checklist is enclosed for your reference. The PBS regulations (6 NYCRR Parts 612-614) can be accessed online at http://www.dec.ny.gov/regs/2490.html.

The law requires that you comply fully with the PBS regulations. You must correct all of the violations noted below within thirty (30) days and submit required documentation.

No facility violations observed.

TANK # 1
New underground tank leak detection - Monitoring at new USTs - [Section 614.5 and Paragraph 613.5(b)(3)]. Leak detection monitoring associated with the above referenced underground tank(s) is not being performed. Regardless of the leak detection method used, the operator must check the system(s) at least weekly for evidence of leaks. Additionally, all leak monitoring systems must be inspected at least monthly to check for operability.

TANK # 1
Monitoring Records for Leak Detection - [Paragraph 613.5(b)(4)]. Weekly monitoring records for the above referenced tank(s) are not being maintained on the premises. These records must be maintained at the facility property for at least one (1) year.

TANK # 1
Monitoring records for leak detection - [Paragraph 613.5(b)(3)]. All leak monitoring systems must be inspected at least monthly to check for operability.

Corrective Action and Penalties

No federal tank violations observed.

Sincerely,

ERIC ROSENZWEIG

Enclosures:
Inspection Checklist

cc.
CABLEVISION AIR FACILITY INC.
RAMON B. GONZALEZ
BOX 311
LIBERTY, NY 12754

New York State Department of Environmental Conservation
Division of Environmental Remediation
21 South Putt Corners Road, New Paltz, NY 12561-1696
Phone: 845-256-3121
Website: www.dec.ny.gov

Joe Martens
Commissioner

NOTICE OF VIOLATION

7/17/2014

HAND DELIVERED ON-SITE
RAMON B. GONZALEZ
SULLLIVAN CO. AIRPORT
WHITE LAKE, NY 12786

Re: Petroleum Bulk Storage (PBS) Program Site
Inspection -6NYCRR Parts 612-614
PBS# 3-496472, Inspection#
CABLEVISION AIR FACILITY INC.
SULLLIVAN CO. AIRPORT
WHITE LAKE, NY 12786

Dear : RAMON B. GONZALEZ

On Tuesday, June 17, 2014, Eric Rosenzweig from CDM Smith inspected the CABLEVISION AIR FACILITY INC. facility to determine compliance with New York State's PBS regulations. The following violations were identified during that inspection and need your immediate attention to bring your facility into compliance. Citations to the applicable regulations are noted in brackets and pertain to the tank(s) that is listed. A copy of the inspection checklist is enclosed for your reference. The PBS regulations (6 NYCRR Parts 612-614) can be accessed online at http://www.dec.ny.gov/regs/2490.html.

The law requires that you comply fully with the PBS regulations. You must correct all of the violations noted below within thirty (30) days and submit required documentation.

No facility violations observed.

No tank violations observed.

Corrective Action and Penalties

As a result of these violations, you are subject to penalties. Pursuant to Environmental Conservation Law Section 71 - 1929, you may be liable for a civil penalty of up to $37,500 per day for each of the above violations. The violations identified in this require your immediate attention. Delays in correcting the violations noted above will affect the amount of penalties for which you will be liable. In addition, under Environmental Conservation Law Section 71-1933, a person may be held criminally liable if any of the foregoing violations was the result of intentional, knowing or criminally negligent conduct.

Note that the inspection may not have disclosed all violations that exist at your site. You are responsible for ensuring that the entire facility is in compliance with applicable requirements.

Additional enforcement action may be warranted by the preceding inspection findings. A follow-up settlement conference may be required. The Department will contact you to schedule an appointment, if necessary. You have thirty (30) days from the date of this letter to submit documentation to Eric Rosenzweig at CDM Smith, 11 British American Boulevard, Suite 200, Latham, NY 12110, that shows how the preceding violations have been cured. If work is contracted or completed before the date of your settlement conference, please bring that documentation with you to the settlement conference. Contact Eric Rosenzweig at 518-782-4500 with any questions about this inspection or its results.

Federal Violations

As a result of these violations, you are subject to penalties. Pursuant to Environmental Conservation Law Section 71 - 1929, you may be liable for a civil penalty of up to $37,500 per day for each of the above violations. The violations identified in this require your immediate attention. Delays in correcting the violations noted above will affect the amount of penalties for which you will be liable. In addition, under Environmental Conservation Law Section 71-1933, a person may be held criminally liable if any of the foregoing violations was the result of intentional, knowing or criminally negligent conduct.

Note that the inspection may not have disclosed all violations that exist at your site. You are responsible for ensuring that the entire facility is in compliance with applicable requirements.

You are scheduled for a settlement conference to address the above violations. The conference will take place at the DEC Region 3 office located at 21 South Putt Corners Road, New Paltz, NY 12561-1696 on 09/13/2011 at 9:00 AM. When you appear for the settlement conference, you must present documentation that the above violations have been corrected, or submit a plan to achieve compliance. If you are unable to appear at the conference at your scheduled date and time, your must contact Eric Rosenzweig from CDM at 518-782-4500.

If compliance documentation is not available at the time of the settlement conference, you must submit the documentation after the violations are cured and compliance has been achieved. Documentation must be submitted to Eric Rosenzweig at 11 British American Boulevard, Suite 200, Latham, NY 12110. Contact Eric Rosenzweig at 518-782-4500 with any questions about this inspection or its results.

Federal Violations

Violations of the Federal EPA Underground Storage Tank regulations (40 CFR Part 280) were also observed during the inspection. This information may be provided to EPA Region 2. Specifically, the following violations were observed:
TANK # 1
This tank(s) does not have monthly monitoring records as required by 40 CFR 280.45(b).

Sincerely,

ERIC ROSENZWEIG

Enclosures:
Inspection Checklist

cc.
CABLEVISION AIR FACILITY INC.
RAMON B. GONZALEZ
SULLLIVAN CO. AIRPORT
BETHEL, NY 12786

NEW YORK STATE DEC PETROLEUM BULK STORAGE (PBS) REGULATIONS INSPECTION REPORT

Date: 6/17/2014 | **PBS#** 3-496472 | **Inspection #** _____

FACILITY Representative, Name & Title: RAMON B. GONZALEZ ,

NYSDEC Representative, Name & Title: Eric Rosenzweig

Facility Name:	CABLEVISION AIR FACILITY INC.	Owner:	RAMON B. GONZALEZ
Facilty Address:	SULLLIVAN CO. AIRPORT	Owner Address:	BOX 311
City:	WHITE LAKE	City:	LIBERTY
Operator:	CABLE AIR	Emergency Cont:	BOB DEIMA
Phone:	(845) 583-5152	Phone:	(845) 295-2415

Facility-level information (indicate dispenser-specific)

1. Is the **registration certificate** posted at the facility? Y/N/1 (no access)	Y
2. Is the **registration information** current and correct?	Y
3. Are **monitoring/observation wells** marked and secured? Y/N/X	X
4. Have **dispenser sumps** been maintained? Y/N(accum. product)/1(accum. water/debris) /2 (no access)/X (no sump)	Y
5. For a motor fuel tank with pressurized piping, is a **shear valve** installed? Y/N/3 (no access)/X (not pressurized)	X
1 (inoperative valve)	☐
2 (improperly installed)	☐

Tank Registration Identification Number	1				
Underground or Aboveground Tank	Underground				
Product Stored / Tank Volume if different from registered	0011 Jet Fuel				
Date Installed	10/31/1989				
6. Is the tank properly **permanently closed**?	X				
7. Is the tank properly **temporarily closed**?	X				
8. Were any **spills** observed during the inspection (also include suspected releases from leak detection equipment and uninvestigated inventory descrepancies)? Y / N	N				
9. Have **tank top sumps** been properly maintained? Y /N (accumulation of product) /1 (accumulation of water/debris) /2 (no access) /X (no sump)	X				
10. Have **fill port catch basins** (spill buckets) been properly maintained? Y /N (accumulation of product) /1 (accumulation of water/debris) /2 (no access) /X (day tank)	X				
11. Is the **fillport color coded** to identify the product in the tank? Y / N / 1 (incorrectly coded) / X (used oil tank or day tank) For products not explicitly listed in Part 613.3(b), is the tank properly marked?	Y				

Underground Storage Tanks

12. For UST systems installed after Dec. 27, 1986, does the **tank system meet standards**? Y / X (system installed prior to Dec. 27, 1986) If not, how is the tank system deficient? 1 (tank not corrosion resistant) / 2 (no tank secondary containment) / 3 (not tank leak monitoring) / 4 (no overfill prevention) / 5 (piping not corrosion resistant) / 6 (no piping leak monitoring) / 7 (more than one check valve in suction piping system) / 8 (no tank label) / 9 (no as-built plans or drawings)	Y				
	☐1 ☐2	☐1 ☐2	☐1 ☐2	☐1 ☐2	☐1 ☐2
	☐3 ☐4	☐3 ☐4	☐3 ☐4	☐3 ☐4	☐3 ☐4
	☐5 ☐6	☐5 ☐6	☐5 ☐6	☐5 ☐6	☐5 ☐6
	☐7 ☐8	☐7 ☐8	☐7 ☐8	☐7 ☐8	☐7 ☐8
	☐ 9	☐ 9	☐ 9	☐ 9	☐ 9

COMPLIANCE WITH REGULATORY REQUIREMENTS WAS ASSESSED VIA THE FOLLOWING METHODS:
FIELDS OBSERVATION, RECORDS REVIEW, AND/OR INTERVIEW WITH FACILITY REPRESENTATIVE

Question	T	P	T	P	T	P	T	P	T	P
13. Is **leak monitoring** being done? Y / N / 1 (inoperative system) / 2 (weekly leak detection records not maintained) / 3 (monthly operability records not maintained) / 4 (interstitial space on double-walled tanks and / or piping not monitored) / X (Category A or B tank system or exempt suction piping)	■ Y	☐ Y	☐ Y	☐ Y	☐ Y	☐ Y	☐ Y	☐ Y	☐ Y	☐ Y
	☐ N	☐ N	☐ N	☐ N	☐ N	☐ N	☐ N	☐ N	☐ N	☐ N
	☐ X	■ X	☐ X	☐ X	☐ X	☐ X	☐ X	☐ X	☐ X	☐ X
	☐ 1	☐ 1	☐ 1	☐ 1	☐ 1	☐ 1	☐ 1	☐ 1	☐ 1	☐ 1
	☐ 2	☐ 2	☐ 2	☐ 2	☐ 2	☐ 2	☐ 2	☐ 2	☐ 2	☐ 2
	☐ 3	☐ 3	☐ 3	☐ 3	☐ 3	☐ 3	☐ 3	☐ 3	☐ 3	☐ 3
	☐ 4	☐ 4	☐ 4	☐ 4	☐ 4	☐ 4	☐ 4	☐ 4	☐ 4	☐ 4

Question					
14. Is **cathodic protection** for steel tank and piping systems monitored annually? Y / N (no monitoring on either) / 1 (no monitoring on tank) / 2 (no monitoring on line) / 3 (records not maintained) / 4 (minimum protection not provided) / 5 (inadequate monitoring,i.e., not enough readings) / X (Category A or B steel tank system or not steel tank system)	Y				
	☐4 ☐5	☐4 ☐5	☐4 ☐5	☐4 ☐5	☐4 ☐5
15. Does the facility have adequate **inventory records** for metered tanks? Y / X (unmetered tank) If not, which items are deficient? 1 (no records) / 2 (no tank bottom water measurements) / 3 (equipment not capable of 1/8" measurement) / 4 (meter not callibrated) / 5 (no reconciliation of records) / 6 (improper reconciliation) / 7 (no investigation of discrepancy)	Y				
	☐1 ☐2	☐1 ☐2	☐1 ☐2	☐1 ☐2	☐1 ☐2
	☐3 ☐4	☐3 ☐4	☐3 ☐4	☐3 ☐4	☐3 ☐4
	☐5 ☐6	☐5 ☐6	☐5 ☐6	☐5 ☐6	☐5 ☐6
	☐7	☐7	☐7	☐7	☐7
16. Do **unmetered tanks** have annual standpipe analysis or tank test, or other acceptable leak detection method? Y / N / X (metered tank)	X				
17. Has **tightness testing** been conducted on the tank and piping system within the last 5 years? Y / N (no test on either tank or line) / 1(no tank test)/ 2(no line test) / 3 (test report not submitted) / X (exempt from tightness testing)	X				

Aboveground Storage Tanks

Question					
18. For AST systems installed after Dec.27, 1986, does the **tank system meet standards**? Y / X (tanksystem installed prior to Dec. 27, 1986) If not, which items are deficient? 1 (tank not welded steel) / 2 (no surface coating) / 3 (tank resting on soil; no cathodic protection) / 4 (tank on grade; no impermeable barrier) / 5 (no leak monitoring between tank and barrier)					
	☐1 ☐2	☐1 ☐2	☐1 ☐2	☐1 ☐2	☐1 ☐2
	☐3 ☐4	☐3 ☐4	☐3 ☐4	☐3 ☐4	☐3 ☐4
	☐5	☐5	☐5	☐5	☐5

19. Does the facility conduct **monthly inspections** for all ASTs? Y / N / 1 (records not maintained)					
20. Does the facility conduct **ten-year inspections** for ASTs? Y / N / 1 (records not maintained) / X (not required per Part 613.6(b))					
21. For ASTs >= 10,000 gallons (or for ASTs < 10k gal. where 2andary containment is req'd), Is the **secondary containment** adequately designed and in good condition? Y / N / 1 (secondary containment not maintained) / 2 (poor design)					
For ASTs < 10,000 gallons if using **alternatives to secondary containment**, Y/N/1(secondary containment not maintained)/ 2(poor design) are SPOTS #17 issues addressed?Y/N/3 (equipment not maintained) / X (not req'd)					
22. Are dike drain valves locked in a closed position? Y / N (unlocked) / 1 (no valve on discharge pipe) / X (no dike)					
23. Does the AST have a **gauge**, **high level alarm** or **other equivalent device**? Y / N / 1 (inoperative)					
24. Is the **design / working capacity**, and **ID number** marked on the tankand at the gauge? Y / N / 1(tank not labeled) / 2 (not marked at gauge)					
25. Is a **solenoid** or equivalent valve in place for gravity-fed motor fuel dispensers? Y / N / 1 (inoperative) / X (not motor fuel/gravity-fed)					
26. Is a **check valve** in place for pump-filled tanks with remote fills? Y / N / 1(inoperative) / X (not remote fill)					
27. Is an **operative valve** in place on every line with gravity head? Y / N / 1 (operative) / X (no gravity head on line)					

Federal UST Questions - Release Prevention

28. Is the spill prevention device (catch basin) present and functional?Y / N (not present) /1 (not functional - holes or cracks present) /2 (no access) /X (tank receives <25 gal. at one time)	Y				
29. Is the overfill prevention device (i.e., automatic shut-off, high-levelalarm, ball float valve) present?Y / N / X (tank receives <25 gal. at one time)	Y				
30. Is the overfill prevention device operational?Y / X (tank receives <25 gal. at one time)If not operational: 1) Automatic shut-off is not operational (i.e., device tampered with or inoperable; gauging stick in drop tube). 2) High-level alarm is not operational. 3) Alarm is not audible or visible to the delivery driver.Ball float is not operational because: 4) Stage I vapor recovery is present.5) Piping system is suction. 6) Drain valve on spill catch basin is broken oris impaired by debris, causing drain valve to act as an emergency vent.	Y ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6	 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6	 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6	 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6	 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6
31. Were structurally repaired tanks and piping tightness tested within 30 days of repair completion (not required w/ internal inspections after repair or if release detection equipment is in use)?Y/N/X (no structural repair)	X				
32. If cathodically protected tank or piping was structurally repaired, were CP systems tested/inspected within 6 months of repair?Y / N / X (no CP system/structural repair)	X				
33. Is buried metal tank and piping (including fittings, connections, etc.) protected from corrosion? Y / X (no buried metal components)If not: 1) Buried metal piping components (such as swing joints, flex-connectors, etc.) are not isolated from the ground or cathodically protected.For new USTs (tanks and piping installed after 12/22/1988): 2) Tank or piping does not meet new tank/piping standards for corrosion.For existing USTs (tanks and piping installed on or before 12/22/1988): 3) Steel tank is not internally lined OR retrofitted with cathodic protection. 4) Metal piping is not retrofitted with cathodic protection.	Y ☐ 1 ☐ 2 ☐ 3 ☐ 4	 ☐ 1 ☐ 2 ☐ 3 ☐ 4	 ☐ 1 ☐ 2 ☐ 3 ☐ 4	 ☐ 1 ☐ 2 ☐ 3 ☐ 4	 ☐ 1 ☐ 2 ☐ 3 ☐ 4
34.Was corrosion protection system tested within required time frame and does it provide continuous protection? Y / X (no CP system)If system does not provide continuous protection: 1) CP system was not tested 2) CPsystem is not performing adequately based on results of testing. 3) Operator is notconducting or has not completed appropriate repair in response to test results.	Y ☐ 1 ☐ 2 ☐ 3	 ☐ 1 ☐ 2 ☐ 3	 ☐ 1 ☐ 2 ☐ 3	 ☐ 1 ☐ 2 ☐ 3	 ☐ 1 ☐ 2 ☐ 3
35.If an impressed current system is in use, has system been operatedcontinuously? Y / X (no impressed current system)If system has not been operated continuously: 1) Rectifier is not operational.2) Rectifier does not have electrical power 24/7.3) Clock shows that power has been turned off.	 ☐ 1 ☐ 2 ☐ 3	 ☐ 1 ☐ 2 ☐ 3	 ☐ 1 ☐ 2 ☐ 3	 ☐ 1 ☐ 2 ☐ 3	 ☐ 1 ☐ 2 ☐ 3
36. Is impressed current system inspected every 60 days? (Operator is onlyrequired to keep 6 months of readings; at least 2 of last 3 readings arerequired if system is operational at time of inspection.)Y / N / X (no impressed current system)					
37. Do reports indicate that lined tanks are inspected periodically (within 10years of installation and every 5 years thereafter) and that lining is incompliance? Y / N (no report) / 1 (lining was inspected and failed) / 2 (inspection procedure not acceptable) / X (tank not lined)	Y				

COMPLIANCE WITH REGULATORY REQUIREMENTS WAS ASSESSED VIA THE FOLLOWING METHODS: FIELDS OBSERVATION, RECORDS REVIEW, AND/OR INTERVIEW WITH FACILITY REPRESENTATIVE

Federal UST Questions - Release Detection (only complete applicable sections)

Specify method(s) of tank release detection used: (NOTE: Methods B&C and C&D can only be used for 10 years after a tankhas been installed or upgraded) A. Automatic Tank Gauging (ATG) - answer questions 38-40, 56 B. Manual Tank Gauging (MTG) for tanks <=1000 gal. - answer questions41 -43, 56 E. Groundwater or Vapor Monitoring - answer questions 47-50, 56 F. Interstitial Monitoring - answer questions 51-52, 56 H. Statistical Inventory Reconciliation (SIR) - answer questions 55, 56	☐ A ☐ B ☐ E ■ F ☐ H	☐ A ☐ B ☐ E ☐ F ☐ H	☐ A ☐ B ☐ E ☐ F ☐ H	☐ A ☐ B ☐ E ☐ F ☐ H	☐ A ☐ B ☐ E ☐ F ☐ H
Specify second method of pressurized piping release detection used: (NOTE: “G. Automatic Line Leak Detector [ALLD]” is always required forpressurized piping) - answer questions 53-54, 56 C. Tightness Testing - answer questions 44-46, 56 E. Groundwater or Vapor Monitoring - answer questions 47-50, 56 F. Interstitial Monitoring - answer questions 51-52, 56 H. Statistical Inventory Reconciliation (SIR) - answer questions 55, 56	☐ C ☐ E ☐ F ☐ G ☐ H	☐ C ☐ E ☐ F ☐ G ☐ H	☐ C ☐ E ☐ F ☐ G ☐ H	☐ C ☐ E ☐ F ☐ G ☐ H	☐ C ☐ E ☐ F ☐ G ☐ H
Specify method of suction piping release detection used: (NOTE: safe [European] suction piping does not require RD - mark box “X”) C. Tightness Testing - answer questions 44-46, 56 E. Groundwater or Vapor Monitoring - answer questions 47-50, 56 F. Interstitial Monitoring - answer questions 51-52, 56 H. Statistical Inventory Reconciliation (SIR) - answer questions 55, 56 X. Exempt Suction Piping, 56	☐ C ☐ E ☐ F ☐ H ■ X	☐ C ☐ E ☐ F ☐ H ☐ X	☐ C ☐ E ☐ F ☐ H ☐ X	☐ C ☐ E ☐ F ☐ H ☐ X	☐ C ☐ E ☐ F ☐ H ☐ X

A. Automatic Tank Gauging (ATG)

38.Is ATG on National Work Group on Leak Detection Evaluations (NWGLDE) list? Y / N					
39.Is ATG set up properly? Y / N / X (unable to confirm)					
40.Did ATG conduct test while tank contained routinely highest level ofproduct? Y / N					

B. Manual Tank Gauging (MTG)

41.Is tank size appropriate for using MTG? (<= 1000 gal. only) Y / N					
42.Do records indicate that MTG method is being conducted correctly?Y/N					
43.Is MTG equipment capable of 1/8” measurement? Y / N					

C. Tightness Testing	**T**	**P**	**T**	**P**	**T**	**P**	**T**	**P**	**T**	**P**
44.Is tightness testing method on National Work Group on Leak Detection Evaluations (NWGLDE) list? Y / N		☐ Y ☐ N		☐ Y ☐ N		☐ Y ☐ N		☐ Y ☐ N		☐ Y ☐ N
45.Is tightness testing conducted per manufacturer's instructions? (Compare test report with NWGLDE specifications for test method.) Y / N		☐ Y ☐ N		☐ Y ☐ N		☐ Y ☐ N		☐ Y ☐ N		☐ Y ☐ N
46.Is tightness testing conducted within the specified time frames for the following equipment? Y / 1 (tanks - not tested every 5 years) / 2(pressurized piping - not tested annually) / 3 (non-exempt suction piping -not tested every 3 years)		☐ Y ☐ 1 ☐ 2 ☐ 3		☐ Y ☐ 1 ☐ 2 ☐ 3		☐ Y ☐ 1 ☐ 2 ☐ 3		☐ Y ☐ 1 ☐ 2 ☐ 3		☐ Y ☐ 1 ☐ 2 ☐ 3

Federal UST Questions - Release Detection (continued)

D. Inventory Control - not valid as release detection for EPA as of 12/22/2008										
E. Groundwater or Vapor Monitoring	**T**	**P**	**T**	**P**	**T**	**P**	**T**	**P**	**T**	**P**
47. Does owner have the site assessment report indicating location andnumber of vapor or groundwater monitoring wells? Y / N (answer '1' forquestions 48-50)	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N
48. According to site assessment report, is groundwater always detectable inthe monitoring well (i.e., never more than 20 feet from the ground surface)?Y / N / 1 (no report) / X (no groundwater monitoring wells)	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ Y ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X
49. Is vapor monitoring well not affected by high groundwater?Y / N / 1 (no report) / X (no vapor monitoring wells)	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X	☐ Y ☐ N ☐ 1 ☐ X
50. Are wells properly designed and positioned? Y / N / 1 (no report)	☐ Y ☐ N ☐ 1	☐ Y ☐ N ☐ 1	☐ Y ☐ N ☐ 1	☐ Y ☐ N ☐ 1	☐ Y ☐ N ☐ 1	☐ Y ☐ N ☐ 1	☐ Y ☐ N ☐ 1	☐ Y ☐ N ☐ 1	☐ Y ☐ N ☐ 1	☐ Y ☐ N ☐ 1
F. Interstitial Monitoring	**T**	**P**	**T**	**P**	**T**	**P**	**T**	**P**	**T**	**P**
51. Does secondary containment have integrity? Y / N	■ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N
52. Is the sensor properly positioned (piping only)?Y / N / X (manual monitoring)		☐ Y ☐ N ☐ X		☐ Y ☐ N ☐ X		☐ Y ☐ N ☐ X		☐ Y ☐ N ☐ X		☐ Y ☐ N ☐ X
G. Automatic Line Leak Detector (ALLD)										
53. Is automatic line leak detector (ALLD) present and operational? Y /N (not present) /1 (not operational) /2 (no access)										
54. Has annual functionality test of the ALLD been conducted, and are records available? Y / N (no test conducted) / 1 (no records)										
H. Statistical Inventory Reconciliation (SIR)	**T**	**P**	**T**	**P**	**T**	**P**	**T**	**P**	**T**	**P**
55. Is SIR method on National Work Group on Leak Detection Evaluations (NWGLDE) list of release detection methods? Y / N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N
Federal UST Questions - Release Detection Monitoring										
56. Are tanks and piping monitored monthly for releases, and are records available (must have records for the two most recent consecutive months and for 8 of the last 12 months)?Y / N (no release detection present) / 1 (no monthly monitoring) /2 (no records) / 3 (inadequate records) / X (exempt suction piping)	**T** ■ Y ☐ N ☐ 1 ☐ 2 ☐ 3	**P** ☐ Y ☐ N ☐ 1 ☐ 2 ☐ 3	**T** ☐ Y ☐ N ☐ 1 ☐ 2 ☐ 3	**P** ☐ Y ☐ N ☐ 1 ☐ 2 ☐ 3	**T** ☐ Y ☐ N ☐ 1 ☐ 2 ☐ 3	**P** ☐ Y ☐ N ☐ 1 ☐ 2 ☐ 3	**T** ☐ Y ☐ N ☐ 1 ☐ 2 ☐ 3	**P** ☐ Y ☐ N ☐ 1 ☐ 2 ☐ 3	**T** ☐ Y ☐ N ☐ 1 ☐ 2 ☐ 3	**P** ☐ Y ☐ N ☐ 1 ☐ 2 ☐ 3
Federal UST Questions - Closure										
57. For tanks permanently closed within the last 3 years, was site assessment performed? Y / N / 1 (inadequate) / X (not applicable)	X									

COMMENTS (continue on separate paper if needed): Regional notes or forms attached: 0 pages

facility is compliant.

COMPLIANCE WITH REGULATORY REQUIREMENTS WAS ASSESSED VIA THE FOLLOWING METHODS:
FIELDS OBSERVATION, RECORDS REVIEW, AND/OR INTERVIEW WITH FACILITY REPRESENTATIVE

Refer to:

- ☐ Spills (e.g., remediation system not operating)
- ☐ Air (e.g., vapor recovery problems)
- ☐ Water (e.g.,SPDES problems/illegal floor drains)
- ☐ Solid & HazMat (e.g., used oil issues)

COMPLIANCE WITH REGULATORY REQUIREMENTS WAS ASSESSED VIA THE FOLLOWING METHODS:
FIELDS OBSERVATION, RECORDS REVIEW, AND/OR INTERVIEW WITH FACILITY REPRESENTATIVE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 3
21 South Putt Corners Road, New Paltz, NY 12561-1620
P: (845) 256-3000 I F: (845) 255-2987
www.dec.ny.gov

October 26, 2016

JOE GILARDI
CABLE AIR
PO BOX 311
LIBERTY, NY 12754

Re: Petroleum Bulk Storage (PBS) Program Site
Inspection -6NYCRR Part 613
PBS# 3-496472, Inspection# 51805
CABLEVISION AIR FACILITY INC.
SULLLIVAN CO. AIRPORT
COUNTY ROAD 183
WHITE LAKE, NY 12786

Dear JOE GILARDI:

On October 21, 2016, the New York Department of Environmental Conservation (DEC) inspected the facility identified above to determine compliance with DEC's PBS regulations (6 NYCRR Part 613). Based upon a review of the records provided and an inspection of the accessible portions of the tank system(s), no violations were observed at the time of the inspection. We appreciate your cooperation during the inspection and your efforts in maintaining compliance to prevent releases of petroleum to the environment.

To assist you in keeping your facility in compliance, DEC provides several resources on our website including:

- the PBS regulations (6 NYCRR Part 613) at http://www.dec.ny.gov/docs/remediation_hudson_pdf/part613text.pdf ;
- the PBS inspection form at http://www.dec.ny.gov/docs/remediation_hudson_pdf/pbsinspfrm.pdf ; and
- additional program guidance at http://www.dec.ny.gov/chemical/287.html

Note that the inspection may not have disclosed all violations that may exist at the facility. It is the responsibility of the facility owner, tank owner(s), and operator(s) to ensure that the entire facility is maintained in compliance with applicable requirements at all times. If you have any questions or need additional information, please contact me at the address given above.

Sincerely,

FRANK KELLY
ENVIRONMENTAL ENGINEER I
NYSDEC, Region 3

Appendix B
Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN

SULLIVAN COUNTY INTERNATIONAL AIRPORT
75 COUNTY ROAD 183A
SWAN LAKE, NEW YORK 12783

EnSafe Project Number:
0888821949

Prepared for:

Sullivan County Department of Public Works
100 North Street
P.O. Box 5012
Monticello, New York 12701

June 2018

1233 Silas Deane Highway
Wethersfield, Connecticut 06109
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www.ensafe.com

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List of Acronyms

%R	percent recovery
COC	chain-of-custody
DQIs	data quality indicators
DQOs	data quality objectives
DUSR	Data Usability Summary Report
ELAP	Environmental Laboratory Accreditation Program
MDLs	method detection limits
MRL	method reporting limits
MS	matrix spike
MSD	matrix spike duplicate
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PID	photoionization detector
PFAS	per- and polyfluoroalkyl substances
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
SCIA	Sullivan County International Airport
SCWP	Site Characterization Work Plan
SOPs	standard operating procedures
TAL	target analyte list
U.S. EPA	United States Environmental Protection Agency
VOCs	volatile organic compounds

1.0 INTRODUCTION

EnSafe Inc. has prepared this Quality Assurance Project Plan (QAPP) to describe the protocols and procedures that will be followed during implementation of the Site Characterization Work Plan (SCWP) to be completed for the Sullivan County International Airport (SCIA), 75 County Road 183A, Swan Lake, New York. The purpose of these protocols and procedures is to ensure that all project activities will be performed in a manner consistent with the data quality objectives (DQOs) established for the project and all data collected during the characterization are precise, accurate, representative, comparable, and complete.

This QAPP has been prepared in accordance with *DER-10, Technical Guidance for Site Investigation and Remediation* (New York State Department of Environmental Conservation [NYSDEC], May 3, 2010).

2.0 PROJECT GOALS AND OBJECTIVES

The site characterization at the SCIA is being performed to provide data to complete the following objectives:

- Determine if per- and polyfluoroalkyl substances (PFAS) or other contaminants are present in onsite soil, groundwater, or surface water.
- Evaluate onsite geological conditions and complete a preliminary assessment of groundwater flow.
- Preliminary evaluation of whether groundwater may be a transport mechanism for offsite migration of PFAS or other contaminants.
- Assess potential PFAS impacts to offsite receptors.
- Fulfill the site characterization requirements listed in DER-10.

Specific details of the work to be performed, including the scope and goals, are provided in the work plan. Site characterization activities include, but are not limited to, the following tasks:

- Utility clearance
- Notifications, Mobilization, and Site Preparation
- Surface soil sampling and analysis

- Soil boring installation with subsurface soil sampling and analysis
- Monitoring well installation and development
- Groundwater sampling and analysis
- Investigation-derived waste management
- Data validation and reporting

3.0 PROJECT ORGANIZATION AND RESPONSIBILITY

EnSafe is responsible for site characterization activities, including the supervision of contractors, field activities, data analysis, and reporting. Key project team members are listed in Table 1; resumes for the key project team members are provided in Appendix E of the SCWP.

Table 1
Key Team Personnel

Name	Title	Contact Number	Responsibility
Robert McCarthy	Project Manager	(860) 920-5898	Primary point of contact for EnSafe. Oversees project implementation including financials, schedule, and technical aspects
David Farrell	Corporate Health and Safety Manager	(724) 470-4481	Oversees EnSafe's Health and Safety Program
Dana Miller	Project Chemist	(972) 865-4857	Prepares laboratory scopes of work and coordinates laboratory-related functions. Performs data quality reviews.
Marshall Gibson	Field Team Lead	(603) 505-8964	Supervises, coordinates, and performs field activities.
John Bender	Field Team Member	(401) 256-0681	Performs field activities

4.0 QUALITY ASSURANCE OBJECTIVES

The overall quality assurance objective for this project is to develop and implement procedures for field sampling, chain-of-custody (COC), laboratory analysis, and reporting that will provide results that are scientifically valid at levels that are sufficient to meet the DQOs. Specific procedures for sampling, COC, laboratory instrument calibration, laboratory analysis, reporting of data, internal quality control, preventive maintenance of field equipment, and corrective action are described in other sections of this QAPP.

In combination, quality assurance (QA)/quality control (QC) represents a set of procedures designed to produce analytical data of known and measurable quality. A useful distinction between QA and QC can be made as follows: QA represents the set of procedures used to ensure that this evidence is available and used properly to evaluate and, if necessary, to qualify the data quality; QC represents the set of

measurement procedures to provide overall evidence of the quality of a particular analytical batch. QA elements to be evaluated include accuracy, precision, sensitivity, representativeness, and completeness. The data generated by the analytical laboratory for this project are required to be sensitive enough to achieve detection levels low enough to meet the Contract Required Quantitation Limits. The QC elements that are important to this project are blank contamination, instrument calibration, field data completeness, sample holding times, sample preservation, and sample custody.

4.1 Data Quality Objectives

DQOs are qualitative and quantitative statements to ensure that data of known and appropriate quality are obtained during sampling and analysis activities. Data developed during the site characterization will be used to fulfill the overall objectives of the project. The following sections describe the DQO process for the site characterization.

4.1.1 State the Problem

NYSDEC Consent Order, executed on December 21, 2017, was issued in response to the detection of PFAS in both potable and non-potable supply wells at, and in the vicinity of, SCIA. NYSDEC issued Site No. 353016 on April 18, 2017 to track response and investigation activities related to the presence of PFAS in groundwater at SCIA. A Records Search Report (RSR) (EnSafe, January 30, 2018) identified 17 Areas of Concern (AOC). The SCWP, to which this QAPP is appended, was developed to address each of the 17 AOCs.

4.1.2 Identify the Decision

Analytical data obtained at each of the AOCs investigated will be used to determine:

- Absence/presence of PFAS or other contaminant related constituents in soil, groundwater, drinking water, and surface water at the Site and offsite;

- Evaluate the potential degree of PFAS impacts in target areas, determine the surface and subsurface characteristics of the site, identify sources of contamination, potential migration pathways, and potential human or ecological receptors at the Site and offsite

Section 2 of the SCWP summarizes each of the AOCs and proposed path forward.

4.1.3 Identify Inputs to the Decision

Inputs include analytical results and regulatory guidance. Analytical methods will be of sufficient sensitivity that method detection limits (MDLs) and practical quantitation limits measure constituent concentrations at, or below, constituent NYSDEC and United States Environmental Protection Agency (U.S. EPA) guidance values. Table 2A (soil) and Table 2B (aqueous) provides the reporting limits and analytical site screening objectives for samples collected under the SCWP.

TABLE 2A AND TABLE 2B TO BE PROVIDED AS ADDENDUM UPON CONTRACTING A LABORATORY AND RECEIPT OF THE LABORATORY SPECIFIC REPORTING AND DETECTION LEVELS

4.1.4 Define the Study Boundaries

Soil, groundwater, and surface water samples from AOCs and drinking water samples from offsite locations, are based on findings from the RSR and site observations. See Section 2 of the SCWP regarding sample locations.

4.1.5 Develop a Decision Rule

The site characterization is being conducted to provide sufficient data to evaluate the necessity for further action.

4.1.6 Specify Limits on Decision Errors

a) The null hypothesis is that each of the areas investigated (or to be investigated) is not contaminated. Sampling and analyses will be performed based on historical uses in the area. This sampling and analysis is being performed to determine if contamination is present.

b) A sampling design error occurs when the data collection design does not capture the complete variability within the area of investigation to the extent appropriate for a decision to be made. This could potentially lead to the extent of contamination not being defined properly and/or corrective measures not adequately treating the true problem area.

c) A false rejection decision error may occur if a limited amount of sampling and analysis is performed, causing a broader area of contamination to be outlined. This may result in additional expense related to corrective measures implementation.

While the possibilities of decision errors cannot be totally eliminated, the occurrence of such errors can be minimized by developing better work plans.

4.1.7 Optimize the Design for Obtaining Data

The sampling plan for each AOC is based on reasonable sample numbers for the size of the area. The analytical methods or analysis of the soil, groundwater, drinking water, and surface water samples are New York State Department of Health (NYSDOH) approved.

4.2 Measurement Performance Criteria

Performance criteria selected for the analytical measurement systems will ensure the project objectives in Section 4 are met. The analytical data will be evaluated to achieve an acceptable level of confidence in the decisions derived from the data. The methods and the procedures used to implement and achieve the DQOs are described throughout this QAPP. Data quality indicators (DQI) are qualitative

and quantitative descriptors used to interpret the degree of acceptability or usability of data. The five principal DQIs are (1) precision, (2) accuracy, (3) representativeness, (4) comparability, and (5) completeness. The DQIs for this project are discussed below.

4.2.1 Precision

Precision measures the reproducibility of measurements and methods, and is defined for qualitative data as a group of values' variability compared with its average value. To assess the precision of the measurement systems used in this project, field duplicates will be obtained and analyzed with the samples collected. Precision of laboratory analysis will be assessed by comparing the analytical results between matrix spike/matrix spike duplicates (MS/MSDs). The relative percent difference will be calculated for each pair of duplicate analysis using the following equation:

$$RPD = \frac{(S - D)}{(S + D)/2} x100$$

Where:

S = sample result
D = duplicate result

4.2.2 Accuracy

Accuracy is the degree to which a given result agrees with the true value. The accuracy of an entire measurement system is an indication of any bias that exists. Spiked sample results provide information needed to assess the accuracy of analyses. Specifically, surrogate spike, MS/MSD, and laboratory control sample percent recoveries (%Rs) are used to assess accuracy. Every organic sample is spiked with known quantities of non-target surrogate compounds. Five percent of all samples analyzed are spiked with target chemicals for the MS/MSD. If the calculated %Rs for the known spike concentrations are within defined control limits set by each method, the reported sample concentrations are considered accurate. Accuracy is calculated using the following equation.

$$\%R = \frac{(SSR - SR)}{SA} x100$$

Where:

SSR = spike sample recovery
SR = sample recovery
SA = concentration of spike added

4.2.3 Representativeness

Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Representativeness is a qualitative parameter which is dependent upon the proper design of the sampling program and proper laboratory protocol. The sampling approach was designed to provide data representative of site conditions and the number of sampling points was selected based requirements set forth in the order. During development of this approach, consideration was given to past waste disposal practices, existing analytical data, physical setting, and processes previously and currently used at the facility. The sampling approach is discussed in Section 2 of the SCWP. Representativeness will be satisfied by insuring that, the SCWP, associated QAPP, and NYSDEC protocols are followed, proper sampling technique are used, proper analytical procedures are followed, and holding times of the samples are not exceeded by the laboratory.

4.2.4 Comparability

Comparability expresses the confidence with which one data set can be compared to another. Comparability is also dependent on similar QA objectives. Comparability is dependent upon the proper design of the sampling program and will be satisfied by ensuring proper sampling techniques are used.

The objective of this QA/QC plan is to produce a high level of comparability between data sets. Heterogeneous investigative samples make it difficult to obtain consistently high comparability values. However, the use of standard methods for sampling and analysis (U.S. EPA protocols), reporting data in standard units, and using standard and comprehensive reporting formats will optimize the potential for high levels of data comparability.

4.2.5 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions. It is expected that 100% of the planned sampling points will be collected. All monitoring wells at the facility are expected to be accessible. In the event that storm sewer sediment locations are inaccessible, alternate locations will be chosen downgradient from the proposed sampling location. The completeness goal for field measurements will be greater than 90%. Laboratory analysis for this project will have a completeness goal greater than 95% to account for unanticipated results that may be rejected during data validation. Completeness can be calculated using the following equation.

$$\%Completeness = \frac{No.\ of\ Valid\ Tests}{Total\ Tests\ Taken} x100$$

4.2.6 Sensitivity

Sensitivity is the measure of the concentration at which an analytical method can positively identify and report analytical results. The sensitivity of a given method is commonly referred to as the detection limit. Definitions for common detection limits are defined below.

1. The MDL is a statistically determined concentration. It is the minimum concentration of an analyte that can be measured and reported with 99% confidence that the analyte concentration is greater than zero.

2. The method reporting limit (MRL) is a multiple of the MDL and is regarded as the minimum level of target analyte in a sample that can be reliably achieved within specified limits of precision and accuracy. The MRL is variable and highly matrix-dependent.

The sensitivity goal (or MDL) for laboratory measurements reported for this project shall at least meet, or be lower than, the NYSDEC soil cleanup objectives and ambient water quality standards.

5.0 SAMPLING PLAN

Sampling activities for site characterization will identify absence/presence of PFAS or other contaminant related constituents in soil, groundwater, and surface water at the site and for PFAS in drinking water offsite. Section 2 of the SCWP identifies AOCs, and provides a summary of sample matrices and the anticipated number of samples including QC samples. Section 4 of the SCWP describes tasks and sampling procedures to be performed as part of site characterization activities. Actual numbers of samples may change based on field conditions.

A NYSDOH Environmental Laboratory Approval Program (ELAP)-accredited laboratory will be used to evaluate all samples collected under the SCWP. Potable water supply well samples submitted for PFAS will be analyzed by International Organization of Standardization method 25101, while soil, groundwater, and surface water samples submitted for PFAS will be analyzed by U.S. EPA method 537, modified. In addition to the PFAS analysis, select soil and groundwater samples will be further analyzed for volatile organic compounds (VOCs) by U.S. EPA method 8260B, semi volatile organic compounds by U.S. EPA method 8270D, Target Analyte List metals by U.S. EPA method 6020, polychlorinated biphenyls by U.S. EPA method 8082A, and pesticides by U.S. EPA method 8081B. Project screening levels and method

detection limits are provided in Table 2A (soil) and Table 2B (aqueous) of this QAPP. Sample-specific identifications and requested analyses is provided in Table 3 of the SCWP.

5.1 Soil Boring Installation and Subsurface Soil Sampling

Soil borings will be installed; as described in Section 4 of the SCWP. The final locations of the proposed soil borings may be adjusted based on the results of the utility markouts, field conditions, or obstructions. Discrete subsurface soil samples are proposed to be collected for laboratory analysis from soil borings. Soil borings will be advanced using a direct push technology drill rig (GeoProbe or equivalent) equipped with a MacroCore sampling device or equivalent lined with Teflon-free disposable polyvinyl chloride sampling sleeves. Soil will be collected continuously in each soil boring, characterized using the Unified Soil Classification System (USCS) and screened for organic vapors utilizing a photoionization detector (PID) or equivalent hand held device. Upon completion, drill cuttings that do not exhibit visual evidence of contamination or a PID response greater than 25 parts per million will be returned to their boring of origin as backfill. Drill cuttings that exhibit evidence of contamination will be transferred into a 55-gallon drum and handled as described in Section 4.2.13 of the SCWP.

Discrete surface soil samples will be collected from the top 0-2 inch and 2-6-incheintervals from below the ground surface. Surface and subsurface soil samples will be collected using stainless steel sampling instruments (e.g., hand auger or trowels), stainless-steel bowls, and disposable TerraCore samplers, transferred into laboratory-provided sample jars, and placed in ice-filled coolers. Samples will be shipped under COC to a NYSDOH ELAP certified laboratory for analyses specified in Table 3 of the SCWP. Decontamination of non-disposable, non-dedicated sampling equipment will consist of a water rinse station to remove gross contamination (if needed), followed by a non-phosphate detergent (e.g., Liquinox) water rinse, and a rinse with de-ionized water. Detailed decontamination procedures are discussed in Section 4.2.11 of the SCWP.

5.2 Groundwater Sampling

Groundwater samples and water supply well samples will be collected from the locations specified in Section 2 of the SCWP. All samples will be analyzed for PFAS; samples from MW-01, Well #1, and Well #3 will be further analyzed for VOCs.

With the exception of onsite Well #3, groundwater samples will be obtained with bladder pumps utilizing low-flow sampling procedures outlined in U.S. EPA Region 1 Low-Stress (Low-Flow) EQASOP-GW001 (U.S. EPA, January 19, 2010). Groundwater will be measured in the field for pH, specific conductivity, turbidity, temperature, dissolved oxygen, and oxidation-reduction potential to determine purge

stabilization. After the field parameters meet stabilization criteria, in-line field measurement equipment will be disconnected and samples will be collected into laboratory-prepared glassware. During groundwater sampling, only the stainless steel tip of the water level meter should come into contact with the water and care shall be taken to prohibit the plastic tape of the water level meter to become immersed into the well water. No Teflon tubing will be used during sampling activities. See Section 4.2.9 of the SCWP for additional field precautions with respect to PFAS sampling. Well #3, and the offsite water supply wells, will each be purged for approximately 20 minutes prior to sample collection to flush water that may be present in the supply lines.

Groundwater samples will be collected in laboratory-supplied sample jars and placed in ice-filled coolers. Samples will be shipped under COC to a NYSDOH ELAP certified laboratory for the analyses specified in Table 3 of the SCWP. Disposable or dedicated groundwater sampling equipment will be used where possible. Decontamination of non-disposable, non-dedicated sampling equipment will consist of a water rinse station to remove gross contamination (if needed), followed by a non-phosphate detergent (e.g., Liquinox) water rinse, and a rinse with de-ionized water. Detailed decontamination procedures are discussed in Section 4.2.11 of the SCWP.

5.2.1 Surface Water Sampling

Surface water samples from the locations specified in Section 2 of the SCWP. Surface water samples will be collected in laboratory-supplied sample jars and placed in ice-filled coolers. Samples will be shipped under COC to a NYSDOH ELAP certified laboratory for the analyses specified in Table 3 of the SCWP. Because surface samples will be collected directly into the laboratory-supplied jars, no sampling equipment or subsequent decontamination is required.

5.3 Waste Characterization

Waste characterization sampling will be conducted for soil cuttings and liquid samples (e.g., drilling fluids and well development water) to facilitate offsite disposal. Composite samples will be collected from the storage containers for parameters required by the selected disposal facility.

5.4 Field Quality Control Samples

To assess field sampling and decontamination performance, two types of "blanks" will be collected and submitted to the laboratory for analysis. In addition, the precision of field sampling procedures will be assessed by collecting field duplicates and MS/MSDs. A description of field quality control samples to be collected as part of the SCWP is provided in the following subsections.

5.4.1 Equipment Blanks

Equipment blanks are collected to evaluate decontamination procedures and possible sources of contamination. These samples will utilize laboratory-supplied distilled or deionized water; the water will be poured over decontaminated piece(s) of sampling equipment and containerized in sampling bottles. Equipment blanks will be collected and submitted at a frequency of one per 20 samples for all analytical methods; equipment blanks will not be collected for waste characterization samples.

5.4.2 Trip Blanks

Trip blanks consist of a single set of sample containers (TerraCore samplers for soil samples and three 40-ml vials for water samples) filled at the laboratory with deionized, laboratory-grade water. The water used will be from the same source as that used for the laboratory method blank. The containers will be carried into the field and handled and transported in the same way as the samples collected that day. Analysis of the trip blank for VOCs only is used to identify contamination from the air, shipping containers, or from other items coming in contact with the sample bottles (the bottles holding the trip blanks will be not opened during this procedure). A complete set of trip blanks will be provided with each shipment of samples to the certified laboratory.

5.4.3 Field Duplicates

Field duplicate samples are two or more samples considered to be representative sub-samples of the same source. The samples are identically processed throughout the measurement system to assess the sampling and analytical reproducibility. The original sample that the duplicate is collected of will be noted in the field book. Field duplicates will be collected and submitted at a frequency of one per 20 samples for all analytical methods; field duplicates will not be collected for waste characterization samples.

5.4.4 Matrix Spike / Matrix Spike Duplicate

MS/MSD analyses will be performed to evaluate the matrix effect of the sample upon the analytical methodology along with the precision of the instrument by measuring recoveries. The original sample that the MS/MSD is collected of will be noted in the field book. MS/MSDs will be collected and submitted at a frequency of one per 20 samples for all analytical methods; MS/MSDs will not be collected for waste characterization samples.

5.5 Sample Preparation and Analytical Procedures

Samples will be collected in certified, pre-cleaned, pre-preserved (if applicable) containers provided by the contracted analytical laboratory. To the extent possible, disposable sampling tools will be used for sampling waste material. Table 3 shows the sample containers, holding times, and preservation requirements for samples collected during this sampling effort.

Table 3
Sample Containers, Holding Times, and Preservation Requirements

Matrix	Analytical Group	Analytical	Sample Containers (number, size, and type)	Sample Volume	Preservation Requirements	Maximum Holding Time[(1)]
Soil	PFAS	U.S. EPA 537 modified	1 — 4 ounce HDPE (free of Teflon and other PFAS)	2 grams	Cool to ≤10°C. Samples must be chilled during shipment and must not exceed 10 °C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 10 °C when the samples are received at the laboratory. Samples stored in the lab must be held at or below 6 °C until extraction, but should not be frozen.	60 days to extraction/ 30 days from extraction to analysis
Groundwater/ Surface water	PFAS	U.S. EPA 537 modified	2 — 250 mL HDPE (free of Teflon and other PFAS)	250 mL	Cool to ≤10°C. Samples must be chilled during shipment and must not exceed 10 °C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 10 °C when the samples are received at the laboratory. Samples stored in the lab must be held at or below 6 °C until extraction, but should not be frozen.	14 days to extraction/ 28 days from extraction to analysis
Potable Water	PFAS	International Organization for Standardization 25101	2 — 250 mL HDPE (free of Teflon and other PFAS)	250 mL	Cool to ≤10°C. 5.0 g/l of TRIZMA should be added to each sample as a buffering reagent and to remove free chlorine if sample is from a chlorinated source. Samples must be chilled during shipment and must not exceed 10 °C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 10 °C when the samples are received at the laboratory. Samples stored in the lab must be held at or below 6 °C until extraction, but should not be frozen.	14 days to extraction/ 28 days from extraction to analysis
Soil	VOC	SW-846 8260B	3 — 40 mL glass vials 1 — 2 ounce glass jar	5 grams	Laboratory-grade water and methanol, Cool 0-6˚ Celsius, Protect from light Frozen upon laboratory receipt to <-7 ˚ Celsius	14 days
Groundwater	VOC	SW-846 8260B	3 — 40mL glass vials	40 mL	Hydrochloric acid to a pH less than 2; Cool to 0-6°Celsius; no headspace	14 days
Soil	SVOC	SW-846 8270D	1 — 4 ounce glass jar	30 grams	Cool 0-6˚ Celsius	14 days to preparation / 40 days to analysis
Groundwater	SVOC	SW-846 8270D	2 — 1 liter glass amber bottles	1,000 mL	Cool 0-6˚ Celsius	7 days to preparation / 40 days to analysis
Soil	Metal	SW-846 6020A	1 — 4 ounce glass jar	1 gram	None	180 days
Groundwater	Metal	SW-846 6020A	1 — 500 mL plastic	100 mL	Nitric acid to a pH less than 2	180 days

Table 3
Sample Containers, Holding Times, and Preservation Requirements

Matrix	Analytical Group	Analytical	Sample Containers (number, size, and type)	Sample Volume	Preservation Requirements	Maximum Holding Time[(1)]
Soil	Mercury	SW-846 7471B	1 –- 4 ounce glass jar	0.5 grams	Cool 0-6° Celsius	28 days
Groundwater	Mercury	SW-846 7470A	1 — 500 mL plastic	100 mL	Nitric acid to a pH less than 2	180 days
Soil	PCB	SW-846 8082A	1 – 4 ounce glass jar	30 grams	Cool 0-6° Celsius	14 days to preparation / 40 days to analysis
Groundwater	PCB	SW-846 8082A	2 – 1 liter glass amber bottles	1000 mL	Cool 0-6° Celsius	7 days to preparation / 40 days to analysis
Soil	Pesticide	SW-846 8081B	1 – 4 ounce glass jar	30 grams	Cool 0-6° Celsius	14 days to preparation / 40 days to analysis
Groundwater	Pesticide	SW-846 8081B	2 – 1 liter glass amber bottles	1000 mL	Cool 0-6° Celsius	7 days to preparation / 40 days to analysis

Notes:
(1) Maximum holding time is calculated from the time the sample is collected to the time the sample is prepared/extracted.

PFAS = Per-and Polyfluoroalkyl Substances
U.S. EPA = United States Environmental Protection Agency
VOC = volatile organic compound
SVOC = semivolatile organic compound
PCB = Polychlorinated biphenyl
mL = milliliter
HDPE = High-Density Polyethylene
°C = Degree Celsius
g/l = Grams per Liter
TRIZMA = Tris(hydroxymethyl)aminomethane and Tris(hydroxymethyl)aminomethane hydrochloride (Sigma-Aldrich registered trademark)

6.0 SAMPLE CUSTODY, DOCUMENTATION, AND CHAIN-OF-CUSTODY

Custody is one of several factors necessary for the admissibility of environmental data as evidence in a court of law. Custody procedures help to satisfy the two major requirements for admissibility: relevance and authenticity. Sample custody is addressed in three parts: field sample collection, laboratory analysis, and final evidence files. Final evidence files, including all originals of laboratory reports and purge files, are maintained under document control in a secure area. A sample or evidence file is under your custody if:

- The item is in actual possession of a person
- The item is in the view of the person after being in actual possession of the person
- The item was in actual physical possession but is locked up to prevent tampering
- The item is in a designated and identified secure area

6.1 Field Notes

Field notes documenting field activities will be recorded in a field notebook. The field notebook will be a bound, numbered notebook with water-resistant pages. Entries will be dated, written legibly, and contain sufficient information to document daily field activities. If incorrect entries are made, they will be crossed out with a single line and initialed and dated by the sampler. The field notebook will facilitate preparation of weekly field reports.

6.1.1 Sample Identification and Labeling

All samples collected in the course of the project will be identified by a unique sample identification code. That identification code will be recorded on the sample label affixed to the sample container, in the field log and on the analytical COC form. The sample identification code will be used to track each sample as well as cross-reference sample data with other activities. Sample identification nomenclature for samples will include the matrix code. Matrix codes may be found at the bottom of the EnSafe COC. Sample information, including IDs, sampling depths, and analytical requirements, are shown in Table 3 of the SCWP.

6.1.2 Chain-of-Custody

Sample labels will be attached to all sampling bottles before field activities begin. The sample labels will contain the project name and number, sample location and identification, date and time of collection, sampler's initials, and the parameter(s) for analysis. The number, type of sample, and sample identification will be entered into the field logbook.

A COC form, initiated at the analytical laboratory, will accompany the sample bottles from the laboratory into the field. Upon receipt of the bottles and cooler, the sampler will sign and date the first “Received” blank space. After each sample is collected and appropriately identified, entries will be made on the COC form that include:

- Site name and address
- Samplers' names and signatures
- Names and signatures of persons involved in chain of possession
- Sample number
- Number of containers
- Sampling station identification
- Date and time of collection
- Type of sample and the analyses requested
- Preservatives used (if any)
- Pertinent field data (pH, temperature, turbidity, etc.)

After sampling has been completed, the samplers will return/ship the samples to the laboratory. The sampler will sign and date the next "Relinquished" blank space. One copy of the COC form will remain in the field and the remaining copies will accompany the samples to the laboratory. The laboratory will receive all samples within 24-hours of collection. Samples will be received by laboratory personnel, who will assume custody of the samples and sign and date the next "Received" blank. Example COC form is provided in Figure 1.

6.2 Laboratory Custody Procedures

Upon receipt by the analytical laboratory, samples will proceed through an orderly processing sequence specifically designed to ensure continuous integrity of both the sample and its documentation. All samples will be received by the laboratory's sample control group and will be carefully checked for label identification and completed accurate COC records. The sample will be tracked from storage through the laboratory system until the analytical process is completed and the sample is returned to the custody of the sample control group for disposal.

7.0 CALIBRATION PROCEDURES AND PREVENTATIVE MAINTENANCE

7.1 Field Equipment

EnSafe and any contractors will follow manufacturer's recommendations and guidelines with regard to field instrument calibration procedures. The calibration of each instrument will be checked prior to each day's use. The date and time of the calibration check, instrument serial and model number, and signature of the calibrating technician will be entered into the field logbook and within the instrument specific calibration log. If the instrument readings are incorrect, the instrument will be either recalibrated by the technician or returned to the office/equipment rental company where it will be further evaluated and/or repaired. If field instruments require major overhauls, the instruments will be returned to the manufacturer.

7.2 Laboratory Equipment

The laboratory will calibrate analytical instruments in accordance with the U.S. EPA's published methods, the Laboratory QA Plan, and associated standard operating procedures (SOPs).

8.0 VERIFICATION, VALIDATION, AND REPORTING

The process of verification, validation, and reporting ensures that assessments or conclusions based on the final data accurately reflect actual site conditions. This section presents the specific procedures, methods, and format that will be employed for review, verification, validation, and reporting of each measurement parameter determined in the laboratory and field.

8.1 Field Data Reporting

All field real-time measurements and observations will be recorded in project field books or field data records. Field measurements will include photoionization detector results. All data will be recorded directly and legibly into field logbooks, with all entries signed and dated. If entries are changed, the change will not obscure the original entry. The reason for the change will be stated, and the correction and explanation will be signed and dated at the time the correction is made. Field data records will be organized into standard formats whenever possible, and retained in permanent files. The field data package will include all logbooks, field records, and measurements obtained on-site. The package will be verified by conducting:

- A review of the field data compiled on sampling logs for completeness. Failure in this area may result in the data being invalidated for the intent of the project.

- Verification that field equipment blanks and trip blanks were properly prepared, identified, and analyzed. Failure in this area may compromise the analytical data package and result in some data being considered qualitative or invalid.

- A check on field analyses for equipment calibration and condition. Failure in this area may result in the field measurements being invalid.

- A review of the COC forms for proper completion, signatures of field personnel, and the laboratory sample custodian, and dates. Failure in this area may result in the data being invalid for the purpose of the project.

8.2 Laboratory Data Reporting

All sample data packages submitted by the analytical laboratory will be required to be reported in conformance to the NYSDEC deliverable requirements. The contracted laboratory will review/validate the laboratory data according to their SOPs.

8.3 Validation

The purpose of data validation is to define and document analytical data quality and determine whether the laboratory data quality is sufficient for the intended use(s) of the data. Data validation is the systematic process by which data quality is determined with respect to data quality criteria that are defined in project and laboratory QC programs and in the referenced analytical methods. The data validation process consists of an assessment of the acceptability or validity of project data with respect to stated project goals and requirements for data usability. Ideally, data validation establishes the data quality in terms of project DQOs. Data validation consists of data editing, screening, checking, auditing, certification, review, and interpretation. Prior to data validation, electronic laboratory data will be verified for accuracy against the hardcopy laboratory report. The EnSafe data validator will review the data in accordance with the following documents: *National Functional Guidelines for Superfund Organic Methods Data Review* (U.S. EPA, January 2017a) and *National Functional Guidelines for Inorganic Superfund Methods Data Review* (U.S. EPA January 2017b). Additionally, for PFAS (by U.S. EPA method 537 modified), all manual integrations will be reviewed to ensure integrations of branched and linear isomers have been properly performed. The validator will evaluate the analytical laboratory's ability to meet the DQOs provided in this QAPP. Non-compliant data will be flagged in accordance with “Functional Guidelines” and corrective action will be undertaken to rectify any problems.

8.3.1 Task I: Determine Data Completeness

Each data package will be reviewed for completeness. At a minimum, a complete data package will contain the following components:

- All sample COC forms.
- The case narrative(s) presenting a discussion of any problems and/or procedural changes required during analyses. Also presented in the case narrative are sample summary forms.
- QA/QC summaries.
- All relevant calibration data summaries.
- Instrument and method performance data.
- Documentation demonstrating the laboratory's ability to attain the contract specified method detection limits for all target analyses in all required matrices.

If during the review process it is found that deficiencies exist in the data package, the analytical laboratory will be contacted and given 10 calendar days to produce the documentation needed to remove these deficiencies.

8.3.2 Task II: Determine Data Compliance

Each data package will be reviewed to determine compliance with those portions of this QAPP that pertain to the production of laboratory data. Compliance is defined by the following criteria:

- The data package is complete as defined in Task I above.
- The data have been produced and reported in a manner consistent with the requirements of this plan and the laboratory subcontract.
- All protocol-required QA/QC criteria have been met.
- All instrument calibration requirements have been met for the timeframe during which the analyses were completed.

- All protocol-required initial and continuing calibration summaries have been presented.
- All data reporting forms are complete for all samples submitted. This includes all requisite flags, all sample dilution/concentration factors, and all pre-measurement sample cleanup procedures.
- All problems encountered during the analytical process have been reported in the case narrative along with any and all actions taken by the laboratory to correct these problems.
- Verifying that calibration procedures were followed.
- Verifying that data are reported in correct units.
- Checking 10% of all field calculations.
- Verifying that samples were properly shipped with the appropriate COC documentation.
- Verifying that QC samples were prepared and taken.

The quality assurance officer will perform further review of such data prior to data integration and evaluation. All assigned data reduction or analytical procedures will be verified for accuracy and content by at least two professionals qualified and experienced in evaluating the particular technical specialty.

8.3.3 Laboratory Data

Each analytical package will be reviewed prior to validation for completeness (i.e., *have all the analyses requested been performed?*) and general protocol compliance, such as holding times, detection limits, spike recoveries, and surrogate recoveries. The results of this review will be summarized and submitted with the data package. If information is found to be missing from the data package the analytical laboratory will be contacted and requested to submit any missing information.

8.3.4 Data Quality Assessment

NYSDEC recommends two levels of data review. The basic review is a Data Usability Summary Report (DUSR). Current NYSDEC policy is to require this level of review for analytical data from investigations

on most sites. Full data validation is called for at sites where the data will be used in litigation, or where problems are expected with data quality (such as where matrix interference is expected to be significant). For this investigation a DUSR will be performed. The DUSR will contain a description of the samples and parameters reviewed. Any deficiencies identified during the review will be noted and the effect on the generated data will be discussed. Any re-sampling or reanalysis recommendations will be then be made to the investigation's Project Manager. The results of the evaluation will be incorporated into the final investigative report.

Based on the results of data assessment, the validated analytical results reported by the laboratory will be assigned one of the following U.S. EPA-defined data usability qualifiers:

- U — Not detected at given value
- UJ — Estimated not detected at given value
- J — Estimated value
- N — Presumptive evidence at the value given
- R — Result not useable
- No Flag — Result accepted without qualification

Upon completion of data validation, a data usability analysis will be performed on all analytical laboratory data. Taking into account protocols for sampling, transport, analysis, reduction, reporting, and the DUSR, the quality assurance officer will use this information and his/her own experience to establish whether the results of each analysis can be used for the purpose intended. The quality assurance officer will determine whether the final results can be used as reported, qualified to indicate limitations, or rejected outright.

9.0 INTERNAL QUALITY CONTROL

QC checks will be performed to ensure the collection of representative and valid data. Internal QC refers to all data compilation and contaminant measurements. QC checks will be used to monitor project activities to determine whether QA objectives are being met.

9.1 Analytical Samples

Laboratory and field quality internal control checks will be used to ensure the DQOs and will include:

- Holding times
- Instrument tuning

- Instrument calibrations
- Method and/or instrument blanks
- Internal standards
- Field duplicates
- MS/MSD samples
- Laboratory control spike samples
- Interference check samples
- Surrogate spikes for organic analyses
- Serial dilutions
- Pesticide cleanup
- Result verifications and reported detection limits

9.2 Laboratory Quality Control

The analytical laboratory is required to exercise internal control in a manner consistent with the requirements of this plan. Control checks and internal QC audits are required by the U.S. EPA's published methods. These include reference material analysis, blank analysis, MS/MSD analysis, cleanups, instrument adjustments and calibrations, standards, and internal audits.

One qualified professional will proof and check all final reports for transcription and/or calculation errors. Twenty percent of all final reports will be subsequently checked again by a qualified professional. All data tables will be checked to ensure that no transcription errors have occurred. Data tables will also be checked to ensure that any criteria cited for comparison purposes is appropriate and correctly referenced. All calculations will be checked to ensure that they will be properly presented and that resulting values are achievable. If any results cannot be duplicated the calculations will be independently checked for accuracy.

10.0 PERFORMANCE AND SYSTEM AUDITS

Performance audits may be used to monitor project activities to assure compliance with project DQOs. The following text summarizes the field audits that may be conducted periodically.

10.1 Field Audits

EnSafe will routinely monitor all field activities to ensure that work is done correctly. All sampling and analytical work will be reviewed routinely by the project manager. All data sheets obtained in the field will be initialed and dated by project manager after review and acceptance of the services performed.

Field audits may be performed and will include monitoring and evaluation of sample collection, sample holding times, preservation techniques, field QC, and equipment calibration. These audit forms will be kept on file with the EnSafe project manager for one year after completion of the project, then will be transferred to storage and held for an additional five years.

11.0 CORRECTIVE ACTION

Corrective actions will be implemented if unsatisfactory performance and/or system audit results indicate that problems exist. Corrective action may also be implemented if the result of a data assessment or internal QC check warrants such action.

Field-implemented corrective actions will be documented in the field book and include the reason for the corrective action, a description of the corrective action, and approvals (if necessary).

Corrected action in the laboratory will be completed in accordance with laboratories QA procedures. Any corrective actions completed by the laboratory will be documented in their corrective action files and the narrative data report sent from the laboratory to EnSafe.

12.0 REFERENCES

EnSafe, Inc. *Records Search Report, Sullivan County International Airport, Tax Map/Parcel Nos. 18.-1-16.1, 18.-1-18.3, and 24.-1-1, 75 County Road 183A, Swan Lake, New York 12783.* January 30, 2018.

New York State Department of Environmental Conservation. *Technical Guidance for Site Investigation and Remediation.* May 3, 2010.

United States Environmental Protection Agency. *Low Stress (Low Flow) Purging and Sampling Procedure for the Collections of Groundwater Samples from Monitoring Wells.* 2010, January 19.

— *National Functional Guidelines for Superfund Organic Methods Data Review*. January 2017a.

— *EPA National Functional Guidelines for Inorganic Superfund Methods Data Review*. January 2017b.

Figure

Figure 1 – Example Chain-of-Custody Form

ENSAFE

EnSafe Inc.
800-588-7962

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

COC No. | Page of

Project Name: | PO No. | Project No. | Phase

Site Location: | **Sample Analysis Requested** (*Enter number of containers for each test*)

Send Results To: | (3)→

Sampler/Site Phone#

Lab Name: | Turnaround Time(specify):

Lab ID	Sample ID (sys_samp_code)	Location ID (sys_loc_code)	(mm/dd/yy)	Time (Military) (hhmm)	Matrix Code (1)	Sample Type (2)	Field Filtered (Y/N)	Total No. of Containers											Extra Volume for MS/MSD	HOLD

Field **Comments:**

Lab **Comments:**

Sample Shipment and Delivery Details

Number of coolers in shipment:

Relinquished by (signature)	Date	Time	Received by (signature)	Date	Time
1			1		
2			2		
3			3		

Samples Iced?(check) Yes_____ No_____

Method of Shipment:

Airbill No:

Date Shipped:

(1) Matrix Code: **AA**=Air, **AQ**=Air QC Matrix, **CK**=Caulk, **GS**=Soil Gas, **LF**=Free Product, **LH**=Liquid Waste, **MS**=Mastic, **Oil**=Oil, **PT**=Paint, **SC**=Cement/Concrete, **SE**=Sediment, **SF**=Filter Sandpack, **SL**=Sludge, **SN**=Miscellaneous Solid/Building Materials, **SO**=Soil, **SQ**=Soil/Solid QC Matrix, **ST**=Solid Waste, **SW**=Swab/Wipe, **TA**=Animal Tissue, **TP**=Plant Tissue, **WG**=Ground Water, **WL**=Leachate, **WO**=Ocean Water, **WP**=Drinking Water, **WQ**=Water QC Matrix, **WS**=Surface Water, **SU**=Storm Water, **WW**=Waste Water

(2) Sample Type: **AB**=Ambient Blank, **EB**=Equipment Blank, **FB**=Field Blank, **FD**=Field Duplicate Sample, **FR**=Field Replicate, **MB**=Material Blank, **N**=Normal Environmental Sample, **RB**=Material Rinse Blank, **TB**=Trip Blank

(3) Preservative added: **HA**=Hydrochloric Acid, **NI**=Nitric Acid, **SH**=Sodium Hydroxide, **SA**=Sulfuric Acid, **AA**=Ascorbic Acid, **HX**=Hexane, **ME**=Methanol, **SB**=sodium bisulfate, **ST**=Sodium Thiosulfate, If **NO preservative** added leave blank

Rev. 12/12

Appendix C
Health and Safety Plan

PROJECT HEALTH AND SAFETY PLAN

SULLIVAN COUNTY INTERNATIONAL AIRPORT
75 COUNTY ROAD 183A
SWAN LAKE, NEW YORK 12783

EnSafe Project Number:
0888821949

Prepared for:

Sullivan County Department of Public Works
100 North Street
P.O. Box 5012
Monticello, New York 12701

June 2018

1233 Silas Deane Highway
Wethersfield, Connecticut 06109
860-665-1140 | 800-588-7962
www.ensafe.com

ENSAFE

creative thinking. **custom solutions.**®

Emergency Telephone Numbers

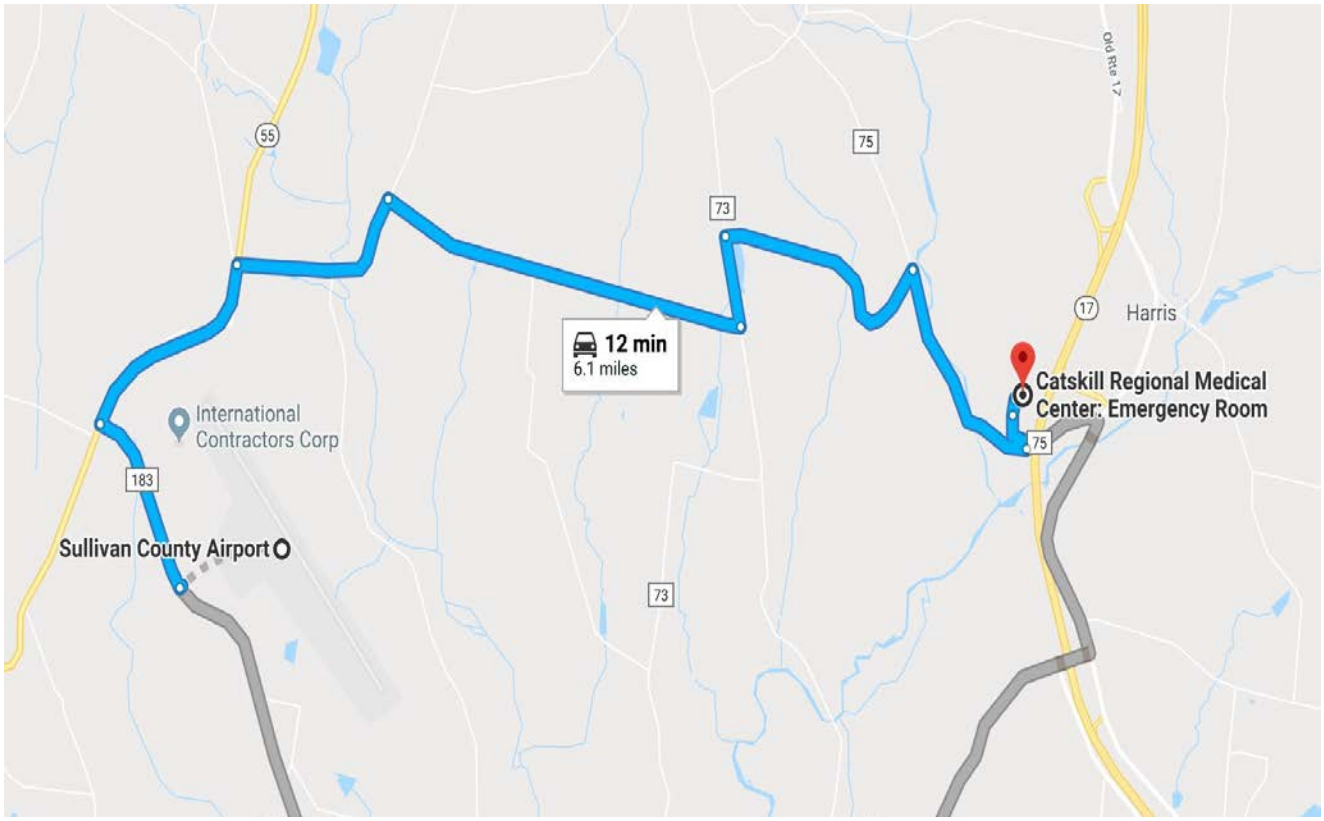
Ambulance — Bethel Volunteer Ambulance	**Emergency 911**
Kauneonga Lake Fire District	**Emergency 911**
Sullivan County Sheriff's Department	**Emergency 911**
Hospital — Catskill Regional Medical Center	(845) 794-3300
Minor Medical Treatment — Catskill Regional Medical Group Urgent Care Facility	(845) 333-6500
National Capital Poison Center	(800) 222-1222

Key Personnel Telephone Numbers

Title	Category	Data
EnSafe Site Supervisor/H&S	Name	TBD
	Work	TBD
	Mobile	TBD
EnSafe Project Manager	Name	Robert McCarthy rmccarthy@EnSafe.com
	Work	(860) 665-1140 x6007
	Mobile	(860) 625-1244
EnSafe Corporate Health and Safety Manager	Name	Mike Palmer mpalmer@EnSafe.com
	Work (direct)	(865) 219-2673
	Work	(865) 693-3623 x5804
	Mobile	(865) 607-1704
EnSafe Local Health and Safety Specialist	Name	Geoff Huit ghuit@EnSafe.com
	Work	(860) 665-1140
	Mobile	(860) 681-1550

In the event that an unpredictable event occurs such as physical injury to onsite personnel, chemical exposure, or fire, EnSafe will coordinate first with the local plant support personnel. Immediately thereafter, the EnSafe Corporate H&S Manager will be informed.

Primary Hospital Directions and Map
Catskill Regional Medical Center
68 Harris-Bushville Road, Harris, New York 12742
(845) 794-3300



Sullivan County International Airport
75 County Road 183A
Swan Lake, New York 12783

- Turn right onto Airport Rd (County Route 183)
- Turn right onto State Route 55 East
- Turn right onto Old White Lake Turnpike
- Turn right onto Fraser Road
- Turn left onto Lt J G Brender Highway (County Route 73)
- Turn right onto Tony A Dworetsky Lane
- Turn right onto Bushville Rd (County Route 75)
- Turn left onto Harris-Bushville Road and into the hospital

Catskill Regional Medical Center
68 Harris-Bushville Road
Harris, New York 12742

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1.0 PURPOSE

This Health and Safety Plan (HASP) was prepared for activities performed at the Sullivan County International Airport (Site) in Swan Lake, New York. This HASP specifies procedures and protective measures to mitigate risks and ensure the health and safety of workers and other individuals in and around the site.

The objective of this project is to conduct a site characterization. EnSafe employees will oversee activities related to a subsurface investigation, which include, but not limited to, drilling for installation of soil borings and monitoring wells.

The provisions of this plan are mandatory for all EnSafe personnel and EnSafe subcontractors associated with installation activities at the Site. All onsite EnSafe personnel shall read this plan and sign the accompanying plan acceptance form, located in Appendix A, before performing any site activities. EnSafe subcontractors will not sign this plan.

The following Code of Federal Regulations also apply and will be followed: Title 29 Code of Federal Regulations Part 1910.120, Standards for Hazardous Waste Operations and Emergency Response (HAZWOPER). These regulations include the following provisions for employees: training, Section 1910.120(e); medical surveillance, Section 1910.120(f); personal protective equipment (PPE), Section 1910.120(g), and requirements of a site safety and health plan 1910.120(b)(4)(ii).

It is the obligation of every employee to work safely, to help ensure the safety of his/her coworkers, and to bring any potential or previously unrecognized hazard to the attention of the EnSafe site supervisor. EnSafe will suspend site work and will instruct all personnel to evacuate the area under the following conditions:

- If inadequate safety precautions are being taken
- If it is believed that site personnel may be exposed to an immediate health hazard

In the event of an emergency, refer to the Emergency Action Plan located in Appendix B. Emergency contacts for police, EMS, fire, and corporate are located in Appendix C. Also included are directions to the emergency medical care driving directions, Appendix D. Appendix E presents detailed information on biological and chemical hazards and Appendix F presents job hazard analyses (JHAs) for known process hazards.

Compliance with the HASP will be verified by periodic safety audits, as needed, to be conducted by the site health and safety specialist, or his or her designee.

2.0 SITE DESCRIPTION

Table 2-1
General Information

Site Name:	Sullivan County International Airport
Site Location:	75 County Road 183A, Swan Lake, New York
Tasks Included:	Subsurface investigation (drilling)
Hours of operations:	Work will be conducted mainly during daylight hours
Potable drinking water:	Bottled water and/or coolers will be provided
Toilet facilities:	Toilet facilities are available onsite

The Sullivan County International Airport in Swan Lake, New York, is a 603-acre airport located off of County Route 183 in the Town of Bethel. All work covered in this HASP will be performed onsite. Work performed at the site will be the installation of soil borings and monitoring wells.

Chemicals of concern at the site are volatile organic compounds (VOCs), specifically, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), which are likely to only be present in soil and groundwater below the water table, or in cuttings or water brought to the surface.

EnSafe will provide oversight for all intrusive work. Drilling depths will range from 10 to 20 feet below ground surface (bgs) for soil borings, and may extend up to approximately 150 feet bgs for monitoring well installation. EnSafe field personnel will use a photoionization detector (PID) to test each soil sample in order to ensure safety for all EnSafe employees in the sample area. EnSafe will also perform community air monitoring in accordance with New York State Department of Health Generic Community Air Monitoring Plan, Appendix 1A of Technical Guidance for Site Investigation and Remediation (DER-10).

3.0 DOCUMENTATION AND PROCEDURES

All injuries, accidents, near misses, and spills must be reported immediately to the EnSafe Corporate Health and Safety Manager. Injuries related to or on a client project will be reported within the same shift that the injury becomes known.

Forms to document items are included *Appendix A*:

- Health and Safety Plan Acceptance Form
- Daily Safety Meeting
- Safety Work Permit Form
- Utility Checklist
- Investigation Report Form
- Daily Air Monitoring Forms

Onsite Reviews/Audits

Onsite reviews/audits will be conducted on a weekly basis by the site health and safety specialist, or designee.

Post-Work Debriefing Reviews

Post-work debriefing reviews will be scheduled on an as-needed basis. JHAs and other field procedures will be evaluated periodically to determine appropriateness to site tasks. Procedures will be reviewed with EnSafe personnel and subcontractors, as needed, to assess lessons learned.

Incident/Accident Procedures

In the event of a serious near miss or an accident on the jobsite an Incident Investigation Report will be conducted to determine the root cause of each incident and determine the appropriate corrective action(s) to prevent the event from occurring again. In the event of an incident / accident the site will immediately notify the EnSafe Corporate Health and Safety Manager. The Project Manager and Corporate Health and Safety Manager will then initiate the investigation process using the site employees and site subcontractors as an investigative team. The results of the investigation will be shared with all applicable parties including the client. Work shall be halted until any immediate unsafe acts and or conditions are mitigated. A blank copy of the incident / accident investigation for can be found in Appendix A (forms).

4.0 ROLES AND RESPONSIBILITIES

Everyone plays a role in the safety process while on an EnSafe site. Listed below are the responsibilities of each group of people.

4.1 Corporate Health and Safety Manager

- Ensure all management and affected employees are aware of the *EnSafe Corporate Safety Management System* and enforce the same.

4.2 Site Health and Safety Specialist

- Coordinate and manage the overall health and safety program.
- Advise Corporate Health and Safety Manager of any program deficiencies noted requiring their action or involvement.
- Periodically review jobs or work areas for engineering, administrative, or other controls that would preclude the need for PPE.
- Authorize JHA reviews when determined necessary.
- Make routine surveys of work areas to ensure utilization of PPE by employees in applicable areas or job tasks.
- Oversee and provide guidance for JHAs, and inform applicable staff when PPE requirements are modified.
- Maintain all training records for HASP training.

4.3 Site Supervisor

- Oversee and direct all onsite task activities to address client project demands.
- Hold all site personnel accountable to the requirements as set forth in this HASP.

4.4 Employees

- Obey all established requirements outlined in the HASP.
- Use PPE supplied by the company in all applicable areas and while performing designated tasks.
- Use all existing engineering controls, work practice controls, and/or administrative controls provided.
- Inform supervisor if PPE may not be providing the appropriate level of protection.
- Affected employees must participate in training sessions as scheduled.
- Require the use of PPE for subcontractor personnel in all PPE-required areas. Make sure subcontractors are aware that disregarding PPE regulations will result in disciplinary action which may include removal from the job.
- Follow all directions given by the Site Supervisor and Site Health and Safety Specialist, or designee.

5.0 SITE HAZARDS

The sections below will outline the associated site hazards to be aware of while onsite and conducting work.

Following is a list and brief description of the onsite hazards that could reasonably be expected to be encountered during onsite activities. Following the description of onsite hazards are the general protective measures which will be employed to reduce the risk posed by each.

5.1 Physical Hazards

Field personnel should be aware of and act to minimize dangers associated with physical hazards typically encountered during intrusive activities. These hazards include under and above-ground utilities; hot, cold, and severe weather; biological hazards; noise; and process hazards, such as heavy equipment, which are explained in more detail in Appendix F.

5.1.1 Underground Utilities

A utility clearance will be performed at the site. New York One Call shall be contact to locate all possible underground utilities at this site.

5.1.2 Above-ground Utilities

A visual inspection of the site should be conducted to locate any above ground utilities. A minimum 10 feet clearance should be maintained from any line of 50 kilovolt (kv) or less. As a best practice EnSafe does not allow drilling underneath power lines unless cleared with the Corporate Health and Safety Manager.

5.1.3 Procedures for Hot and Cold Weather

The Site Supervisor will evaluate the expected temperature for the day before arriving at the site. If the initial ambient air temperature is indicated to be below 40ºF or above 90ºF, site workers will be monitored for heat and cold exposure. All temperature measurements will be recorded in the Site Safety Log, a sample page from which is included in Appendix A.

Cold Exposure

Site workers will be actively monitored for the following symptoms of hypothermia if protracted (i.e., >1 hour in duration) onsite operations are conducted when the air temperature is below 40ºF:

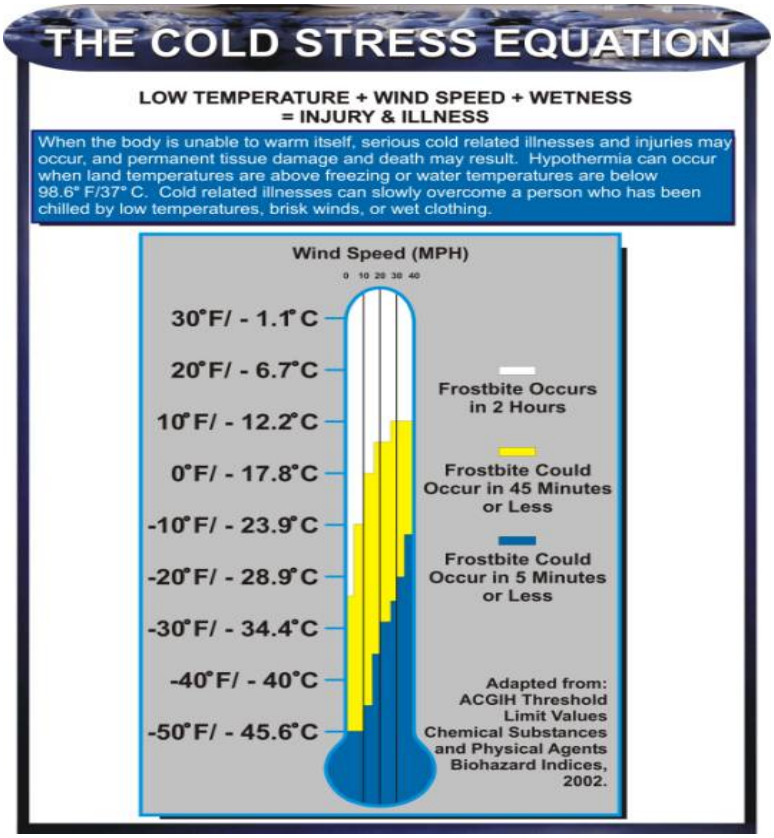
- Speech problems (e.g., slurring),
- Skin with "goose bumps" and a bluish or "dead white" appearance,
- Vertigo, and/or
- Intense shivering.

If a worker develops one or more of these symptoms, he/she will immediately be taken to a warm, sheltered area and his/her oral temperature taken. Any worker thus affected will remain in the sheltered area until his/her temperature is measured at 98.6ºF and/or the above-mentioned symptoms desist. Any worker exhibiting an oral temperature below 95ºF or who loses consciousness will immediately be transported to Catskill Regional Medical Center, 68 Harris-Bushville Road, Harris, New York 12742

If protracted onsite activities are undertaken in air temperatures lower than 40ºF, site workers will be monitored for the following signs of frostbite:

- Extreme pain and cold in exposed area(s) of skin;
- Loss of dexterity;
- Numbness; and/or
- Pale or blotchy skin.

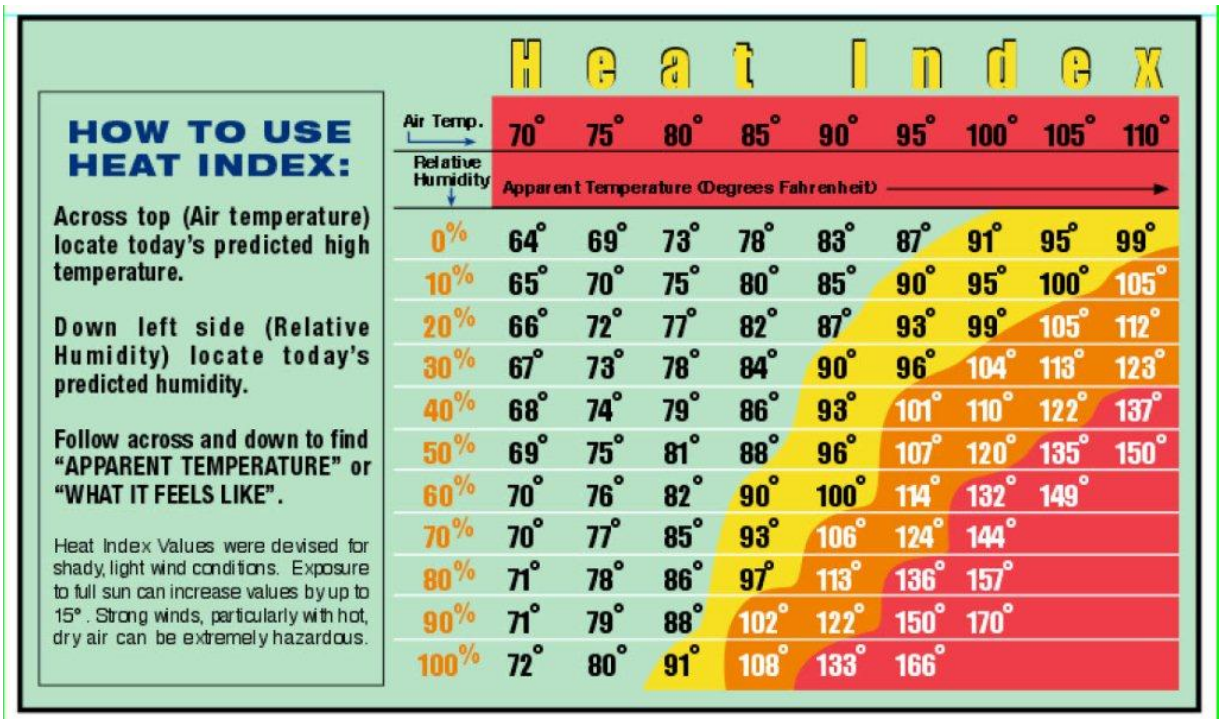
Any site worker exhibiting one or more of these symptoms will be withdrawn from the site to a warm, sheltered area and his/her affected extremities will be warmed (without rubbing). If symptoms persist or if true frostbite is suspected, the subject will be transported to the hospital immediately.



Heat Exposure

If protracted site operations are conducted when air temperatures are above 90ºF, site workers will be monitored for the following signs and symptoms of heat-related illnesses:

- Hot, dry skin (usually red or mottled) or clammy, moist skin (with pale complexion)
- Confusion
- Loss of consciousness, fainting
- Nausea
- Fatigue
- Giddiness



HOW TO USE HEAT INDEX:

Across top (Air temperature) locate today's predicted high temperature.

Down left side (Relative Humidity) locate today's predicted humidity.

Follow across and down to find "APPARENT TEMPERATURE" or "WHAT IT FEELS LIKE".

Heat Index Values were devised for shady, light wind conditions. Exposure to full sun can increase values by up to 15°. Strong winds, particularly with hot, dry air can be extremely hazardous.

Heat Index

Air Temp. → / Relative Humidity ↓	70°	75°	80°	85°	90°	95°	100°	105°	110°
	Apparent Temperature (Degrees Fahrenheit) →								
0%	64°	69°	73°	78°	83°	87°	91°	95°	99°
10%	65°	70°	75°	80°	85°	90°	95°	100°	105°
20%	66°	72°	77°	82°	87°	93°	99°	105°	112°
30%	67°	73°	78°	84°	90°	96°	104°	113°	123°
40%	68°	74°	79°	86°	93°	101°	110°	122°	137°
50%	69°	75°	81°	88°	96°	107°	120°	135°	150°
60%	70°	76°	82°	90°	100°	114°	132°	149°	
70%	70°	77°	85°	93°	106°	124°	144°		
80%	71°	78°	86°	97°	113°	136°	157°		
90%	71°	79°	88°	102°	122°	150°	170°		
100%	72°	80°	91°	108°	133°	166°			

Any site worker exhibiting one or more of these symptoms will be withdrawn from the site to a cool, sheltered area for further evaluation. If symptoms persist, the subject will be transported to the hospital. Also, any site worker who loses consciousness will immediately be transported to the hospital.

5.1.4 Severe Weather

Fieldwork shall not be conducted when lightning can be seen or thunder heard from the work area. When lightning and/or thunder occur, employees are to cease work, perform emergency personal and equipment decontamination as needed, then seek shelter. Work shall not resume until lightning and/or thunder have not been detected for a period of not less than 15 minutes.

During extreme weather conditions, the Site Supervisor shall use his best judgment and has the authority to stop fieldwork or dismiss workers for the day. Examples of conditions that may warrant work stoppage include: tornado warnings, high winds, hail, and flooding.

5.1.5 Biological Hazards

Biological hazards that may be present at hazardous waste sites include poisonous plants, insects, animals, and indigenous pathogens. Additional information regarding these hazards is provided below and included in Appendix F.

Ticks

Ticks are present at the site. It is important to remember that ticks are active year round, even with snow cover and temperatures below freezing. When working at the site personnel should wear light colored clothing and shirts with long sleeves. Pants should be tucked into socks. Alternatively, tick gaiters can be worn. Long loose hair should be covered, braided, or otherwise tied back.

Tick repellant sprays may be used. Products containing DEET can be used to treat clothing or be sprayed onto the skin. Permethrin can be used, but this spray should only be used on clothing and never on skin. It is recommended to pretreat your clothes with Permethrin prior to an event. For all sprays, follow the manufacturer's recommendations.

If a worker is bitten the tick should be removed promptly. The following steps should be taken:

1. Using fine pointed tweezers, grasp the tick as close to the skin as possible without squeezing the tick's body.
2. Firmly pull it straight out. Expect to feel some resistance. Save the tick for future testing by placing it in a plastic bag or in a small jar of alcohol. If a tick is to be tested for spirochetes place it in a small jar or vial with a blade of grass to keep it alive. Be sure to note the date and site of the bite for future reference.
3. Never squeeze the tick, burn it, or cover it with Vaseline or any other substance.
4. Remember to disinfect the site of the bite, wash hands and disinfect the tweezers.
5. Contact a doctor.

Additionally, tick checks should be performed at the end of each work day.

Mosquitos

Mosquitos are present at the site. Mosquitos bites potentially carry disease, such as West Nile Virus, and Eastern Equine Encephalitis. As with ticks, the best protection is long sleeved shirts and sprays containing DEET or Permethrin.

Other Insects and Spiders

The site is home to a variety of insects. Some, such as bees, wasps, spiders, and ants, can make nests inside monitoring wells or other site features. Bug spray or wipes can be used to mitigate the chance of injury. Caution should be used when opening monitoring wells to ensure that site personnel are not bitten or stung. If a site worker is bitten or stung make sure to clean and disinfect the wound. Some people may be allergic to certain insects or spiders and may suffer reactions. The most extreme reaction is allergic reaction is anaphylaxis, however, other symptoms may include:

- hives

- shortness of breath
- wheezing
- weakness
- sweating
- chills
- headache
- body aches
- stomach cramps
- leg cramps
- rapid pulse
- exhaustion

If a site worker displays any of these symptoms, take them to the Catskill Regional Medical Center or call 911.

Poisonous Plants and Thorn Brambles

Poison Ivy. Poison Oak, and Poison Sumac all possess an irritating, oily sap called urushiol that typically triggers allergic reactions when it comes into contact with the skin.

Wearing protective clothing (i.e., long-sleeve Tyvek), use of protective creams, and using good personal hygiene practices will reduce the potential suffering from contact with poisonous plants such as poison ivy.

If a site worker comes in contact with Poison Ivy, Poison Oak, or Poison Sumac, it should be treated with a lotion such as Tecnu. Rub the affected area with Tecnu to remove the urushiol oil and alleviate the itching and/or rash. If symptoms persist, see a doctor.

Poisonous Snakes and Reptiles

Poisonous snakes and reptiles may be a nuisance in any investigation area. When working in areas that support habitat for poisonous snakes or reptiles, personnel shall wear protective chaps made of heavy puncture-resistant material designed to prevent snake bites to the legs. Anytime personnel are required to work in an area that supports habitat for snakes or reptiles, the buddy system will be employed where no less than two people may work in an area and they must remain in eye contact with each other.

If a snake or reptile is encountered, at no time should personnel attempt to confront it. If the snake or reptile does not leave the immediate work area, work shall be shifted to another area until the snake or reptile leaves.

If personnel are bitten by a snake or reptile, the buddy must keep the victim calm and keep the bitten area below the level of the heart. The buddy will then contact emergency services and prepare for transportation to the nearest emergency room.

Before initiating work in an area that supports habitat for snakes, tall grasses and scrub brush will be mowed or cleared to decrease the possibility of snake or reptile encounters.

5.1.6 Noise Control

Personnel shall wear appropriate hearing protection devices in areas where sound levels could exceed federal OSHA permissible exposure limit for noise of 85 decibels measured on the A-weighted scale for an 8-hour time-weighted average, including when drill rigs or other heavy machinery is operating. A rule of thumb is to wear hearing protection if personnel must raise their voices to be heard at arm's length.

5.1.7 General Rules of Conduct

The following general rules of conduct are required for anyone working on this project:

- Liquor, firearms, narcotics, tape recorders, and other contraband items are not permitted on the premises.
- Any violation of local, state, or federal laws, or conduct outside the generally accepted moral standards of the community is prohibited.
- Willfully damaging or destroying property, or removing records is forbidden.
- Misappropriation or unauthorized alteration of any record is forbidden.
- Gambling in any form, selling tickets or articles, taking orders, soliciting subscriptions, taking up collections, etc., is forbidden.
- Compliance with posted signs and notices is required.
- Boisterousness and noisy or offensive work habits, abusive language, or any oral, written, symbolic, or other communication that tends to disrupt work or morale of others is forbidden.
- Fighting or threatening bodily harm to another is forbidden.
- Defacing any property is forbidden.

5.1.8 Medical Monitoring Program

Medical monitoring is a necessary part of the health and safety program at EnSafe. All employees are required to participate in the program and undergo yearly checkups or as needed. The EnSafe Medical Monitoring Program is outlined in the *EnSafe Corporate Safety Management System.*

5.2 Chemical Hazards

Health and safety protocols and PPE have been selected to protect against hazards presented by materials that may be encountered during system installation activities. The chemicals of concern are VOCs, specifically PCE and TCE.

5.3 Process Hazards

The process hazards, such as heavy machinery, equipment, and excavation safety, are described in detail in the JHAs located in Appendix F.

5.4 Vehicle Hazards

Site activities will be performed in an active airport. EnSafe personnel and EnSafe subcontractors shall maintain a physical boundary of the work area to maintain safety of the workers and public in the work area. Daily work activities will be coordinated with airport personnel to ensure a smooth flow of vehicle and airplane traffic in the vicinity of work areas. If an airplane needs to come in close proximity to the work area, a stop-work may be issued if needed.

6.0 SITE CONTROL AND DELINEATION

The work zone will be divided into three areas: a support zone, a contaminant reduction zone, and an exclusion zoned based on the degree of danger present. To the extent possible, the support and contaminant reduction zones will be established outside of the exclusion zone.

6.1 Support Zone

The support zone will be located outside of the exclusion zone. Personnel allowed in this area include all site personnel, visitors, and representatives of regulatory agencies and observes. No particular training or personal protective devices are needed in the support zone.

6.2 Contaminant Reduction Zone

The contaminant reduction zone will be located between the support zone and the designated exclusion zone. In this area, authorized personnel will don PPE that is needed in the exclusion zone. When exiting the exclusion zone, personnel will remove contaminated PPE in this zone.

6.3 Exclusion Zone

The exclusion zone is the immediate work area and adjacent area as defined by EnSafe personnel and subcontractors.

7.0 PERSONAL PROTECTIVE EQUIPMENT

The purpose of this section is to establish and maintain PPE that protects employees from hazards present on the jobsite.

7.1 Job Hazard Analysis

Where one does not already exist, a JHA will be conducted to determine the appropriate PPE for any task. JHA reports will be maintained by the Site Health and Safety Specialist, or designee. JHAs will be reviewed for accuracy according to the following schedule.

- Whenever a change in production, process, equipment, or controls may result in additional or different hazards.
- When an incident is reported that indicates the proper level of PPE may not be assigned for a particular task or job.
- Every three years (i.e., three years from the last review date).

Task specific JHAs are included in Appendix F.

The PPE for each task/position will be selected by the Site Health and Safety Specialist, or designee using the JHA and other resources.

7.2 Control Method Approach

EnSafe will use common hazard reduction approaches to control or reduce workplace hazards. They are, in order of preference:

- Engineering controls
- Substitution or elimination
- Process changes
- Isolation of the hazard
- Guarding, tools, and barriers
- Work practice controls
- Administrative controls
- PPE

When economically and technically feasible, EnSafe will initially attempt to reduce jobsite hazards through engineering and work practice controls. When these efforts have been exhausted or considered not to be feasible, administrative controls and PPE will be utilized.

7.3 Minimum Requirements for PPE

General PPE for this site includes:

- Hard hat
- Safety glasses
- Steel or composite-toed safety boots
- Leather gloves
- Nitrile gloves

Whenever a general type of PPE is required, either as a companywide requirement or for a specific task, it will meet or exceed the following requirements. All PPE to be used must meet or exceed all applicable American National Standards Institute standards.

PPE requirements are subject to change as site information is updated or changes. **The site Health and Safety Officer must review or make a decision to deviate from specified levels of PPE as contained in this HASP.** Table 6-1 presents the levels of PPE which may be employed onsite, and the criteria for upgrades.

Table 7-1
Level of Protection and Criteria

Level of Protection	Criteria for Use	Equipment
Level A	▪ When atmospheres are "immediately dangerous to life and health" (IDLH according to the *NIOSH/OSHA Pocket Guide to Chemical Hazards* or other guides). ▪ When known atmospheres or potential situations exist that could affect the skin or eyes or be absorbed into the body through these surfaces. Consult standard references to obtain concentrations hazardous to skin, eyes, or mucous membranes. ▪ Potential situations include those where immersion may occur, vapors may be generated, or splashing may occur through site activities. ▪ Where atmospheres are oxygen-deficient. ▪ When the type(s) and or potential concentration of toxic substances are not known.	▪ Positive-pressure, full facepiece, self-contained breathing apparatus (SCBA) or supplied air respirator (SAR) with escape SCBA. ▪ Fully encapsulating chemical-protective suit. ▪ Chemical-resistant inner and outer gloves. ▪ Steel toe and steel shank chemical-resistant boots. ▪ Hard hat under suit. ▪ Two-way radios worn inside suit. ▪ Optional: coveralls, long cotton underwear, disposable protective suit, gloves and boots, over fully encapsulating suit.
Level B	▪ When respiratory protection is warranted and cartridge respirators are not appropriate. Examples of these conditions are: ▪ When work area may contain less than 19.5% oxygen, ▪ When expected contaminants do not have appropriate warning properties, e.g., vinyl chloride, or ▪ When cartridges are not available to protect against all chemicals of potential concern.	▪ Chemical-resistant coveralls (Saranex or equivalent). ▪ Positive-pressure, full-face SCBA or SAR with escape bottle. ▪ Hard hat. ▪ Chemical-resistant outer and inner gloves. ▪ Steel toe and steel shank boots. ▪ Chemical-resistant outer boots.
Level C	▪ When respiratory protection is warranted and cartridge respirators are appropriate. ▪ When FID readings exceed the action level. ▪ When air monitoring indicates airborne concentration of a chemical is 50% or more of the Permissible Exposure Limit or Threshold Limit Value. ▪ When the work area contains at least 19.5% oxygen.	▪ Chemical-resistant coveralls (Tyvek or equivalent). ▪ Full-face, air-purifying respirator equipped with cartridges suitable for the hazard. ▪ Hard hat. ▪ Chemical-resistant outer and inner gloves. ▪ Steel toe and steel shank boots. ▪ Disposable outer boots.
Modified Level D	▪ When chemical contamination is known or expected to be present, yet inhalation risk is low and respiratory protection is not required. ▪ Site contaminants may be absorbed through the skin.	▪ Chemical-resistant coveralls (optional). ▪ Chemical-resistant outer gloves; inner gloves or glove liners, optional. ▪ Steel toe and steel shank boots.

Table 7-1 Level of Protection and Criteria		
Level of Protection	**Criteria for Use**	**Equipment**
	▪ The "default level" of PPE required when the HASP does not specify another level of PPE. ▪ When minimal or no chemical contamination is expected. ▪ When HASP specifies Level D protection is adequate. ▪ When the work area has at least 19.5% oxygen.	▪ Hard hat. ▪ Safety glasses with side shields or safety goggles. ▪ Optional: chemical-resistant outer boots. ▪ Inner gloves or chemical-resistant gloves needed to handle soil or water samples. ▪ Optional: coveralls and disposable outer boots. ▪ Work clothes.

Level C will be required for a continuous flame ionization detector (FID) reading of 5 parts per million (ppm) or greater in the breathing zone, more than 50% of the OSHA Permissible Exposure Limit or American Conference of Governmental Industrial Hygienists Threshold Limit Value, whichever is lower, or 25 milligrams per kilogram total pesticide. If FID readings exceed 200 ppm in the breathing zone, Level B PPE will be required. These requirements are subject to change as site information is updated or changes.

7.4 Eye Protection

- The side of the eye will be protected by using clear side shields or a "wraparound" glass style that provides similar coverage with a minimum of optical distortion.
- Side shields will be rigid with firm mounts to the temple bars. Slip-on disposable side shields do not offer sufficient protection and are prohibited.
- Contact lenses may be worn under safety glasses, except during hot work (welding/cutting), when materials that are irritating to the eyes are being handled, or when the employee is working with solvents.
- Any task or risk area involving exposure to liquid thermal; liquid or solid corrosive; skin toxic; high-pressure, high-velocity liquid, or solid streams; or radiation hazards will have either safety glasses supplemented by a face shield, chemical splash goggles and face shield, chemical splash goggles, or tinted lenses, depending on a risk assessment of the operation. The use of a face shield by itself does not provide adequate eye protection from chemical splashes.
- Impact resistance and other certification requirements such as combustibility will be referenced against the American National Standards Institute Z87.1, which will be the minimum requirement.

7.5 Hearing Protection

- Hearing protectors will be selected and worn to attenuate noise to below 85 decibels adjusted.
- Hearing protection is necessary during most activities.
- All hearing protection devices will be used in accordance with the EnSafe Hearing Conservation Program.

7.6 Foot Protection

- All foot protection must be equipped with hard toes, nonskid soles, and a defined heel.
- Safety footwear will have closed toes and sides.
- The footwear's upper part will be made of leather or another nonwoven or non-knit (e.g., felt) equivalent.
- Safety footwear requiring other features such as elongated boot uppers (i.e., boots vs. shoes), protective shank, or metatarsal guards will be required if determined necessary by the JHA.
- Sandals, moccasins, woven cloth tennis shoes, open-toe shoes, and high-heel shoes are not permitted in areas requiring safety shoe usage, unless specifically authorized by the Corporate Health and Safety Manager.

7.7 Skin Protection (Clothing)

- Clothing will be worn to protect the body from direct and indirect contact with hazardous chemical, physical, thermal, and mechanical energies as identified in the individual JHA.
- Short-sleeved shirts and long pants are the minimum required clothing.

7.8 Skin Protection (Gloves)

- Glove types suitable to the hazard will be selected and worn as identified in the individual JHA or as selected by the Site Health and Safety Specialist, or designee.
- The two basic glove types are: impervious gloves for working with solvents, acids, and caustics, and cloth gloves for handling rough or sharp materials.

7.9 Respiratory Protection

Respiratory protection is not anticipated on this project. If a need for such protection is suspected the following will apply:

- Respiratory protection devices suitable to the hazard will be selected and worn as identified in the individual JHA or as selected by the Corporate Health and Safety Manager.
- All respirators will be used in accordance with the EnSafe Respiratory Protection Program.

7.10 Head Protection

Head protection (e.g., hard hats, bump caps) suitable to the hazard will be selected and worn as identified in the individual JHA or as selected by the Site Health and Safety Specialist, or designee.

7.11 Vehicle Occupant Protection

Seat belts will be worn by EnSafe employees and passengers traveling in over-the-road vehicles such as cars, vans, or trucks when traveling at the site.

8.0 JOB TASKS

The following tasks will require the use of a JHA:

- drilling and well installation

A JHA is included in Appendix F for this task.

EnSafe will provide oversight for all intrusive work. Drilling depths will range from 10 to 20 feet bgs for soil borings, and may extend up to approximately 150 feet bgs for monitoring well installation.

9.0 AIR MONITORING REQUIREMENTS

EnSafe field personnel will use a PID to test each soil sample in order to ensure safety for all EnSafe employees in the sample area. EnSafe will also perform community air monitoring in accordance with New York State Department of Health Generic Community Air Monitoring Plan, Appendix 1A of Technical Guidance for Site Investigation and Remediation (DER-10).

10.0 DECONTAMINATION

To the maximum extent possible, dedicated and disposable sampling equipment will be utilized to avoid the potential for cross contamination of samples due to inadequate decontamination processes. The dedicated/disposable sampling equipment will include disposable polyethylene tubing, disposable gloves, and laboratory-supplied sample bottles.

Non-disposable or non-dedicated sampling equipment (e.g., peristaltic pumps, water level indicators, water quality meters, etc.) will be decontaminated prior to sampling and between samples. Cleaning of equipment is performed to prevent cross-contamination between samples and to maintain a clean working environment for all personnel. Decontamination will generally consist of a water rinse station to remove gross contamination (if needed), followed by a non-phosphate detergent (e.g., Liquinox) water rinse, and a rinse with de-ionized water (provided by the laboratory). Paper towels containing recycled paper content are prohibited. Additional decontamination shall be handled according to the *EnSafe Corporate Safety Management System* (Appendix G).

The drilling subcontractor will decontaminate any downhole equipment (augers, rods, spoons, etc.) prior to the start of drilling and after each boring by washing with a Liquinox wash and rinse using clean water.

11.0 SANITARY FACILITIES AND LIGHTING REQUIREMENTS

Sanitary facilities, permanent or temporary, will be provided on the job site. EnSafe will utilize agreed upon sanitation facilities on-site. The requirements for sanitary facilities onsite will meet all applicable standards found in 29 CFR 1910.120(n)(3).

12.0 QUALIFICATIONS AND TRAINING

The following table outlines the requirements for EnSafe employees to work at the site.

Title	40-Hour OSHA 8-Hour Refresher	Medically Monitored	Site-Specific Training	First Aid/CPR	Fire Extinguisher
EnSafe Personnel	Yes	Yes	Review of this HASP	Yes	Yes

Copies of training records for employees are included onsite.

Appendix A
Forms

Project Health and Safety Plan

INSTRUCTIONS: This form is to be completed by each person working on the project work site.

Project:

I represent that I have read and understand the contents of the above plan and agree to perform my work in accordance with it.

Signed: _____

Print Name: _____

Company: _____

Date: _____

ENSAFE

DAILY SITE SAFETY MEETING
ACKNOWLEDGMENT FORM

Date: _____ Project Name: _____

Project Address: _____

Meeting Conducted By: _____

Section 1: ***Today's Operations***

_____

_____

_____

_____

Section 2: ***Health and Safety Topics***

_____

_____

_____

_____

Section 3: ***Special Considerations***

_____

_____

_____

_____

Section 4: ***Acknowledgments***

I acknowledge that I attended this safety meeting. I have been informed of today's operations and specific health and safety concerns. I agree to work to the Health and Safety Plan guidelines and understand that failure to do so could result in removal from the site and/or termination.

Printed Name	Signature	Organization

Printed Name	Signature	Organization

ENSAFE

Safe Work Assessment & Permit (SWAP) – T3

This form must be filled out daily prior to any work in the field and reviewed with all project personnel in a daily safety brief.

Project Information

Project/Client Name: _____ **SWAP Date:** _____

Location or Address: _____ **Site Emergency #:** _____

General Description of Today's Work: _____

Critical Safety Tasks: (if yes, call Corporate H&S (901) 451-1464 or Sr. Safety PM, unless approved HASP is in place)

	Yes	N/A		Yes	N/A
Work in confined spaces or excavations	☐	☐	Use of LOTO or live electrical work	☐	☐
Hazardous chemical exposure requiring respirator	☐	☐	Working at unguarded heights greater than 4 feet	☐	☐

Common Hazards				
	Driver safety, distractions, etc.	Vehicle, Fork truck, Equip.	Hand or Power tools	Limited communication
	Climbing ladders, elevated work	Ergonomic hazards	Drilling hazards	Inclement weather
	Lifting/hoisting equip.	Chemical, Noise Exposures	Underground utilities	Extreme hot or cold
	Trips/falls, slick/uneven surfaces	Sharp/rough edges, etc.	Moving/unguarded equipment	Spiders, ticks, poison ivy, etc.

List each task, list the hazards and identify controls you will take to control the hazards and reduce risk.

NOTE: *For special PPE such as gloves, respirator, clothing, etc., list the specific type (e.g., full face respirator w/organic vapor cartridge).*

Task 1:								
Hazards:								
Controls:								
PPE:	Hard Hat Safety Glasses Goggles	☐ ☐ ☐	Face Shield Ear plugs Safety Shoes	☐ ☐ ☐	Gloves (specify type) High-Viz Vest Protective Clothing	☐ ☐ ☐	Respirator ☐ Additional PPE:	
Task 2:								
Hazards:								
Controls:								
PPE:	Hard Hat Safety Glasses Goggles	☐ ☐ ☐	Face Shield Ear plugs Safety Shoes	☐ ☐ ☐	Gloves (specify type) High-Viz Vest Protective Clothing	☐ ☐ ☐	Respirator ☐ Additional PPE: Additional PPE:	

Emergency Contact Info: Corporate Safety (Mike Palmer): 901-451-1464 - Corporate HR: 800-588-7962

Update SWAP as needed throughout the day. Keep focused on Recognizing Hazards and

I understand the hazards and will utilize the controls and PPE as noted above. (all EnSafe personnel and subcontractors*)

Name	Name

*** Subcontractors must provide their own job hazard analysis tool to validate their tasks and controls. Subcontractors signing on this document merely verify that they participated in the EnSafe safety meeting.**

SWAP Originator:

- ✓ **Return completed form to your Project Manager or save in Project File**
- ✓ **Contact EnSafe Corporate H&S if you have any questions: (901) 451-1464**

THE LOCATION WHERE THE WORK IS TO BE DONE HAS BEEN EXAMINED AND NECESSARY PRECAUTIONS TAKEN FOR THE WORK.
I certify that the above-listed project has been evaluated for hazards and personal protective measures assigned and communicated with all EnSafe personnel on the jobsite. Changes in scope of work or work conditions may require the modification of existing SWAP or creation of a new SWAP.

List each task, list the hazards and identify controls you will take to control the hazards and reduce risk.									
NOTE:	For special PPE such as gloves, respirator, clothing, etc., list the specific type (e.g., full face respirator w/organic vapor cartridge).								
Task 3:									
Hazards:									
Controls:									
PPE:	Hard Hat Safety Glasses Goggles	☐ ☐ ☐	Face Shield Ear plugs Safety Shoes	☐ ☐ ☐	Gloves (specify type) High-Viz Vest Protective Clothing	☐ ☐ ☐	Respirator ☐ Additional PPE:		
Task 4:									
Hazards:									
Controls:									
PPE:	Hard Hat Safety Glasses Goggles	☐ ☐ ☐	Face Shield Ear plugs Safety Shoes	☐ ☐ ☐	Gloves (specify type) High-Viz Vest Protective Clothing	☐ ☐ ☐	Respirator ☐ Additional PPE:		
Task 5:									
Hazards:									
Controls:									
PPE:	Hard Hat Safety Glasses Goggles	☐ ☐ ☐	Face Shield Ear plugs Safety Shoes	☐ ☐ ☐	Gloves (specify type) High-Viz Vest Protective Clothing	☐ ☐ ☐	Respirator ☐ Additional PPE:		
Task 6:									
Hazards:									
Controls:									
PPE:	Hard Hat Safety Glasses Goggles	☐ ☐ ☐	Face Shield Ear plugs Safety Shoes	☐ ☐ ☐	Gloves (specify type) High-Viz Vest Protective Clothing	☐ ☐ ☐	Respirator ☐ Additional PPE:		
Task 7:									
Hazards:									
Controls:									
PPE:	Hard Hat Safety Glasses Goggles	☐ ☐ ☐	Face Shield Ear plugs Safety Shoes	☐ ☐ ☐	Gloves (specify type) High-Viz Vest Protective Clothing	☐ ☐ ☐	Respirator ☐ Additional PPE:		
Comments:									

ENSAFE

PRE-DRILLING/EXCAVATION UTILITY CHECKLIST (COMPLETE IN ADDITION TO THE SWAP)

Site Name & Address:_____

EnSafe Project Number & Manager:_____

Proposed Date of Field Work & Duration:_____

Project Manager Signature AFTER *fieldwork has been completed:*_____

(A)=To be accomplished during planning stages **(B)**=To be accomplished onsite before fieldwork activities

UNDERGROUND UTILITIES (PUBLIC AND PRIVATE PROPERTY) REQUIREMENTS	YES	NO
1(A). Has the "State-Specific One Call" been notified to mark the locations of all underground utilities? ***Update One-Call if Fieldwork is Extended Past 2 Weeks After Inquiry.***	☐	☐
2(A). One-Call Ticket Info. ***(REQUIRED BY LAW).*** *Date Called:*_____ *One-Call Phone#:* _____ *Ticket Number:* _____ *Beginning & Expiration Date/Time:*_____ *Entities to be contacted separately:*_____		
3(A&B). Have facility (and other relevant) personnel been interviewed and asked to provide copies of all available facility diagrams and drawings about underground utilities near the excavation area?	☐	☐
4(B). Has an onsite walk-through been accomplished to identify surface indicators of utilities?	☐	☐
5(B). Have the types/positions of underground utilities been marked on the surface by one-call and/or the facility? Do the field personnel understand how these utilities traverse underground?	☐	☐
6(A&B). Have the locations of utilities been inserted on the work area drawing(s)?	☐	☐
7(B). Has all available information concerning the type/location/depth of known underground utilities been given to the responsible supervisor or contractor at the work site for review and possible offset/relocation?	☐	☐
8(B). Have suitable cable and pipe locating devices (**PM/Qualified Safety Review approval**) been used to confirm position of the utilities?	☐	☐
9(B). Have appropriate tools (hand auger and/or equivalent technology) been used to dig trial holes (**minimum depth of 4 FEET below ground surface AND ideally to include the minimum diameter of downhole sampling tool, including any surficial materials**) to visually identify position/depth of the underground utilities, or to determine that utilities are not present within the test location? Depending on regional subsurface (Depth of Frost in NE part of USA) conditions, unground utilities may be buried deeper than 4 feet. All modifications regarding assumed depth shall be documented in the Field Notes/Concerns section on the next page.	☐	☐
EXCAVATION ONLY — **10(B).** During excavation (at all times), a watch is kept for evidence of cables, pipes, or other underground utilities not previously identified.		
11(B). If heavy equipment is required to cross an area where underground utilities are known to be present, the cross points are kept to a minimum and are clearly marked.		

— Please refer to the back of this form for explanations and tips on how to answer the questions listed above. Also use the back of this checklist for comments/concerns to any of these questions and/or contact a Qualified Safety Reviewer (listed on the EnSafe Intranet) for the specific State/Region that fieldwork is performed.

— **A Qualified Safety Reviewer MUST be consulted and approve this site-specific form BEFORE fieldwork may commence if the answer to ANY Question on the checklist is NO).** Expedited approval (Telephone/Email/In Person) is possible prior to starting work operations, but advanced noticed is preferred to allow the reviewer time to look at maps/drawings of the site and all other relevant documents.

Checklist Submitted By:

Name:_____

Signature:_____

Date: _____

Qualified Safety Review (If Needed):

Name: _____

Signature: _____

Date: _____

Revised August 28, 2015

ENSAFE

PRE-DRILLING/EXCAVATION UTILITY CHECKLIST (EXPLANATIONS AND TIPS)

The instructions below have been developed to assist field personnel in accomplishing the tasks on the front of this form. If at any time field personnel are unclear on how to perform these necessary pre-job steps, refer to the Qualified Safety Reviewer list on the EnSafe Intranet.

(A)=To be accomplished during planning stages **(B)**=To be accomplished onsite before fieldwork activities

UNDERGROUND UTILITIES (PUBLIC AND PRIVATE PROPERTY)	
1(A). *This is REQUIRED no matter if the work area is on public or private property. Borings/excavations should be located onsite before One-Call notification, if possible, with WHITE paint/flagging.* ***Update One-Call every 2 weeks, and locators need 3 working days to mark all utilities within the work area.***	
2(A). *This may be accomplished by telephone/internet. Most state-specific one-call agencies are open 8AM-5PM local time, Monday thru Friday.*	
3(A&B). *This may happen the morning of the drilling/excavation activities to be performed. All personnel need to be aware of underground utilities within (or near) the work area. Offsets may be performed to minimize the probability of encountering underground utilities.*	
4(B). *Example: light posts, valve pits, pit covers, curb/gutter inlets, manholes, surface indentations, saw cut areas, etc. This is best performed during the pre-bid site visit, but may be performed immediately before activities.*	
5(B). *One-Call color markings typically are as follows: WHITE (Excavation/Borings), RED (Power/Electrical), YELLOW (Gas/Petroleum), ORANGE (Communication/Fiber Optics), BLUE (Potable Water), GREEN (Sanitary/Storm Sewer). Review all colors and positions with field personnel prior to beginning drilling/excavating.*	
6(A&B). *This refers to simply looking at the underground utilities onsite and plotting them (by hand initially) on the site drawing or aerial.*	
7(B). *If NO, please explain. After all underground utilities have been plotted on the drawing, review the locations with the EnSafe PM, all personnel (including subcontractors), and the client if deemed necessary. This will help to orient all field personnel as to the location of the underground utilities within or near work operations. If the utilities are marked within a 3 horizontal feet lateral distance of the boring/excavation, offsets SHOULD be considered.*	
8(B). *This refers to the use of a private utility locator to assist in locating underground utilities on private property that haven't been located by the One-Call system. This is highly dependent upon the makeup of the underground utility (metal, plastic, clay terra cotta, etc.) and complications due to rebar within concrete, multiple utilities crossing points, etc. Only previously trained personnel (most likely private utility locator and/or geophysical subcontractors) should use these devices. The Qualified Safety Reviewer AND the EnSafe PM AND the client will make the decision TOGETHER if a private utility locator is required.*	
9(B). *Example — hand augers, probe rod, vacuum extraction, air knife, post-hoe digger, etc. This is NON-NEGOTIABLE for drilling activities. Every boring must be advanced (without mechanical means) to a depth of four (4) feet below ground surface (or maximum boring depth if boring terminal depth is less than 4 feet). Only exception is where large boulder or bedrock in within the top 4 feet of the boring. Boring may be halted at a depth less than 4 feet if it is confirmed and documented that the boring is blocked by rock with apparent diameter greater than that of the boring/trial hole.*	
EXCAVATION ONLY	**10(B).** *This is site-specific, but usually no closer than 3 horizontal feet from any and all underground utilities (especially lines with high pressure or voltage/flammable/combustible substances). The safe distance for overhead utilities is 10 horizontal - 10 vertical feet (up to 50kV). Stay alert at all times. All personnel (EnSafe and Subcontractors) have stop work authority in reference to underground utilities. No job is too important to compromise safety.*
	11(B). *The depth/alignment of the underground utility to be crossed should be determined to prevent damage to each buried utility.*

Insert Field Notes/Concerns Here:

Subsurface Utility Location Team Members

Memphis, TN – Wesley Goodnight, Dave Fuehrer, Joe Matthews, Jason Broughton, Ben Brantley

Nashville, TN – Tammy Keim-Williams, Greg Olin, Troy Estes

Knoxville, TN – Brian Caldwell, Jerry Truitt, Lance Green

Charleston, SC – David Warren, Chad Tripp

Bowling Green, KY – David Doyle, Ric Federico

Cincinnati, OH – Jim Rathbone

Cleveland, OH – Ned Baker, Wendy Zayac

Dallas, TX – Tom Wiberg, Jay Spence

Hartford, CT – Glen Bianchi, Rob McCarthy

Londonderry, NH – Robert Francis

Jackson, MS – Brian Derry, Kirk Giessinger

Pleasant Hill, CA – Josh Teves, Maulik Bavishi

Jacksonville, FL – Frank McInturff, David Myers

Additional Corporate Resources – Paul Stoddard, Jeff James, John Knopf

EnSafe Investigation Report

Select the report type: ___ near miss - ___ incident - ___ injury

1. Dates		
Of Near Miss/Incident/Injury	Investigation Started	Investigation Completed

2. Location	3. Time

4. EnSafe Employees		
Injured	Involved	Witnesses

5. Others		
Injured	Involved	Witnesses

6. Injured					
Name	Length of time with firm	EnSafe Employee Yes/no	Job Title or Occupation	How long assigned to job	Nature and Extent of Injury

7. Equipment/Tools/Vehicles Involved
Item:
Damage:
Ownership:

8. Description

Events leading up to:

Accident/Incident/Event/Illness:

Contributing Factors:

9. Cause

Immediate Cause:

Root Cause:

10. Policy, Work Rule, Regulation, Standard

Applicable:

Violations:

11. Recommendations
To Prevent Recurrence:
Additional Training:

12. Investigation Team			
Leader: Signature: Date:		Members:	

13. Review		
Reviewed by	Signature	Date
Comments:		

14. Corrective Action		
Action	Date	Signature
1		
2.		
3.		
4.		
5.		
6.		

Appendix B
Emergency Action Plan

Emergency Action Plan

In the event that an unpredictable event occurs such as physical injury to onsite personnel, chemical exposure, or fire, EnSafe will coordinate first with the local plant support personnel. Immediately thereafter, the EnSafe Corporate H&S Manager will be informed. Contacts are provided in *Appendix C*.

During an Emergency

Emergency procedures are to be followed if any of the following situations develop onsite:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while onsite.

- A condition is discovered that suggests a situation more hazardous than anticipated.

The following emergency procedures should be followed:

- Site work area entrance and exit routes will be planned and emergency escape routes delineated by the site health and safety officer.

- If any member of the field team experiences any effects or symptoms of exposure while on the scene, the entire field crew will immediately halt work and act according to the instructions provided by the site health and safety officer.

- For applicable site activities, wind indicators visible to all onsite personnel will be provided by the site health and safety officer to indicate possible routes for upwind escape.

- Identifying any conditions that suggest a situation more hazardous than anticipated will result in the suspension of work until the site health and safety officer has evaluated the situation and provided the appropriate instructions to the field team.

- If an accident occurs, the Site Manager is to complete an accident report form for submittal to the appropriate company official.

- If a member of the field crew suffers a personal injury, the site health and safety officer will call the ambulance (serious injury) to alert appropriate emergency response agencies or administer onsite first aid (minor injury) as the situation dictates. An Accident Report Form will be completed for any such incident.

- If a member of the field crew suffers a chemical exposure, the affected areas should be flushed immediately with generous amounts of clean water. If the situation dictates, the site health and safety officer should alert appropriate emergency response agencies, or personally ensure that the exposed individual is transported to the nearest medical treatment facility for prompt treatment. An Accident Report Form will be completed for any such incident.

Unexpected Hazards

If there is any doubt regarding the degree of hazard of a particular circumstance, and personnel are unsure as to what measures to take or what protective equipment to utilize, the following steps should be taken to ensure the health and safety of those involved.

1) Stop Work Immediately and Secure the Area
   Personnel should remove themselves from the hazard or suspected hazard area.

2) Contact Supervisor and/or Safety Officer
   Personnel should immediately inform their supervisor regarding the situation.

Personnel will be given proper direction on how to proceed. Many accidents can be avoided by simply removing personnel from the hazard and maintaining good communication.

Employee Injury

In the event that an employee is injured in the field due to physical or chemical hazards, the following course of action should be taken:

1) Initiate first-aid procedures using universal precaution techniques and arrange for prompt medical attention for the employee. If possible, remove or evacuate all personnel from the area of immediate hazard.

2) If the injury is severe, call emergency services (contact telephone numbers Table B-1).

3) Promptly notify Client Emergency Response (see Table C-1).

In the event of a nonemergency accident, the injured worker will first be given immediate and appropriate first aid. If the injury as requiring care that exceeds first-aid applied at the site, then a non-injured worker will drive the injured worker to the hospital to complete the necessary emergency care. The EnSafe Corporate Health and Safety Manager will be notified within 8-hours of the injury and the appropriate injury reporting forms will be completed and submitted to ENSAFE and Client.

Fire and/or Explosion (no injury)

If a fire or explosion occurs onsite, the following steps should be taken:

1) If the fire is small and manageable, appropriate fire extinguishers should be utilized by properly trained personnel to control the situation. All fire extinguishers must be inspected and certified annually so that they are in proper working condition for possible emergency situations. Projects must maintain a fire extinguisher at the site throughout site activities.

2) If the fire is beyond control or there is a potential for explosion, all personnel should immediately evacuate the site.

3) Emergency fire department personnel should be contacted immediately. If the fire involves hazardous chemicals, the emergency responders must be informed of such.

Chemical Spills (no injury)

If a chemical spill occurs on site, the following steps should be taken:

1) If properly trained personnel with appropriate PPE are present, begin spill containment immediately.

2) Immediately report the spill to the Site Health and Safety Officer. The initial report shall include at least the following information:

    - Identify the person and their employer reporting the spill.
    - Type and description of released material.
    - Estimate amount of material released.
    - Extent of injury or property damage occurring.
    - Extent of actual or potential environmental damage if known.
    - Information concerning the spill reaching or potentially reaching the plant storm sewer system.
    - Identify the actions being taken in response to the spill.
    - Identify the assistance required to respond to the spill.

Incident Report Forms

Incident response forms are included in *Appendix A*. These forms must be filled out and submitted to EnSafe in the event of an injury or spill, after the emergency response is complete and the situation is stabilized. In addition, a "Investigation Report" form is also provided and should be used where appropriate.

Appendix C
Site Specific Contacts

Emergency Telephone Numbers

Ambulance — Bethel Volunteer Ambulance	**Emergency 911**
Kauneonga Lake Fire District	**Emergency 911**
Sullivan County Sheriff's Department	**Emergency 911**
Hospital — Catskill Regional Medical Center	(845) 794-3300
Minor Medical Treatment — Catskill Regional Medical Group Urgent Care Facility	(845) 333-6500
National Capital Poison Center	(800) 222-1222

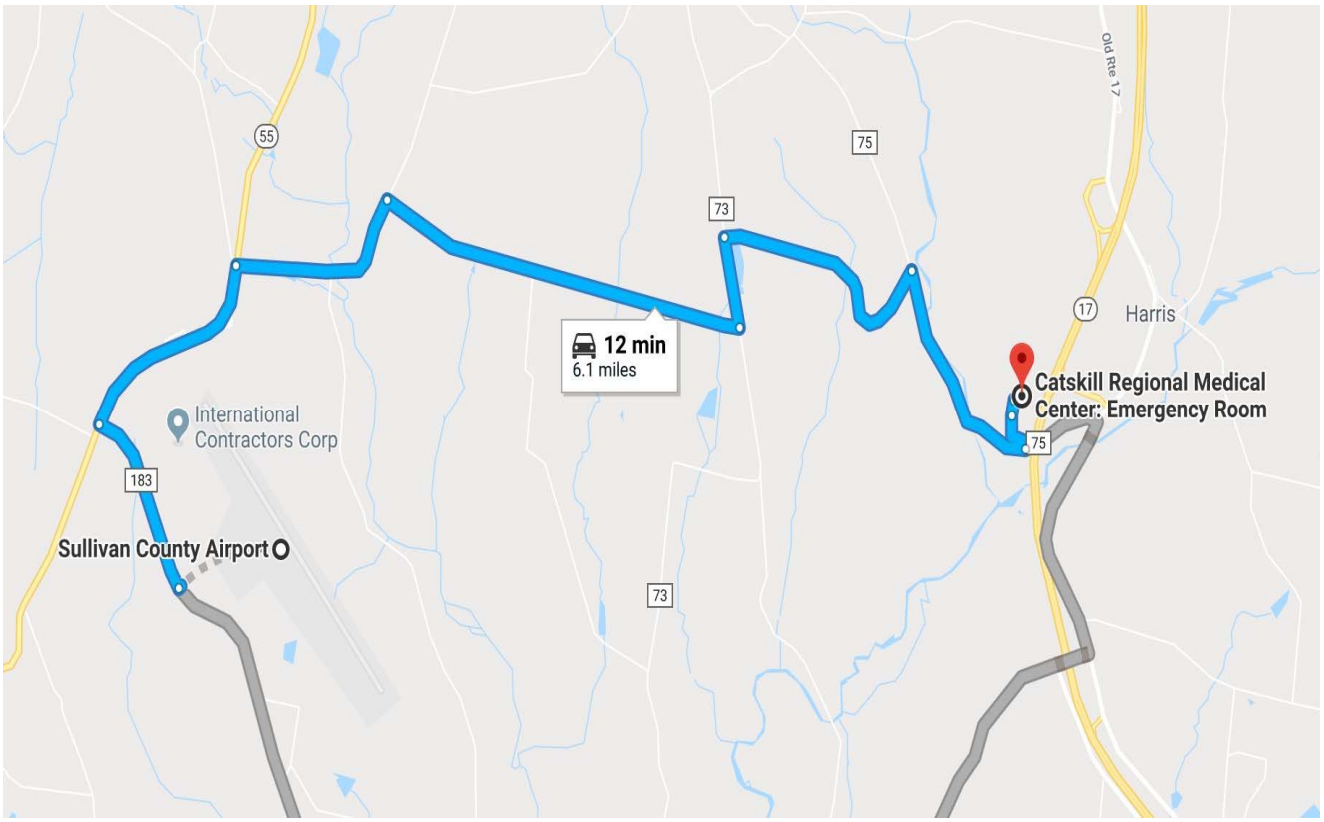
Key Personnel Telephone Numbers

Title	Category	Data
EnSafe Site Supervisor/H&S	Name	TBD
	Work	TBD
	Mobile	TBD
EnSafe Project Manager	Name	Robert McCarthy rmccarthy@EnSafe.com
	Work	(860) 665-1140 x6007
	Mobile	(860) 625-1244
EnSafe Corporate Health and Safety Manager	Name	Mike Palmer mpalmer@EnSafe.com
	Work (direct)	(865) 219-2673
	Work	(865) 693-3623 x5804
	Mobile	(865) 607-1704
EnSafe Health and Safety Specialist	Name	Geoff Huit ghuit@EnSafe.com
	Work	(860) 665-1140
	Mobile	(860) 681-1550

In the event that an unpredictable event occurs such as physical injury to onsite personnel, chemical exposure, or fire, EnSafe will coordinate first with the local plant support personnel. Immediately thereafter, the EnSafe Corporate H&S Manager will be informed.

Appendix D
Emergency Medical Care Driving Directions

Primary Hospital Directions and Map
Catskill Regional Medical Center
68 Harris-Bushville Road, Harris, New York 12742
(845) 794-3300



Sullivan County International Airport
75 County Road 183A
Swan Lake, New York 12783

- Turn right onto Airport Rd (County Route 183)
- Turn right onto State Route 55 East
- Turn right onto Old White Lake Turnpike
- Turn right onto Fraser Road
- Turn left onto Lt J G Brender Highway (County Route 73)
- Turn right onto Tony A Dworetsky Lane
- Turn right onto Bushville Rd (County Route 75)
- Turn left onto Harris-Bushville Road and into the hospital

Catskill Regional Medical Center
68 Harris-Bushville Road
Harris, New York 12742

Appendix E
Biological and Chemical Hazards

Poisonous Snakes of the United States

Coral Snake

- There are 3 different species of coral snakes in North America.
- They range in size at adulthood from 1 foot to 3 feet in length.
- Remember the jingle, “Red and black, friend of Jack; red and yellow kill a fellow.”

Rattle Snake

- There are 9 different species of rattle snakes in North America.
- Found in all 48 lower states.
- They range in size at adulthood from 1 foot to 8 feet in length. The majority of rattle snakes are between 2 and 3 feet in length.
- All have the signature rattle snake design as a defense mechanism to keep predators away.

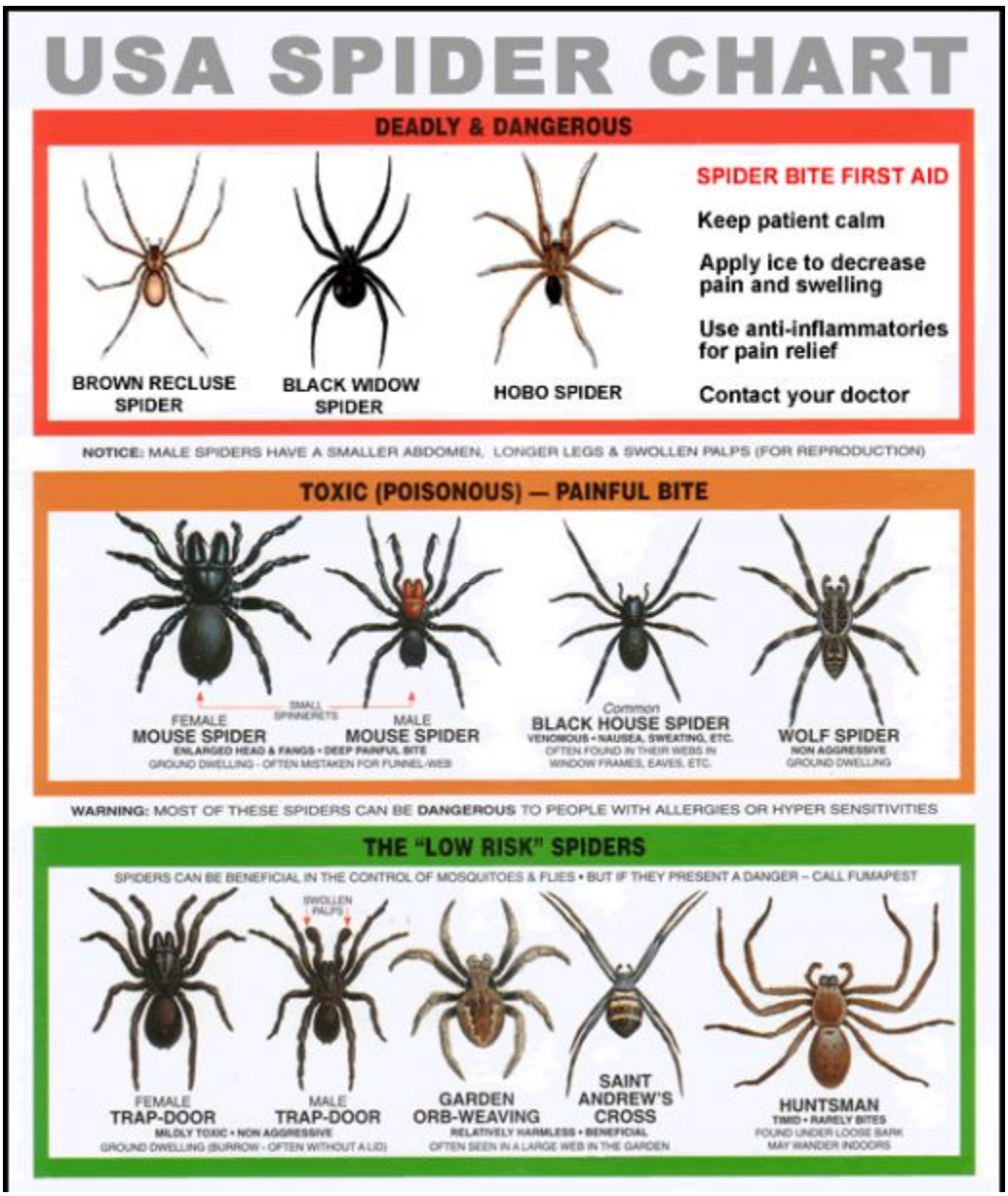
Cotton Mouth (Water Moccasin)

- There are 4 species of cottonmouth and it is found in the Southeast United States into the boot heel of Missouri.
- They range in size at adulthood from 2 feet to 6 feet and are very aggressive.
- Prefers lowland wet areas and ditches.
- Signature white ‘cotton colored’ interior of mouth.

Copperhead

- There are 2 species of Copperhead.
- They reach a maximum size of 4 ½ feet in length.
- They are found in all areas of the United States except for the Pacific Northwest and California.
- Copperheads prefer wooded hillsides with rock outcrops above streams or ponds; edges of swamps.
- Signature ‘copper’ color.

POISONOUS SPIDERS OF THE UNITED STATES



Note: The Poisonous Spiders are at the top of the chart

OTHER BIOLOGICAL HAZARDS

Ticks

- Ticks are blood-feeding parasites that are often found in tall grass and shrubs, where they will wait to attach to a passing host.
- Ticks pass a number of diseases including Lyme disease.
- Daily inspection of your body will reveal any ticks that can easily be removed.
- First Aid-Antiseptic ointment and observation of bite area.
- If bite area turns red or swells after a few days, seek medical attention.

Rodents

- **Rats**
- **Mice**
- **Squirrels**
- **Chipmunks**
- **Muskrats**
- **Beavers**
- **Prairie Dogs**

Rodents are disease carriers who can carry over 20 different diseases that are dangerous to humans. These diseases can be transmitted either through direct or indirect contact. While a rodent may seem like a small animal, you cannot underestimate their potential for harm. The best course of action is to avoid contact with them at all times. Should you become bitten or scratched by these disease carrying animals, seek medical attention immediately.

Poison Ivy

The most common and well-known irritating plant in this area is poison ivy. It can grow as a groundcover or as a “hairy” vine climbing up the bark of trees. Skin contact with any part of the plant can result in an allergic response that causes itching red spots and blistering. Washing thoroughly with warm, soapy water can reduce the likeliness of a reaction if you have touched the plant.

Poison Oak

The Poison Oak of the southeastern United States has its leaves divided into three leaflets; the leaflets are densely haired and generally have three to seven distinct lobes. The white, berry-like fruit are also somewhat hairy. Both species contain poisonous substances that are believed to be identical or closely related to that found in poison ivy.

Poison Sumac

Poison Sumac is a small tree or large shrub with large attractive leaves and white fruit that could be used as an ornamental if it didn't cause severe skin irritation in most people. Its smaller relatives with 3-parted leaves, Poison Ivy and Poison Oak, have similar irritating properties.

Key features to identify it include are alternate leaves usually with 9-13 entire (not toothed) leaflets and a red rachis (the stem connecting the leaflets). The leaflets are smooth and may be shiny above.

SAFETY DATA SHEET

Version 4.6
Revision Date 06/29/2014
Print Date 01/28/2015

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Perfluorooctanoic acid

Product Number : 171468
Brand : Aldrich

CAS-No. : 335-67-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)
P260 Do not breathe dust or mist.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.
P301 + P330 + P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/ physician.
P321	Specific treatment (see supplemental first aid instructions on this label).
P363	Wash contaminated clothing before reuse.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : Pentadecafluorooctanoic acid
Perfluorocaprylic acid
Perfluorooctanoic acid

Formula : $C_8HF_{15}O_2$
Molecular Weight : 414.07 g/mol
CAS-No. : 335-67-1
EC-No. : 206-397-9

Hazardous components

Component	Classification	Concentration
Pentadecafluorooctanoic acid Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)		
	Acute Tox. 4; Skin Corr. 1B; Eye Dam. 1; Aquatic Acute 3; Aquatic Chronic 3; H302, H314, H412	-

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
no data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen fluoride

5.3 Advice for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

5.4 Further information
no data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.Normal measures for preventive fire protection.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: > 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: > 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: flakes Colour: colourless
b)	Odour	no data available
c)	Odour Threshold	no data available
d)	pH	2.6 at 1 g/l
e)	Melting point/freezing point	Melting point/range: 55 - 56 °C (131 - 133 °F) - lit.
f)	Initial boiling point and boiling range	189 °C (372 °F) at 981 hPa (736 mmHg) - lit.
g)	Flash point	no data available
h)	Evapouration rate	no data available
i)	Flammability (solid, gas)	no data available
j)	Upper/lower flammability or explosive limits	no data available
k)	Vapour pressure	0.69 hPa (0.52 mmHg) at 25 °C (77 °F)
l)	Vapour density	no data available

m)	Relative density	0.900 g/cm3
n)	Water solubility	no data available
o)	Partition coefficient: n-octanol/water	no data available
p)	Auto-ignition temperature	no data available
q)	Decomposition temperature	no data available
r)	Viscosity	no data available
s)	Explosive properties	no data available
t)	Oxidizing properties	no data available

9.2 Other safety information
no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
no data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
no data available

10.4 Conditions to avoid
no data available

10.5 Incompatible materials
Bases, Oxidizing agents, Reducing agents

10.6 Hazardous decomposition products
Other decomposition products - no data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Inhalation: no data available

Dermal: no data available

LD50 Intraperitoneal - rat - 189 mg/kg

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitisation
no data available

Germ cell mutagenicity

rat
DNA damage

rat
DNA damage

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
no data available

no data available

Specific target organ toxicity - single exposure
no data available

Specific target organ toxicity - repeated exposure
no data available

Aspiration hazard
no data available

Additional Information
RTECS: RH0781000

Cough, Shortness of breath, Headache, Nausea, Vomiting

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity
no data available

12.2 Persistence and degradability
no data available

12.3 Bioaccumulative potential
no data available

12.4 Mobility in soil
no data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

no data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3261 Class: 8 Packing group: III
Proper shipping name: Corrosive solid, acidic, organic, n.o.s. (Pentadecafluorooctanoic acid)
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 3261 Class: 8 Packing group: III EMS-No: F-A, S-B
Proper shipping name: CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (Pentadecafluorooctanoic acid)
Marine pollutant: No

IATA
UN number: 3261 Class: 8 Packing group: III
Proper shipping name: Corrosive solid, acidic, organic, n.o.s. (Pentadecafluorooctanoic acid)

15. REGULATORY INFORMATION

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Pentadecafluorooctanoic acid	335-67-1	

New Jersey Right To Know Components

	CAS-No.	Revision Date
Pentadecafluorooctanoic acid	335-67-1	

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Eye Dam.	Serious eye damage
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.6 Revision Date: 06/29/2014 Print Date: 01/28/2015

Perfluorooctanesulfonic acid

Safety Data Sheet 6164308

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 12/10/2015 Version: 1.0

SECTION 1: Identification

1.1. Identification

Product form	:	Substance
Substance name	:	Perfluorooctanesulfonic acid
CAS No	:	1763-23-1
Product code	:	6164-3-08
Formula	:	C8HF17O3S
Synonyms	:	1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-Heptadecafluorooctane-1-sulfonic acid
Other means of identification	:	MFCD00042454

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	:	Laboratory chemicals Manufacture of substances Scientific research and development

1.3. Details of the supplier of the safety data sheet

SynQuest Laboratories, Inc.
P.O. Box 309
Alachua, FL 32615 - United States of America
T (386) 462-0788 - F (386) 462-7097
info@synquestlabs.com - www.synquestlabs.com

1.4. Emergency telephone number

Emergency number	:	(844) 523-4086 (3E Company - Account 10069)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Acute Tox. 4 (Oral)	H302 -	Harmful if swallowed
Skin Corr. 1B	H314 -	Causes severe skin burns and eye damage
Eye Dam. 1	H318 -	Causes serious eye damage
STOT SE 3	H335 -	May cause respiratory irritation

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :

GHS05 GHS07

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) :
H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H335 - May cause respiratory irritation

Precautionary statements (GHS-US) :
P260 - Do not breathe dust, mist, spray
P264 - Wash skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301+P312 - If swallowed: Call a POISON CENTER or doctor/ physician if you feel unwell
P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/ physician
P321 - Specific treatment (see supplemental first aid instructions on this label)
P330 - Rinse mouth

P363 - Wash contaminated clothing before reuse
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container to an approved waste disposal plant

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Substance type : Mono-constituent

Name	Product identifier	%	Classification (GHS-US)
Perfluorooctanesulfonic acid (Main constituent)	(CAS No) 1763-23-1	<= 100	Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 3, H335

Full text of H-phrases: see section 16

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Move the affected personnel away from the contaminated area.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. Get immediate medical advice/attention.

First-aid measures after skin contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Get immediate medical advice/attention.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

First-aid measures after ingestion : Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get immediate medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

Symptoms/injuries after inhalation : Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Alcohol resistant foam. Carbon dioxide. Dry powder. Water spray. Use extinguishing media appropriate for surrounding fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Thermal decomposition generates: Carbon oxides. Hydrogen fluoride. Sulfur oxides.

5.3. Advice for firefighters

Firefighting instructions : In case of fire: Evacuate area.

Protection during firefighting : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Evacuate unnecessary personnel. Ensure adequate air ventilation. Do not breathe dust.

6.1.1. For non-emergency personnel

Emergency procedures : Only qualified personnel equipped with suitable protective equipment may intervene.

6.1.2. For emergency responders

Protective equipment	:	Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment	:	Stop leak if safe to do so.
Methods for cleaning up	:	Sweep or shovel spills into appropriate container for disposal. Minimize generation of dust.
Other information	:	For disposal of solid materials or residues refer to section 13 : "Disposal considerations".

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	:	Do not handle until all safety precautions have been read and understood. Ensure good ventilation of the work station. Do not breathe dust, mist, spray. Wear personal protective equipment. Avoid contact with skin and eyes.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety procedures. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures	:	Comply with applicable regulations.
Storage conditions	:	Keep container closed when not in use. Hygroscopic. Keep contents under inert gas.
Incompatible materials	:	Refer to Section 10 on Incompatible Materials.
Storage area	:	Store in dry, cool, well-ventilated area.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Exposure controls

Appropriate engineering controls	:	Ensure good ventilation of the work station. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
Hand protection	:	Protective gloves. 29 CFR 1910.138: Hand Protection.
Eye protection	:	Chemical goggles or safety glasses. Face shield. 29 CFR 1910.133: Eye and Face Protection.
Skin and body protection	:	Wear suitable protective clothing.
Respiratory protection	:	In case of inadequate ventilation wear respiratory protection. 29 CFR 1910.134: Respiratory Protection.
Other information	:	Safety shoes. 29 CFR 1910.136: Foot Protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Solid
Color	:	No data available
Odor	:	No data available
Odor threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	145 °C (@ 10 mm Hg)
Flash point	:	No data available
Relative evaporation rate (butyl acetate=1)	:	No data available
Flammability (solid, gas)	:	No data available
Explosion limits	:	No data available
Explosive properties	:	No data available

Oxidizing properties	:	No data available
Vapor pressure	:	No data available
Relative density	:	1.25 (@ 25 °C)
Relative vapor density at 20 °C	:	No data available
Molecular mass	:	500.13 g/mol
Solubility	:	No data available
Log Pow	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

The product is stable at normal handling and storage conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Keep away from heat, sparks and flame.

10.5. Incompatible materials

Strong bases. Strong oxidizing agents.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Hazardous decomposition products in case of fire, see Section 5.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	Oral: Harmful if swallowed.
Skin corrosion/irritation	:	Causes severe skin burns and eye damage.
Serious eye damage/irritation	:	Causes serious eye damage.
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	May cause respiratory irritation.
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified
Symptoms/injuries after inhalation	:	Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Remove to an authorized incinerator equipped with an afterburner and a flue gas scrubber.

Waste disposal recommendations : Dispose of contents/container in accordance with licensed collector's sorting instructions.

Additional information : Recycle the material as far as possible.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN3261 Corrosive solid, acidic, organic, n.o.s., 8, II

UN-No.(DOT) : UN3261

Proper Shipping Name (DOT) : Corrosive solid, acidic, organic, n.o.s.

Transport hazard class(es) (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136

Hazard labels (DOT) : 8 - Corrosive

Packing group (DOT) : II - Medium Danger

DOT Packaging Non Bulk (49 CFR 173.xxx) : 212

DOT Packaging Bulk (49 CFR 173.xxx) : 240

DOT Symbols : G - Identifies PSN requiring a technical name

DOT Special Provisions (49 CFR 172.102) : IB8 - Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2).
IP2 - When IBCs other than metal or rigid plastics IBCs are used, they must be offered for transportation in a closed freight container or a closed transport vehicle.
IP4 - Flexible, fiberboard or wooden IBCs must be sift-proof and water-resistant or be fitted with a sift-proof and water-resistant liner.
T3 - 2.65 178.274(d)(2) Normal..... 178.275(d)(2)
TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter.

DOT Packaging Exceptions (49 CFR 173.xxx) : 154

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 15 kg

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 50 kg

DOT Vessel Stowage Location	:	B - (i) The material may be stowed ''on deck'' or ''under deck'' on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) ''On deck only'' on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.
Other information	:	No supplementary information available.

TDG

No additional information available

Transport by sea

UN-No. (IMDG)	:	3261
Proper Shipping Name (IMDG)	:	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.
Class (IMDG)	:	8 - Corrosive substances
Packing group (IMDG)	:	II - substances presenting medium danger

Air transport

UN-No. (IATA)	:	3261
Proper Shipping Name (IATA)	:	Corrosive solid, acidic, organic, n.o.s.
Class (IATA)	:	8 - Corrosives
Packing group (IATA)	:	II - Medium Danger

SECTION 15: Regulatory information

15.1. US Federal regulations

Perfluorooctanesulfonic acid (1763-23-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	S - S - indicates a substance that is identified in a proposed or final Significant New Uses Rule.

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

CANADA

Perfluorooctanesulfonic acid (1763-23-1)
Listed on the Canadian NDSL (Non-Domestic Substances List)

EU-Regulations

No additional information available

National regulations

Perfluorooctanesulfonic acid (1763-23-1)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Japanese Pollutant Release and Transfer Register Law (PRTR Law) Listed on INSQ (Mexican national Inventory of Chemical Substances)

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

SECTION 16: Other information

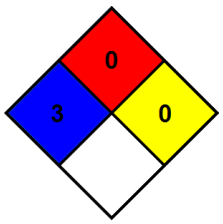
Full text of H-phrases:

Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Skin Corr. 1B	Skin corrosion/irritation Category 1B
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H335	May cause respiratory irritation

NFPA health hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

SDS US (GHS HazCom 2012)

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is offered solely for your consideration, investigation, and verification. It does not represent any guarantee of the properties of the product nor that the hazard precautions or procedures described are the only ones which exist. SynQuest shall not be held liable or any damage resulting from handling or from contact with the above product.

Appendix F
Job Hazard Analyses

Job Hazard Analysis (JHA)

Activity/Work Task: **Drilling Activities**	Overall Risk Assessment Code (RAC) (Use highest code)					**M**
Project Location: Sullivan County International Airport	**Risk Assessment Code (RAC) Matrix**					
Project Number: 0888821949	**Severity**	**Probability**				
Date Prepared: 2/15/2018		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title): Vincent Varricchio, PG/Geologist	Catastrophic	**E**	**E**	**H**	**H**	**M**
	Critical	**E**	**H**	**H**	**M**	**L**
Reviewed by (Name/Title): Robert McCarthy, PE/Senior Project Manager	Marginal	**H**	**M**	**M**	**L**	**L**
	Negligible	**M**	**L**	**L**	**L**	**L**
Notes: (Field Notes, Review Comments, etc.)	Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)					
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**				
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk**				
		H = High Risk				
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk**				
		L = Low Risk				

Job Steps	Hazards	Controls	RAC
Mobilization / Site set up	a. Struck by b. Tip over c. Backing d. Electrocution/Explosion e. Slips, trips, falls	a. All equipment, augers, rods and tools will be properly secured during transport. b. Never move the drilling rig with the mast upright. Set hydraulic leveling jacks before raising the mast. Ensure the drilling site foundation is stable and as level as possible. c. Use a ground guide along with a functioning back-up alarm during equipment backing. d. Inspect for buried and overhead utilities in the vicinity of the drilling location. A drilling clearance permit shall be obtained from base personnel or utility companies prior to initiating intrusive operations. e. Clear trees, roots, weeds, limbs and other ground hazards from the drilling location. Practice good housekeeping to keep the ground around the drilling site clear of obstructions, equipment and other tripping hazards. Wear appropriate foot protection to prevent slips and trips. Use caution when working on uneven and wet ground surfaces.	**M**
Drill Rod / Auger / Tool Handling	a. Struck by b. Back strain	a. Drill rods and augers stored and transported in racks shall be blocked to prevent shifting. Unload drill rods and augers layer by layer. Be prepared for sudden shifting when tailing rod sections. Keep a wide base and secure footing. b. Use proper lifting techniques when manually handling rods, augers and tools. Use mechanical equipment	**M**

		during lifting whenever possible. Use the buddy system when lifting tools and supplies.	
Hoisting operations	a. Struck by	a. Never engage the rotary clutch until all personnel and equipment are clear. Never leave the brake unattended when engaged. Drill rods and auger sections should not be picked up or dropped suddenly. Do not lift more than 10 feet of augers or one joint of pipe between tool breaks. Test the brakes daily. Use caution when drilling in wet or damp conditions. Suspend drilling activities if moisture comprises the performance of the braking mechanism.	**M**
Catline operations	a. Struck by	a. Do not use more wraps than necessary to lift the load. More than one layer of wraps on the cathead is not allowed. Personnel should not stand near, step over or go under the cathead rope under tension. The cathead must be kept clear of obstructions and entanglements. Never leave the cathead unattended when engaged. Do not stand under the object being lifted with the cathead.	**M**
Derrick operations	a. Fall b. Weather	a. The mast should be lowered, if possible, to make repairs or to free up entangled wire rope or obstructions. If the mast must be ascended while upright, a proper ladder safety climbing device or safety block system must be used in conjunction with a full body harness. b. The drill rig operator must be aware of weather conditions and terminate operations in the event of unsafe conditions.	**M**
Auger operations	a. Struck by	a. Use a long handled flat head shovel when removing auger cuttings. Stay away from the augers when rotating. Prevent shovel from lodging into the augers and kicking out. Do not wear loose clothing when working with augers.	**L**
Pumping/Grouting	a. Blow out	a. The pump must not exceed maximum pressure of grout and mud lines. High-pressure lines must be secured to the rig. Lines and hoses must be inspected daily and replaced if worn or damaged. Engage pump in low gear then shift to subsequent higher gears.	**L**

HTRW drilling	a. Chemical exposure	a. All drilling personnel will wear personnel protective equipment specified in the HASP. Personnel and equipment decontamination procedures will be followed. HTRW drilling personnel will meet training and medical surveillance requirements outlined in 29 CFR 1910.120. Site specific air monitoring procedures will be implemented as specified in the SSHP for HTRW drilling locations.	**M**
Hazardous drilling locations	a. Explosion	a. Special procedures will be implemented when drilling in known natural gas locations, such as special mud procedures and blow out preventers.	**M**

Chemical Hazards and Monitoring Procedures

Chemical Hazard(s) (list):	**VOC**
Monitoring Instrument(s):	**PID**
Applicable HASP Section(s):	**CAMP**

Additional Safety Considerations

1. Ensure all personnel have read the HASP
2. Ensure all equipment is equipped with necessary fire extinguishers (min 5 lbs ABC).
3. Follow safe driving procedures. Always use the buddy system when moving vehicles. Plan your travel path ahead of time. Use maps and known construction zones to make your selection. Consult with the other team members before making any changes to travel path.
4. Use an equipment checklist to verify you have the appropriate equipment/tools for your tasks. Consult appropriate JHAs or SOPs.
5. Stow all materials in vehicle properly, use appropriate cases and bags. Secure equipment in bed of truck with netting or straps. Do not leave any equipment loose in the cab or bed of the truck. It can cause property damage or serious injuries by falling from vehicle.
6. When securing equipment, watch for pinch points. Straps and netting can get caught on objects and snap back as well as trap a finger if hand placement is not correct. Use a buddy to help secure equipment when possible.
7. Maintain good housekeeping practices. When possible, use mechanical equipment to perform lifting of heavy objects. When lifting, follow safe lifting practices. Use the buddy system when lifting.
8. Wear nitrile gloves when collecting samples in soil to avoid dermal contact with potential contaminants. Be observant for tripping hazards, holes, stickups, vines, old fence wire, etc.

Additional Operational Safety Procedures	PPE
	LEVEL D • ANSI approved hard hat • ANSI approved safety glasses • Shirts with sleeves and full-length pants. • ANSI approved steel safety-toe boots or approved equivalent. • High visibility reflective traffic vest if near moving vehicles • Appropriate work task gloves • First aid kit (located in vehicle). • Fire extinguisher (if in EnSafe field truck).

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
1. Drill rig	1. Drilling to be performed by competent person as certified by employer	1. Equipment will be inspected daily by equipment operator. Any safety deficiencies detected will require cessation of clearing activities until appropriate repairs have been made.

Physical Task Requirements

Please answer for the task being analyzed:

Yes	No	
		Ability to climb ladders.
		Ability to climb industrial stairs.
		Ability to climb ladder wells.
		Ability to fit into limited entry access points (Confined Spaces) such as manways, ports, and vaults.
		Ability to operate from heights.
		Ability to wear Personal Fall Arrest System (PFAS).
		Ability to wear tight-fitting face pieces (negative pressure respirators).
		Ability to lift over 40 pounds.
		Operation of powered mechanical equipment (List equipment and training requirements in the section above).

Appendix D
Community Air Monitoring Plan

Appendix D
Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

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

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

(this CAMP is based on NYSDOH Generic CAMP from NYSDEC DER-10)

Appendix E
Project Team Resumes

DAVID FARRELL, SR, CSP

CORPORATE HEALTH AND SAFETY MANAGER

EDUCATION

MS, Organizational Leadership, Robert Morris University, *Currently Pursuing*

BS, Occupational Health and Safety, Columbia Southern University, 2007

REGISTRATIONS & CERTIFICATIONS

- Certified Safety Professional
- OHSAS 18001 Lead Auditor
- ISO 9001/ 14001 Internal Auditor
- Yellow Belt in Lean Manufacturing
- Quality of Leadership
- Business Acumen

AFFILIATIONS/ ORGANIZATIONS

- American Society of Safety Engineers

David has over twenty-five years of HSE experience in various industries. Oil and gas (upstream, midstream and downstream), chemical manufacturing facilities and heavy industrial manufacturing. In his role as the Manager of Operations and Contractor Safety, he was responsible for developing and delivering health and safety training in the oil and gas industry. As a Regional HSE Manager, David was responsible for implementing and sustaining ISO management systems such as ISO 14001 and OHSAS 18001 (ISO 45001). David has extensive knowledge in OSHA regulations for both General Industry and Construction as well Recording and Reporting Occupational Injuries. Further, he has extensive knowledge and experience leading investigations and root cause analyses for injuries and process related incidents. David now serves as the Corporate Health and Safety Manager and is responsible for managing the corporate Safety Management System.

RELEVANT EXPERIENCE

***Manager of Operations and Contractor Safety, EQT Corporation, Pittsburgh, PA (2014-2017)**

As Manager, David led a 12-member team of safety professionals throughout multi-state operations and construction including drilling, completions, compressor stations, and pipelines. He was primarily responsible for establishing the safety management system, including safety program updates and team development. His other areas of responsibility included budget planning and oversight, contractor qualification and monitoring, employee training plans, audits and inspections and establishing and monitoring leading metrics.

***Regional HSE Manager- Dresser-Rand Company, Olean, NY (2010-2014)**

As Regional HSE Manager, David led a 9-member team of HSE professionals throughout four industrial manufacturing facilities. He established HSE skills leadership program for supervision, oversaw the HSE management system for four manufacturing facilities (approximately 2700 personnel), oversaw the Chemical Review Board and served as the HSE advisor on the Executive Safety Council. Davis successfully reduced total recordable rate to 0.49, reduced DART rate to 0.12 and reduced DAWCR to 0.00.

***HSE Manager- Dresser-Rand Company, Houston, TX (2005-2010)**

As HSE Manager, David led a 5-member team of HSE professionals responsible for the safe execution of projects at client facilities throughout the U.S. (primarily in petrochemical industry). He established behavior-based safety program and a HSE committee for field services.

***HSE Representative – Dresser-Rand Company, Houston, TX (2001-2005)**

As HSE Representative, David developed the HSE manual for the services division and served as subject-matter expert for HSE matters. He was responsible for contractor Process Safety Management documentation, maintaining regulatory documentation and preforming incident Investigations and Root Cause Analysis.

***Safety Director, LandCoast Insulation, Inc., Deer Park, TX (1996-2001)**

As Safety Director, David updated HSE manual to bring into OSHA compliance, performed site-safety audits and inspections, primarily on new construction sites and was responsible for DOT and non-DOT drug and alcohol policies. He also performed Incident Investigations and Root Cause Analysis

***Field Safety Coordinator, Basic Industries, Inc., Sulphur, LA (1992-1996)**

As Field Safety Coordinator, David served in various construction roles within supervision and safety. He performed new hire orientations and was responsible for incident investigation.

**indicates work for a previous employer*

DANA R. MILLER
CHEMIST

EDUCATION

BS, Chemistry, Louisiana State University, 2003

BS, Environmental Science, American University, 2011

MCE, Norwich University, 2014

CERTIFICATIONS

- 40-Hour Health and Safety Training: OSHA (29 CFR 1910.120)
- 30-Hour OSHA Constructor Training
- gINT/WinLoG
- Geographic Information System

Dana has served as a Staff Scientist for Phase I and II investigations where she managed project tasks associated with environmental data validation under Comprehensive Environmental Response, compensation, and Liability Act (CERCLA) Site Investigations, Louisiana Risk Evaluation/Corrective Action Program (RECAP), Navy CLEAN, the Resource Conservation and Recovery Act (RCRA), the Superfund Amendments and Reauthorization Act, and the Clean Water Act. She has experience in environmental chemistry, federal and state environmental regulations, remedial investigations (RIs), soil and groundwater contamination assessments, project coordination, Quality Assurance Project Plan (QAPP) preparation, data interpretation, data usability assessments, and data validation. In addition, she has been responsible for laboratory data validation to determine whether analytical data for organics, inorganics, pesticides, and polychlorinated biphenyls (PCBs) were generated within USEPA Solid Waste-846 and Contract Laboratory Program (CLP) method guidelines. Her data validation experience includes U.S. EPA Regions 1 through 6. She has also validated data using Louisiana, Texas, New York, New Jersey, and U.S. Department of Defense (DOD) protocols.

RELEVANT EXPERIENCE

SITE INVESTIGATION AND REMEDIATION

U.S. Navy Projects; Florida, Georgia, Indiana, New Jersey, New York Tennessee, Texas (September 2015—Present)

Role: Chemist

Naval Weapons Industrial Reserve Plant Bethpage, New York, NAS Pensacola, Florida; NSA Mid-South, Tennessee; NAS Corpus Christi, Texas; NSB Kings Bay, Georgia; NAS Cecil Field, Nava Station Mayport, NSA Crane, Indiana

Provided QA/QC chemistry support for several projects under the Comprehensive Long-Term Environmental Action Navy (CLEAN) program with Naval Facilities Engineering Command Southeast. Provided chemistry support in the areas of QA, laboratory methodology, and validation. Performed data validation in accordance with project-specific sampling and analysis plans following applicable DoD, federal, regional, and state-specific data validation guidelines. Prepared data usability summary reports and provided data management support using EQuIS™.

Quarterly Groundwater Monitoring, Stamina Mills Site; North Smithfield, Rhode Island (January 2014-October 2015)

Role: Chemist

Performed data validation to determine whether analytical data for organic analyses of quarterly groundwater samples were generated in accordance with U.S. EPA SW-846 and CLP method guidelines. Data were assessed as compliant or non-compliant by examining field and laboratory Quality Assurance/Quality Control (QA/QC) samples. Validated data in accordance with Region 1, U.S. EPA New England Data Validation Functional Guidelines for Evaluating Environmental Analyses; prepared a report summarizing data quality, including analytical summary data tables; and provided chemical database management support services using EQuIS™ Environmental Data Management software.

Groundwater Sampling, NSA Mid-South; Millington, Tennessee (September 2015—Present)
Conducted soil and groundwater sampling at Naval Support Activity (NSA) Mid-South. Also performed ecological surveys, quarterly well inspections, monthly well injections, well abandonments, and new well developments and then interpreted analyzed data.

Perfluoroalkyl Substances Groundwater Investigation, *NSA Mid-South; Millington, Tennessee* (2016-Present)
Six historical groundwater monitoring wells were sampled for the extended list of 16 PFAS to evaluate the presence or absence of these compounds in the environment. As project site chemist, Dana planned, coordinated, and reported on findings of the assessment indicating the presence of PFAS in the environment.

Long Term Groundwater Monitoring, Former NAS Dallas, Dallas, TX (2015-Present)
As project a project chemist, under the Navy CLEAN contract, Dana collected groundwater samples from various sites following a low-flow sampling protocol using a peristaltic pump and/or bladder pump and disposable tubing. She has coordinated logistics for field efforts and development of drawings/figures, maps, and analytical data.

***Annual, Semiannual, and Quarterly Potentiometric Survey and Groundwater Sampling, Confidential Client, Bedford, MA (2012—2013)**
Served as a field team leader surveying more than 100 groundwater wells for total depth and depth to water using an electric water-level meter. The groundwater wells were then sampled for site-specific parameters using peristaltic pumps and bladder pumps. Coordinated the delivery of these samples, which were then sent to a laboratory for analysis. Maintained event scheduling and hand-delivered samples when required. Worked as lead author on field summary and laboratory results.

***Confidential Client, Virginia Beach, Virginia (June 2010—February 2012)**
Served as Field Team Lead/SSC for the entire site. Collected groundwater samples from various sites following a low-flow sampling protocol using a peristaltic pump and disposable tubing. Worked as lead author on multiple SAPS, procurements, Project Instructions, and Health and Safety Plans. Coordinated logistics for field efforts and development of drawings/figures, maps, and analytical data.

***Mud Rotary Borehole Logging, Confidential Client, VA (January 2012—February 2012)**
As Field Scientist, performed geotechnical logging of soil samples in accordance with the Unified Soil Classification System. Helped oversee the installation of 14 new monitoring wells (7 shallow and 7 deep, field determined); well development and 40 groundwater samples were collected via bladder pump.

***Groundwater Investigation, Confidential Client, LA (2010)**
As Site Safety Coordinator/Field Team Lead, supervised the subcontractor during the installation of two temporary boring locations for groundwater and soil sampling. Responsible for ensuring all safety procedures, work permitting, data quality, and regulatory standards were met. Interfaced with the client to provide updates on work status and expectations.

***Database Management Phase 1, Confidential Client, LA (January 2010—December 2013)**
As Task Manager, loaded lab data into a deliverable database and served as an interface between RECAP assessment end-users and database management. Coordinated the digitization process and delivery of the original hard copy document to support staff and the electronic product to the database manager, and tracked the progress of the data upload.

***Site Remedial Investigation, Confidential Client, Baton Rouge, LA (2009—2012)**
Role: Site Safety Coordinator/Field Team Member

- Executed the field effort in the capacity of project scientist to provide field documentation during drilling activities over a week-long period.
- Client Company had contracted with a local drilling company to complete 12 soil borings at a proposed construction site.
- Documented soil lithologic conditions as well as recorded FID soil headspace readings. Kept a concise field logbook of activities and ensured that the sampling process was completed under Louisiana Department of Environmental Quality regulations.
- Worked as lead author on field summary and laboratory results.

***Semiannual and Annual Groundwater Sampling and Potentiometric Survey, Confidential Chemical Manufacturer, Westlake, LA (2008—2010)**
Role: Field Team Member

- Served as Site Safety Coordinator for a team that surveyed 101 groundwater monitoring wells for total depth and depth to water using an electric water-level meter. These same wells were then sampled for site-specific parameters using submersible pumps and sent to a laboratory for analysis.
- Worked as lead author on field summary and laboratory results.

***Annual and Semiannual Potentiometric Survey and Groundwater Sampling, Confidential Client, Taft, LA (2007—2013)**
Role: Task Manager

- Served as a field team member that surveyed more than 40 groundwater wells and piezometers and 11 staff gauges for total depth and depth to water using an electric water-level meter. The groundwater wells were then sampled for site-specific parameters using peristaltic pumps and bailers.
- Coordinated the delivery of these samples, which were then sent to a laboratory for analysis.
- Maintained event scheduling and hand-delivered samples when required.
- Worked as lead author on field summary and laboratory results.

***CH2MHill Baton Rouge, Louisiana; Knoxville, Tennessee; Boston, MA (July 2007—January 2014)**
Role: Staff Scientist

- Conducted and/or inspected field sampling and other miscellaneous field support services, analyzed environmental site and material data, and prepared environmental reports and plans such as Quality Assurance Project Plans (QAPPs), Uniform Federal Policy-QAPPs and Sampling and Analysis Plans for remedial investigations.

***Flood Control and Water Conversation, County of Riverside, Riverside, CA (October 2005—June 2007)**
Role: Staff Scientist

- Conducted source water assessments of public drinking water systems. The water assessment included collecting field data and GPS data, generating GIS maps, and reporting of potential sources of contamination.

***Ampol Pollutions, New Iberia, LA (2001—2005)**
Role: Staff Scientist

- Inspected and monitored unit operations and developed and made final determination of efficiency. Researched and analyzed long-term trends and made recommendations to maximize the economic performance of the units.

**indicates work for a previous employer*

JOHN BENDER
GEOLOGIST

EDUCATION
MSCE, Norwich University, 2017

BA, Geology, Cleveland State University, 1998

BA, Arts, Cleveland State University, 1998

REGISTRATIONS
- 40-Hour Health and Safety Training, OSHA (29CFR 1910.120) with 8-Hour Annual Refresher
- 10-Hour OSHA Construction Industry Outreach Training Program
- 10-Hour OSHA Construction Safety and Health Lock Out/Tag Out Training
- 8-Hour OSHA Site Supervisor Training
- CPR/First Aid Certification, American Red Cross

John is a geologist and military engineer with over seven years of experience in the environmental consulting industry. John's focus around project management, field work, contractor oversight, and completing assignments on time and under budget. Additional experience working with MCP, CERCLA, NHDES, and federal regulations for military, commercial, and financial clients. John has a wide array of experience working on PFAS field sampling programs at U.S. Navy facilities.

Selected Accomplishments

- Developed and implemented remediation strategy for approximately 1 million gallons of contamination with multiple contamination plumes.
- Increased efficiency of Groundwater Pump and Treat (GWP&T) system and LNAPL recovery systems by 60%, increasing runtime production and decreasing costs.
- Led successful installation of 700 foot cured-in-place pipe liner (CIPP).
- Implemented procedures that resulted in cost savings of between 15% and 30% on various projects.

RELEVANT EXPERIENCE

Bedford Naval Station, Groundwater Investigation, Bedford, MA (2014-2015)
Project geologist conducting groundwater investigation of PFAS and VOCs for government property transition. Responsibilities included liaison for the project manager, local airport representatives, site personnel, and the EPA, low-flow groundwater sampling and technical support.

South Weymouth Naval Air Station, Hangar 1 Site, South Weymouth, MA (2014-Present)
Project geologist for investigation of site area for PFAS. Responsibilities include project management, soil boring advancement, monitoring well advancement, above-ground site surveys, soil sampling, low-flow groundwater sampling, EQUIS database work, and technical support.

Ongoing Former Mill Remediation, North Smithfield, RI (2014-Present)
Project geologist conducting continuing remediation of site contaminants. Responsibilities included liaison for the project managers, local homeowners, town officials, and the EPA, system operations and maintenance, air sampling, low-flow groundwater sampling and technical support.

Fire Fighting Training Area (FFTA) Site, South Weymouth, MA (2014-Present)
Project geologist for continuing investigation of site contaminants, including emerging contaminants. Responsibilities include contractor oversight, low-flow groundwater sampling, soil sampling, sediment sampling, and technical support.

MARSHALL GIBSON

ENVIRONMENTAL SCIENTIST

EDUCATION
BS-Bachelor of Science, Soil Science, University of New Hampshire, 2000

YEARS EXPERIENCE:
16 years

TECHNICAL EXPERTISE

- PFAS Regulatory & Technical Protocols
- NHDES Regulatory Relationships & Negotiations
- Soil & Groundwater Investigations

Marshall is an environmental scientist with in-depth experience managing and performing site investigations where perfluorinated compounds are the contaminants of concern. From project management to implementation of field protocols, to analytical and data interpretation, Marshall has successfully evaluated the nature and extent of PFAS in soil and groundwater.

RELEVANT EXPERIENCE

Naval Facilities Engineering Command - Atlantic Division, Bedford, MA
Acted as the Field Manager for a multi-phase groundwater investigation of PFAS and 1,4-dioxane at a former Naval weapons research facility. Tasks included coordination and implementation of all field tasks with adherence to the project's Uniform Federal Policy-Quality Assurance Project Plan, communication with on-site regulatory agencies, and assist with the data analysis and preparation of a report summarizing findings.

Naval Facilities Engineering Command - Atlantic Division, South Weymouth, MA
Performed as Task Order Manager for the investigation of PFAS at two separate sites at a former Naval Air Station. Tasks included preparation of Uniform Federal Quality-Quality Assurance Plans (UFP-QAPP), Long-Term Monitoring programs, implementation of various PFAS field programs, preparation and data analysis of multiple regulatory documents for PFAS activities including a CERCLA Remedial Investigation report and several Long-term Monitoring reports.

Naval Facilities Engineering Command - Atlantic Division, Former Bronson Field, Pensacola, FL
Primary author of a Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) in support of the investigation of a drinking water supply well impacted by PFAS at a former Naval Air Station. Developed unique groundwater sampling strategy to evaluate potential PFAS impacts across multiple aquifers, and assess potential on-and off-site PFAS sources.

The Concord Group Insurance Co, Somersworth, NH
Manager responsible for investigation and remediation of impacts from a No. 2 fuel oil release. Duties included developing scopes of work for each project phase, generate both task and long-term strategic budget estimates, interface with regulatory agency and client, supervise field work and project deliverables. Used innovative application of a bio-remedial product to reduce source area that couldn't be removed by excavation to reduce client's long-term liability associated with groundwater impacts.

Massachusetts Water Resource Authority, Somersworth, NH
Managed all aspects of project technical and financial tasks related to a No. 2 fuel oil plume at a former shipyard. Evaluated multiple free-phase product recovery systems through pilot-testing to identify the most effective remedial solution for a No. 2 fuel oil plume, developed long-term site strategic plan to ensure smooth project transition.

ROBERT P. MCCARTHY, PE, LEP

SENIOR PROJECT MANAGER/ENGINEER

EDUCATION

MS, Civil Engineering, 1997, University of Florida

BS, Civil Engineering, 1990, University of Florida

REGISTRATIONS

- Professional Engineer, Connecticut, No. 20643, 1998
- Professional Engineer, Rhode Island, No. 7637, 2002
- Professional Engineer, New York, No. 082259, 2004
- Professional Engineer, Kansas, No. 16925, 2002
- Licensed Environmental Professional (LEP), Connecticut, No. 0405, 2003

Rob has 24 years of experience managing and performing environmental site assessments, property transfers, site redevelopment analysis, Brownfields cleanups, feasibility studies, permitting, risk assessment and remediation for local, state, federal, and commercial clients. As a senior project manager, he has been responsible for projects across the northeast, including MA, RI, CT, NY and NJ.

He provided planning, management and oversight of several large scale investigations with multiple field teams, expedited timeframes, neighborhood wide assessments, data management/analysis/presentation, alternative reviews, remedial scenario development, cost estimating, and reporting. Remediation experience has included vertical and horizontal wells, soil vapor extraction, multi-phase extraction, air sparge, enhanced bioremediation/injection, excavation, and natural attenuation. Project sites have included long time industrial properties, dry cleaners, gas stations, brownfields, former manufactured gas plant, ash landfill, and former orchards. Project work has involved application of technology such as GPS locating, GIS analysis, historic graphic overlays, data logging, and real time field measurement.

Project tasks have included QAPP/SAP, Record of Decision and Five Year Review writing and reviews, conceptual site model development, vapor intrusion investigations, indoor air quality assessments, emerging contaminant assessments, groundwater/contaminant modeling, SPCCs, SWPPPs, specification writing, material handling plans, hazardous waste disposal, emergency response oversight, public information sessions, construction oversight, and storage tank design, inspection, removal, and compliance. Permitting experience for air and water discharges for mechanical equipment installations, construction site dewatering, and sub-slab depressurization. Investigation and remediation Sites have involved USEPA superfund and RCRA closures as well as state agency coordination in CT, RI, NY, and MA.

RELEVANT EXPERIENCE

Environmental Site Investigation / Remedial Design, Naval Weapons Industrial Reserve Plant Bedford, NAVFAC Atlantic, Bedford, MA (April 2014—Present)

As Task Order Manager, manage Sample and Analysis Plan development and Data Quality Objective planning process for emerging contaminant investigations, targeting PFCs and 1,4-dioxane, at areas of the facility abutting Hanscom Air Field. Sample plans included use of specialized procedures, equipment, sample handling, and laboratory methods. Provided oversight for expedited completion of the PFC and 1,4-dioxane sample event in support of a proposed property transfer. Revised Land Use Control and long term sampling plans based on identification of PFCs exceeding the federal health advisory value. Prepared and implemented 1,4 dioxane delineation investigations and prepared treatment studies for equipment modifications to handle 1,4 dioxane at a groundwater extraction system.

Environmental Site Investigation / Remedial Design, Submarine Base New London, NAVFAC Atlantic, Groton, CT (March 2012—Present)

As Task Order Manager, managing 5 simultaneous Contract Task Orders totaling $1.15M for this Superfund site. Providing Five-Year Review for 15 sites, remedial designs for soil and sediment impacts in the lower subase area, Land Use Control designs, RACRs, SAP for

TRAINING CONT.

- 40-hour Health and Safety Training: OSHA (29 CFR 1910.120)
- 8-hour Refresher Training
- Basics of Partnering Training

data gap investigation, risk assessment, O&M revision, site assessment screening evaluation (SASE), updating facility-wide Site Management Plan (SMP), regulatory schedules, health and safety plan, community information assistance, RAB and public meeting coordination and presentations, and oversight of remedial actions by contractors. Effective CTO Manager, working closely with the Navy RPM and base personnel on technical, financial and administrative management and direction. Revising and updating complicated LUC and O&M plans for continued effectiveness and streamlined implementation by base personnel to maintain compliance and protectiveness. Advancing multiple sites toward closure and working with regulators on an aggressive goal of base delisting.

Environmental Site Investigation / Remedial Design, Former Stamina Mills Superfund Site, Kayser Roth Corp. (January 2014—Present); North Smithfield, Rhode Island
As Project Manager for CERCLA site with ongoing groundwater pump and treat system for TCE in fractured bedrock, successfully manages O&M oversight, permitting, semi-annual groundwater and vapor sampling; preparing and filing required USEPA submittals; completion of Five-Year Reviews, neighborhood potable well sampling, assistance with groundwater restriction ordinance, strategic site decision-making, technical expertise as well as regulatory interface on an ongoing basis; recent on-site soil sampling was completed to justify removal of portions of the remediation system.

Remedial Design, Former Dry Cleaner Investigation and Remediation, Property Transfer Site, New Canaan, CT (2007—Present)
Served as Project Manager / Engineer, performing services consisting of due diligence Phase II/III Investigation, vertical delineation, off-site well installations, GPR assessment, sub-slab vapor assessment, remedial planning, CTDEEP Form filing, and CTDECD Dry Cleaner Fund Application. Project has been partially funded by the CTDECD and remediation was conducted throughout 2009. Remediation included excavation of indoor and outdoor areas, UST removals, injection of 3DMe along the property line, installation of vent piping, and continued monitoring of groundwater conditions.

Voluntary Clean-Up Program Investigation and Remediation, Greenburgh, NY (2000—Present)
Project Manager / Engineer for former dry cleaner site consisting of an active shopping center with chlorinated compounds identified in soil and groundwater extending below the building and off property. Interim Remedial Measures included excavating impacted soil from below the building and installation of a sub-slab depressurization system. Recent injection of 3DMe completed throughout the plume area to reduce concentrations underneath the on-site building and migrating off-site. On-going monitoring of vapor intrusion and groundwater plume condition continues.

UST Removal/Installation, CT Former Truck Stop/Repair Garage, Union, CT (1998—Present)
Served as Project Manager / Engineer for former truck stop and vehicle repair facility with numerous USTs. Completed identification and removal of non-compliant UST systems and investigation of on-site underground injection wells. Removal and investigation completed following CTDEEP consent agreement.

***Environmental Site Investigation, Community Redevelopment Project, Norwalk, CT (2005—2011)**
Project Engineer for site encompassing 20+ acres, 50+ properties consisting of industrial, commercial, and residential uses, and 5 CTDEEP Property Transfer Sites. Environmental investigations included Site specific and area wide assessments. Investigations included coordination with engineering, geotechnical, surveying, and other project disciplines regarding planning, objectives, and schedules. Data management and presentation methods utilized GIS, CAD, and spreadsheets. Investigation results have been utilized in conjunction with proposed development plans for estimating potential project costs associated with environmental compliance.

Sub-Consulting Assistance (1995—Present); Various Locations
As Project Engineer, provide technical review and consulting assistance to longtime client with projects in the states of Indiana, New York, Connecticut, New Jersey, Illinois, and Massachusetts. Projects typically consist of dry cleaner Sites with completed investigations or remedial actions which require analysis of current information for data gaps, risk, proposed remedial methods, cost ranges, regulatory implications, and closure scenarios.

**indicates work for a previous employer*