AECOM Environment

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Field Activities Plan (FAP)

FORTINO TIRE

WEST MONROE, NEW YORK 13167
WORK ASSIGNMENT D009803.15.1

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1.0 Introduction

This Field Activities Plan (FAP) is designed to provide typical procedures for the field activities on work assignments (WAs) issued under New York State Department of Environmental Conservation (NYSDEC) Contract D009803. It will serve as the field procedures manual for all AECOM USA, Inc. (AECOM) personnel. Adherence to these procedures will ensure the quality and defensibility of the field data collected. In addition to the field procedures outlined in this document, all personnel performing field activities must do so in compliance with: (1) the Quality Assurance/ Quality Control (QA/QC) measures outlined in the Quality Assurance Project Plan (QAPP); (2) the appropriate Health and Safety guidelines found in the Health and Safety Plan (HASP); (3) the scope of work outlined in the WAs; and (4) the time schedule outlined in the WAs.

1.1 Work Assignment Objectives

The objectives of the work assignment are be established in the WAs issued by NYSDEC under contract D009803-15 and documented in the Scope of Work (SOW); refer to **Appendix A**. The general objectives of the work assignment are to determine the vertical and lateral extent of contamination due to automotive shredder residual (ASR) that has been disposed of at the Fortino Tire Site (Site) and develop alternatives for remediation. For the current WA, this will be done through a Supplemental Remedial Investigation at the Site, to address data gaps identified following the 2021 Remedial Investigation (RI).

Field activities are planned and conducted in general accordance with NYSDEC DER-10, Technical Guidance for Site Investigation and Remediation (NYSDEC, 2010), the United States Environmental Protection Agency (USEPA) Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (USEPA, 1988), and New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH, 2006).

The FAP is intended to be a companion document to the SOW (**Appendix A**) prepared for each work assignment. This FAP was prepared using the Generic NYSDEC-approved FAP for NYSDEC Contract D009803 to address site-specific conditions and project-specific requirements.

1.2 Site Description and Background Information

Available site information is be presented below and includes, to the extent available and relevant, the following:

- Site Description
- Site Location
- Site History
- Previous Investigations, Remedial Actions, and Reports

- Record of Decision
- Current Site Conditions
- Local and Regional Geology and Hydrogeology
- Any other relevant information

1.3 Site Description and Location

The Former Fortino Tire Landfill Site is located at the northern end of Pinnacle Road Spur in the town of West Monroe, Oswego County (**Figure 1** – **Site Location**). The area of concern (AOC) is approximately 10 acres within the 77-acre parcel. The Site is bound on all sides by private property, to the east by the town of Constantia, and Three Mile Creek to the southwest (**Figure 2** – **Site Plan**).

The Site is partially open fields, partially wooded and contains protected wetlands. The Site is currently inactive and zoned for residential use. The surrounding parcels consist mostly of undeveloped land with the closest residents approximately 1,900 feet to the north and south.

1.4 Site History

In the early 1980s, the Site began receiving ASR from Roth Steel of Syracuse, New York. The Site was utilized as a municipal waste accumulation area and a used tire and ASR waste accumulation area. During the mid-1980's, ASR waste was dumped over the embankment and entered wetlands to the north and east of the Site. Town of West Monroe municipal waste was dumped to the west, adjacent to the ASR waste.

Historically, the south area of the Site was partially flooded from beaver activity, but engineering controls in the form of Clemson beaver pond levelers eliminated much of the flooding.

1.5 Previous Investigations, Remedial Actions, and Reports

Sampling performed by NYSDEC in 1990 and 1991 indicated the presence of polychlorinated biphenyls (PCBs) not above 1 part per million (ppm) in soil and water. From 2004 to 2009, a NYSDEC initiated tire remediation removed approximately 11 to 12 million tires from the Site. The Site currently contains approximately 55,000 cubic yards of ASR waste. Additional sampling by NYSDEC from 2008, 2009 and 2011 of the ASR waste indicates some samples above 50 ppm, the Toxic Substances Control Act (TSCA) hazardous waste concentration limit. Sampling performed in May 2015 by NYSDEC Division of Materials Management indicated the presence of PCBs at levels up to 240 ppm and Lead and Mercury above NYCRR Part 371 standards. A Site Characterization (SC) was performed by TRC Engineers, Inc. (TRC) between November 2016 and July 2017. Six groundwater wells were installed and sampled along with one historical well that was located at the Site. Additional soil boring samples, surface water and sediment samples were collected. The SC determined that the ASR waste is exposed at the surface with little to no soil cover and ranges from 5-10 feet thick in most locations but was found at least 22 feet deep in a few select locations. Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, PCBs, and/or metals were detected at concentrations above Unrestricted Use Soil Cleanup Objectives (SCOs) for all sampled media. Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were detected at concentrations above the Health Advisory levels in both surface water samples collected east of the ASR waste and in some groundwater samples. In 2019 an RI was performed to assess the horizontal and vertical extent of contamination outside of the ASR waste pile. Samples during the RI were collected from surface water, sediment, surface and subsurface soil, and overburden groundwater and focused on sampling the areas immediately surrounding the known limits of the ASR waste pile.

The highest impacts were found within the ASR waste. A significant decrease in concentrations of constituents was evident in the soil below the ASR waste, however, there were sporadic concentrations of constituents detected in underlying soil above the Unrestricted Use SCOs.

1.6 Current Site Conditions

The Site is currently abandoned and overgrown vacant land. Previous investigations indicate that the disposal of ASR has led to contamination of soil, groundwater, surface water, and sediment in and around the disposal area. Applicable standards, criteria, and guidance values are exceeded for PCBs, metals, VOCs, SVOCs, pesticides, and per- and polyfluoroalkyl substances (PFAS). Based on investigation conducted to date, the primary contaminants of concern are PCB's, Cadmium, Lead, and Mercury. Currently sampling has been conducted only in the area of ASR waste. An estimated 55,000 cubic yards of the ASR waste pile ranges from approximately 640 feet at its longest, 400 feet at its widest, and from one up to approximately 22 feet depth. In the early 1980s, the Site began receiving wastes from Roth Steel of Syracuse, New York.

1.7 Local and Regional Geology and Hydrogeology

Site bedrock is Medina Sandstone, encountered at a depth of approximately 50 feet. The geology of West Monroe consists of soils and unconsolidated sediments overlying crystalline bedrock. the subsurface geology for the Site likely includes the following formations: the Ordovician Queenston Shale, the Early Silurian Medina Group, which is comprised of the Whirlpool Sandstone, Power Glen Shale, Devils Hole Sandstone, Grimsby Formation, Thorold Sandstone, Cambria Shale, Kodak Sandstone, and the Early Silurian Clinton Group. The interval containing the Thorold, Cambria, and Kodak has previously been assigned to the overlying Clinton Group. The Medina consists of 80 to 115 feet of white, green, red, barren to moderately fossiliferous sandstone, siltstone, and shale. The depth to crystalline bedrock for the area is estimated to be approximately 50 feet below ground surface (bgs). During recent Site investigations bedrock was not encountered.

Soils encountered during a 2015 sampling investigation were described as primary fill composed of brown and gray sand, silt and clay with tire, glass, and foam partials. Native soil encountered during soil boring advancement during the 2019 RI consisted of native brown to pink-brown fine sands and silts overlying native till composed of pink-brown and pink-gray gravelly sands and silts. In general, till was observed at depth ranging from 1-18 feet bgs. The Site consists of wetlands and drains to the south. Groundwater at the Site is found within a silt and fine sand layer. Previous investigations identified groundwater from approximately 10-18 feet bgs at existing Site wells.

2.0 General and Preparatory Field Activities

The SOW presented in the work assignment include a variety of field activities intended to obtain Site-specific data pertaining to the extent of contamination and the extent to which releases or potential releases from the Site pose a threat to human health and the environment.

The work includes a variety of field activities intended to obtain site-specific data pertaining to the extent of contamination and the extent to which releases or potential releases from the site pose a threat to human health and the environment. Project objectives include:

- Assess site geology;
- Assess site hydrogeology;
- Evaluate areal and vertical extent of contamination, including transport mechanisms;
- Assess and survey jurisdictional wetlands within the Site;
- Assess the source(s) of contamination and determine if this source(s) has impacted off-site properties; and
- Collect additional data to support the design and implementation of remedial actions.

To accomplish these objectives, the field subtasks described in this FAP will be utilized. Additional methodology information will be provided in the QAPP. Unless otherwise noted, it is assumed that all field work will be completed at Level D personal protection in accordance with the HASP. Field activities will be monitored by a qualified AECOM representative(s).

2.1 Mobilization

Following authorization to proceed with the field investigation from NYSDEC, AECOM and its subcontractors will mobilize necessary materials and equipment to the site. As this project involves intrusive work (e.g., monitoring well installation and soil borings), a call will be placed to DigSafely New York and will be the responsibility of the subcontractor performing the intrusive work. Utility clearance is detailed in Section 2.3.

This FAP describes the provisions made for providing all necessary facilities and material, independent of the site owners/occupants.

Site preparation will be performed by AECOM's drilling subcontractor, Matrix Environmental (Matrix) under direction by AECOM.

Site preparation activities include:

- Construct a temporary decontamination pad on an existing concrete slab for decontamination of tools and equipment. The temporary decontamination pad will be lined with plastic sheeting so wash water can be collected, containerized, and properly disposed. Following the supplemental remedial investigation, the temporary decontamination pad will be disassembled and removed from the Site.
- Establish an investigative derived waste (IDW) staging area on an existing concrete slab.

Project kick-off meetings will be held prior to initiating each phase of field work to orient field team members and subcontractors with the Site and to familiarize all Site workers with site background, potential dangers, health and safety requirements and emergency contingencies and other field procedures.

2.2 Health and Safety

Work to be completed at this Site will be performed in Level D personal protection with the potential to upgrade to Level C. Field workers will be instructed to keep Level C equipment available should it be needed. Should health and safety monitoring during field activities indicate a threat to field personnel or warrant an upgrade beyond Level C protection, work will stop, and site conditions will be re-evaluated by NYSDEC and AECOM. An upgrade to Level B protection will require modification of the HASP and review by AECOM's regional safety manager.

2.3 Utility Clearance: Callout

Intrusive activities that will be conducted during this Site investigation include soil borings and monitoring well installations. Prior to the start of intrusive activities, a call will be placed to New York DIG SAFE CALL CENTER at Dig Safely New York (for all areas north of New York City) 811 (http://www.digsafelynewyork.com) or 1-800-962-7960; for New York City and Long Island, 811 or 1-800 272-4480 for utility markouts to minimize the risk of encountering subsurface utilities.

2.4 Utility Clearance: Hand Tools

Excavation with hand tools allows for excavation near subsurface utilities with reduced chance of impacting the utilities. Hand clearings are not anticipated for the borings within the landfill area, although monitoring wells will be hand-cleared unless determined not needed by NYSDEC.

Procedure:

1. Excavate a two-foot square by approximately five-foot deep area manually using post-hole diggers, pry bars, and/or hand digging.

2. After the location is cleared for drilling, the hole will be backfilled flush with the ground surface using the excavated spoils (small rocks and debris removed).

3. Excavated material not returned to the hole will be drummed along with the monitoring well boring spoils for proper disposal.

2.5 Community Air Monitoring

Community air monitoring will be performed as outlined in the NYSDOH Generic Community Air Monitoring Plan (CAMP), unless it is determined by NYSDEC that a Site-specific air monitoring plan is required, or that some of the provisions of the CAMP are not appropriate for a specific work assignment. AECOM's approach to implementing the Generic CAMP is provided in Section 8.0 of this FAP.

2.1 Wetland Delineation Survey

A routine wetland delineation survey for the 70-acre Site will be conducted in accordance with the USACE 1987 Wetlands Delineation Manual and the January 2012 Northcentral and Northeast Regional Supplements along with the 1995 NYDEC Freshwater Wetlands Delineation Manual. Also, for New York State-listed wetlands, AECOM will delineate the wetland boundaries in accordance with the New York State Freshwater Manual.

Open water systems (Waters of the United States) will be delineated based on bed and bank channels. The boundaries of jurisdictional wetlands within the Site will be delineated with pin flags or tape flags. The flags will be surveyed using a high accuracy Trimble Global Positioning System (GPS) Pathfinder Geosha unit with external Zephyr antenna to provide sub-foot post-processed data accuracy.

Additional information that will support a Fish and Wildlife Resource Impact Analysis (FWRIA) such as plant stress and wildlife observations, will also be collected during the wetland survey.

AECOM scientists who are knowledgeable in soil science and geomorphology will determine the classification (i.e., sediments or soils) at the proposed sediment and surface soil locations. AECOM scientists will visit each location and based upon visual observations, determine if the sample location is sediment or soil.

The criteria for determining sediment will be the following:

1) If the sample location is below the mean high-water mark of a permanent flowing/ponded area;

2) If the sample location is within a confined basing or ephemeral channel that could hold sufficient water for two months during the growing season to support aquatic life (e.g., amphibians).

Any location not meeting one of these criteria will be classified as soil.

The determination of sediments and soils may be further supported with review of readily available historical maps aerial photography. Based on the differentiation between sediment from soils, the sample intervals for soil or sediment sampling conducted as described in Sections 5.0 and 6.0 of this FAP will be adjusted from the SOW descriptions.

2.2 Site Survey

Project surveying will provide data necessary to plot groundwater monitoring wells, borings, and surface water locations on the existing base map. All surveying will be performed by AECOM subcontractor CT Male Associates under the supervision of a New York State licensed land surveyor, following the requirements of the SOW and HASP.

The horizontal positions will be tied into the North American Datum 1983 (2011) State Plan New York Central FIPS 3102 (US Feet). The vertical positions will be tied to the North American Vertical Datum 1988 (NAVD88). The measuring point associated with the existing monitoring wells or other Site reference features will be recorded to a vertical accuracy of 0.01 feet. The final survey will be supplied in a digital CAD format (i.e., .dwg or .dxf files in the cited coordinate systems) and in ASCII file format.

2.3 PFAS Sampling

PFAS have been identified in previous sampling events. Therefore, discrete samples collected during this investigation will also be analyzed for the emerging contaminants in accordance with the following guidance documents:

- Sampling, Analyses, and Assessment of Per-and Polyfluoroalkyl Substances (PFAS), under NYSDEC's Part 375 Remedial Programs (DRAFT June 2022).

Additionally, on October 6, 2021, NYSDEC released new water quality guidance values (GVs) that will advance the State's regulation of the emerging contaminants PFOA, PFOS, and 1,4-Dioxane. The GVs for these contaminants are established in a draft addendum to TOGS 1.1.1 (NYSDEC 2021b).

Since PFAS are to be analyzed, the following techniques will be used in conjunction with procedures cited in the QAPP and NYSDEC PFAS sampling guidance documents:

- Use only laboratory certified "PFAS-free" water for equipment decontamination.
- Use only Alconox® or Liquinox® soap for decontamination.
- No Sharpies® will be used, only ball point pens.
- No water-resistant field books/ laboratory notebooks, only loose paper on aluminum clipboards or non-resistant field books.
- Do not wear the following:
    - Personal hygiene items (cosmetics, lotions, moisturizers).
    - Sunscreens and insect repellants. Instead, wear long sleeve / light colored 100% cotton shirts and wide brimmed hats.
    - New or unwashed clothing.
    - Clothing washed with fabric softeners.

  - Treated clothing (i.e., waterproof, water resistant, stain-resistant, etc.).
  - Treated boots (i.e., waterproof, water resistant, stain-resistant, etc.).
  - Coated Tyvek® suits.
- Do not handle prepackaged food products immediately prior to sampling.
- Wear a new pair of disposable powderless nitrile gloves prior to sample collection.
- Do not use fluoropolymer bailers, pump bladders, tubing, valves and other pump parts.
- Do not use anything with Teflon®.
- Use HDPE and silicon materials only.
- Do not use glass containers for sampling. Use only bottleware provided by the laboratory (i.e., polypropylene or HDPE sample bottles with unlined [no Teflon®] polypropylene or HDPE screw caps).
- Do not use aluminum foil.
- Do not filter samples in the field.

3.0 Drilling Procedures

Drilling activities for installation of eight (8) overburden monitoring wells will be conducted according to the SOW and will utilize hollow-stem auger (HSA) drilling. Procedures for these activities are described below.

3.1 Hollow-Stem Auger Drilling Procedures

A standard method of subsurface drilling which enables the recovery of representative subsurface samples for identification and laboratory testing. When sampling for PFAS, special field procedures will be followed per **Appendix B**.

Procedure:

1. HSAs, drill rods, and the drill rig will be thoroughly decontaminated prior to initial borehole installation and between each borehole at the centralized decontamination area. All decontamination liquids will be collected and placed in DOT-approved 55-gallon drums.

4. The drill rig will be inspected for oil leaks and any leaks reported prior to starting drilling operations.

5. Advance the boring by rotating and advancing the HSAs to the desired depth. The borings will be advanced incrementally to permit continuous or intermittent subsurface soil sampling, as required.

6. Remove center plug from the HSAs and collect a split spoon sample per the method stipulated by the project geologist or hydrogeologist.

References: American Society for Testing and Materials (ASTM) D1452/D1452M-16.

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4.0 Groundwater Investigation Tasks

Groundwater investigations are typically part of a site investigation. Field activities which will be implemented as part of a groundwater investigation include (but are not limited to) the following:

- Groundwater Elevation Survey
- Monitoring Well Installation
- Monitoring Well Development
- Groundwater Sampling from Monitoring Wells
- Aquifer Properties Testing (hydraulic conductivity “slug” testing)

4.1 Groundwater Elevation Survey

In order to better understand the hydrogeologic conditions, synoptic water level readings will be collected by AECOM prior to groundwater sampling.

Water levels in monitoring wells scheduled to be sampled during the field work will be measured using an electronic water level indicator. Initially, measurements will be taken following well development until the well has recovered to anticipated static conditions. Water level measurement procedures are presented below.

Procedure:

1. Clean the water level probe and the lower portion of cable following standard decontamination procedures (Section 7.1) and test water level meter to ensure that the batteries are charged.
2. Lower the probe slowly into the monitoring well until the audible alarm indicates water.
3. Read the depth to the nearest hundredth of a foot from the graduated cable using the V-notch on the inner casing as a reference point or from the north side of the inner casing.
4. Repeat the measurement for confirmation and record the water level.
5. Remove the probe from the well slowly, drying the cable and probe with a clean "Chem Wipe" or paper towel.
6. Replace the well cap and lock protective cap in place.
7. Decontaminate the water level meter (Section 7.1) if additional measurements are to be taken.

Reference: ASTM D4750-87(2001).

4.2 Monitoring Well Installation

The number and locations of proposed monitoring wells are shown on **Figure 3 – Proposed Monitoring Well Locations**.

Prior to advancing augers, the borings will be hand cleared to five feet bgs. Split spoons will be advanced ahead of the 4¼-inch HSAs and soils will be logged.

Eight (8) monitoring well borings will be advanced to the target depth of approximately 25 feet bgs as listed in the SOW. Subsurface soil samples for logging purposes will be obtained and logged in accordance with Section 5.2. No soil samples for laboratory analysis will be collected at these locations unless anthropogenic fill material is encountered as described in the SOW. Soil cuttings will be screened for organic vapors using a PID.

During monitoring well installation, precautions will be used to eliminate or minimize the occurrence of PFAS-containing materials used during the investigation. This will include making sure that field staff use PFAS-free clothing, equipment, and supplies when appropriate, and using certified PFAS-free water during decontamination activities.

4.2.1 Overburden Monitoring Well Construction Procedures

The monitoring wells during this investigation will be constructed with a 10-foot-long, 2-inch inside diameter Schedule 40 PVC, No. 0.010 slot screen and 4-inch steel protective casing for stickup completions. The groundwater monitoring wells will be installed during this investigation using the procedures described below.

Procedure:

1. Advance subsurface boring to the desired depth by means of HSA drilling.
2. While boring, collect split spoon samples on a continuous basis to geologically log the boring.
3. Remove center plug from augers and verify borehole depth using weighted measuring tape.
4. Add washed and graded medium sand as needed to base of borehole.
5. Insert the well screen and riser pipe into borehole through the HSA. Cap the riser to prevent well construction materials from entering the well.
6. Add sand to screen section of well while slowly removing augers. Sand pack should extend at least two feet above the top of the screen section. Measure with a tape.
7. Slowly add bentonite pellet seal to borehole as augers are slowly removed. The bentonite seal should extend at least two feet above the top of the sand pack section. Measure with tape.
8. Note: The rate of removal of the auger from the borehole should closely follow the rate that the sand pack and bentonite pellets fill the borehole.

9. If bentonite seal is placed above the groundwater level within the borehole, add water to the borehole to hydrate the bentonite pellets. Allow pellets to hydrate for at least 30 minutes.

10. Mix cement/bentonite grout per manufacturer's specifications (94 pounds cement, 5 pounds powdered bentonite, 6.5 gallons water; thoroughly mix cement and water prior to adding bentonite).

11. Add grout to borehole through tremie pipe or hose from the top of the bentonite seal to the ground surface.

12. Remove remaining augers from the borehole.

13. Top off grout in borehole. Grout should extend to approximately two feet below ground surface.

14. Cut well-riser pipe to about three feet above the ground surface for stickup type wells. Flush-mount well risers should be cut off just below surface grade. Wells will be completed as stickup completion whenever possible.

15. Backfill the remaining two feet of the borehole with concrete.

16. Install a protective casing over the well riser pipe and set it into the concrete backfill.

17. Lock the protective casing cover.

18. Document well construction in the field notebook and on a Well Construction Detail diagram (**Appendix C**).

Reference: ASTM D5092/D5092M-16.

4.3 Well Development

Newly installed monitoring wells will be developed by an AECOM field geologist, with assistance by AECOM's drilling subcontractor, a minimum of 24 hours after their completion. Each monitoring well will be developed by pumping until the discharged water is relatively sediment free and the indicator parameters (pH, temperature, and specific conductivity) have reached steady state. Approximately 50 gallons of development water are estimated for removal from each newly installed well based on five well volumes; assuming a 2-inch well casing, 12-foot long saturated sand pack and 8-inch diameter borehole. Developing the monitoring well not only removes any sediment but also may improve the hydraulic properties of the formation. The effectiveness of the development measures will be closely monitored in order to keep the volume of discharged water to the minimum necessary to obtain sediment-free samples. A portable turbidimeter will be used to monitor effectiveness of development. A turbidity reading of < 50 Nephelometric Turbidity Units (NTU) and steady-state pH, temperature, and specific conductivity readings will be used as a guide for discontinuing well development. Per previous discussions with NYSDEC, development water from the newly installed monitoring wells outside the ASR waste pile will be returned to the ground surface. When sampling for PFAS, see **Appendix B** for special field procedures.

Procedure:

1. An appropriate monitoring well development method should be selected, depending on water level depth, well productivity, and sediment content of water. Monitoring well development options include: (a) manual pumping; and (b) powered suction-lift or hydrolift pumping.

2. Equipment should be assembled, decontaminated (if necessary), and installed in the well. Care should be taken not to introduce contaminants to the equipment during installation.

3. Monitoring well development should proceed by repeated removal of water from the well until the discharged water is relatively sediment-free. All development waters will be containerized. Effectiveness of development should be monitored at regular intervals using a portable turbidimeter and water quality meter. Volume of water removed, and turbidity, pH, temperature, and conductivity measurements will be recorded on a Well Development/Purging Log form (**Appendix C**).

4. Monitoring well development will be discontinued when the turbidity of the discharged water is below 50 NTU and the other indicator parameters have stabilized.

Reference: ASTM D5092/D5092M-16.

4.4 Groundwater Sampling from Monitoring Wells

Groundwater sampling (both filtered and non-filtered samples) will be performed to evaluate the extent of groundwater contamination. The rationale, locations and well identifications are presented on **Figure 3 – Propose Monitoring Well Locations, Table 1A – Proposed Groundwater Analytical Sampling Program,** and in the QAPP.

Two groundwater sampling events will be performed by AECOM's field geologist and separated by approximately three to six months. Phase I will consist of the 15 existing monitoring wells. Phase II will consist of the eight newly installed monitoring wells and approximately seven previously installed wells with exceedances above action levels from Phase I. Dedicated sampling equipment will be used at each well. Per previous discussions with NYSDEC, purge water from monitoring wells outside the ASR waste pile will be returned to the ground surface, while purge water from monitoring wells on the ASR waste pile will be transferred to 55-gallon closed-top, UN rated steel DOT drums for characterization and disposal.

4.4.1 Low-Flow Sampling Technique

Groundwater sampling will be performed in accordance with *Groundwater Sampling Guidelines for Superfund and RCRA Project Managers* (USEPA OSWER 542-S-02-001). The default groundwater sampling method will be in accordance with EPA's low stress (often referred to as low flow) sampling technique (EPA, 2017).

Monitoring well purging will be completed using the low-flow purging technique as follows:

1. The well cover will be unlocked and carefully removed to avoid having any foreign material enter the well. The interior of the riser pipe will be monitored for organic vapors using PID. If a reading of greater than 5 ppm is recorded, the well will be vented until levels are below 5 ppm before purging begins.

2. Using an electronic interface probe/water level detector, the water level below top of casing will be measured. The depth of the well will be measured to determine the volume of water in the well. The end of the probe will be decontaminated between wells.

3. Calibrate field instruments (e.g., pH, specific conductance, PID, turbidity).

4. Purge the required water volume (i.e., until stabilization of pH, temperature, specific conductivity, and turbidity) using a peristaltic pump and dedicated HDPE tubing. New dedicated tubing will be used for each well.

5. A flow-through cell will be used to obtain water quality parameters. Purge the well until the water quality parameters have stabilized. The stabilization criteria are: specific conductivity - 3% full-scale range; pH - 0.10 pH unit; dissolved oxygen – 10%, Turbidity – 10% and oxidation/reduction (redox) potential - +/- 10 units.

6. Purging of three well volumes is not necessary if the indicator parameters are stable. However, at least one (1) well volume must be purged before sampling can begin. During purging, it is permissible to by-pass the flow cell until the groundwater has cleared.

7. Indicator parameters of pH, conductivity, dissolved oxygen, oxidation/reduction (redox) potential, turbidity, and temperature must be measured continuously using the flow cell.

8. Well purging data are to be recorded in the field notebook and on the Low Flow Purge Log (**Appendix C**).

4.4.2 Sample Collection Procedures

Procedure:

1. After well purging is completed, the flow-through cell will be disconnected, and a sample will be collected into the appropriate containers.

2. Direct water flow toward the inside wall of the sample container to minimize volatilization. Fill volatile sample containers so no headspace (air bubbles) is present. If containers are pre-preserved, do not overfill sample containers. Note if effervescence is observed.

3. All sample bottles will be labeled in the field using a waterproof permanent marker (Section 9.4).

4. Samples will be collected into sample bottles (containing required preservatives) and placed on ice in coolers for processing (preservation and packing) prior to shipment to the analytical laboratory. A chain-of-custody record will be initiated. The analytical laboratory will certify that the sample bottles are analyte-free prior to shipping.

5. Remove pump and disconnect tubing as necessary.

6. Well sampling data are to be recorded in the field notebook and on the Well Purging Log (**Appendix C**).

4.5 Aquifer Property Testing

Aquifer tests will be performed at select monitoring wells to determine various hydrogeologic parameters (aquifer characteristics) such as permeability, transmissivity, and storativity. The two primary methods for determining aquifer characteristics are short-term permeability tests (often referred to as “slug” tests) or longer-term aquifer pumping tests. Slug test will be performed during this phase of work.

4.5.1 Aquifer Tests

Available geologic and hydrogeologic data will be evaluated prior to conducting the aquifer test for the purpose of determining a suitable network of wells to complete the aquifer test. The number and location of water level observation wells and the frequency of measurement is described below. Hydraulic testing (i.e., slug tests) of seven (7) wells will be performed to characterize the permeability of saturated subsurface materials at the Site. Slug tests will be performed at the following in-ASR waste pile and downgradient wells:

- In- ASR waste pile wells: FT-MW-101, FT-MW-103, FT-MW-104
- Downgradient wells: MW-107, MW-109, MW-116, MW-117

Discharge of large volumes of water generated from the aquifer test can be problematic. Per previous discussions with NYSDEC, purge water from monitoring wells outside the ASR waste pile will be returned to the ground surface, while purge water from monitoring wells on the ASR waste pile will be transferred to 55-gallon closed-top, UN rated steel DOT drums for characterization and disposal.

4.6 Slug Tests

Hydraulic conductivity tests (slug tests) will be performed in in- ASR waste pile wells: FT-MW-101, FT-MW-103, FT-MW-104; and in downgradient wells: MW-107, MW-109, MW-116, MW-117. During any slug testing, gauging of fluid levels will be performed using a data logger/pressure transducer, and stainless-steel slugs. Since the water table is shallow, only rising head (slug-out) tests will be performed. This test will consist of inserting a ‘slug’ of known volume into the well/piezometer, allowing the water level in to return to a steady state, removing the slug allowing the water level to return to static conditions. The transducer/data logger will record changes in water level. These data will be analyzed using the methods of Bouwer and Rice (1976) and Bouwer (1989).

Slug testing is a rapid and inexpensive procedure for estimating the horizontal hydraulic conductivity of an aquifer material screened by a monitoring well. Equipment consists of dedicated/disposable

nylon rope, decontaminated stainless steel slug and a data logger/pressure transducer, and a water level indicator.

Procedure:

1. Measure dimensions of the slug to be used to displace water in the monitor and predetermine the volume of water, which will be displaced, and corresponding initial water level change, which will occur by adding or removing the slug.

2. Record initial water level in the wells (static water level).

3. Lower the pre-cleaned data logger/pressure transducer into wells to the wells bottom. Pull transducer up one foot.

4. Insert slug into well, below water table, with nylon rope. Allow water level in well to return to static condition.

5. Simultaneously initiate data logger/pressure transducer and rapidly remove the slug from the wells.

6. Monitor water level recovery in well with data logger/pressure transducer until static water level has been regained.

7. Download data logger/pressure transducer and record data in field notebook. Review data to verify slug test was successful.

8. Remove equipment from well and decontaminate.

9. Analyze data in office using computer.

5.0 Soil Sampling Activities

Soil sampling activities will include surface soil sampling and subsurface soil sampling. Procedures for these activities are described below.

5.1 Surface Soil Sampling

Surface soil samples will be taken at approximately 19 locations as shown on **Figure 4 – Proposed Surface Soil Locations**. Near-surface soil sampling by hand implements is also discussed in this section. Samples will be analyzed per **Table 1B – Proposed Surface Soil Analytical Sampling Program**.

It is anticipated that samples will be collected in two phases as follows:

Phase I Sampling

- During the first phase, surface soil (and near surface soil) samples will be collected at 19 locations.
- Soil samples will be collected at three intervals: the 0-2 inch, 2-12 inch interval, and 12-24 inch depth intervals (note that the 12-24 inch sample interval will be held at the laboratory as a contingency and analyzed for constituents exhibiting exceedances at the 2-12 inch interval).

Phase II Sampling

- During the second phase, surface soil (and near surface soil) samples will be collected at up to 5 locations to fill in potential data gaps from Phase I sampling.
- Soil samples will be collected at three intervals: the 0-2 inch, 2-12 inch interval, and 12-24 inch depth intervals (note that the 12-24 inch sample interval will be held at the laboratory as a contingency and analyzed for constituents exhibiting exceedances at the 2-12 inch interval).

Equipment will be decontaminated per the QAPP prior to advancing the next boring.

5.1.1 Surface Soil Sample Collection Procedure

1. Using a decontaminated stainless-steel trowel or by hand (protected by a chemically resistant glove), remove rocks, vegetation, and debris to gain access to the surface soils.

2. Using a decontaminated stainless device (teaspoon, trowel, “scoopula,” or similar), transfer the exposed soils directly into the laboratory-provided sample containers. Sampling depth of the uppermost interval typically should not exceed two inches per NYSDOH requirements.

3. Complete the label on the sample container and transfer the sample container(s) to an iced cooler.

4. After collection of the sample, screen the hole with a photoionization detector for volatile organic vapors. Record the readings and any significant observations such as staining, oily sheen, or odors.

5. Continue near-surface soil sampling per Section 5.1.2.

6. PFAS samples will be collected per **Appendix B** and all equipment will receive a final rinse with laboratory grade PFAS-free water.

5.1.2 Near-Surface Soil Sampling (by Hand Auger)

1. Remove rocks, vegetation, debris etc. from the ground surface in the sampling area.

2. Lay a section of plastic sheet adjacent to the soil sampling location.

3. Use a clean (decontaminated) bucket auger, required extension rods and “T” handle to collect a soil sample from the desired depth.

4. Monitor VOCs in the ambient air during soil collection.

5. Turn the auger in a clockwise direction with the “T” handle to remove soil until the desired soil sampling depth is reached. Place the excavated soil on the adjacent plastic. If possible, lay out the cuttings in stratigraphic order.

6. During auger advancement record observations made of the geologic features of the soil.

7. Stop advancing the auger when the top of the specified sampling depth has been reached. Decontaminate the auger.

8. Insert the auger into the borehole to the sample depth and collect the sample. Place sample on ice and transfer to the lab under COC custody.

9. Decontaminate the auger bucket and complete the preceding steps for sample collection from deeper depths.

10. When sampling is complete, place cuttings back in the borehole in the order in which they were removed if possible.

Reference: ASTM D6907-05(2016).

5.2 Subsurface Soil Sampling

Borings will be advanced at approximately 90 locations as specified in the SOW; Phase I sample locations are shown on **Figure 5 – Proposed Soil Boring Locations**. Borings will be advanced at grid nodes on 50 feet by 50 feet spacing, filling data gaps from previous investigations. Samples will be analyzed per **Table 1C – Proposed Subsurface Soil Analytical Sampling Program**.

Samples will be collected in two phases as follows:

Phase I Sampling

- During the first phase, 71 borings will be advanced within a 50 by 50 feet grid.
- Samples will be collected at 0-0.5 feet, 2-4 feet, 6-8 feet, 10-12 feet, 14-16 feet and 18-20 feet depth intervals with adjustments in the intervals made, as appropriate, based on field observations (e.g., staining, etc.).
- Borings will terminate at a maxim of 2 feet below the top of native soils and the final sample will be collected within the native soils.

Phase II Sampling

- During the second phase, up to 19 borings will be advanced.
- Sample locations and intervals will be determined based on identified areas of insufficient data after Phase I.

5.2.1 Subsurface Soil Sampling from Direct Push Borings

Borings will be advanced by direct push technology drilling methods. Depth to native soils in the ASR waste pile is estimated to range from 4 to 20 feet bgs. Soils will be logged during subsurface sampling. Typical procedures for direct push sampling and soil logging are presented below. Equipment will be decontaminated per the QAPP prior to advancing the next boring. Subsurface Soil Sampling from Direct Push Borings

Soil samples will be collected at specific locations and intervals as specified above, or based on field observations (e.g., if contamination is observed or if elevated PID readings are recorded). The soil samples will be analyzed for parameters as indicated in **Table 1C – Proposed Subsurface Soil Analytical Sampling Program** and the QAPP.

A standard method of subsurface boring using hydraulically powered (static force plus percussion) soil-probing equipment that enables the recovery of representative subsurface samples for identification and laboratory testing. When sampling for PFAS, see **Appendix B** for special field procedures.

Procedure:

1. Inspect the sampling equipment to ensure proper working condition.
2. Insert dedicated disposable acetate liner into the sampler and select additional components for the¬ sampler as required (i.e., leaf spring core retainer for clays, or a sand trap for non-cohesive sands).
3. Lower the sampler to the ground surface, or bottom of the hole previously made by the sampler and check the depth against length of the rods and the sampler.

4. Attach the drive head assembly to the sample rods.

5. Push the sampler in increments up to 5 feet into the subsurface up to the desired depth with a hydraulic press.

6. Rotate the sampling rods clockwise and remove the sampler.

7. Split the sample lengthwise and screen the soil with a PID for volatile organic vapors.

8. Document all properties and sample locations in the field notebook, and on the Direct-Push Log form (**Appendix C**).

Reference: ASTM D6282/D6282M-14.

5.2.2 Unified Soil Classification System

Soils are classified for engineering purposes according to the Unified Soil Classification System (USCS) adopted by the U.S. Army Corps of Engineers and U.S. Department of the Interior Bureau of Reclamation. Soil properties that form the basis for the USCS are:

- Percentage of gravel, sand, and fines;
- Shape of the grain-size distribution curve; and
- Plasticity and compressibility characteristics.

According to this system, all soils are divided into three major groups: coarse-grained, fine-grained, and highly-organic (peaty). The boundary between coarse-grained and fine-grained soils is taken to be the 200-mesh sieve (0.074 mm). In the field the distinction is based on whether the individual particles can be seen with the unaided eye. If more than 50% of the soil by weight is judged to consist of grains that can be distinguished separately, the soil is considered to be coarse-grained.

The coarse-grained soils are divided into gravelly (G) or sandy (S) soils, depending on whether more or less than 50% of the visible grains are larger than the No. 4 sieve (3/16 inch). They are each divided further into four groups:

W: Well graded; fairly clean (<5% finer than 0.074 mm)

P: Poorly graded (gap-graded); fairly clean (<5% finer than 0.074mm)

C: Clayey (>12% finer than 0.074mm); plastic (clayey) fines. Fine fraction above the A- line with plasticity index above 7.

M: Silty (>12% finer than 0.074 mm); non-plastic or silty fines. Fine fraction below the A- line and plasticity index below 4.

The soils are represented by symbols such as GW or SP. Borderline materials are represented by a double symbol, as GW-GC.

The fine-grained soils are divided into three groups: inorganic silts (M), inorganic clays (C), and organic silts and clays (O). The soils are further divided into those having liquid limits lower than 50% (L), or higher than 50% (H).

The distinction between the inorganic clays (C), the inorganic silts (M), and organic soils (O) is made on the basis of a modified plasticity chart. Soils CH and CL are represented by points above the A-line, whereas soils OH, OL, and MH correspond to positions below the A-line. Soils ML, except for a few clayey fine sands, are also represented by points below the A-line. The organic soils O are distinguished from the inorganic soils M and C by their characteristic odor and dark color.

Reference: ASTM D2487-17.

5.2.3 Visual Identification

Soil samples collected during boring advancement will be visually identified. Soil properties required to define the USCS classification of a soil and other observed characteristics normally identified in describing a soil are defined below:

a. Color
b. Moisture conditions
c. Grain size
    i. Estimated maximum grain size
    ii. Estimated percent by weight of fines (material passing No. 200 sieve)
d. Gradation
e. Grain shape
f. Plasticity
g. Predominant soil type
h. Secondary components of soil
i. Classification symbol
j. Other features such as:
    - organic, chemical, or metallic content;
    - compactness;
    - consistency;
    - cohesiveness near plastic limit;
    - dry strength; and
    - source - residual, or transported (aeolian, water borne, glacial deposit, etc.)

Reference: ASTM D2488-17.

6.0 Surface Water and Sediment Sampling Activities

Surface water and sediment samples are typically taken concurrently and at the same location; but one may be collected without the other, depending on the goals of the sampling.

6.1 Surface Water Sampling

Surface water samples will be collected from 12 locations as specified on **Figure 6** for the analyses as described on **Table 1D – Proposed Surface Water Analytical Sampling Program**. Surface water samples will be co-located with select sediment samples. One typical method (hand held bottles) is described below; other methods may be appropriate depending on the investigative objectives and site characteristics.

6.1.1 Hand-Held Bottle Method

In shallow standing water, surface water samples may be collected by dipping laboratory supplied clean bottleware into the standing water and then transferring the water directly into the sample jars. Nitrile gloves will be worn during sample collection.

Collection of surface water samples using the hand-held bottle method may be used for easily accessible locations. The sample will be collected by submerging the appropriate sample container with the cap in place into the body of water. The container will then be slowly and continuously filled using the cap to regulate the rate of sample entry into the container. The sample container should be filled such that a minimum of bubbling (and volatilization) occurs.

6.2 Sediment Sampling

Sediment samples may be either grab samples of surface sediments; or sediment cores may be obtained for profiling. It is anticipated that sampling from wetlands will occur during the fall/winter season using soil sampling techniques with a hand auger (see Section 5.1.2) or sediment coring techniques. Sediment sampling within the Site's wetlands will take place at approximately 30 locations as specified in this FAP.

Phase I sample locations are as shown in **Figure 6** and will be analyzed per **Table 1E – Proposed Sediment Analytical Sampling Program** and the QAPP. When sampling for PFAS, collect those samples first using HDPE sample equipment, isolate them from other samples; refer to **Appendix B** for other special field procedures.

It is anticipated that samples will be collected in two phases as follows:

Phase I Sampling

- During the first phase, sediment samples will be collected at 25 locations.
- Sediment samples will be collected at three intervals: the 0-6 inch, 6-12 inch interval, and 12-24 inch depth intervals (note that the 12-24 inch sample interval will be held at the laboratory as a contingency and analyzed for constituents exhibiting exceedances at the 2-12 inch interval).

Phase II Sampling

- During the second phase, sediment samples will be collected at approximately 5 locations.
- Sediment samples will be collected at three intervals: the 0-6 inch, 6-12 inch interval, and 12-24 inch depth intervals (note that the 12-24 inch sample interval will be held at the laboratory as a contingency and analyzed for constituents exhibiting exceedances at the 2-12 inch interval).

Equipment will be decontaminated per the QAPP prior to advancing the next boring.

6.2.1 Surface Sediment Sampling

Surface sediment samples may be collected by a variety of methods. Two typical methods are described below.

6.2.1.1 Scoop/Trowel (Sediment)

The scoop/trowel method will be used for collection of easily accessible dry/moist sediment samples and sediment samples located underwater where the water depth is less than six inches. This collection method will be accomplished using a stainless-steel trowel or spoon used to manually dig into the subsurface material to the required depth designated for the sampling location. Sampled material then will be transferred to a stainless-steel bowl for homogenization.

The trowel and bowl will be decontaminated between sample locations.

7.0 Decontamination and Management of Investigation Derived Waste

7.1 Equipment Decontamination

To avoid cross contamination, sampling equipment (defined as any piece of equipment which may contact a sample) will be decontaminated according to the following procedures specified in the FAP. Field equipment rinsate blanks are generated and analyzed to monitor the effective of field decontamination procedures.

Cross contamination is minimized by the use of vendor-decontaminated, dedicated, disposable equipment to the extent practical.

When sampling for PFAS, see **Appendix B** and other instructions in the FAP for special field procedures.

7.1.1 Decontamination Procedures

For larger projects, and as indicated in and as indicated in this FAP and the QAPP, a decontamination pad will be constructed on the site. The pad will be sized to be large enough to handle the equipment used on site (e.g., drill rig). Additionally, the pad will be used for small equipment decontamination as well as personnel decontamination. The decontamination pad will be lined with plastic sheeting so wash water can be collected, containerized, and properly disposed. Following the remedial investigation, the temporary decontamination pad will be disassembled and removed from the Site.

7.1.2 Small Equipment Decontamination

Small equipment decontamination for non-disposable equipment will be accomplished using the following procedures:

- Alconox (or equivalent) and potable water wash;
- Potable water rinse;
- PFAS-free distilled/deionized water rinse.

Solvents will not be used in the field decontamination of such equipment. Decontamination will include scrubbing/washing with a laboratory grade detergent (e.g. Alconox) to remove visible contamination, followed by PFAS-free potable (tap) water and analyte-free water rinses. Due to the sampling for PFAS, PFAS-free water will be obtained from the laboratory; the use of an untreated potable water supply is not an acceptable substitute.

Equipment should be allowed to dry prior to use. Steam cleaning or high-pressure hot water cleaning may be used in the initial removal of gross, visible contamination. If steam cleaning is used. PFAS-free seals for the pressure washer must be used.

Electric submersible pumps (such as a Grundfos Redi-Flow II) will be decontaminated using the above steps followed by running a large volume (several gallons) of potable water through the pump, followed by an analyte-free water rinse. Tubing will not be re-used (new tubing will be used for each well). Submersible pumps and supporting lines and cables will be placed in a plastic bucket filled with Liquinox and PFAS-free potable water and then run for several minutes (to decontaminate both exterior and interior parts). The process will be repeated with PFAS-free potable water. Submersible pumps will also be given a final analyte-free water rinse of both interior and exterior parts.

If bladder pumps are used, the pump will be disassembled and cleaned after each used. A new bladder will be used for each sample. Small parts, such as screens and gaskets will be replaced after each use. Dedicated airline tubing and HDPE sample tubing will be used at each monitoring well. The pump will be cleaned using the following steps:

- Alconox (or equivalent) and potable water wash;
- PFAS-free potable water rinse;
- PFAS-free distilled/deionized water rinse;
- Solvent (reagent or pesticide grade) rinse if samples are collected for organic analysis;
- Dilute (10%) nitric acid rinse if samples are collected for metals analysis; and
- Distilled/deionized rinse, air dry.

7.1.3 Heavy Equipment Decontamination

Drilling equipment will be decontaminated before the first use, between boreholes and prior to demobilization using high-pressure steam. Decontamination will be conducted at a dedicated decontamination pad constructed for the project. Decontamination fluids will be containerized (drummed) for subsequent characterization or disposal, unless other arrangements are made on a project-specific basis.

7.1.4 Personnel Decontamination

Wash buckets and potable water will be set up at the decontamination pad or alternate location as indicated in the HASP. This includes washing hands and a boot wash. Details of the personnel decontamination procedures will be provided in the HASP.

7.2 Management of Investigation Derived Waste

Investigation-derived waste (IDW) management will be in accordance with section 3.3(3e) of DER-10 (NYSDEC, 2010). The sampling methods and equipment will be selected to limit both the need for decontamination and the volume of IDW.

IDW generated during field activities include, but is not limited to, the following:

- Purge water;
- Poly sheeting;
- Spent macrocore liners;
- PPE; and
- Drill cutting and soil boring spoils.

This IDW must be placed in 1A2 open head 55-gallon steel drums pending shipment off site for disposal except for purge water from monitoring wells outside the ASR waste pile. Per previous discussions with NYSDEC, purge water from monitoring wells outside the ASR waste pile will be returned to the ground surface, while purge water from monitoring wells on the ASR waste pile will be transferred to 55-gallon closed-top, UN rated steel DOT drums for characterization and disposal.

Procedure:

Segregation

Drummed IDW is to be divided into the following categories:

- Drill cuttings and soil boring spoils (see Section 3.0);
- Purge water from monitoring well development/sampling; and,
- Solid waste other than drill cuttings and boring spoils (i.e., spent poly tubing, PPE, etc.).

Generator ID

Any IDW generated is assigned USEPA Generator ID Number NYR000237529.

Hazardous/Non-Hazardous Classification

AECOM will collect characterization samples to classify the IDW as either hazardous or non-hazardous. Based on the IDW manifests and results from previous sampling, liquid IDW outside of the landfill area will be assumed non-hazardous. Liquid IDW within the landfill at the Site will be assumed hazardous and solids IDW will be considered TSCA requiring off-Site disposal, AECOM will collect characterization samples to classify the IDW and solicit bids for disposal at a licensed facility.

Shipment/Disposal

Drummed IDW must be staged at its point of origin until it is shipped off site on the same day it's generated or staged in a designated and secured area until it can be shipped off site at a later date.

All IDW must be shipped off site by a permitted contractor to a permitted facility and may be disposed of at a facility licensed to accept hazardous waste, if necessary.

Manifests

Waste manifests must accompany the IDW during shipment off site for disposal. For non-hazardous waste, a non-hazardous waste manifest must be completed. For hazardous waste, a Uniform Hazardous Waste Manifest (USEPA Form 8700-22) must be completed, along with a Land Disposal Restriction Notification Form 1. IDW manifests can be signed by AECOM personnel as agents for the generator (NYSDEC).

8.0 Community Air Monitoring Program

A Community Air Monitoring Plan (CAMP) is used 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 protocols cited below are based on the NYSDOH Generic CAMP (May, 2010; Appendix 1A to DER-10 [NYSDEC, 2010]) which is typically utilized by NYSDEC as guidance for work conducted under these contracts.

8.1 Monitoring

Real-time air monitoring for VOCs and/or particulate levels at the perimeter and surrounding community of the work will be performed during intrusive activities at the ASR waste pile and drilling of monitoring wells. Air monitoring activities will consist of a combination of continuous and periodic monitoring, which will be performed dependent upon the type of activity being conducted at the site, as discussed below.

The specific types of monitoring necessary and appropriate for any particular project will be determined by NYSDEC and AECOM and this FAP.

8.1.1 Continuous Air Monitoring

Continuous monitoring for VOCs and particulates will be performed during ground intrusive activities at the ASR waste pile.

VOC monitoring will be conducted at the downwind perimeter of the immediate work area on a continuous basis. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. VOC monitoring will be performed using a MiniRAE 3000 or equivalent, which is appropriate to detect a wide range of contaminants typically encountered. The MiniRAE 3000 will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The MiniRAE 3000 is capable of calculating 15-minute running average concentrations, which will be compared to the action levels specified below.

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the work area at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) such as a Thermo MIE pDR-4000 DataRam or equivalent. The Thermo MIE pDR-4000 DataRam is a real-time monitoring equipment capable of measuring particulate matter less than 10 microns (µm) in size [PM-10] and capable of integrating over a

period of 15 minutes for comparison to the airborne particulate action level. The Thermo MIE pDR is equipped with an audible alarm to indicate exceedance of the action level. In addition to using the Thermo MIE pDR-4000 DataRam, fugitive dust migration will be visually assessed during work activities. If particulate concentrations at the upwind station are higher or equivalent to concentrations at or downwind of work areas, then continuous air monitoring may be discontinued, as approved by NYSDEC.

8.1.2 Periodic (As-Needed) Air Monitoring

Periodic or as-needed air monitoring for VOCs may be performed during ground intrusive activities at the ASR waste pile and during drilling of the monitoring wells. Non-intrusive activities may include the collection of surface soil and sediment samples and the collection of groundwater samples from monitoring wells. Periodic air monitoring during sample collection will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location.

8.2 Action Levels and Response

This subsection identifies the action levels and corresponding responses for concentrations of VOCs and particulates detected during the field activities associated with a site.

8.2.1 Volatile Organic Compounds

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

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

If the organic vapor level is above 25 ppm at the perimeter of the work area, field activities will be shut down.

All 15-minute readings will be recorded and be available for NYSDEC and NYSDOH personnel to review. Instantaneous readings (if any) used for decision purposes will also be recorded.

8.2.2 Particulates

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

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

Similar to the VOC readings, particulate readings will be recorded and be available for state (NYSDEC and NYSDOH) and county health personnel to review.

9.0 Field Records and Documentation

The objective of this subsection is to provide consistent procedures and formats by which field records will be kept and activities documented, and a methodology by which field records will be managed. Field records and documentation to be used during field activities include Field Log Books and Standard Forms. Standard Forms are provided in **Appendix C**.

9.1 Field Log Books

Field log books will be prepared and maintained throughout the course of the investigation**.** With the exception of PFAS sampling events **(Appendix B)**, only bound, weatherproof field log books will be used by personnel working on NYSDEC projects. The log books will be turned in for copying/filing/tracking when complete. If performing PFAS sampling, then loose leaf notebook paper shall be used in lieu of a field log book.

Each log book will be labeled on the front cover in indelible ink with the following designation: “Site Name/Project Type, NYSDEC Work Assignment D009803-15, AECOM Project Number 60629330.

Log book entries will be recorded in indelible, waterproof ink. If errors are made in any field log book, field record (form), Chain-of-Custody Record, or any other field record document, corrections will be made by crossing a single line through the error, entering the correct information, and initialing and dating the correction.

Standard Forms have been adopted in this FAP to facilitate the collection of consistent data (see **Appendix C**). This will preclude detailed documentation of, for example, lithologic descriptions in the field log book. A reference, however, to use of each specific form must be made in the log book.

The date will be placed at the top of every page in the left-hand corner of the right page. The time of entry recordings will be in columnar form down the left-hand side of the right page. If an entry is made in a non-dedicated log book, then the date, project name, and project number will be entered left to right, respectively, along the top of the right page. Entries should be dated, and time of entry recorded. At the beginning of each day, the first two entries will be “Personnel/Contractors On Site” and “Weather.” At the end of each day's entry or particular event, if appropriate, the person entering the field notes should draw a diagonal line originating from the bottom left corner of the page to the conclusion of the entry and sign along the line indicating the conclusion of the entry or the day's activity.

Entries in field log books will be legible (printing is preferable) and will contain accurate and inclusive documentation of project activities (investigation, monitoring remediation, closure,

maintenance, etc.). Information pertaining to health and safety aspects, personnel on site, visitor's names, association, and time of arrival/departure, etc., should also be recorded. Language should be objective, factual, and free of personal feelings or other terminology that might prove inappropriate, since field records are the basis for later written reports. Once completed, these field log books become accountable documents and must be maintained as part of the project files.

Sample collection and handling activities, as well as visual observations, will be documented in the field log books. The sample collection equipment (where appropriate), field analytical equipment, and equipment used to make physical measurements will be identified in the field log books. Calculations, results, and calibration data for field sampling, field analytical, and field physical measurement equipment will also be recorded in the field log books, except where these are referenced as being recorded on approved field forms. Field analyses and measurements must be traceable to the specific piece of field equipment utilized and to the field investigator collecting the sample, making the measurement, or conducting analyses. Log books will be updated as field work progresses.

On a periodic basis (i.e., daily, weekly, etc.), or at the end of each field event, the pages of the field log book that were filled out during that time will be scanned into PDF format. The resulting PDF files will then be uploaded to the project folder located on the office server.

When an individual log book is full, the log book will be submitted to the AECOM project manager for final cataloging and filing. The log books will be stored in the Project File. Copies of specific sections will be made available to personnel upon request.

9.2 Standard Forms

All non-bound field records (e.g., boring logs, well diagrams, well sampling logs, etc.) will be completed the day the associated activity occurs. Field data collected using electronic data loggers or computer entry forms, will be downloaded as soon as practical onto CDs and/or uploaded to office servers. If possible, the person collecting the data will download electronic data on a daily basis. This person will be responsible for verifying that the data collected are adequately represented in electronic media and in the file. Examples of forms typically used are provided in **Appendix C** of this FAP.

On a periodic basis (i.e., daily, weekly, etc.), or at the end of each field event, the field forms that were completed during that time will be scanned into PDF format. The resulting PDF files will then be uploaded to the project folder located on the office server.

9.3 Sample Identification

During this project, a unique sample identifier will designate each sample collected. The following system may be used to assign unique sample identification numbers; however, modifications

should be made as needed to clearly and appropriate identify samples for each site or project. Each sample will be identified by an alphanumeric character identifier, as described below.

The following codes will be used for identifying other sample types:

CODE	Sample Type
MW	Monitoring well
SB	Soil boring
SS	Surface soil
SW	Surface water
SD	Sediment
FB	Field (Rinsate) Blank
N + 50	Field Duplicate (e.g., field duplicate of MW-3S will be MW-53S)
TB	Trip Blank
MS/MSD	Matrix Spike/ Matrix Spike Duplicate

Field blanks and tip blanks will be labeled for the day of collection. For MS/MSD samples, the MS/MSD will be added to the sample ID and included on the COC as a note.

An example of the sample numbering system is provided below.

Sample Identifier	Description
MW-107	Monitoring well MW-107
SB-02-4-6	Soil boring sample from 4 to 6 ft interval from boring SB-02.
SS-01-0-2	Surface soil sample from 0 to 2 inch interval from boring SS-01.
FBW220502	Field blank associated with water samples collected on 5/2/22
TB220503	Trip blank associated with samples shipped 5/3/22.

9.4 Sample Labeling

A non-removable label will be affixed to each sample container. Labels will be marked with permanent marker pens. The following information will be contained on each label:

Project name;

Sample identifier;

Company;

Sample date and time;

Sampler's initials;

Sample preservation; and

Analysis required.

9.5 Sample Shipping

Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody (COC) procedures. Chain-of-custody procedures are essential for presentation of sample analytical chemistry results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The procedures should follow the chain-of-custody guidelines outlined in National Enforcement Investigations Center (NEIC) of the U.S. Environmental Protection Agency Office of Enforcement.

Procedure:

1. The COC record (**Appendix C**) should be completely filled out, with all relevant information.
2. The original COC goes with the samples. It should be placed in a Ziploc bag and taped inside the sample cooler. The sampler should retain a copy of the COC.
3. Place inert cushioning material such as vermiculite or bubble-wrap in the bottom of the cooler.
4. Place the bottles in the cooler in such a way that they do not touch (use cardboard dividers or bubble-wrap).
5. Wrap VOA vials securely in bubble-wrap and tape. Place them in the center of the cooler.
6. Pack the cooler with ice in doubled Ziploc plastic bags.
7. Pack the cooler with cushioning material.
8. Tape the drain shut.

9. Wrap the cooler completely with strapping tape at two locations securing the lid. Do not cover any labels.

10. Place the lab address on top of cooler. For out-of-town laboratory, add the following: Put "This side up" labels on all four sides and "Fragile" labels on at least two sides. Affix numbered custody seals on front right and left of cooler. Cover seals with wide, clear tape.

11. Ship samples via overnight carrier the same day that they are collected or drop sample coolers off at the laboratory. Samples must be maintained at 4 degrees Celsius (C) ± 2ºC throughout the shipping duration.

10.0 References

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Tables

Table 1A
Proposed Groundwater Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location	TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[2] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	PCB homologs (680)	Pesticides (8081B)	PFAS (1633)	1,4-Dioxane (8270D SIM)
Total Sample Quantity including QA/QC	43	37	74	74	37	74	38	37	41	37
Existing Monitoring Wells - Round 1[1]										
MW's	15	15	15	15	15	15	8	15	15	15
MW's filtered	0	0	15	15	0	15	8	0	0	0
MW-FD	1	1	2	2	1	2	1	1	1	1
MW-MS	1	1	2	2	1	2	1	1	1	1
MW-MSD	1	1	2	2	1	2	1	1	1	1
MW-TB	3	0	0	0	0	0	0	0	0	0
MW-EB	0	0	0	0	0	0	0	0	1	0
MW-FB	0	0	0	0	0	0	0	0	1	0
Existing and New Monitoring Wells - Round 2 [1][4]										
MW's	16	16	16	16	16	16	8	16	16	16
MW's filtered	0	0	16	16	0	16	8	0	0	0
MW-FD	1	1	2	2	1	2	1	1	1	1
MW-MS	1	1	2	2	1	2	1	1	1	1
MW-MSD	1	1	2	2	1	2	1	1	1	1
MW-TB	3	0	0	0	0	0	0	0	0	0
MW-EB	0	0	0	0	0	0	0	0	1	0
MW-FB	0	0	0	0	0	0	0	0	1	0
Groundwater Investigative Derived Waste Profiling[3]										
IDW-Water	Full TCPL/RCRA Characteristics (2 sample)									

Notes:

QC - Quality Control
EB - Equipment (or Rinse) Blank
FB - Field Blank (PFAS only)
FD - Field Duplicate
IDW - Investigation Derived Waste
MS - Matrix Spike
MSD - Matrix Spike Duplicate
MW - Monitoring Well
PCB - Polychlorinated Biphenyls
RCRA- Resource Conservation and Recovery Act
SVOC - Semivolatile Organic Compounds
TB - Trip Blank
TCLP - Toxicity Characteristic Leaching Procedure
TOC - Total Organic Carbon
VOC - Volatile Organic Compounds

[1]Field Parameters include pH, temperature, turbidity, oxidation-reduction potential (ORP), dissolved oxygen (DO), and specific conductivity.
[2]Target Analyte List (23 Metals); Mercury (Hg) listed separately
[3]Composite sample collected from drummed purge and decontamination water.
[4]Phase II samples are contingency dependent on the Phase I results. Actual quantities and locations subject to change.
20% QA/QC samples

Table 1B
Proposed Surface Soil Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location		TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[1] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
Total Sample Quantity Including Solid QA/QC		78	78	78	78	78	78	78	78	78
Total Sample Quantity (Aqueous QA/QC)		4	4	4	4	4	4	4	4	4
Surface Soil Phase I[2]										
SS Samples w/o QA/QC		51	51	51	51	51	51	51	51	51
SS-FD		3	3	3	3	3	3	3	3	3
SS-MS		3	3	3	3	3	3	3	3	3
SS-MSD		3	3	3	3	3	3	3	3	3
SS-EB (Aqueous)		3	3	3	3	3	3	3	3	3
SS-16	SS-16-0-2	1	1	1	1	1	1	1	1	1
	SS-16-2-12	1	1	1	1	1	1	1	1	1
	SS-16-12-24	1	1	1	1	1	1	1	1	1
SS-17	SS-17-0-2	1	1	1	1	1	1	1	1	1
	SS-17-2-12	1	1	1	1	1	1	1	1	1
	SS-17-12-24	1	1	1	1	1	1	1	1	1
SS-18	SS-18-0-2	1	1	1	1	1	1	1	1	1
	SS-18-2-12	1	1	1	1	1	1	1	1	1
	SS-18-12-24	1	1	1	1	1	1	1	1	1
SS-19	SS-19-0-2	1	1	1	1	1	1	1	1	1
	SS-19-2-12	1	1	1	1	1	1	1	1	1
	SS-19-12-24	1	1	1	1	1	1	1	1	1
SS-20	SS-20-0-2	1	1	1	1	1	1	1	1	1
	SS-20-2-12	1	1	1	1	1	1	1	1	1
	SS-20-12-24	1	1	1	1	1	1	1	1	1
SS-21	SS-21-0-2	1	1	1	1	1	1	1	1	1
	SS-21-2-12	1	1	1	1	1	1	1	1	1
	SS-21-12-24	1	1	1	1	1	1	1	1	1
SS-22	SS-22-0-2	1	1	1	1	1	1	1	1	1
	SS-22-2-12	1	1	1	1	1	1	1	1	1
	SS-22-12-24	1	1	1	1	1	1	1	1	1
SS-23	SS-23-0-2	1	1	1	1	1	1	1	1	1
	SS-23-2-12	1	1	1	1	1	1	1	1	1
	SS-23-12-24	1	1	1	1	1	1	1	1	1
SS-24	SS-24-0-2	1	1	1	1	1	1	1	1	1
	SS-24-2-12	1	1	1	1	1	1	1	1	1
	SS-24-12-24	1	1	1	1	1	1	1	1	1
SS-25	SS-25-0-2	1	1	1	1	1	1	1	1	1
	SS-25-2-12	1	1	1	1	1	1	1	1	1
	SS-25-12-24	1	1	1	1	1	1	1	1	1
SS-26	SS-26-0-2	1	1	1	1	1	1	1	1	1
	SS-26-2-12	1	1	1	1	1	1	1	1	1
	SS-26-12-24	1	1	1	1	1	1	1	1	1
SS-27	SS-27-0-2	1	1	1	1	1	1	1	1	1
	SS-27-2-12	1	1	1	1	1	1	1	1	1
	SS-27-12-24	1	1	1	1	1	1	1	1	1
SS-28	SS-28-0-2	1	1	1	1	1	1	1	1	1
	SS-28-2-12	1	1	1	1	1	1	1	1	1
	SS-28-12-24	1	1	1	1	1	1	1	1	1

Table 1B
Proposed Surface Soil Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location		TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[(1)] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
SS-29	SS-29-0-2	1	1	1	1	1	1	1	1	1
	SS-29-2-12	1	1	1	1	1	1	1	1	1
	SS-29-12-24	1	1	1	1	1	1	1	1	1
SS-30	SS-30-0-2	1	1	1	1	1	1	1	1	1
	SS-30-2-12	1	1	1	1	1	1	1	1	1
	SS-30-12-24	1	1	1	1	1	1	1	1	1
SS-31	SS-31-0-2	1	1	1	1	1	1	1	1	1
	SS-31-2-12	1	1	1	1	1	1	1	1	1
	SS-31-12-24	1	1	1	1	1	1	1	1	1
SS-07R	~~SS-07R-0-2~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
	~~SS-07R-2-12~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
	SS-07R-12-24	1	1	1	1	1	1	1	1	1
SS-06R	~~SS-06R-0-2~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
	~~SS-06R-2-12~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
	SS-06R-12-24	1	1	1	1	1	1	1	1	1
SS-05R	~~SS-05R-0-2~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
	~~SS-05R-2-12~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
	SS-05R-12-24	1	1	1	1	1	1	1	1	1
Surface Soil Phase II[(4)]										
SS Samples w/o QC		15	15	15	15	15	15	15	15	15
SS-FD		1	1	1	1	1	1	1	1	1
SS-MS		1	1	1	1	1	1	1	1	1
SS-MSD		1	1	1	1	1	1	1	1	1
SS-EB (Aqueous)		1	1	1	1	1	1	1	1	1

Notes:

QC - Quality Control
EB - Equipment (or Rinse) Blank
FB - Field Blank (PFAS only)
FD - Field Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
PCB - Polychlorinated Biphenyls
SS - Surface Soil
SVOC - Semivolatile Organic Compounds
TB - Trip Blank
TOC - Total Organic Carbon
VOC - Volatile Organic Compounds

[1]Target Analyte List (23 Metals); Mercury (Hg) listed separately
[2]Sediment or surface soil will be determined following wetland delineation.
[3]Perform if wetland delineation determines sample to be sediment. Not all locations/intervals will receive a sample.
[4]Phase II samples are contingency dependent on the Phase I results. Actual quantities and locations subject to change.
20% QA/QC samples
There is existing data for greyed/line strikeout intervals. No sample will be collected at these depths.
Soil intervals in inches.
Phase I consists of 19 locations.
Phase II consists of approximately 5 locations.

Table 1C
Proposed Soil Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location		TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[(1)] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
Total Sample Quantity Including Solid QA/QC		192	192	192	192	192	502	192	192	192
Total Sample Quantity (Aqueous QA/QC)		8	8	8	8	8	21	8	8	8
Soil Boring Phase I										
SB Samples w/o QA/QC (per est. depth to native (ft bgs))		88	88	88	88	88	346	88	88	88
SB-FD		4	4	4	4	4	17	4	4	4
SB-MS		4	4	4	4	4	17	4	4	4
SB-MSD		4	4	4	4	4	17	4	4	4
SB-EB (Aqueous)		4	4	4	4	4	17	4	4	4
SB-14 (nat. est. 14')	SB-14-0-0.5						1			
	SB-14-2-4						1			
	SB-14-6-8						1			
	SB-14-10-12						1			
	SB-14-14-16						1			
SB-15 (nat. est. 10')	SB-15-0-0.5						1			
	SB-15-2-4						1			
	SB-15-6-8						1			
	SB-15-10-12						1			
SB-16 (nat.est.18')	SB-16-0-0.5						1			
	SB-16-2-4						1			
	SB-16-6-8						1			
	SB-16-10-12						1			
	SB-16-14-16						1			
	SB-16-18-20						1			
SB-17 (nat. est. 18')	SB-17-0-0.5						1			
	SB-17-2-4						1			
	SB-17-6-8						1			
	SB-17-10-12						1			
	SB-17-14-16						1			
	SB-17-18-20						1			
SB-18 (nat. est. 22')	SB-18-0-0.5						1			
	SB-18-2-4						1			
	SB-18-6-8						1			
	SB-18-10-12						1			
	SB-18-14-16						1			
	SB-18-18-20						1			
	SB-18-22-24						1			
SB-19 (nat. est. 18')	SB-19-0-0.5						1			
	SB-19-2-4						1			
	SB-19-6-8						1			
	SB-19-10-12						1			
	SB-19-14-16						1			
	SB-19-18-20						1			
SB-20 (nat. est. 9')	SB-20-0-0.5						1			
	SB-20-2-4						1			
	SB-20-6-8						1			
	SB-20-10-12						1			
SB-21 (nat. est. 19')	SB-21-0-0.5						1			
	SB-21-2-4						1			
	SB-21-6-8						1			
	SB-21-10-12						1			
	SB-21-14-16						1			
	SB-21-18-20						1			
SB-22 (nat. est. 22')	SB-22-0-0.5						1			
	SB-22-2-4						1			
	SB-22-6-8						1			
	SB-22-10-12						1			
	SB-22-14-16						1			
	SB-22-18-20						1			
	SB-22-22-24						1			

Table 1C
Proposed Soil Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location		TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[1] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
SB-23 (nat. est. 22')	SB-23-0-0.5						1			
	SB-23-2-4						1			
	SB-23-6-8						1			
	SB-23-10-12						1			
	SB-23-14-16						1			
	SB-23-18-20						1			
	SB-23-22-24						1			
SB-24 (nat. est. 19')	SB-24-0-0.5						1			
	SB-24-2-4						1			
	SB-24-6-8						1			
	SB-24-10-12						1			
	SB-24-14-16						1			
	SB-24-18-20						1			
SB-25 (nat. est.13')	SB-25-0-0.5						1			
	SB-25-2-4						1			
	SB-25-6-8						1			
	SB-25-10-12						1			
	SB-25-14-16						1			
SB-26 (nat. est. 9')	SB-26-0-0.5						1			
	SB-26-2-4						1			
	SB-26-6-8						1			
	SB-26-10-12						1			
SB-27 (nat. est. 19')	SB-27-0-0.5						1			
	SB-27-2-4						1			
	SB-27-6-8						1			
	SB-27-10-12						1			
	SB-27-14-16						1			
	SB-27-18-20						1			
	SB-27-22-24						1			
SB-28 (nat. est. 19')	SB-28-0-0.5						1			
	SB-28-2-4						1			
	SB-28-6-8						1			
	SB-28-10-12						1			
	SB-28-14-16						1			
	SB-28-18-20						1			
	SB-28-22-24						1			
SB-29 (nat. est. 16')	SB-29-0-0.5						1			
	SB-29-2-4						1			
	SB-29-6-8						1			
	SB-29-10-12						1			
	SB-29-14-16						1			
	SB-29-18-20						1			
	SB-29-22-24						1			
SB-30 (nat. est. 16')	SB-30-0-0.5	1	1	1	1	1	1	1	1	1
	SB-30-2-4	1	1	1	1	1	1	1	1	1
	SB-30-6-8	1	1	1	1	1	1	1	1	1
	SB-30-10-12	1	1	1	1	1	1	1	1	1
	SB-30-14-16	1	1	1	1	1	1	1	1	1
	SB-30-18-20	1	1	1	1	1	1	1	1	1
SB-31 (nat. est. 16')	SB-31-0-0.5						1			
	SB-31-2-4						1			
	SB-31-6-8						1			
	SB-31-10-12						1			
	SB-31-14-16						1			
	SB-31-18-20						1			
SB-32 (nat. est. 16')	SB-32-0-0.5						1			
	SB-32-2-4						1			
	SB-32-6-8						1			
	SB-32-10-12						1			
	SB-32-14-16						1			
	SB-32-18-20						1			

Table 1C
Proposed Soil Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location		TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[(1)] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
SB-33 (nat. est. 16')	SB-33-0-0.5						1			
	SB-33-2-4						1			
	SB-33-6-8						1			
	SB-33-10-12						1			
	SB-33-14-16						1			
	SB-33-18-20						1			
SB-34 (nat. est. 9')	SB-34-0-0.5	1	1	1	1	1	1	1	1	1
	SB-34-2-4	1	1	1	1	1	1	1	1	1
	SB-34-6-8	1	1	1	1	1	1	1	1	1
	SB-34-10-12	1	1	1	1	1	1	1	1	1
SB-35 (nat. est. 9')	SB-35-0-0.5						1			
	SB-35-2-4						1			
	SB-35-6-8						1			
	SB-35-10-12						1			
SB-36 (nat. est. 18')	SB-36-0-0.5	1	1	1	1	1	1	1	1	1
	SB-36-2-4	1	1	1	1	1	1	1	1	1
	SB-36-6-8	1	1	1	1	1	1	1	1	1
	SB-36-10-12	1	1	1	1	1	1	1	1	1
	SB-36-14-16	1	1	1	1	1	1	1	1	1
	SB-36-18-20	1	1	1	1	1	1	1	1	1
SB-37 (nat. est. 12')	SB-37-0-0.5						1			
	SB-37-2-4						1			
	SB-37-6-8						1			
	SB-37-10-12						1			
	SB-37-12-14						1			
SB-38 (nat. est. 14')	SB-38-0-0.5						1			
	SB-38-2-4						1			
	SB-38-6-8						1			
	SB-38-10-12						1			
	SB-38-14-16						1			
SB-39 (nat. est. 14')	SB-39-0-0.5						1			
	SB-39-2-4						1			
	SB-39-6-8						1			
	SB-39-10-12						1			
	SB-39-12-14						1			
	SB-39-16-18						1			
SB-40 (nat. est. 19')	SB-40-0-0.5						1			
	SB-40-2-4						1			
	SB-40-6-8						1			
	SB-40-10-12						1			
	SB-40-14-16						1			
	SB-40-18-20						1			
SB-41 (nat. est. 16')	SB-41-0-0.5						1			
	SB-41-2-4						1			
	SB-41-6-8						1			
	SB-41-10-12						1			
	SB-41-12-14						1			
	SB-41-16-18						1			
SB-42 (nat. est. 12')	SB-42-0-0.5						1			
	SB-42-2-4						1			
	SB-42-6-8						1			
	SB-42-10-12						1			
	SB-42-14-16						1			
SB-43 (nat. est. 12')	SB-43-0-0.5	1	1	1	1	1	1	1	1	1
	SB-43-2-4	1	1	1	1	1	1	1	1	1
	SB-43-6-8	1	1	1	1	1	1	1	1	1
	SB-43-10-12	1	1	1	1	1	1	1	1	1
	SB-43-12-14	1	1	1	1	1	1	1	1	1

Table 1C
Proposed Soil Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location		TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[(1)] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
SB-44 (nat. est. 14')	SB-44-0-0.5						1			
	SB-44-2-4						1			
	SB-44-6-8						1			
	SB-44-10-12						1			
	SB-44-14-16						1			
SB-45 (nat. est. 45')	SB-45-0-0.5						1			
	SB-45-2-4						1			
	SB-45-6-8						1			
	SB-45-10-12						1			
	SB-45-12-14						1			
SB-46 (nat. est. 12')	SB-46-0-0.5	1	1	1	1	1	1	1	1	1
	SB-46-2-4	1	1	1	1	1	1	1	1	1
	SB-46-6-8	1	1	1	1	1	1	1	1	1
	SB-46-10-12	1	1	1	1	1	1	1	1	1
	SB-46-14-16	1	1	1	1	1	1	1	1	1
SB-47 (nat. est. 11')	SB-47-0-0.5						1			
	SB-47-2-4						1			
	SB-47-6-8						1			
	SB-47-10-12						1			
SB-48 (nat. est. 11')	SB-48-0-0.5	1	1	1	1	1	1	1	1	1
	SB-48-2-4	1	1	1	1	1	1	1	1	1
	SB-48-6-8	1	1	1	1	1	1	1	1	1
	SB-48-10-12	1	1	1	1	1	1	1	1	1
SB-49 (nat. est. 16')	SB-49-0-0.5						1			
	SB-49-2-4						1			
	SB-49-6-8						1			
	SB-49-10-12						1			
	SB-49-14-16						1			
	SB-49-18-20						1			
SB-50 (nat. est. 1')	SB-50-0-0.5						1			
	SB-50-2-4						1			
SB-51 (nat. est. 1')	SB-51-0-0.5						1			
	SB-51-2-4						1			
SB-52 (nat. est. 9')	SB-52-0-0.5						1			
	SB-52-2-4						1			
	SB-52-6-8						1			
	SB-52-10-12						1			
SB-53 (nat. est. 11')	SB-53-0-0.5						1			
	SB-53-2-4						1			
	SB-53-6-8						1			
	SB-53-10-12						1			
	SB-53-12-14						1			
SB-54 (nat. est. 16')	SB-54-0-0.5						1			
	SB-54-2-4						1			
	SB-54-6-8						1			
	SB-54-10-12						1			
	SB-54-14-16						1			
	SB-54-18-20						1			
SB-55 (nat. est. 16')	SB-55-0-0.5	1	1	1	1	1	1	1	1	1
	SB-55-2-4	1	1	1	1	1	1	1	1	1
	SB-55-6-8	1	1	1	1	1	1	1	1	1
	SB-55-10-12	1	1	1	1	1	1	1	1	1
	SB-55-14-16	1	1	1	1	1	1	1	1	1
	SB-55-18-20	1	1	1	1	1	1	1	1	1
SB-56 (nat. est. 1')	SB-56-0-0.5	1	1	1	1	1	1	1	1	1
	SB-56-2-4	1	1	1	1	1	1	1	1	1

Table 1C
Proposed Soil Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location		TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[(1)] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
SB-57 (nat. est. 1')	SB-57-0-0.5						1			
	SB-57-2-4						1			
SB-58 (nat. est. 9')	SB-58-0-0.5						1			
	SB-58-2-4						1			
	SB-58-6-8						1			
	SB-58-10-12						1			
SB-59 (nat. est. 16')	SB-59-0-0.5	1	1	1	1	1	1	1	1	1
	SB-59-2-4	1	1	1	1	1	1	1	1	1
	SB-59-6-8	1	1	1	1	1	1	1	1	1
	SB-59-10-12	1	1	1	1	1	1	1	1	1
	SB-59-14-16	1	1	1	1	1	1	1	1	1
	SB-59-18-20	1	1	1	1	1	1	1	1	1
SB-60 (nat. est. 16')	SB-60-0-0.5						1			
	SB-60-2-4						1			
	SB-60-6-8						1			
	SB-60-10-12						1			
	SB-60-14-16						1			
	SB-60-18-20						1			
SB-61 (nat. est. 1')	SB-61-0-0.5						1			
	SB-61-2-4						1			
SB-62 (nat. est. 9')	SB-62-0-0.5						1			
	SB-62-2-4						1			
	SB-62-6-8						1			
	SB-62-10-12						1			
SB-63 (nat. est. 10')	SB-63-0-0.5						1			
	SB-63-2-4						1			
	SB-63-6-8						1			
	SB-63-10-12						1			
SB-64 (nat. est. 16')	SB-64-0-0.5	1	1	1	1	1	1	1	1	1
	SB-64-2-4	1	1	1	1	1	1	1	1	1
	SB-64-6-8	1	1	1	1	1	1	1	1	1
	SB-64-10-12	1	1	1	1	1	1	1	1	1
	SB-64-14-16	1	1	1	1	1	1	1	1	1
	SB-64-18-20	1	1	1	1	1	1	1	1	1
SB-65 (nat. est. 6')	SB-65-0-0.5	1	1	1	1	1	1	1	1	1
	SB-65-2-4	1	1	1	1	1	1	1	1	1
	SB-65-6-8	1	1	1	1	1	1	1	1	1
SB-66 (nat. est. 8')	SB-66-0-0.5						1			
	SB-66-2-4						1			
	SB-66-6-8						1			
	SB-66-10-12						1			
SB-67 (nat. est. 10')	SB-67-0-0.5	1	1	1	1	1	1	1	1	1
	SB-67-2-4	1	1	1	1	1	1	1	1	1
	SB-67-6-8	1	1	1	1	1	1	1	1	1
	SB-67-10-12	1	1	1	1	1	1	1	1	1
SB-68 (nat. est. 10')	SB-68-0-0.5						1			
	SB-68-2-4						1			
	SB-68-6-8						1			
	SB-68-10-12						1			
SB-69 (nat. est. 10')	SB-69-0-0.5						1			
	SB-69-2-4						1			
	SB-69-6-8						1			
	SB-69-10-12						1			
SB-70 (nat. est. 10')	SB-70-0-0.5						1			
	SB-70-2-4						1			
	SB-70-6-8						1			
	SB-70-10-12						1			

Table 1C
Proposed Soil Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location		TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[(1)] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
SB-71 (nat. est. 10')	SB-71-0-0.5						1			
	SB-71-2-4						1			
	SB-71-6-8						1			
	SB-71-10-12						1			
SB-72 (nat. est. 9')	SB-72-0-0.5	1	1	1	1	1	1	1	1	1
	SB-72-2-4	1	1	1	1	1	1	1	1	1
	SB-72-6-8	1	1	1	1	1	1	1	1	1
	SB-72-10-12	1	1	1	1	1	1	1	1	1
SB-73 (nat. est. 2')	SB-73-0-0.5						1			
	SB-73-2-4						1			
SB-74 (nat. est. 12')	SB-74-0-0.5	1	1	1	1	1	1	1	1	1
	SB-74-2-4	1	1	1	1	1	1	1	1	1
	SB-74-6-8	1	1	1	1	1	1	1	1	1
	SB-74-10-12	1	1	1	1	1	1	1	1	1
	SB-74-12-14	1	1	1	1	1	1	1	1	1
SB-75 (nat. est. 10')	SB-75-0-0.5	1	1	1	1	1	1	1	1	1
	SB-75-2-4	1	1	1	1	1	1	1	1	1
	SB-75-6-8	1	1	1	1	1	1	1	1	1
	SB-75-10-12	1	1	1	1	1	1	1	1	1
SB-76 (nat. est. 10')	SB-76-0-0.5									
	SB-76-2-4									
	SB-76-6-8									
	SB-76-10-12									
SB-77 (nat. est. 19')	SB-77-0-0.5	1	1	1	1	1	1	1	1	1
	SB-77-2-4	1	1	1	1	1	1	1	1	1
	SB-77-6-8	1	1	1	1	1	1	1	1	1
	SB-77-10-12	1	1	1	1	1	1	1	1	1
	SB-77-12-14	1	1	1	1	1	1	1	1	1
	SB-77-16-18	1	1	1	1	1	1	1	1	1
	SB-77-20-22	1	1	1	1	1	1	1	1	1
SB-78 (nat. est. 19')	SB-78-0-0.5	1	1	1	1	1	1	1	1	1
	SB-78-2-4	1	1	1	1	1	1	1	1	1
	SB-78-6-8	1	1	1	1	1	1	1	1	1
	SB-78-10-12	1	1	1	1	1	1	1	1	1
	SB-78-12-14	1	1	1	1	1	1	1	1	1
	SB-78-16-18	1	1	1	1	1	1	1	1	1
	SB-78-20-22	1	1	1	1	1	1	1	1	1
SB-79 (nat. est. 14')	SB-79-0-0.5						1			
	SB-79-2-4						1			
	SB-79-6-8						1			
	SB-79-10-12						1			
	SB-79-12-14						1			
	SB-79-16-18						1			
SB-80 (nat. est. 16')	SB-80-0-0.5						1			
	SB-80-2-4						1			
	SB-80-6-8						1			
	SB-80-10-12						1			
	SB-80-12-14						1			
	SB-80-16-18						1			
SB-81 (nat. est. 16')	SB-81-0-0.5						1			
	SB-81-2-4						1			
	SB-81-6-8						1			
	SB-81-10-12						1			
	SB-81-12-14						1			
	SB-81-16-18						1			

Table 1C
Proposed Soil Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location		TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[1] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
SB-82 (nat. est. 1')	SB-82-0-0.5						1			
	SB-82-2-4						1			
SB-83 (nat. est. 1')	SB-83-0-0.5						1			
	SB-83-2-4						1			
SB-84 (nat. est. 8')	SB-84-0-0.5	1	1	1	1	1	1	1	1	1
	SB-84-2-4	1	1	1	1	1	1	1	1	1
	SB-84-6-8	1	1	1	1	1	1	1	1	1
	SB-84-10-12	1	1	1	1	1	1	1	1	1
SB-85 (nat. est. 8')	SB-85-0-0.5						1			
	SB-85-2-4						1			
	SB-85-6-8						1			
	SB-85-10-12						1			
Soil Boring Phase II[2]										
SB		76	76	76	76	76	76	76	76	76
SB-FD		4	4	4	4	4	4	4	4	4
SB-MS		4	4	4	4	4	4	4	4	4
SB-MSD		4	4	4	4	4	4	4	4	4
SB-EB (Aqueous)		4	4	4	4	4	4	4	4	4
Soil Investigative Derived Waste Profiling[3]										
IDW-Soil		Full TCPL/RCRA Characteristics (2 samples)								

Notes:

QC - Quality Control
EB - Equipment (or Rinse) Blank
FB - Field Blank (PFAS only)
FD - Field Duplicate
IDW - Investigation Derived Waste
MS - Matrix Spike
MSD - Matrix Spike Duplicate
MW - Monitoring Well
nat. est. - native estimation
PCB - Polychlorinated Biphenyls
RCRA- Resource Conservation and Recovery Act
SB - Soil Boring
SS - Surface Soil
SVOC - Semivolatile Organic Compounds
TB - Trip Blank
TCLP - Toxicity Characteristic Leaching Procedure
TOC - Total Organic Carbon
VOC - Volatile Organic Compounds

[1]Target Analyte List (23 Metals); Mercury (Hg) listed separately
[2]Phase II samples are contingency dependent on the Phase I results. Actual quantities and locations subject to change.
[3]Composite sample collected from drummed soil cuttings.
20% QA/QC samples
Soil depth intervals in feet.
Phase I consists of 71 locations.
Phase II consists of approximately 19 locations.

Table 1D
Proposed Surface Water Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location	TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[(1)] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
Total Sample Quantity including QA/QC	12	12	12	12	12	12	12	12	12
Surface Water Phase I									
SW Samples w/o QA/QC	12	12	12	12	12	12	12	12	12
SW-FD	1	1	1	1	1	1	1	1	1
SW-MS	1	1	1	1	1	1	1	1	1
SW-MSD	1	1	1	1	1	1	1	1	1
SW-EB	1	1	1	1	1	1	1	1	1
SW-07	1	1	1	1	1	1	1	1	1
SW-08	1	1	1	1	1	1	1	1	1
SW-09	1	1	1	1	1	1	1	1	1
SW-10	1	1	1	1	1	1	1	1	1
SW-11	1	1	1	1	1	1	1	1	1
SW-12	1	1	1	1	1	1	1	1	1
SW-13	1	1	1	1	1	1	1	1	1
SW-14	1	1	1	1	1	1	1	1	1
SW-15	1	1	1	1	1	1	1	1	1
SW-16	1	1	1	1	1	1	1	1	1
SW-17	1	1	1	1	1	1	1	1	1
SW-18	1	1	1	1	1	1	1	1	1

Notes:
QC - Quality Control
EB - Equipment (or Rinse) Blank
FB - Field Blank (PFAS only)
FD - Field Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
PCB - Polychlorinated Biphenyls
SVOC - Semivolatile Organic Compounds
SW - Surface Water
TB - Trip Blank
TOC - Total Organic Carbon
VOC - Volatile Organic Compounds

[1]Target Analyte List (23 Metals); Mercury (Hg) listed separately
Surface water samples to be collocated with sediment samples.
20% QA/QC samples
Note no Phase II samples proposed at this time.

Table 1E
Proposed Sediment Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location		TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[1] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	TOC[3] (Lloyd Kahn)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
Total Sample Quantity Including Solid QA/QC		94	94	94	94	94	94	27	94	94	94
Total Sample Quantity (Aqueous QA/QC)		4	4	4	4	4	4	0	4	4	4
Sediment Phase I[2]											
SD Samples w/o QA/QC		67	67	67	67	67	67	14	67	67	67
SD-FD		3	3	3	3	3	3	1	3	3	3
SD-MS		3	3	3	3	3	3	1	3	3	3
SD-MSD		3	3	3	3	3	3	1	3	3	3
SD-EB (Aqueous)		3	3	3	3	3	3	0	3	3	3
SD-17	SD-17-0-6	1	1	1	1	1	1	1	1	1	1
	SD-17-6-12	1	1	1	1	1	1	0	1	1	1
	SD-17-12-24	1	1	1	1	1	1	0	1	1	1
SD-18	SD-18-0-6	1	1	1	1	1	1	0	1	1	1
	SD-18-6-12	1	1	1	1	1	1	0	1	1	1
	~~SD-18-12-24~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
SD-19	SD-19-0-6	1	1	1	1	1	1	1	1	1	1
	SD-19-6-12	1	1	1	1	1	1	0	1	1	1
	SD-19-12-24	1	1	1	1	1	1	0	1	1	1
SD-20	SD-20-0-6	1	1	1	1	1	1	0	1	1	1
	SD-20-6-12	1	1	1	1	1	1	0	1	1	1
	SD-20-12-24	1	1	1	1	1	1	0	1	1	1
SD-21	SD-21-0-6	1	1	1	1	1	1	1	1	1	1
	SD-21-6-12	1	1	1	1	1	1	0	1	1	1
	SD-21-12-24	1	1	1	1	1	1	0	1	1	1
SD-22	SD-22-0-6	1	1	1	1	1	1	0	1	1	1
	SD-22-6-12	1	1	1	1	1	1	0	1	1	1
	~~SD-22-12-24~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
SD-23	SD-23-0-6	1	1	1	1	1	1	1	1	1	1
	SD-23-6-12	1	1	1	1	1	1	0	1	1	1
	SD-23-12-24	1	1	1	1	1	1	0	1	1	1
SD-24	SD-24-0-6	1	1	1	1	1	1	0	1	1	1
	SD-24-6-12	1	1	1	1	1	1	0	1	1	1
	SD-24-12-24	1	1	1	1	1	1	0	1	1	1
SD-25	SD-25-0-6	1	1	1	1	1	1	1	1	1	1
	SD-25-6-12	1	1	1	1	1	1	0	1	1	1
	SD-25-12-24	1	1	1	1	1	1	0	1	1	1
SD-26	SD-26-0-6	1	1	1	1	1	1	0	1	1	1
	SD-26-6-12	1	1	1	1	1	1	0	1	1	1
	SD-26-12-24	1	1	1	1	1	1	0	1	1	1
SD-03R	~~SD-03R-0-6~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
	SD-03R-6-12	1	1	1	1	1	1	1	1	1	1
	SD-03R-12-24	1	1	1	1	1	1	0	1	1	1

Table 1E
Proposed Sediment Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

Location		TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[1] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	TOC[3] (Lloyd Kahn)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
SD-27	SD-27-0-6	1	1	1	1	1	1	0	1	1	1
	SD-27-6-12	1	1	1	1	1	1	0	1	1	1
	~~SD-27-12-24~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
SD-28	SD-28-0-6	1	1	1	1	1	1	1	1	1	1
	SD-28-6-12	1	1	1	1	1	1	0	1	1	1
	SD-28-12-24	1	1	1	1	1	1	0	1	1	1
SD-05R	~~SD-05R-0-6~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
	SD-05R-6-12	1	1	1	1	1	1	0	1	1	1
	SD-05R-12-24	1	1	1	1	1	1	0	1	1	1
SD-29	SD-29-0-6	1	1	1	1	1	1	1	1	1	1
	SD-29-6-12	1	1	1	1	1	1	0	1	1	1
	SD-29-12-24	1	1	1	1	1	1	0	1	1	1
SD-30	SD-30-0-6	1	1	1	1	1	1	0	1	1	1
	SD-30-6-12	1	1	1	1	1	1	0	1	1	1
	SD-30-12-24	1	1	1	1	1	1	0	1	1	1
SD-31	SD-31-0-6	1	1	1	1	1	1	1	1	1	1
	SD-31-6-12	1	1	1	1	1	1	0	1	1	1
	~~SD-31-12-24~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
SD-32	SD-32-0-6	1	1	1	1	1	1	0	1	1	1
	SD-32-6-12	1	1	1	1	1	1	0	1	1	1
	SD-32-12-24	1	1	1	1	1	1	0	1	1	1
SD-33	SD-33-0-6	1	1	1	1	1	1	1	1	1	1
	SD-33-6-12	1	1	1	1	1	1	0	1	1	1
	SD-33-12-24	1	1	1	1	1	1	0	1	1	1
SD-34	SD-34-0-6	1	1	1	1	1	1	0	1	1	1
	SD-34-6-12	1	1	1	1	1	1	0	1	1	1
	~~SD-34-12-24~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
SD-35	SD-35-0-6	1	1	1	1	1	1	1	1	1	1
	SD-35-6-12	1	1	1	1	1	1	0	1	1	1
	SD-35-12-24	1	1	1	1	1	1	0	1	1	1
SD-36	SD-36-0-6	1	1	1	1	1	1	0	1	1	1
	SD-36-6-12	1	1	1	1	1	1	0	1	1	1
	SD-36-12-24	1	1	1	1	1	1	0	1	1	1
SD-37	SD-37-0-6	1	1	1	1	1	1	1	1	1	1
	SD-37-6-12	1	1	1	1	1	1	0	1	1	1
	~~SD-37-12-24~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
SD-38	SD-38-0-6	1	1	1	1	1	1	0	1	1	1
	SD-38-6-12	1	1	1	1	1	1	0	1	1	1
	SD-38-12-24	1	1	1	1	1	1	0	1	1	1
SD-39	SD-39-0-6	1	1	1	1	1	1	1	1	1	1
	SD-39-6-12	1	1	1	1	1	1	0	1	1	1
	SD-39-12-24	1	1	1	1	1	1	0	1	1	1

Table 1E
Proposed Sediment Analytical Sampling Program
Fortino Tire
Site ID: 738047
West Monroe, New York

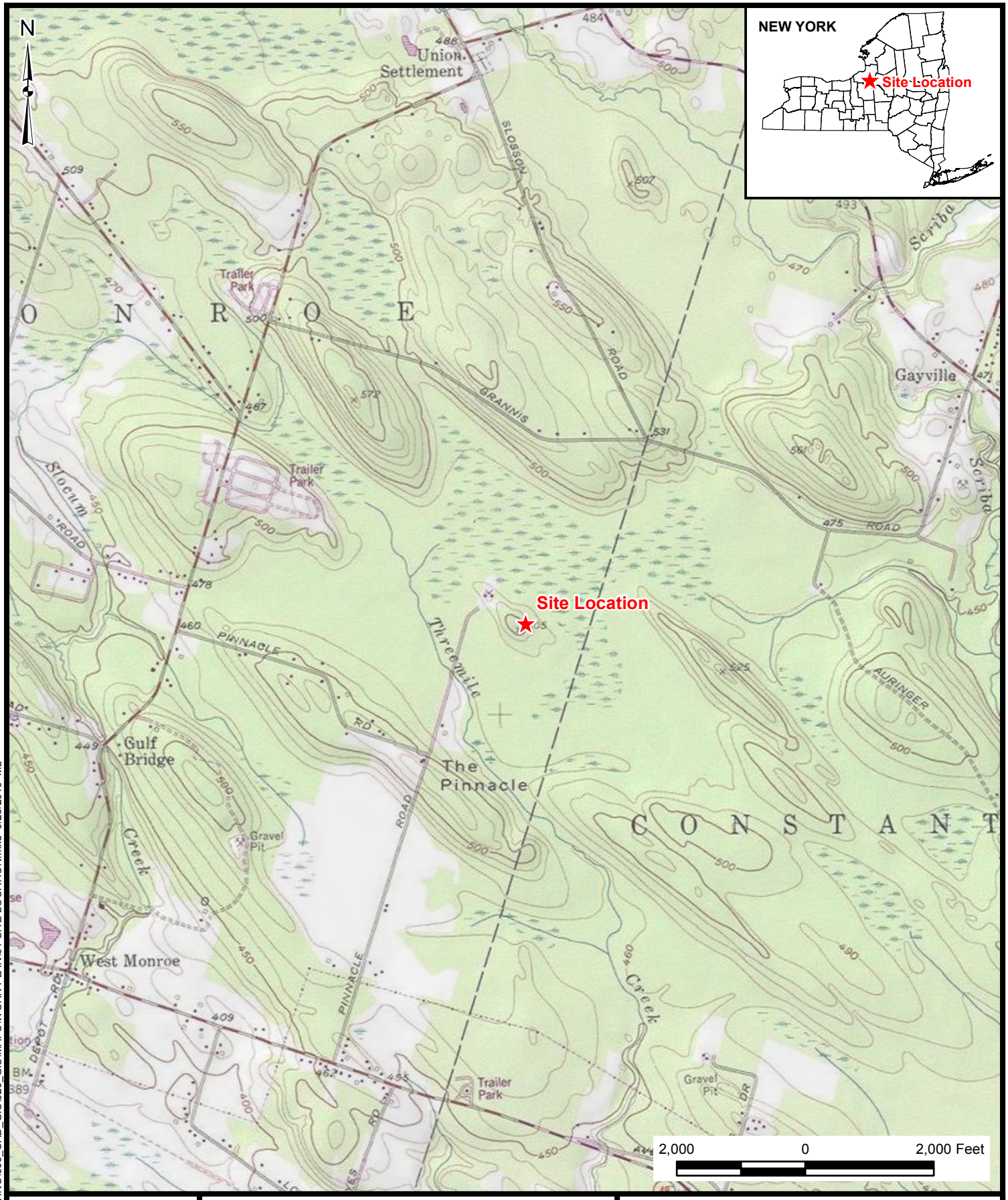
Location	TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[(1)] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	TOC[(3)] (Lloyd Kahn)	Pesticides (8081B)	PFAS* (1633)	1,4-Dioxane (8270D SIM)
Sediment Phase II[(4)]										
SD Samples w/o QC	15	15	15	15	15	15	7	15	15	15
SD-FD	1	1	1	1	1	1	1	1	1	1
SD-MS	1	1	1	1	1	1	1	1	1	1
SD-MSD	1	1	1	1	1	1	1	1	1	1
SD-EB (Aqueous)	1	1	1	1	1	1	1	1	1	1

Notes:

QC - Quality Control
EB - Equipment (or Rinse) Blank
FB - Field Blank (PFAS only)
FD - Field Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
PCB - Polychlorinated Biphenyls
SD - Sediment
SVOC - Semivolatile Organic Compounds
TB - Trip Blank
TOC - Total Organic Carbon
VOC - Volatile Organic Compounds

[1]Target Analyte List (23 Metals); Mercury (Hg) listed separately
[2]Sediment or surface soil will be determined following wetland delineation.
[3]Perform if wetland delineation determines sample to be sediment. Not all locations/intervals will receive a sample.
[4]Phase II samples are contingency dependent on the Phase I results. Actual quantities and locations subject to change.
20% QA/QC samples
There is existing data for greyed/line strikeout intervals. No sample will be collected at these depths.
Sediment depth intervals in inches.
Phase I consists of 25 locations.
Phase II consists of approximately 5 locations.

Figures



AECOM
257 WEST GENESEE STREET
SUITE 400
BUFFALO, NY 14202
PHONE: (716) 856-5636

Source: USGS 1:24,000-scale topographic map, 7.5 x 7.5 Minute Quadrangle: Mallory, 1978

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORTINO TIRE LANDFILL SITE

SITE LOCATION

PINNACLE ROAD SPUR
WEST MONROE, NEW YORK

FILE NAME:	DRAWN:	PROJECT NO.:	DATE:	FIGURE NO.:
01 SITE LOCATION.mxd	ML	60608155	9/25/2019	1

J:\Projects\60608155_DECFORTINO\900_CAD_GIS\920_GIS\MAPS\WORK PLAN\01 SITE LOCATION.mxd 9/25/2019 ML

Legend

- NYSDEC Stream *(Class, Standard)*
- Ground Surface Elevation Contour (ft) (M.J. Land Survey)
- Extent of Capped Landfill
- Limits of Automobile Shredder Residue Waste
- Approximate Parcel Boundary
- NWI Wetland

SOURCES:
NYSDEC Water Quality Classifications, 2013
NYS ITS GIS Program Office, 2015
USFWS National Wetlands Inventory, 2020

250 0 250 Feet

AECOM

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORTINO TIRE LANDFILL SITE

SITE PLAN

PINNACLE ROAD SPUR
WEST MONROE, NEW YORK

FILE NAME:	DRAWN:	PROJECT NO.:	DATE:	FIGURE NO.:
2-1 SITE PLAN	ML	60629330	3/3/2021	2-1

J:\Projects\60608155_DECFORTINO\900_CAD_GIS\920_GIS\MAPS\RIR\2-1 SITE PLAN.mxd 3/3/2021

Legend

- Proposed Monitoring Well
- RIR Monitoring Well
- SC Monitoring Well
- Extent of Capped Landfill
- Limits of Automobile Shredder Residue Waste

SOURCE:
NYS ITS GIS Program Office, 2020

150 0 150 Feet

AECOM

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORTINO TIRE LANDFILL SITE

PROPOSED MONITORING WELL LOCATIONS

PINNACLE ROAD SPUR
WEST MONROE, NEW YORK

FILE NAME:	DRAWN:	PROJECT NO.:	DATE:	FIGURE NO.:
03 PROPOSED MW LOCATIONS	ML	60629330	10/20/2022	3

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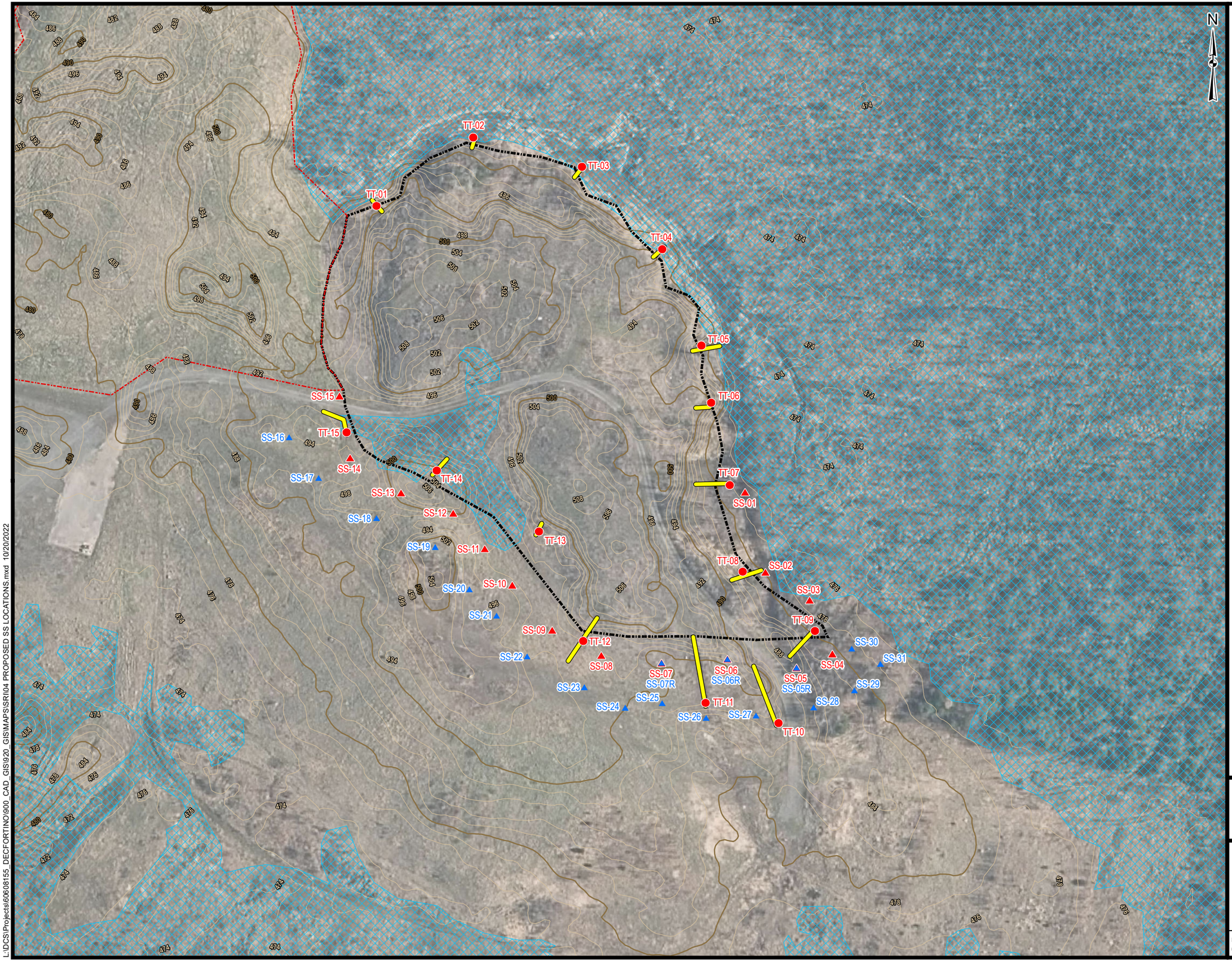

Legend

- Proposed Surface Soil Sample Location
- RIR Surface Soil Sample Location
- RIR Test Trench Sample Location
- RIR Test Trench Location
- Extent of Capped Landfill
- Limits of Automobile Shredder Residue Waste
- Delineated Wetland

Elevation Contours:

- 2-ft Interval
- 10-ft Interval

SOURCES:
NYS ITS GIS Program Office, 2020
Oswego County, 2-ft contours derived from 2007 Oswego LIDAR data

100 0 100 Feet

AECOM

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORTINO TIRE LANDFILL SITE

PROPOSED SURFACE SOIL LOCATIONS

PINNACLE ROAD SPUR
WEST MONROE, NEW YORK

FILE NAME:	DRAWN:	PROJECT NO.:	DATE:	FIGURE NO.:
04 PROPOSED SS LOCATIONS	ML	60629330	10/20/2022	4

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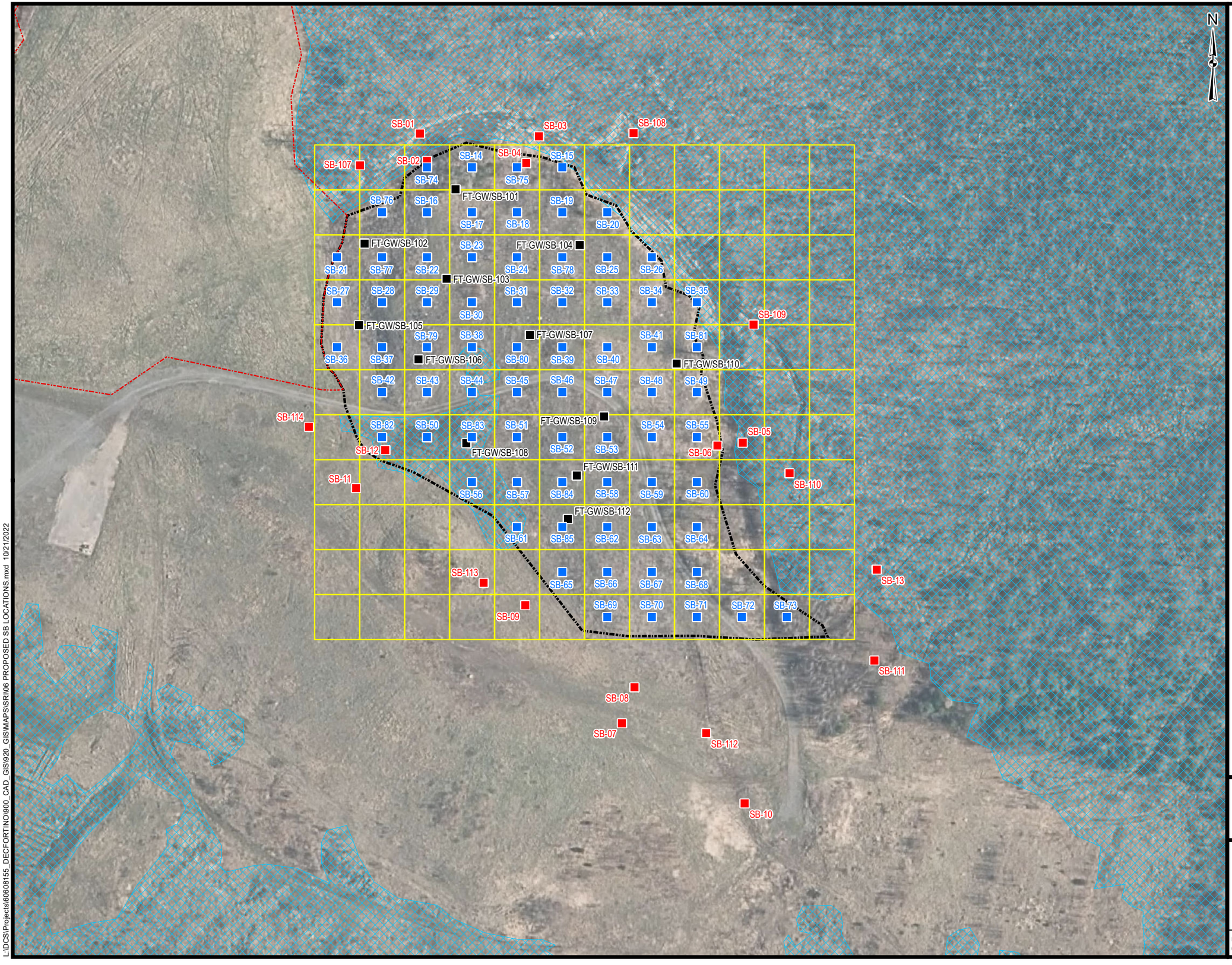

Legend

- Proposed Soil Boring Location
- SC Direct-Push Sample Location
- RIR Soil Boring Location
- Extent of Capped Landfill
- Limits of Automobile Shredder Residue Waste
- Delineated Wetland
- 50ft Grid

SOURCE:
NYS ITS GIS Program Office, 2020

100 0 100 Feet

AECOM

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORTINO TIRE LANDFILL SITE

PROPOSED SOIL BORING SAMPLE LOCATIONS

PINNACLE ROAD SPUR
WEST MONROE, NEW YORK

FILE NAME:	DRAWN:	PROJECT NO.:	DATE:	FIGURE NO.:
06 PROPOSED SB LOCATIONS	ML	60629330	10/21/2022	5

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Legend

- Proposed Sediment/Surface Water Sample Location
- Proposed Sediment Sample Location
- SC Sediment Sample Location
- RIR Sediment Sample Location
- RIR Test Trench Sample Location
- RIR Test Trench Location
- Extent of Capped Landfill
- Limits of Automobile Shredder Residue Waste
- Delineated Wetland

Elevation Contours:

- 2-ft Interval
- 10-ft Interval

SOURCES:
NYS ITS GIS Program Office, 2020
Oswego County, 2-ft contours derived from 2007 Oswego LIDAR data

100 0 100 Feet

AECOM

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORTINO TIRE LANDFILL SITE

PROPOSED SEDIMENT & SURFACE WATER LOCATIONS

PINNACLE ROAD SPUR
WEST MONROE, NEW YORK

FILE NAME:	DRAWN:	PROJECT NO.:	DATE:	FIGURE NO.:
05 PROPOSED SD & SW LOCATIONS	ML	60629330	10/20/2022	6

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Appendix A

Scope of Work

AECOM Imagine it. Delivered.

Schedule 1 - Scope of Work

Schedule 1 –Scope of Work
AECOM Work Assignment (WA) D009803-15.1
Fortino Tire
Phase II Remedial Investigation
Site No. 738047

TASK DESCRIPTIONS

Task 1: Preliminary Activities

This task includes the preparation of the budget estimate in Schedule 2.11 format, the preparation of the cover letter, the development of the scope of work, the completion of the work assignment checklist, the preparation of the M/WBE and SDVOB Utilization Plans and site-specific updates of the generic Field Sampling Plan (FSP), generic Quality Assurance Project Plan (QAPP), and generic Health and Safety Plan (HASP). Additionally, this task includes AECOM participating in teleconferences with the NYSDEC project manager (PM) to discuss the project scope.

Amendment 1
Additional budget is included for the preparation of this amendment including subcontractor procurement as well as updates to the schedule, HASP, FSP, and QAPP, and trip to the site by PM. This task also includes administrative time for all tasks.

Task 2: Phase I Remedial Investigation

AECOM initiated the first phase of the remedial investigation (RI) in November 2019 under WA D007626-51. The fieldwork for this WA D009803-15 will included a second round of groundwater sampling. Following groundwater sampling, a RI report was drafted. Activities under this task for the RI and RI Report are summarized below.

Remedial Investigation

RI activities were performed by a team of two AECOM field geologists, mobilizing from Buffalo, New York and Chestnut Ridge, New York, with support by the AECOM PM/technical lead as needed. The field portion of the RI was expected to be completed in approximately five 10-hour days (including transportation to and from the Site).

- A complete synoptic round of water levels were collected by AECOM's field geologist prior to the start of the groundwater sampling event. Water levels were collected from the 14 on-site monitoring wells and measured from the north side of the top of the inner casing.
- AECOM's field geologist collected groundwater samples from 14 on-Site monitoring wells in accordance with low-flow groundwater sampling procedures as referenced in the FSP and QAPP (14 groundwater sample sets total, not including quality assurance/quality control (QA/QC) samples). Groundwater samples were analyzed per Table 1 – Analytical Sampling Program by the Department's call-out laboratory (Eurofins TestAmerica Buffalo). Dedicated sampling equipment was used at each well.

Remedial Investigation Report

The RI Report was submitted as a draft report within 100 days after the analytical sample results from the second round of groundwater sampling were received from the laboratory and validated. A final version of the report will be submitted within 28 days after the Department's comments on the draft report are received by AECOM. This scope and budget assume only one set of Department comments. The RI Report for this task includes the following:

- Complete description of all field activities conducted by AECOM on the Site;

- Summary of previous investigations;
- Site map depicting relevant site features;
- Figure(s) depicting test pit, soil boring, monitoring well, surface soil, sediment sample, and surface water sample locations;
- Figures depicting sample locations and New York State Standards, Criteria, and Guidance (NYS SCG) non-compliance values from the soil, sediment, surface water, and groundwater analytical data collected during the RI;
- Discussion of analytical results;
- Figures depicting groundwater elevation contours;
- Data summary tables of detected compounds with NYS SCGs listed, and non-compliance values highlighted;
- AECOM daily activity logs;
- Photographs taken at the site during field activities;
- Soil boring/test trench logs;
- Monitoring well construction logs;
- Monitoring well development logs;
- Manifests signed by the disposal facility documenting the proper disposal of IDW;
- Survey field notes and site sketches;
- Survey drawing;
- Data validation;
- DUSR (including Form Is);
- EQuIS submittal of RI data to NYSDEC's database;
- Qualitative Human Health Risk Exposure Assessment;
- Fish and Wildlife Impact Assessment; and
- Summary and recommendations.

This task includes EQuIS submittals by AECOM for all analytical data collected during the RI.

Amendment 1
The slight budget increase is due to revision in labor rates for 2021 and 2022 from estimated average to actual average rates based on CPI adjustments.

Task 3: Phase II Remedial Investigation

A Phase II RI will be performed to fill in any identified data gaps identified following the Phase I RI as summarized in the Phase I RI Report recommendations section. This task is not included in the current scope of work and would require an addendum to this WA.

This task was unfunded in the original budget for this WA.

Amendment 1
AECOM prepared subcontractor scopes of work for access to remote and vegetated boring locations (i.e., all-terrain vehicle (ATV) rig required), drilling and direct push activities to collect soil samples and to install eight overburden monitoring wells to be completed as part of the Phase II Remedial Investigation. Additional work scope elements also include requirements for the transportation and off-Site disposal of investigation-derived waste (IDW), a Site survey and data validation. The field work is anticipated to include the following:

- Task 3a - Wetland survey and reporting by AECOM of the 70-acre Site. AECOM will conduct a routine wetland delineation in accordance with the USACE 1987 Wetlands Delineation Manual and the January 2012 Northcentral and Northeast Regional Supplements. Also, for New York State-listed wetlands, AECOM will delineate the wetland boundaries in accordance with the New York State Freshwater Manual. Open water systems (Waters of the United States) will be delineated based on bed and bank channels. AECOM will delineate the boundaries of jurisdictional wetlands within the Site with pin flags

or tape flags. The flags will be surveyed by AECOM using a high accuracy Trimble Global Positioning System (GPS) Pathfinder Geosha unit with external Zephyr antenna to provide sub-foot post-processed data accuracy. Additional information to support the Fish and Wildlife Resource Impact Analysis (FWRIA) Part 2 (Task 3g), such as plant stress and wildlife observations, will also be collected during the wetland survey. One qualified AECOM personnel will accompany NYSDEC officials to review the wetland lines in the field and participate in a meeting with NYSDEC to review the findings of the delineation. AECOM will submit a draft wetland report to NYSDEC. The report will include an executive summary, detailed narrative, conclusion, all field data sheets, field pictures and coordinates of each wetland test pit (sample site) and maps (federal and state wetland mapped wetlands, soil type map, water bodies maps, and maps showing the wetland flags at an appropriate scale). After receipt of NYSDEC's comments to the draft report, AECOM will incorporate NYSDEC's comments and include the wetland report as an appendix to the Supplemental Remedial Investigation Report.

Also, as an appendix to the wetland delineation report, AECOM scientists who are knowledgeable in soil science and geomorphology will determine the classification (i.e., sediments or soils) at the proposed sediment and surface soil locations. AECOM scientists will visit each location and based upon visual observations, determine if the sample location is sediment or soil. The criteria for determining sediment will be the following: 1) If the sample location is below the mean high water mark of a permanent flowing/ponded area; 2) If the sample location is within a confined basing or ephemeral channel that could hold sufficient water for two months during the growing season to support aquatic life (e.g., amphibians). Any location not meeting these criteria will be classified as soil. The determination of sediments and soils may be further supported with review of readily available historical maps aerial photography. Based on the differentiation between sediment from soils, the sample intervals under Task 3b will be adjusted accordingly.

- Task 3b - AECOM will perform surface soil/sediment sampling at approximately 72 locations using a hand auger, outside the limits of the automobile shredder residue (ASR) waste pile, to delineate the horizontal and vertical extent of impacts. It is anticipated that samples will be collected in two phases; 35 locations during the first phase (with 12 contingency locations at previously collected remedial investigation sediment locations) and 25 locations during the second phase to fill potential data gaps following review of data from the first phase. Following the proposed wetland delineation (i.e., differentiation between sediment and soil), samples will either be collected at the 0-2 inch, 2-12 inch interval and 12-24 inch depth intervals if determined to be soil or at the 0-6 inch, 6-12 inch interval and 12-24 inch depth intervals if determined to be sediment (note that the 12-24 inch sample interval for either will be held at the lab as a contingency). If the sediment samples collected during the Phase I remedial investigation are determined to be soil per the proposed wetland survey, the remedial investigation samples will be re-collected using the correct sample intervals per each media. Samples will be analyzed per Table 2 – Analytical Sampling Program. Equipment will be decontaminated per the QAPP prior to advancing the next boring.

- Task 3c - Soil borings will be advanced by AECOM's drilling subcontractor and sampled at 90 locations within the ASR waste pile into native soils using a track mounted direct push rig. It is anticipated that samples will be collected in two phases; during the first phase, 60 borings will be advanced at grid nodes on 50 feet by 50 feet spacing, filling data gaps from previous investigations. Samples will be collected at 0-0.5 feet, 2-4 feet, 6-8 feet, 10-12 feet, 14-16 feet and 18-20 feet depth intervals with adjustments in the intervals made, as appropriate, based on field observations (e.g., staining, etc.). Borings will terminate at 2 feet below the top of native soils and the final sample will be collected within that interval. Samples will be analyzed per Table 2 – Analytical Sampling Program. During the first phase, twelve borings will also be advanced at previous boring locations to fill vertical data gaps, and 30 samples will be collected and analyzed per Table 2 – Analytical Sampling

Program. The second phase of soil boring investigation will consist of approximately 18 borings used to fill potential data gaps (e.g., delineation of high concentration areas) following review of data from the first phase. Note there is a 6 month holding time for PCBs; if needed, samples can be held and analyzed at a later date following review of data. Depth to native soils in the ASR waste pile is estimated to range from 4 to 20 feet below ground surface (bgs). The drill rig shall be capable of advancing a 2-inch outside diameter by 4 or 5-foot long acetate lined macrocore sampler through the ASR material, terminating approximately 2 feet below the top of native soils. Drilling and soil sampling will be conducted continuously to classify the ASR in subsurface material and to determine the native soil interface. After the AECOM geologist completes soil logging, drilling spoils will be placed in 55-gallon open-top, UN rated steel DOT drums for characterization and disposal. Equipment will be decontaminated per the QAPP prior to advancing the next boring.

- Task 3d - Eight monitoring wells will be installed by AECOM's drilling subcontractor to approximately 25 feet bgs under direction of AECOM's field geologist. Monitoring wells will be installed outside the footprint of the ASR waste pile and municipal town landfill to delineate impacts to the north and east. Six wells will be installed downgradient of the ASR waste pile, and two background wells will be installed to the south and west of the ASR and town landfill. Prior to advancing augers, the borings will be hand cleared to five feet bgs. Borings will be advanced using 4¼-inch diameter hollow stem auger drilling methods. Continuous soil cores will be collected using a spilt-spoon sampler and logged by an AECOM field geologist. No soil samples will be collected at these locations unless anthropogenic fill material is encountered. The monitoring wells will be constructed with a 10-foot-long, 2-inch inside diameter Schedule 40 PVC, No. 0.010 slot screen and 4-inch steel protective casing. Each monitoring well will be finished with a locking well cap and a 2-foot square concrete apron. The concrete apron for each well pad will be approximately 6 inches thick. Drilling spoils will be placed in 55-gallon UN rated steel DOT drums for characterization and disposal. Equipment will be decontaminated per the QAPP prior to advancing the next boring.

  Newly installed monitoring wells will be developed by an AECOM field geologist, with assistance by AECOM's drilling subcontractor, a minimum of 24 hours after their completion. Approximately 50 gallons of development water will be removed from each newly installed well based on five well volumes; assuming a 2-inch well casing, 12-foot long saturated sand pack and 8-inch diameter borehole, or until turbidity levels are below 50 NTU and the indicator parameters (pH, temperature, and specific conductivity) have stabilized. Per previous discussions with NYSDEC, development water from the newly installed monitoring wells will be returned to the ground surface.

- Task 3e - Two groundwater sampling events will be performed by AECOM's field geologist and separated by six months. The first event will consist of the 15 existing monitoring wells. The second event will consist of 23 monitoring wells (15 existing monitoring wells and the eight newly installed monitoring wells). Groundwater sampling will be performed in accordance with low-flow groundwater sampling procedures as referenced in the FAP and QAPP. Groundwater samples will be analyzed per Table 2 – Analytical Sampling Program and include both filtered and non-filtered samples. Dedicated sampling equipment will be used at each well. Per previous discussions with NYSDEC, purge water from monitoring wells outside the ASR waste pile will be returned to the ground surface, while purge water from monitoring wells on the ASR waste pile will be transferred to 55-gallon UN rated steel DOT drums for characterization and disposal.

  A complete synoptic round of water levels will be collected by AECOM's field geologist prior to the start of both groundwater sampling events as well as a third event to account for seasonal variability. Groundwater levels will be collected from the 15 existing monitoring

wells and the eight newly installed wells and measured from the north side of the top of the inner casing.

Hydraulic testing (i.e., slug tests) of seven wells will be performed to characterize the permeability of saturated subsurface materials. Slug tests will be performed at two upgradient wells, two wells below the ASR waste pile, and three wells down gradient of the ASR waste pile.

- All soil spoils will be placed in drums for off-Site disposal. Soil spoils from borings completed on the ASR waste pile will be segregated from borings completed outside the footprint of the ASR waste pile. The drums will be staged on-Site until transport and disposal is arranged.

- Two solid samples and two aqueous samples will be collected for disposal parameters as listed in Table 2 – Analytical Sampling Program or as required by the disposal facility in order to complete the waste profiles for the IDW transportation and off-Site disposal; one composite sample will be collected from soil spoils generated from borings completed on the ASR waste pile and one composite sample from borings completed outside the footprint of the ASR waste pile. One composite aqueous sample will be collected from the drum containing decontamination water and one composite aqueous sample will be collected from the drum containing purge water from the monitoring wells located on the ASR waste pile.

- The chemical testing will be performed by a NYSDEC call-out laboratory. Data validation will be performed by an AECOM standby subcontractor.

- Location and elevation survey of the borings and monitoring wells will be performed by an AECOM subcontractor.

Task 3f: Data Validation

Following receipt of analytical data from the laboratory, the data will be forward to AECOM's subcontractor for validation. The sample quantity is estimated on the attached Table 2 – Analytical Sampling Program. Note the sample quantity may change as the FAP is drafted.

Task 3g: Supplemental Remedial Investigation Report

The Supplemental Remedial Investigation Report will be submitted as a draft report within 90 days after all fieldwork has been completed and data have been received and validated. A final version of the report will be submitted within two weeks after the Department's comments on the draft report are received by AECOM. The report for this task will include the following:

- A description of all field activities conducted on the Site, including those performed during the remedial investigation;
- A summary of previous investigations;
- A Site map depicting relevant Site features;
- Figure(s) depicting soil boring, monitoring well, and key Site features;
- Figures depicting sample locations and NYS standards, criteria, guidance (SCG) non-compliance values from the soil and groundwater analytical data collected during Site work;
- A discussion of analytical results;
- Figures depicting groundwater elevation contours;

- Figures depicting extent of ASR waste pile;
- Data summary tables of detected compounds with NYS SCGs listed, and non-compliance values highlighted;
- Field notes and/or daily activity logs;
- Photographs taken at the Site during field activities;
- Soil boring logs;
- Monitoring well construction logs;
- Monitoring well development logs;
- Monitoring well purge logs with water quality measurements;
- Manifests and/or bills of lading signed by the disposal facility documenting the proper disposal of IDW;
- Survey field notes and Site sketches;
- A survey drawing;
- A DUSR (including Form 1s) containing only data from the current fieldwork;
- A Qualitative Human Health Risk Exposure Assessment;
- A Fish and Wildlife Resource Impact Analysis (Part 2: Ecological Assessment); and
- Recommendations.

This task includes EQuIS submittals to the NYSDEC for all analytical data collected by AECOM during the RI.

The FWRIA Part 2 Ecological Impact Assessment will evaluate potential ecological exposure at the Site using the results of sediment/soil determinations in Task 3a to determine appropriate the ecological SCG applied for each sample. The sediment and surface soil samples collected as described in Task 3b will be used to assess ecological impacts from Site contaminants. No toxicity testing or biota tissue sampling and assessment will be performed.

Task 4: Feasibility Study and Remedy Selection

Task 4 was included in the original WA# 15. Task 4 will include a feasibility study (FS) report and public meeting assistance/proposed remedial action plan support.

Feasibility Study Report

The following assumptions will be used for completing this task:

- One trip by the AECOM PM from Buffalo, NY and FS Engineer from Albany, NY will be made to the Department's office in Syracuse, NY for planning/scoping meeting with the NYSDEC PM.
- Anticipate that the site will have one operable unit (OU).
- Anticipate that a maximum of four alternatives will be included for impacts in soil, sediment, surface water, and groundwater, including 'No Action'.
- A draft FS report will be written after the remedial alternatives have been agreed upon. A detailed analysis will be presented in narrative form and will provide a basis for the selection of the remedy.
- One trip by the AECOM PM from Buffalo, NY and FS Engineer from Albany, NY will be made to the Department's office in Syracuse, NY to review the draft FS report with the NYSDEC PM.
- Incorporation of one set of comments from the Department.

- Finalization of the document.

The FS Report will include the following sections:

- Introduction;
- Site description and history;
- Summary of RI and exposure assessment;
- Remedial goals and remedial objectives;
- General response actions;
- Identification and screening of technologies;
- Development and analysis of alternatives, which:
    - Assembles technologies into remedial alternatives;
    - Evaluates alternatives with respect to appropriate criteria; and
    - Evaluates the institutional/engineering controls for the selected remedy; and
- Recommended remedy, with a discussion supporting why it is recommended.

Public Meeting Assistance/Proposed Remedial Action Plan Support

The following assumptions will be used for completing this task:

- One trip by the AECOM PM from Buffalo, NY and FS Engineer from Albany, NY will be made to the Department's office in Syracuse, NY to assist the NYSDEC PM during a public information meeting. AECOM personnel will attend to answer technical questions regarding the remedial strategy, as needed.

Amendment 1

Per NYSDEC concurrence, labor hours and ODCs (including on-Site and Teams meetings with NYSDEC) for the development of this Phase II RI scope of work and associated estimated budget were charged against the existing Task 4. The funding estimated for this task includes the additional funding needed to re-fund this task as well as additional funding required to draft the feasibility study due to the increased complexity of accounting for the supplemental remedial investigation and technical expert input/review of the TSCA and PFAS data.

Task 5 – Residential Well PFAS Sampling and Residential Water Treatment System Installation

This task will include the following:

- Quarterly sampling for PFAS at one residential well to be determined by the Department for three years (July 2020 through October 2022). Sampling will begin as determined by the NYSDEC PM and be performed by one AECOM field geologist; includes a one-day trip per event, traveling from Buffalo, New York;
- Analysis of samples at the NYSDEC call-out laboratory;
- Installation of a water treatment system at one residence to be determined by the Department; and
- Project management, reporting and data validation associated with the above.

This task includes EQuIS submittals by AECOM for all analytical data collected during the residential well sampling.

Amendment 1

The slight budget decrease is due to revision in labor rates for 2021 and 2022 from estimated average to actual average rates based on CPI adjustments.

SUBCONTRACTOR PROCUREMENT DETAILS

Water Treatment System Installation

In order to provide an accurate quotation for the installation of a water treatment system in a residential building, the subcontractor needs to have access to the building to determine the treatment system specifications and what supplies are necessary in order to connect the treatment system to the existing plumbing and electrical system. In addition, without a specific time frame for the installation, pricing cannot be guaranteed for an extended period (e.g., valid until 2022). Therefore, a placeholder has been included for the water treatment system installation. Once an installation time frame has been established and access to the building is provided, AECOM will solicit the required number of quotes and will notify the Department of the subcontractor selection for this WA prior to that firm's commencement of work.

Amendment 1

Data Validator

Initially a placeholder for data validation services was used in the initial budget package. Subsequently, AECOM selected a Standby subcontractor, Validata Chemical Services, Inc. (M&WBE) for the Task 2 work. A memo requesting approval to used Validata Chemical Services was submitted to the Department on September 3, 2020 and approval was provided on September 9, 2020.

Since Draft USEPA PFAS Method 1633 and PCB homolog Method 680 are not included in our current data validation price list, quotes were solicited for these parameters from AECOM's standby data validation subcontractors: Environmental Data Validation, Inc. (M&WBE), Laboratory Data Consultants, Inc., and Validata Chemical Services, Inc. (M&WBE) for the Task 3 data validation services. Standby rates were used for all other parameters. Validata Chemical Services, Inc was selected as the low bidder at $92,526.

Direct-Push Services

Quotes were received from six direct-push subcontractors: Matrix Environmental Technologies, Inc., Nothnagle Drilling, Inc., SJB Services, Inc., Cascade Remediation Services, Parratt Wolff, Inc. and North Star Drilling. After the bids were received, Parratt Wolff and Nothnagle they would not be available to commence work in October 2022. Matrix Environmental confirmed it could start in October 2022, therefore Matrix Environmental was selected as the low/available bidder at $81,399.

Land Survey Services

Quotes were received from three survey subcontractors: CT Male Associates, KHEOPS Architecture, Engineering & Survey (MBE), and MJ Engineering and Land Survey. CT Male Associates was selected as the low bidder at $2,570.

IDW Disposal

Quotes were received from three subcontractors for IDW transportation and disposal: Frank's Vacuum Truck Service, Inc., Sun Environmental Corp., and Environmental Services Group NY, Inc. Frank's Vacuum Truck Service was selected as the low bidder at $10,520.

ANTICIPATED SCHEDULE

This WA will be performed in general accordance to the following time frames:

Work Element	Days after NTP	Date
AECOM Notice to Proceed	0	3/9/2020
Budget Package Approved	89	6/2/2020
Submit Amendment 1 Budget Package	832	9/19/2022
Task 2 Phase I Started	105	6/22/2020
Task 2 Draft RI Report Submitted	557	9/17/2021
Task 3 Phase II Fieldwork Start	928	9/23/2022
Task 3 Phase II Fieldwork End	1124	4/7/2023
Task 3 EQuIS (90 days following field work or receipt of DUSRs)	1214	7/6/2023
Task 3 Phase II Draft SRIR (90 days following field work or receipt of DUSRs)	1214	7/6/2023
Task 3 Phase II Final SRIR (30 days after receipt of Department comments)	1274	9/4/2023
Task 4 FS Report Draft (30 days after Department approval of Final SRIR)	1334	11/3/2023
Task 4 FS Report Final (30 days after receipt of Department comments)	1390	12/29/2023
Task 5 Residential Well PFAS Sampling and Residential Water Treatment System Installation	--	To be determined

Note, assumes 30 days for Department to review documents.

Table 1
Task 2 Analytical Sampling Program
Fortino Tire
Site ID: 738047

Location	Matrix	TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[(1)] (6010D)	Cyanide (9012B)	Hg (7470A)	PCBs (8082A)	Pesticides (8081B)	PFAS (EPA 537 Modified)	1,4-Dioxane (8270D SIM)
Total Sample Quantity	Water	20	18	18	18	18	18	18	79	18
Remedial Investigation Monitoring Well - Round 2										
MW-1	Water	1	1	1	1	1	1	1	1	1
MW-2	Water	1	1	1	1	1	1	1	1	1
MW-3	Water	1	1	1	1	1	1	1	1	1
MW-4	Water	1	1	1	1	1	1	1	1	1
MW-5	Water	1	1	1	1	1	1	1	1	1
MW-6	Water	1	1	1	1	1	1	1	1	1
MW-7	Water	1	1	1	1	1	1	1	1	1
MW-8	Water	1	1	1	1	1	1	1	1	1
MW-FD	Water	1	1	1	1	1	1	1	1	1
MW-EB	Water	1	1	1	1	1	1	1	1	1
MW-MS	Water	1	1	1	1	1	1	1	1	1
MW-MSD	Water	1	1	1	1	1	1	1	1	1
MW-TB	Water	1								
MW-FB	Water	1							1	
Site Characterization Monitoring Well - Round 2										
FT-MW-101	Water	1	1	1	1	1	1	1	1	1
FT-MW-102	Water	1	1	1	1	1	1	1	1	1
FT-MW-103	Water	1	1	1	1	1	1	1	1	1
FT-MW-104	Water	1	1	1	1	1	1	1	1	1
FT-MW-105	Water	1	1	1	1	1	1	1	1	1
FT-MW-106	Water	1	1	1	1	1	1	1	1	1
Residential Well - Year 1 (July 2020)										
RW-3Q20	Water								1	
RW-FD	Water								1	
RW-EB	Water								1	
RW-MS	Water								1	
RW-MSD	Water								1	
RW-FB	Water								1	
Residential Well - Year 1 (October 2020)										
RW-4Q20	Water								1	
RW-FD	Water								1	
RW-EB	Water								1	
RW-MS	Water								1	
RW-MSD	Water								1	
RW-FB	Water								1	
Residential Well - Year 2 (January 2021)										
RW-1Q21	Water								1	
RW-FD	Water								1	
RW-EB	Water								1	
RW-MS	Water								1	
RW-MSD	Water								1	
RW-FB	Water								1	
Residential Well - Year 2 (April 2021)										
RW-2Q21	Water								1	
RW-FD	Water								1	
RW-EB	Water								1	
RW-MS	Water								1	
RW-MSD	Water								1	
RW-FB	Water								1	
Residential Well - Year 2 (July 2021)										
RW-3Q21	Water								1	
RW-FD	Water								1	
RW-EB	Water								1	
RW-MS	Water								1	
RW-MSD	Water								1	
RW-FB	Water								1	

Table 1
Task 2 Analytical Sampling Program
Fortino Tire
Site ID: 738047

Location	Matrix	TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[(1)] (6010D)	Cyanide (9012B)	Hg (7470A)	PCBs (8082A)	Pesticides (8081B)	PFAS (EPA 537 Modified)	1,4-Dioxane (8270D SIM)
Residential Well - Year 2 (October 2021)										
RW-4Q21	Water								1	
RW-FD	Water								1	
RW-EB	Water								1	
RW-MS	Water								1	
RW-MSD	Water								1	
RW-FB	Water								1	
Residential Well - Year 3 (January 2022)										
RW-1Q22	Water								1	
RW-FD	Water								1	
RW-EB	Water								1	
RW-MS	Water								1	
RW-MSD	Water								1	
RW-FB	Water								1	
Residential Well - Year 3 (April 2022)										
RW-2Q22	Water								1	
RW-FD	Water								1	
RW-EB	Water								1	
RW-MS	Water								1	
RW-MSD	Water								1	
RW-FB	Water								1	
Residential Well - Year 3 (July 2022)										
RW-3Q22	Water								1	
RW-FD	Water								1	
RW-EB	Water								1	
RW-MS	Water								1	
RW-MSD	Water								1	
RW-FB	Water								1	
Residential Well - Year 3 (October 2022)										
RW-4Q22	Water								1	
RW-FD	Water								1	
RW-EB	Water								1	
RW-MS	Water								1	
RW-MSD	Water								1	
RW-FB	Water								1	

Notes:
EB - Equipment (or Rinse) Blank
FB - Field Blank
FD - Field Duplicate
MS - Matrix Spike Duplicate
MSD - Matrix Spike Duplicate
MW - Monitoring Well
RW - Residential Well
SB - Soil Boring
VOC - Volatile Organic Compound
SVOC - Semi volatile Organic Compound
[1] Target Analyte List (22 Metals); does not include mercury (Hg) or Cyanide

Table 2
Task 3 Analytical Sampling Program
Fortino Tire, Site ID: 738047

Location	TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[(2)] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	PCB homologs (680)	TOC[(3)] (Lloyd Kahn)	Pesticides (8081B)	PFAS (1633)	1,4-Dioxane (8270D SIM)
Total Sample Quantity (Soil/Sediment), including 5% QA/QC samples.	436	436	436	436	436	692	0	132	436	436	436
Total Sample Quantity (Aqueous), including 5% QA/QC samples.	43	37	73	73	37	73	53	0	37	41	37
Total number of samples	479	473	509	509	473	765	53	132	473	477	473
Surface Soil/Sediment Phase I											
SS or SED	141	141	141	141	141	141	0	71	141	141	141
SS/SED-FD	7	7	7	7	7	7	0	4	7	7	7
SS/SED-MS	7	7	7	7	7	7	0	4	7	7	7
SS/SED-MSD	7	7	7	7	7	7	0	4	7	7	7
SS/SED-EB	7	7	7	7	7	7	0	4	7	7	7
Surface Soil/Sediment Phase II											
SS or SED	75	75	75	75	75	75	0	38	75	75	75
SS/SED-FD	4	4	4	4	4	4	0	2	4	4	4
SS/SED-MS	4	4	4	4	4	4	0	2	4	4	4
SS/SED-MSD	4	4	4	4	4	4	0	2	4	4	4
SS/SED-EB	4	4	4	4	4	4	0	2	4	4	4
Soil Boring Phase I											
SB	72	72	72	72	72	288	0	0	72	72	72
SB-FD	4	4	4	4	4	14	0	0	4	4	4
SB-MS	4	4	4	4	4	14	0	0	4	4	4
SB-MSD	4	4	4	4	4	14	0	0	4	4	4
SB-EB	4	4	4	4	4	14	0	0	4	4	4
Soil Boring Phase II											
SB	72	72	72	72	72	72	0	0	72	72	72
SB-FD	4	4	4	4	4	4	0	0	4	4	4
SB-MS	4	4	4	4	4	4	0	0	4	4	4
SB-MSD	4	4	4	4	4	4	0	0	4	4	4
SB-EB	4	4	4	4	4	4	0	0	4	4	4

Table 2
Task 3 Analytical Sampling Program
Fortino Tire, Site ID: 738047

Location	TCL VOCs (8260C)	TCL SVOCs (8270D)	TAL Inorganics[2] (6010C)	Hg (7471B)	Cyanide (9012B)	PCBs (8082A)	PCB homologs (680)	TOC[3] (Lloyd Kahn)	Pesticides (8081B)	PFAS (1633)	1,4-Dioxane (8270D SIM)
Existing Monitoring Wells - Round 1[1]											
MW's	15	15	15	15	15	15	8	0	15	15	15
MW's filtered	0	0	15	15	0	15	8	0	0	0	0
MW-FD	1	1	2	2	1	2	0	0	1	1	1
MW-MS	1	1	2	2	1	2	0	0	1	1	1
MW-MSD	1	1	2	2	1	2	0	0	1	1	1
MW-TB	3	0	0	0	0	0	0	0	0	0	0
MW-EB	0	0	0	0	0	0	0	0	0	1	0
MW-FB	0	0	0	0	0	0	0	0	0	1	0
Existing and New Monitoring Wells - Round 2 [1]											
MW's	16	16	16	16	16	16	16	0	16	16	16
MW's filtered	0	0	16	16	0	16	16	0	0	0	0
MW-FD	1	1	2	2	1	2	2	0	1	1	1
MW-MS	1	1	2	2	1	2	2	0	1	1	1
MW-MSD	1	1	2	2	1	2	2	0	1	1	1
MW-TB	3	0	0	0	0	0	0	0	0	0	0
MW-EB	0	0	0	0	0	0	0	0	0	1	0
MW-FB	0	0	0	0	0	0	0	0	0	1	0

Soil Investigative Derived Waste Profiling[5]	
IDW-Soil	Full TCPL/RCRA Characteristics (2 samples)
IDW-Water	Full TCPL/RCRA Characteristics (1 sample)

Notes:

EB - Equipment (or Rinse) Blank
FB - Field Blank
FD - Field Duplicate
IDW - Investigation Derived Waste
MS - Matrix Spike
MSD - Matrix Spike Duplicate
MW - Monitoring Well
PCB - Polychlorinated Biphenyls
PFAS - Per- and Polyfluoroalkyl Substances
RCRA- Resource Conservation and Recovery Act
SB - Soil Boring
SS - Surface Soil
SVOC - Semivolatile Organic Compounds
TB - Trip Blank
TCL - Target Compound List
TCLP - Toxicity Characteristic Leaching Procedure
TOC - Total Organic Carbon
VOC - Volatile Organic Compounds

[1]Field Parameters include pH, temperature, turbidity, oxidation-reduction potential (ORP), dissolved oxygen (DO), and specific conductivity.
[2]Target Analyte List (23 Metals); Mercury (Hg) listed separately
[3]Perform if wetland delineation determines sample to be sediment.
[4]Sediment or surface soil will be determined following wetland delineation.
[5]Composite sample collected from drummed soil cuttings, and drummed purge and/or decon water.

Appendix B

NYSDEC PFAS Sampling and Analysis Guidance

NEW YORK STATE OF OPPORTUNITY.

Department of Environmental Conservation

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Under NYSDEC's Part 375 Remedial Programs

DRAFT June 2022

Table of Contents

ERRATA SHEET for

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) Under NYSDEC's Part 375 Remedial Programs Issued January 17, 2020

Citation and Page Number	Current Text	Corrected Text	Date
Title of Appendix I, page 32	Appendix H	Appendix I	2/25/2020
Document Cover, page 1	Guidelines for Sampling and Analysis of PFAS	Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs	9/15/2020
Routine Analysis, page 9	"However, laboratories analyzing environmental samples…PFOA and PFOS in drinking water by EPA Method 537, 537.1 or ISO 25101."	"However, laboratories analyzing environmental samples…PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533."	9/15/2020
Additional Analysis, page 9, new paragraph regarding soil parameters	None	"In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (EPA Method 9060), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils."	9/15/2020
Data Assessment and Application to Site Cleanup Page 10	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Target levels for cleanup of PFAS in other media, including biota and sediment, have not yet been established by the DEC.	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Water Sample Results Page 10	PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water (…) If PFAS are identified as a contaminant of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water (…) If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	9/15/2020
Soil Sample Results, page 10	"The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase."	"Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values. " [Interim SCO Table] "PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP. As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf. "	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Testing for Imported Soil Page 11	Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the PFAS Analyte List (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs. If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State's Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable. PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Footnotes	None	[1] TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances. [2] The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the soil cleanup objective for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	9/15/2020
Additional Analysis, page 9	In cases… soil parameters, such as Total Organic Carbon (EPA Method 9060), soil…	In cases… soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil…	1/8/2021
Appendix A, General Guidelines, fourth bullet	List the ELAP-approved lab(s) to be used for analysis of samples	List the ELAP- certified lab(s) to be used for analysis of samples	1/8/2021
Appendix E, Laboratory Analysis and Containers	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101.	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101	1/8/2021
Water Sample Results Page 9	"In addition, further assessment of water may be warranted if either of the following screening levels are met: a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L"	Deleted	6/15/2021

Citation and Page Number	Current Text	Corrected Text	Date
Routine Analysis, Page XX	Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP)… criteria set forth in the DER's laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids).	Deleted	5/31/2022
Analysis and Reporting, Page XX	As of October 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.	Deleted	5/31/2022
Routine Analysis, Page XX	LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media.	EPA Method 1633 is the procedure to use for environmental samples.	
Soil Sample Results, Page XX	Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6	Soil cleanup objectives for PFOA and PFOS have been proposed in an upcoming revision to 6 NYCRR Part 375-6	
Appendix A	"Include in the text… LC-MS/MS for PFAS using methodologies based on EPA Method 537.1"	"Include in the text ….EPA Method 1633"	
Appendix A	"Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, EPA Method 533, or ISO 25101"	Deleted	
Appendix B	"Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1"	"Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633"	

Citation and Page Number	Current Text	Corrected Text	Date
Appendix C	"Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1"	"Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633"	
Appendix D	"Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1"	"Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633"	
Appendix G		Updated to include all forty PFAS analytes in EPA Method 533	
Appendix H		Deleted	
Appendix I	Appendix I	Appendix H	
Appendix H	"These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report."	"These guidelines are intended to be used for the validation of PFAS using EPA Method 1633 for projects within the Division of Environmental Remediation (DER)."	
Appendix H	"The holding time is 14 days…"	"The holding time is 28 days…"	
Appendix H, Initial Calibration	"The initial calibration should contain a minimum of five standards for linear fit…"	"The initial calibration should contain a minimum of six standards for linear fit…"	
Appendix H, Initial Calibration	Linear fit calibration curves should have an R^2 value greater than 0.990.	Deleted	
Appendix H, Initial Calibration Verification	Initial Calibration Verification Section	Deleted	
Appendix H	secondary Ion Monitoring Section	Deleted	
Appendix H	Branched and Linear Isomers Section	Deleted	

Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis, reporting, and assessment of PFAS, DER has developed this document which summarizes currently accepted procedures and updates previous DER technical guidance pertaining to PFAS.

Applicability

All work plans submitted to DEC pursuant to one of the remedial programs under Part 375 shall include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected. Equipment blanks should be collected at a minimum frequency of one per day per site or one per twenty samples, whichever is more frequent.

Analysis and Reporting

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical

procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third party data validator. Electronic data submissions should meet the requirements provided at: https://www.dec.ny.gov/chemical/62440.html.

DER has developed a *PFAS Analyte List* (Appendix G) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

Routine Analysis

EPA Method 1633 is the procedure to use for environmental samples. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist. Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay).

In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.[1]

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

[1] TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.

Data Assessment and Application to Site Cleanup

Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.

Water Sample Results

PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt) and is determined to be attributable to the site, either by a comparison of upgradient and downgradient levels, or the presence of soil source areas, as defined below.

If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

Soil Sample Results

Soil cleanup objectives for PFOA and PFOS have been proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values:

Guidance Values for Anticipated Site Use	PFOA (ppb)	PFOS (ppb)
Unrestricted	0.66	0.88
Residential	6.6	8.8
Restricted Residential	33	44
Commercial	500	440
Industrial	600	440
Protection of Groundwater[2]	1.1	3.7

PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP.

As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf.

[2] The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).

Testing for Imported Soil

Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.

PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
    - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP certified lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an "Analytical Methods/Quality Assurance Summary Table" specifying:
    - Matrix type
    - Number or frequency of samples to be collected per matrix
    - Number of field and trip blanks per matrix
    - Analytical parameters to be measured per matrix
    - Analytical methods to be used per matrix with minimum reporting limits
    - Number and type of matrix spike and matrix spike duplicate samples to be collected
    - Number and type of duplicate samples to be collected
    - Sample preservation to be used per analytical method and sample matrix
    - Sample container volume and type to be used per analytical method and sample matrix
    - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by EPA Method 1633
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
    - Reporting Limits should be less than or equal to:
        - Aqueous – 2 ng/L (ppt)
        - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
-
- Include detailed sampling procedures
    - Precautions to be taken
    - Pump and equipment types
    - Decontamination procedures
    - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment
- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per site for each matrix

Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix C - Sampling Protocols for PFAS in Monitoring Wells

General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix D - Sampling Protocols for PFAS in Surface Water

General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., washroom sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank per day per site and a minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers.
- A field reagent blank (FRB) should be collected at a rate of one per 20 samples. The lab will provide a FRB bottle containing PFAS free water and one empty FRB bottle. In the field, pour the water from the one bottle into the empty FRB bottle and label appropriately.
- Request appropriate data deliverable (Category B) and an electronic data deliverable
- For sampling events where multiple private wells (homes or sites) are to be sampled per day, it is acceptable to collect QC samples at a rate of one per 20 across multiple sites or days.

Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the latest guidelines developed by the Division of Fish and Wildlife (DFW) entitled "General Fish Handling Procedures for Contaminant Analysis" (Ver. 8).

Procedure Name: General Fish Handling Procedures for Contaminant Analysis

Number: FW-005

Purpose: This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

Organization: Environmental Monitoring Section
Bureau of Ecosystem Health
Division of Fish and Wildlife (DFW)
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, New York 12233-4756

Version: 8

Previous Version Date: 21 March 2018

Summary of Changes to this Version: Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

Originator or Revised by: Wayne Richter, Jesse Becker

Date: 26 April 2019

Quality Assurance Officer and Approval Date: Jesse Becker, 26 April 2019

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES

A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:

   1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).

   2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.

   3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.

B. The following data are required on each **Fish Collection Record** form:

   1. Project and Site Name.

   2. DEC Region.

   3. All personnel (and affiliation) involved in the collection.

   4. Method of collection (gill net, hook and line, etc.)

   5. Preservation Method.

C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:

   1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.

   2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.

   3. Date collected.

   4. Sample location (waterway and nearest prominent identifiable landmark).

   5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.

2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.

3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.

4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate “Age” column.

5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.

6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.

7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.

E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish’s tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **The Bureau of Ecosystem Health will supply the bags.** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with

the same information.

F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.

G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.

H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:

No materials containing Teflon.
No Post-it notes.
No ice packs; only water ice or dry ice.
Any gloves worn must be powder free nitrile.
No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
Wash hands after handling any food containers or packages as these may contain PFCs.
Keep pre-wrapped food containers and wrappers isolated from fish handling.
Wear clothing washed at least six times since purchase.
Wear clothing washed without fabric softener.
Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with “fluor” in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.

I. All fish must be kept at a temperature <45° F (<8° C) immediately following data processing. As soon as possible, freeze at -20° C ± 5° C. Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.

J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.

K. A recommended equipment list is at the end of this document.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

Project and Site Name _____ DEC Region _____

Collections made by (include all crew) _____

Sampling Method: □Electrofishing □Gill netting □Trap netting □Trawling □Seining □Angling □Other _____

Preservation Method: □Freezing □Other _____ Notes (SWFDB survey number): _____

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17, 4/26/19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAIN OF CUSTODY

I, _____, of _____ collected the
(Print Name) (Print Business Address)

following on _____, 20____ from _____
(Date) (Water Body)

in the vicinity of _____
(Landmark, Village, Road, etc.)

Town of _____, in _____ County.

Item(s) _____

_____

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on _____, 20_____.

_____ _____
Signature Date

I, _____, received the above mentioned sample(s) on the date specified and assigned identification number(s) _____ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

_____ _____
Signature Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

richter: revised 21 April 2014; becker: 23 March 2017, 26 April, 2019

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

HANDLING INSTRUCTIONS

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelops, approximately 2” x 3.5”, if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonic acids	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluoropentanesulfonic acid	PFPeS	2706-91-4
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorononanesulfonic acid	PFNS	68259-12-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
	Perfluorododecanesulfonic acid	PFDoS	79780-39-5
Perfluoroalkyl carboxylic acids	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUnA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTeDA	376-06-7
Per- and Polyfluoroether carboxylic acids	Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
	4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
	Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1
	Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5
	Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6
Fluorotelomer sulfonic acids	4:2 Fluorotelomer sulfonic acid	4:2-FTS	757124-72-4
	6:2 Fluorotelomer sulfonic acid	6:2-FTS	27619-97-2
	8:2 Fluorotelomer sulfonic acid	8:2-FTS	39108-34-4
Fluorotelomer carboxylic acids	3:3 Fluorotelomer carboxylic acid	3:3 FTCA	356-02-5
	5:3 Fluorotelomer carboxylic acid	5:3 FTCA	914637-49-3
	7:3 Fluorotelomer carboxylic acid	7:3 FTCA	812-70-4
Perfluorooctane sulfonamides	Perfluorooctane sulfonamide	PFOSA	754-91-6
	N-methylperfluorooctane sulfonamide	NMeFOSA	31506-32-8
	N-ethylperfluorooctane sulfonamide	NEtFOSA	4151-50-2
Perfluorooctane sulfonamidoacetic acids	N-methylperfluorooctane sulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethylperfluorooctane sulfonamidoacetic acid	N-EtFOSAA	2991-50-6
Perfluorooctane sulfonamide ethanols	N-methylperfluorooctane sulfonamidoethanol	MeFOSE	24448-09-7
	N-ethylperfluorooctane sulfonamidoethanol	EtFOSE	1691-99-2

Group	Chemical Name	Abbreviation	CAS Number
Ether sulfonic acids	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major)	9Cl-PF3ONS	756426-58-1
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	11Cl-PF3OUdS	763051-92-9
	Perfluoro(2-ethoxyethane) sulfonic acid	PFEESA	113507-82-7

Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

These guidelines are intended to be used for the validation of PFAS using EPA Method 1633 for projects within the Division of Environmental Remediation (DER). Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory's Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov.

Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 28 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6ºC upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

Initial Calibration

The initial calibration should contain a minimum of six standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects

Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results

Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample

Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects

Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).

Peak Integrations

Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

Appendix C

Field Activity Forms

Pace Analytical®

Phone: 612-607-6400
Fax: 612-607-6344

https://www.pacelabs.com/

Doc # 380 Rev 1_03242017

CHAIN OF CUSTODY RECORD (New York)

1800 Elm Street SE
Minneapolis, MN 55414

Page _____ of _____

Contact: https://www.pacelabs.com/contact-us/contact-environmental-sciences/

Company Name:	AECOM
Address:	1 John James Audubon Pky, STE 210, Amherst, NY 14228
Phone:	716-856-5636
Project Name:	NYSDEC Fortino Tire
Project Location:	Dump Rd. West Monroe, NY 13167
Project Number:	60629330
Project Manager:	Dino Zack (716) 866-8222
Pace Analytical Quote Name/Number	
Invoice Recipient:	
Sampled By:	

Requested Turnaround Time
7-Day ☐ 10-Day ☐
Due Date:

Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☐ EXCEL ☐
Other:
CLP Like Data Pkg Required: ☐
Email To:
Fax To #:

Pace Analytical Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1]Matrix Code	Conc Code	VOCs 8260 ASP DEC TCL	SVOCs 8270 ASP DEC TCL	1,4-Dioxane SIM	Cyanide, Total by SM4500 CN	TAL 23 Metals 6010 (+ Hg) Total	PCBs 8082	Pests 8081	PFAS 1633			

								2	2	2	1	1	2	2	2			
								H	I	I	X	N	I	I	I			
								V	A	A	P	P	A	A	P			

ANALYSIS REQUESTED

# of Containers
[2] Preservation Code
[3] Container Code

Dissolved Metals Samples
☐ Field Filtered
☐ Lab to Filter

Orthophosphate Samples
☐ Field Filtered
☐ Lab to Filter

Comments:
Call George Kisluk @ 716-923-1321/ 716-341-0800

Please use the following codes to indicate possible sample concentration within the **Conc Code** column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Program & Regulatory Information
☐ AWQ STDS ☐ NY TOGS
☐ NYC Sewer Discharge ☐ NY CP-51
☐ Part 360 GW (Landfill)
☐ NY Restricted Use
☐ NY Unrestricted Use
☐ NY Part 375
Other:

Deliverables
☐ Enhanced Data Package
☒ NYSDEC EQuIS EDD
☐ EQuIS (Standard) EDD
☐ NY Regulatory EDD
☐ NY Regs Hits-Only EDD
Other:
NELAC and AIHA-LAP, LLC Accredited

Project Entity
☐ Government ☐ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA

Other
☐ Chromatogram
☐ *AIHA-LAP,LLC*

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet

[1] Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] Container Codes:
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Pace Analytical®

Phone: 612-607-6400
Fax: 612-607-6344

https://www.pacelabs.com/

Doc # 380 Rev 1_03242017

CHAIN OF CUSTODY RECORD (New York)

1800 Elm Street SE
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Page _____ of _____

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Pace Analytical Quote Name/Number
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Sampled By:

Requested Turnaround Time
7-Day ☐ 10-Day ☐
Due Date:

Rush-Approval Required
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Data Delivery
Format: PDF ☐ EXCEL ☐
Other:
CLP Like Data Pkg Required: ☐
Email To:
Fax To #:

Pace Analytical Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1]Matrix Code	Conc Code	VOCs 8260 ASP DEC TCL	VOCs 8260 ASL DEC TCL	S-1,4-Dioxane SIM	Cyanide	TOC	PCBs, Pest, SVOC, TAL Metals + Hg	PFAS 1633				# of Containers	[2] Preservation Code	[3] Container Code
								2	1	1	1--→		1	1						
								B	M	I	I--→		I	I						
								V	V	A	A--→		G	P						
								ANALYSIS REQUESTED												

Dissolved Metals Samples
☐ Field Filtered
☐ Lab to Filter

Orthophosphate Samples
☐ Field Filtered
☐ Lab to Filter

[1] **Matrix Codes:**
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] **Container Codes:**
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Comments:
Call George Kisluk @ 716-923-1321/ 716-341-0800

Please use the following codes to indicate possible sample concentration within the **Conc Code** column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Program & Regulatory Information
☐ AWQ STDS ☐ NY TOGS
☐ NYC Sewer Discharge ☐ NY CP-51
☐ Part 360 GW (Landfill)
☐ NY Restricted Use
☐ NY Unrestricted Use
☐ NY Part 375
Other:

Deliverables
☐ Enhanced Data Package
☒ NYSDEC EQuIS EDD
☐ EQuIS (Standard) EDD
☐ NY Regulatory EDD
☐ NY Regs Hits-Only EDD
Other:
NELAC and AIHA-LAP, LLC Accredited

Project Entity
☐ Government ☐ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA

Other
☐ Chromatogram
☐ *AIHA-LAP,LLC*

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, 11th Floor
625 Broadway, Albany, New York 12233-7014
Phone: (518) 402-9662 **FAX:** (518) 402-9679
Website: www.dec.state.ny.us

DAILY FIELD REPORT

Site Code #: 738047	**Date:**	**Report #:**

Site Name: Fortino Tire Site
AECOM Project Number: 60629330
Location: West Monroe, NY
NYSDEC Project Manager: Stephanie Fitzgerald
AECOM Project Manager: Dino Zack, AECOM
Site Supervisor: Sean Connelly, AECOM
Site Phone: Sean Connelly, AECOM (cell 716-393-0870)

	AM	PM
Weather		
Temperature		
Wind Speed & Direction		

Description of work performed by AECOM this report period:

-
-

Health & Safety:

-
-

Air Monitoring:

-
-

Site Personnel & Visitors	Representing	Entered Exclusion Zone

Written by: **Date:**

AECOM	Client	NYSDEC	Boring ID:	SB-
	Project Number:	60629330		
	Site:	Fortino Tire Site #738047		
	Northing:	Easting:	Sheet: 1 of	
			Drilling Method:	Direct Push
			Ground Elev.:	

Project Manager:	Dino Zack	Logged By:		Date Started:		Depth of Boring:	
Drilling Co.:	Matrix	Driller:		Date Finished:		Water Level:	

Depth	Elevation	Sample ID	Recovery	Moisture	PID	USCS	Classification of Material
feet	feet		inches		ppm		
2							
4							
6							
8							
10							
12							
14							
16							
18							
20							

AECOM

SURFACE SOIL LOG

PROJECT: Fortino Tire Site				**BORING ID:**
CLIENT: NYSDEC		**JOB NUMBER:** 60629330		
DATE STARTED:			**AECOM GEOLOGIST:**	
DATE COMPLETED:			**Northing:**	
CONTRACTOR:	AECOM performed borings		**Easting:**	**Elevation:**
EQUIPMENT:	Manual stainless steel trowel, spade shovel, and hand auger			
LOCATION:	West Monroe, New York;			
PURPOSE:	Delineate limits of potential site-related impacts in surfae soil.			

DEPTH (inches)	VERTICAL PROFILE DESCRIPTION
1	
2	
3	
4	
5	
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7	
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24	

AECOM

SEDIMENT LOG

PROJECT: Fortino Tire Site				**BORING ID:**
CLIENT: NYSDEC		**JOB NUMBER:** 60629330		
DATE STARTED:			**AECOM GEOLOGIST:**	
DATE COMPLETED:			**Northing:**	
CONTRACTOR:	AECOM performed borings		**Easting:**	**Elevation:**
EQUIPMENT:	Manual stainless steel sediment scoop and hand auger			
LOCATION:	West Monroe, New York;			
PURPOSE:	Delineate limits of potential site-related impacts in sediment.			

DEPTH (inches)	VERTICAL PROFILE DESCRIPTION
1	
2	
3	
4	
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21	
22	
23	
24	

Americas

Instrument Calibration Log

S3AM-127-FM10

Instrument Information	
Instrument Name:	Manufacturer:
Serial Number:	Last Service Date:
Parameter(s):	Calibration Gas:
Calibration Procedure:	

Daily Calibration Results	
Date:	Calibration Result:
Name:	Signature:
Notes:	
Date:	Calibration Result:
Name:	Signature:
Notes:	
Date:	Calibration Result:
Name:	Signature:
Notes:	
Date:	Calibration Result:
Name:	Signature:
Notes:	

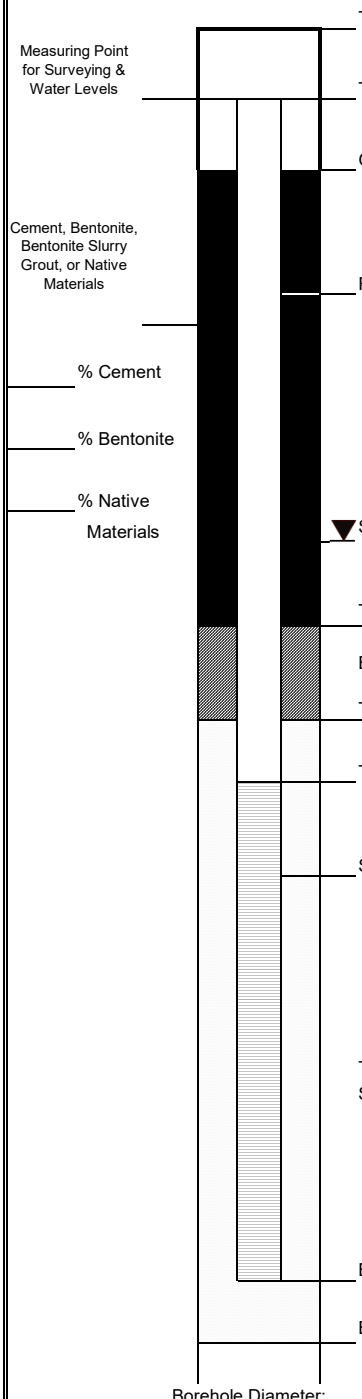
Project: Job No.:

Date: Operator:

Instrument: Calibration:

AECOM	*Client:* NYSDEC	**Well ID:**
	Project Number: 60629330	
	Site Location: West Monroe, NY NYSDEC Site# 738047	Date Installed:
	Well Location: Fortino Tire Site Coords:	Geologist:
	Method: Hollow Stem Augers	Contractor: Matrix

WELL CONSTRUCTION DETAIL



	Depth from Ground Surface (feet)	Elevation(feet) Datum: Existing Site
Top of Steel Casing		
Top of Riser Pipe		
Ground Surface		
Riser Pipe:		
Length		
Inside Diameter (ID)		
Type of Material		
Stabilized Water Level		
Top of Bentonite Seal		
Bentonite Seal Thickness		
Top of Filter Sand		
Top of Screen		
Screen:		
Length		
Inside Diameter (ID)		
Slot Size		
Type of Material		
Type/Size of Sand		
Sand Pack Thickness		
Bottom of Screen:		
Bottom of Borehole		

Borehole Diameter: _____ Approved: _____

Signature _____ Date _____

Describe Measuring Point:

Top of riser pipe

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: Fortino Tire SRI WELL NO.: _____

PROJECT NO.: 60629330

STAFF: _____

DATE(S): _____

			WELL ID.	)L. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=		1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=		2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=		3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=		4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=		5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)											
Time												
PARAMETERS	Initial	5	10	15	20	25	30	35	40	45	50	55
pH												
Spec. Cond												
Appearance												
Temperature (F)												
Turbidity (NTU)												
ORP (mV)												
DO (mg/L)												

COMMENTS:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Fortino Tire SRI - 60629330 Site: Fortino Tire Well I.D.: _____

Date: _____ Sampling Personnel: _____ Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: _____ Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: - Depth to Well Bottom: _____ Well Diameter: _____ Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (gallons): - Estimated Purge Volume (gallons): _____

Sample ID: _____ Sample Time: _____ QA/QC: -

Sample Parameters: _____

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUME-- 2 inch diameter well = 617 ml/ft

Remarks:

DRUM LOG

AECOM

SITE NAME: _____ PROJECT NUMBER: _____

SITE ADDRESS: _____

_____ CLIENT: _____

_____ _____

DRUM ID NUMBER	DATE STARTED/ CLOSED	BORING / WELL LOCATION	MATRIX	CONTENTS / COMMENTS	SOLID WASTE (Y/N)	RCRA WASTE (Y/N)
1						
2						
3						
4						
5						

_____ _____

ONSITE REPRESENTATIVE (PRINT) (SIGN)