
SITE CHARACTERIZATION WORK PLAN

HOFF BROTHERS SITE (SITE NO. 859002)

TOWN OF WALWORTH, WAYNE COUNTY, NEW YORK

Prepared For:



**Department of
Environmental
Conservation**

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I Douglas M. Crawford, certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Site Characterization Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER *Technical Guidance for Site Investigation and Remediation* (DER-10).



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1. BACKGROUND AND PROJECT OBJECTIVES

1.1 Site Setting

The Hoff Brothers Site (the Site) is located at 576 Plank Road in a rural/agricultural area in the Town of Walworth, Wayne County, New York. The nearest water bodies are Mill Creek, which is about 500 feet east of the Site, and an unnamed tributary to Fourmile Creek which is about 500 feet west of the Site. The Site, including a former drum disposal area and associated tax parcel, is approximately 30 acres. The former drum disposal area is approximately 7 acres in the southwest portion of the property.

The Site is heavily wooded. Site topography is generally flat-lying with a gentle slope to the west. A dirt access road runs south from Plank Road into the Site. A small pond is located approximately 650 feet south of Plank Road and north of the purported drum disposal area. This pond was purportedly a small gravel pit that has filled with groundwater. The former drum disposal area includes a previously cleared area located just south of the present-day small pond. Previously, this clearing was the location of a second pond that commonly had low water levels and periodically dried up in summer months and has since been backfilled. Both ponds are locations of small, abandoned gravel pits.

1.2 Background

In the 1960's the Site was used for disposal of 10 to 15 drums containing phenolic and solvent wastes. The drums were purportedly placed on the ground surface within a shallow abandoned gravel pit. The drums were removed sometime in 1967.

Shortly after the disposal, area residents noted that their drinking water developed a bad taste and odor. These problems were brought to the attention of the New York State Department of Health (NYSDOH) in Geneva, New York. The NYSDOH sampled private wells in the area and recommended that they be closed. Arrangements were made to bring public water to the affected residents. The NYSDOH sampled the only remaining private drinking water well in the area in 1986 and 1987. Analysis revealed that the water was still contaminated by volatile organic compounds (VOCs), namely trichloroethylene (TCE), tetrachloroethylene (PCE), 1,1-dichloroethene (1,1-DCE) and 1,2-dichloroethene (1,2-DCE). The DOH recommended that the homeowner not use the well for drinking, and instead hook up with the Town of Walworth water system which was available to them.

A Phase I Investigation was completed in December of 1988. It recommended further investigation. The NYSDOH resampled three residential wells for VOCs in May of 1993, but the analysis did not reveal significant levels.

A Site Characterization (SC) begun in 1991 was terminated prior to completion.

Groundwater contamination had been documented in a homeowner's drinking water well on Plank Rd. However, resampling in 1991, 1993, 1995, and 1997 showed that previously detected contaminant levels were below New York State Department of Environmental Conservation (NYSDEC) drinking water standards. The NYSDOH has reported that of the residences sampled, the property closest to the site continues to use their well. Public water is available in this area.

1.2.1 Site Geologic and Hydrogeologic Conditions

Regional mapping indicates that the bedrock comprises sedimentary rocks of Lower to Upper Silurian age which dip to the south at approximately 40 feet per mile. Bedrock is not exposed at the Site but is mapped as the Lockport Group, which is a massive, highly resistant dolomite interbedded with thin layers of dark gray shale. Subsurface information for several wells in the area indicate that depth to bedrock ranges from 5 to 65 feet below grade. Bedrock occurs at shallow depths in wells nearer the Site.

Generally, bedrock in the area is overlain by a thin layer of unconsolidated sediment of glacial origin. Surficial geologic mapping indicates that these deposits are largely glacial till which is typically variable in texture and composed of poorly-sorted sediments deposited beneath glacial ice.

Bedrock is a source of groundwater in the area and wells in the area are installed within the Clinton and Lockport Groups. Groundwater in bedrock occurs in fractures, joints, and along bedding planes. Bedrock groundwater levels in wells in the vicinity of the Site are approximately 20 feet below grade, with yields ranging from 0.5 to 20 gallons per minute (gallons per minute) and averaging approximately 9 gpm.

The water table generally follows the topography and groundwater flow in the overburden is presumed to flow generally in a north-westerly direction. Regional groundwater flow in the overburden is presumed to be northerly toward Lake Ontario.

1.2.2 Project Objectives

The primary project objective is to implement a SC to evaluate if the site poses a significant threat to public health or the environment due to historic disposal on a portion of the Site. The SC will evaluate the presence of VOCs, semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), 1,4-dioxane, per- and polyfluoroalkyl substances (PFAS), metals, cyanide, and mercury in the vicinity of the disposal area on the Site. The SC will evaluate the presence of these constituents in soil and groundwater. The SC will also evaluate on-Site geologic and hydrogeologic conditions.

2. SITE CHARACTERIZATION

2.1 General

The SC will be conducted in accordance with this *Site Characterization Work Plan* and applicable NYSDEC guidelines outlined in *DER-10/Technical Guidance for Site Investigation and Remediation* (DER-10, 2010).

The following field activities will be conducted as part of the SC:

- An electromagnetic (EM) survey across the purported drum disposal area
- Direct-push soil borings and discrete groundwater sample collection
- Installation of permanent groundwater monitoring wells (overburden and bedrock)
- Survey of site features and sample locations

An iterative approach will be used during implementation of the SC. Initially, an EM survey will be conducted to evaluate if 55-gallon drums may be buried within the former drum disposal area. Results of the EM survey will be used to locate soil borings and discrete groundwater sampling locations. Results from the subsurface soil and/or discrete groundwater samples will be used to locate overburden monitoring wells and a bedrock monitoring well.

Consistent with DER-10, it is assumed that a Fish and Wildlife Resource Impact Analysis (FWRIA) and/or a Qualitative Human Health Exposure Assessment (QHHEA) will not be required as part of the SC.

2.1.1 Electromagnetic Survey

A multiple frequency electromagnetic induction survey will be performed over the former drum disposal area to screen for potential electromagnetic anomalies associated with buried metallic objects such as steel drums. A Geophysical Survey Systems, Inc. (GSSI) Profiler™ EMP-400 will be used to survey variations in the bulk subsurface conductivity at multiple frequencies over the proposed survey area. The Profiler™ EMP-400 is a fixed coil, variable frequency, electromagnetic induction system. The survey will be performed at up to six frequencies ranging from 2,000 to 15,000 hertz (Hz). The Profiler™ EMP-400 will be used in-line with each survey transect and operated in continuous data collection mode allowing the In-Phase and Quadrature components of the induced secondary electromagnetic field and the apparent bulk conductivity to be recorded at a defined time interval. Each transect will be spaced approximately 5 feet apart. After completing the survey transects across the survey area, the survey will be repeated perpendicular to the initial survey transects as the orientation of the potential buried metallic objects are unknown.

The horizontal geographic location of each conductivity reading will be concurrently logged using an integrated global positioning system (GPS) accurate to less than 1 meter. Each horizontal geographic location will be collected in New York Central State Plane feet relative to the North American Datum of 1983 (NAD83). Observations of the surficial geology and surficial debris will be noted during the survey. The spatial position of debris that could potentially interfere with the electromagnetic survey will be marked and recorded using a GPS accurate to less than 1 meter. The resulting conductivity data set will be gridded and plotted spatially relative to an aerial photo of the Site. The plotted conductivity data set and field observations will be interpreted to assess potential anomalies that could be associated with locations of buried metallic objects.

2.1.2 Utility Clearance

Dig Safely New York (DSNY) will be contacted by the drilling subcontractor prior to invasive work to locate utilities at the Site prior to initiating the field program. It should be noted that DSNY will only coordinate location of utilities for those companies subscribing to the service. Furthermore, the utilities will only identify the locations of subsurface lines on public property and rights-of-way.

2.1.3 Soil Borings and Discrete Groundwater Sampling

Soil borings

Three direct-push soil borings will be advanced to the top of bedrock or refusal, whichever occurs first. Top of bedrock is assumed at 20-feet below grade. Continuous soil samples will be collected from each soil boring using a Macro-Core® sampler (or similar). Upon retrieval, each soil sample will be described for: 1) percent recovery; 2) soil type; 3) color; 4) moisture content; 5) texture; 6) grain size and shape; 7) consistency; 8) evidence of staining or other chemically-related impacts; and 9) any other relevant observations. In addition, soil will be screened with a photoionization detector (PID) to allow evaluation of the bulk volatile organic concentration of each soil sample. This descriptive information will be recorded on a soil boring log form.

Up to three soil samples (one per soil boring location) will be collected for analysis based on the field observations during drilling. The samples will be biased to samples exhibiting odors, staining or elevated PID readings. In the event that no observations are noted, the samples will be collected from a depth that is just above the water table.

Each soil sample will be analyzed for Target Compound List (TCL) VOCs and TCL SVOCs. Two soil samples will be analyzed for PCBs, Target Analyte List (TAL) metals, cyanide, 1,4-dioxane, and per- and polyfluoroalkyl substances (PFAS). **Table 1** provides a summary of analytical parameters and associated methods, number of samples and associated quality assurance/quality control (QA/QC) samples.

Discrete groundwater sampling

A Geoprobe® Screen Point 22 Groundwater Sampler using the DT22 Sampling System (or equivalent) will be advanced at ten locations within or proximal to the disposal area. Two discrete groundwater samples will be collected per location from approximate depths of 10-feet and 20-feet below grade. However, the number of discrete groundwater samples may be modified based on the depth to bedrock or refusal. For example, if bedrock or refusal is encountered at 10 feet below grade or shallower, then one groundwater sample will be collected. Alternately, if bedrock or refusal is encountered at depths greater than 20 feet below grade, collection of additional groundwater samples may be appropriate. Depth to bedrock /refusal information obtained during the soil boring advancements will be communicated to the NYSDEC PM to confirm/agree upon discrete groundwater sample intervals and to document changes to this scope of work.

At each discrete depth interval, groundwater samples will be collected using dedicated, disposable, PFAS-free bailers, or a peristaltic pump and PFAS-free well and pump head tubing. The groundwater samples will be analyzed for TCL VOCs and SVOCs.

2.1.4 Permanent Groundwater Monitoring Well Installations

Three permanent overburden groundwater monitoring wells will be installed using direct-push methods, one upgradient of the purported area and two downgradient, each to an assumed depth of 20-feet below grade. Each overburden groundwater monitoring well will be constructed with a 5-foot length of Schedule 40, 1-inch inside diameter, 0.010-inch slot Geoprobe® pre-packed well screen flush-threaded to Schedule 40, 1-inch inside diameter PVC riser of sufficient length to bring the top of the well to approximately 3-feet above ground surface. The overburden groundwater monitoring wells will be constructed through direct-push drill rods, the rods will be retracted to expose the well screen, and additional sand (compatible for use with a 0.010-inch slot screen) will be emplaced within the annular space between the well and the borehole wall to 3-feet above the top of the screen. The remaining annular space between the riser casing and borehole will be filled with cement/bentonite grout as the rods are removed. Each overburden monitoring well will be fitted with 4-inch diameter, lockable, protective casings centered in a 2-ft diameter concrete well pad that is sloped away from the well. Following installation, each overburden monitoring well will be developed to remove fine grained materials that may have settled into the well during installation. Due to the small diameter of the wells, development will be completed using dedicated, disposable, PFAS-free bailers, or a peristaltic pump and PFAS-free well and pump head tubing. A minimum of five well volumes will be removed.

One permanent bedrock groundwater monitoring well will be installed to an assumed depth of 80-feet below grade. Initially, 6.25-inch hollow stem augers will be advanced to the top of bedrock, assumed at 20 feet below grade. Subsurface soil samples will be collected continuously for descriptive purposes and to confirm the depth to bedrock. Once bedrock is confirmed, a nominal 6-inch diameter socket will be advanced 3-ft into bedrock. A 4-inch diameter steel casing will be installed and grouted in-place while removing the auger string. The grout will be allowed to cure for a minimum of 24-hours prior to further advancement of the bedrock borehole. After the grout cures, the borehole will be advanced using HQ coring methods to an assumed terminal depth of 80-ft below grade.

Subsequent to completion of coring, the core hole will be developed by surging and purging using either a bailer or pump, as appropriate, to remove fine-grained material and to provide hydraulic communication with the surrounding formation. Development will be considered complete after pH, temperature, and specific conductivity stabilize, and turbidity is less than 50 NTUs after removal of two core hole groundwater volumes, or until a total of five core hole groundwater volumes have been removed. After development of the core hole, a 2-inch diameter Schedule 40 PVC monitoring well will be installed within the bedrock core hole. The PVC well will be constructed using a 10-ft length of 0.010-inch slot screen flush-threaded to PVC riser casing of lengths necessary to complete the well head as directed by the on-site geologist. A sand pack compatible for use with a 0.010-inch slot screen will be installed within the annular space between the screen and core hole wall extending to 2-feet above the top of the screen. A 3-foot bentonite seal will be installed on top of the sand pack and hydrated with potable water if necessary. The remaining annular space above the bentonite seal will be filled with cement/bentonite grout through a tremie pipe to the ground surface. The 4-inch diameter steel casing will be fitted with a lockable well cover.

2.1.5 Air Monitoring

Consistent with the Community Air Monitoring Plan (CAMP) provided in Appendix 1A of NYSDEC's DER-10, air monitoring will be conducted during advancement of soil borings and monitoring wells. Accordingly, one upwind and one downwind station equipped with PID and particulate monitoring equipment will be housed in enclosures and mounted on tripods. The specific locations of the equipment will be based on wind direction and the location of the potential exposure populations at the time the field activities are completed.

2.1.6 Groundwater Sampling

One set of groundwater samples will be collected from the overburden monitoring wells and the bedrock monitoring well. Prior to the collection of groundwater samples, groundwater levels will be measured to the nearest 0.01 foot from the top of the well head using an electronic water level probe. The water level measurements will be recorded from a reference point to be marked on each well casing.

Groundwater samples from the overburden monitoring wells will be collected using low-flow methods using a peristaltic pump and PFAS-free well and pump head tubing. Groundwater samples from the bedrock monitoring well will be collected using low-flow methods using a bladder pump. The wells will be purged at flow rate not to exceed 500 milliliters per minute (ml/min) and water quality parameters will be monitored. The samples will be collected once the water quality measurements have stabilized as follows:

- Temperature \pm 3% of measurement
- pH \pm 0.1 pH units
- Specific conductance \pm 3% of measurement
- Redox \pm 10 mV
- DO \pm 10% of measurement
- Turbidity \pm 10% of measurement

If a stable water level cannot be maintained within a well at a yield of at least 100 ml/min, the well will be dewatered to the intake of the pump and the groundwater level in the well will be allowed to recover and the groundwater sample will be collected.

Each overburden monitoring well will be sampled for TCL VOCs and SVOCs. One overburden monitoring well will also be sampled for PCBs, TAL metals, cyanide, 1,4-dioxane, and PFAS. The bedrock monitoring well will be sampled for TCL VOCs, TCL SVOCs, PCBs, TAL metals, cyanide, 1,4-dioxane, and PFAS. Samples for PFAS analysis will be collected consistent with *Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances* (NYSDEC, June 2020). PFAS samples will be collected before any other sample(s) at each location. Samples will be collected while wearing appropriate personal protective equipment (PPE).

2.2 Sample Analysis and Validation

Table 1 provides a summary of the environmental media to be sampled, analytical parameters and associated methods, number of samples and associated QA/QC samples.

The environmental samples will be shipped to a NYSDOH Environmental Laboratory Accreditation Program (ELAP) laboratory designated by NYSDEC for this project. The laboratory will provide an analytical data package that is consistent with the requirements of NYS ASP Category B. In

addition, the laboratory will submit analytical data as an Electronic Data Deliverable (EDD) in the NYSDEC format.

Laboratory generated analytical data, except for waste characterization sample results, will be validated and a data usability summary report (DUSR) conforming to Appendix 2B of DER-10 will be prepared.

2.3 Decontamination

Decontamination will take place on-site. Water generated will need to be contained for off-site disposal. A temporary decontamination pad will be used for decontamination of augers and drill rods by use of steam cleaner. Decontamination (other than augers and drill rods) will be completed using non-phosphate detergent (*e.g.* Alconox[®], Liquinox[®], Simple Green[®]) bucket wash and potable water rinse.

2.4 Survey

A location and elevation survey will be completed following completion of the field activities. The survey activities will be performed by a New York State-licensed surveyor and will include horizontal location and grade elevation at soil borings, and horizontal location and vertical elevation of new monitoring wells (grade and top of PVC). Horizontal datum will be referenced to North American Datum (NAD) 83 (2007) New York State Plane Eastern Zone and vertical datum to North American Vertical Datum (NAVD) 88. Elevation will be surveyed to 0.01-foot accuracy.

2.5 Management of Investigation-Derived Wastes

Investigation-derived waste (*i.e.*, soil cuttings, bedrock cores, development water, purge water from groundwater sampling, and decontamination water) will be contained in new D.O.T.-compliant 55-gallon drums. The drums will be staged on wooden pallets in an IDW consolidation area on the Site to be located in an area to allow ease of access for future removal from the Site.

Materials will be segregated by media for characterization and disposal. The soil and water will be transported to a regulated facility for disposal based on the waste characterization results. The PPE and other material used will be disposed as solid waste.

A representative water and soil sample will be collected from the drummed IDW for disposal characterization analysis. The sample will be delivered to the laboratory for analysis. The laboratory will provide a level 1 data-only report for use in developing the waste profile.

3. SITE CHARACTERIZATION REPORT

A Site Characterization Report (SCR) will be prepared following receipt of the analytical results and the DUSR. This report will discuss the investigation activities and the results. Conclusions based on this data will be provided and may include the following components based on the information generated:

Site Description: This will include a discussion of current use of the site and a summary of pertinent background information if available.

Site investigation Summary: This section will describe the activities completed as part of the SC and include any deviations or modifications to the work scope defined in Schedule 1 (this document).

Site Geology and Hydrogeology: A brief description of the subsurface soil, depth to groundwater, and overburden groundwater flow direction will be provided.

Nature of Contamination: This section will include a discussion of the presence of constituents detected and those that are detected at concentrations above regulatory criteria. The latter will be identified as constituents of potential concern (COPC). Detected constituents in soil samples will be compared to 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs) and to Protection of Groundwater for constituents detected in groundwater. The detected constituents in groundwater will be compared to Class GA water quality standards and guidance values as compiled in Technical and Operational Guidance Series 1.1.1 (NYSDEC, 1998) and associated addenda.

The following data presentations will be included as appropriate based on the results:

- Data tables for detected constituents compared to criteria as applicable for soil, and groundwater.
- Figure showing constituents detected above groundwater criteria.
- Figure showing constituents detected in soil above SCOs.
- Attachments will include logs of soil borings and monitoring wells and groundwater sampling logs.

EDDs of the analytical data will be provided separately.

Summary and conclusions: This section will present a summary of the COPCs identified and their respective concentrations. Data gaps will be presented if identified.

4. SCHEDULE

Field activities are anticipated to be initiated during September 2021 and completed during December 2021. The following provides an estimated schedule assuming no significant delays due to uncontrollable circumstances:

<u>TASK</u>	<u>Schedule</u>
Field Activities	September – December 2021
Data Analysis and Validation	4 weeks following receipt of data
Draft Site Characterization Report	4 weeks following receipt of the DUSR
Final Site Characterization Report	3 weeks following receipt of NYSDEC Comments

Table 1
Sample Analysis and QA/QC Summary
Hoff Brothers Site
Town of Walworth, Wayne County, NY

Task	Matrix	Analyses	Method	Number of Samples	Trip Blank	Equipment Blank	Field Duplicate	MS	MSD	Field Reagent Blank	Estimated Total Number of Samples	Deliverable	Validated (Y/N)
Subsurface Soil	Soil	TCL Volatiles + 10	USEPA Method 8260	3	2	1	1	1	1	0	9	Category B	Y
		TCL Semivolatiles + 20	USEPA Method 8270	3	0	1	1	1	1	0	7		
		TCL PCBs	USEPA Method 8082	2	0	1	1	1	1	0	6		
		TAL Inorganics	USEPA Method 6010	2	0	1	1	1	1	0	6		
		Cyanide	USEPA Method 9010	2	0	1	1	1	1	0	6		
		Mercury	USEPA Method 7471	2	0	1	1	1	1	0	6		
		1,4 Dioxane	USEPA Method 8270 SIM	2	0	1	1	1	1	0	6		
		PFAS	USEPA Method 537.1	2	0	1	1	1	1	1	7		
Groundwater Samples	Water	TCL Volatiles + 10	USEPA Method 8260	24	5	0	1	1	1	0	32	Category B	Y
		TCL Semivolatiles + 20	USEPA Method 8270	24	0	0	1	1	1	0	27		
		TCL PCBs	USEPA Method 8082	4	0	0	1	1	1	0	7		
		TAL Inorganics	USEPA Method 6010	4	0	0	1	1	1	0	7		
		Cyanide	USEPA Method 9010	4	0	0	1	1	1	0	7		
		Mercury	USEPA Method 7471	4	0	0	1	1	1	0	7		
		1,4 Dioxane	USEPA Method 8270 SIM	4	0	0	1	1	1	0	7		
		PFAS	USEPA Method 537.1	4	0	0	1	1	1	1	8		
Waste Characterization Sampling	Soil	TCLP Method 1311									0	Category A	N
		TCLP Volatiles	USEPA Method 8260	1	0	0	0	0	0	0	1		
		TCLP Semivolatiles	USEPA Method 8270	1	0	0	0	0	0	0	1		
		TCLP Pesticides	USEPA Method 8080	1	0	0	0	0	0	0	1		
		TCLP Chlorinated Herbicides	USEPA Method 8150	1	0	0	0	0	0	0	1		
		TCLP Metals	USEPA Method 6010C/9014	1	0	0	0	0	0	0	1		
		TCL PCBs	USEPA Method 8082	1	0	0	0	0	0	0	1		
		Corrosivity	USEPA Method 1110	1	0	0	0	0	0	0	1		
		Ignitability	USEPA Method 1030	1	0	0	0	0	0	0	1		
	Reactivity	USEPA Method 9010/9030	1	0	0	0	0	0	0	1			
	Water	TCL Volatiles	USEPA Method 8260	1	0	0	0	0	0	0	1	Category A	N
		TCL Semivolatiles	USEPA Method 8270	1	0	0	0	0	0	0	1		
		TCL Pesticides	USEPA Method 8081	1	0	0	0	0	0	0	1		
		TCL PCBs	USEPA Method 8082	1	0	0	0	0	0	0	1		
		TCL Chlorinated Herbicides	USEPA Method 8150	1	0	0	0	0	0	0	1		
Corrosivity		USEPA Method 1110	1	0	0	0	0	0	0	1			
Ignitability	USEPA Method 1030	1	0	0	0	0	0	0	1				
Reactivity	USEPA Method 9010/9030	1	0	0	0	0	0	0	1				

Notes:
- SIM = Selective Ion Monitoring