Geosyntec consultants

130 Stone Road West
Guelph, Ontario N1G 3Z2
PH 519.822.2230
FAX 888.635.3470
www.geosyntec.com

Memorandum

Date:	13 Mach 2020
To:	Matthew J. Ohl, USEPA
Copies to:	Norman W. Bernstein – N.W. Bernstein & Associates, LLC Peter M. Racher – Plews Shadley Racher & Braun LLP
From:	Suzanne O'Hara and Chris Gale, Geosyntec Consultants, Andrew Gremos Ramboll
Subject:	Addendum to the Dense Non-Aqueous Phase Liquid (DNAPL) Containment Area Sampling Work Plan

---

On behalf of the Trustee of the Third Site Trust Fund, Geosyntec Consultants (Geosyntec) with the assistance of Ramboll have prepared this addendum to the Dense Non-Aqueous Phase Liquid (DNAPL) Containment Area Sampling Work Plan (Work Plan) for the Third Site (or Site) located at 985 S. US Highway 421 in Zionsville, Indiana. This addendum provides information on collecting groundwater samples from the soil core boreholes from below 40 feet below. ground surface (ft bgs). In addition, we have provided clarification on the procedures for screening the boreholes for the presence of DNAPL and the plan should DNAPL be encountered in a borehole.

PURPOSE

The purpose of the proposed work is to further evaluate the distribution of contaminants within the Upper Till, the Upper Sand and Gravel Unit and the top portion of the Lower Till in the DNAPL containment area following the electrical resistance heating (ERH) treatment work conducted by McMillan McGee (MM). The data to be collected will aid in determining the failure mechanisms of the ERH treatment (groundwater concentrations exceed performance metrics in compliance monitoring wells P-1 and P-2). Results from the proposed investigations presented in the Work Plan and herein will inform recommendations for potential future remedial actions. This addendum provides procedures:

- for attempting to collect groundwater samples from 40 to 46 ft bgs; and,
- for screening the soil cores collected from ground surface to a depth of 46 ft bgs and what will be done if DNAPL is encountered.

SCOPE OF WORK

The investigation activities presented in the Work Plan include water level gauging and sampling of existing ERH extraction and performance monitoring wells (Geosyntec, DNAPL Containment Area Sampling Work Plan, February 10, 2020), followed by adaptive field investigation activities using a direct push technology (DPT) drill rig or mini sonic drill rig to collect soil cores for laboratory analysis of VOCs.

Soil cores are more likely to provide a depth discrete profile of contaminant concentrations through the target treatment depth than depth discrete groundwater samples due to the low permeability of the Upper and Lower Tills. Continuous core soil samples will be collected to a depth of 46 ft bgs using either DPT or sonic drilling technologies from at least eight (8) borings locations and up to as many as 14 boring locations. The results of the grab groundwater samples will be used to evaluate potential additional locations for discrete soil sampling.

Continuous core soil samples will be collected from ground surface to a target depth of approximately 46 feet below ground surface (ft bgs). If the DPT rig cannot achieve the target depth of 46 ft bgs, a compact sonic drill rig may be mobilized to achieve the target depth. Soil cores will be screened in the field with a photoionization detector (PID) for the presence of VOCs. One soil sample will be collected from each 5-ft soil core from the portion of the core with the greatest PID response and retained for laboratory analysis. Soil samples will be collected into laboratory provided clean 8 oz glass jars, sealed, placed in sealed plastic bags, and stored on ice for transport to the analytical laboratory under chain of custody procedures. Soil samples will be submitted for analysis of VOCs by EPA method 8260B.

If soil cores from any boring and from any depth exhibit elevated PID readings (> 500 ppm) or there are any visual observation of DNAPL in the soil (oily phase on gloves or core liners, separate phase observed in soil pore spaces) the borehole will be terminated at the depth at which DNAPL is observed and the borehole filled with hydrated bentonite or grout to surface.

Both coring methods proposed, dual tube DPT or mini sonic rig, advance an outer casing that remains downhole while the core is retrieved from the casing. Therefore, the base of the borehole remains isolated from the upper, previously cored, depth intervals. It is proposed that once the final core is collected from a depth of 46 ft bgs, the outer casing of the drill rig will be retracted to approximately 40 ft bgs to expose the bottom 6 ft of the borehole to facilitate collection of groundwater samples from within the upper portion of the Lower Till. An attempt will be made at that time to collect a groundwater sample from 40-46 ft bgs using either a temporary well screen lowered through the casing or a groundwater grab sampler such as a Geoprobe SP22 sampler. The

depths to which the outer casing is retracted may be adjusted based on field observations (i.e., to just above the depth of any potentially higher permeability layers within the upper portions of the Lower Till). A water level tape will be used to determine if there is groundwater entering the borehole and the boring will be allowed to sit for up to three hours to see if there is sufficient water to collect a sample. If there is insufficient groundwater in the boring after three hours the borehole will be abandoned by filling it with hydrated bentonite or grout. If there is sufficient groundwater, a sample will be collected for analysis of VOCs by EPA method 8260B. Sample handling and laboratory analysis will be performed in accordance with the procedures and limits presented in the Site Quality Assurance Project Plan (ENVIRON 2013). The borehole will be abandoned after collection of a groundwater grab sample by back filling the borehole with hydrated bentonite or grout.

REFERENCES

Environ 2013. QAPP Addendum = *Quality Assurance Project Plan Addendum, Third Site, Zionsville, Indiana*. Submitted to: USEPA, Region 5. On behalf of: Third Site Trustees. Prepared by: ENVIRON. Dated February 2013.

* * * * *