U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION II
Emergency and Remedial Response Division
Program Support Branch/Technical Support Section
290 Broadway, 18th Floor
New York, New York 10007-1866
212 -637-3666

MEMORANDUM

TO: Sharon Trocher, RPM

FROM: Robert M. Alvey, P.G.

DATE: July 25, 2013

RE: Vestal Site, Horizontal Drilling

On July 16 I observed the drilling at the Vestal site contracted through ERT/SERAS. Dave Aloysius (Lockheed Martin), Ray Ledbetter (ERT) and Dr. Terrence Johnson (ERT) were also at the site in addition to Sandra Richards conducting the actual soils sample collection. The drilling contractor is Directional Technologies, Inc., 77 North Plains Industrial Road, Wallingford, CT (203)294-9200 which specializes in horizontal directional drilling.

The Vestal public supply well had been impacted by releases from a nearby industrial park in the vicinity of on Stage Road in the 1980's. Vestal Well 1-1A is used solely as an extraction and treatment system associated with the plume of VOCs. A comprehensive review of monitoring results and incorporation of a groundwater model identified the possibility of a dnapl source underneath the foundation of one of the buildings at the current Stage Road Industrial Park.

Access into the building to drill vertically underneath the foundation was not practical. The current facility operator was not involved with any of the discharges, and their operations would be significantly halted in order to obtain access and clear the building. Use of horizontal drilling to collect samples from discrete locations and depths under the foundation was recognized as a potential overall cost savings means to address the uncertainty regarding dnapl in soils under the facility.

The rig used by Directional Technologies for this assignment was reportedly one of their smallest rigs, manufactured by Ditch Witch in Oklahoma. A three- person crew was at the site. The operator sits at the rig and operates the rig via controls to adjust pressure and angle of the drilling as well as automatically adding and subtracting drillpipe. The area was well marked out and a unit was used to mark the exact location and depth of the guide head at the end of the pipe. The overall diameter of the drill hole for this investigation was about 2". Some drillers mud and water was used for each hole, but the operation was surprisingly "clean" and quiet. There was no observable indication of noise at levels of concern.

Dave Aloysius, the field geologist for EPA, provided a figure showing the initial planned directional drilling along three (3) primary lines perpendicular to the building (refer to Figure 1). His summary of the drilling is below.

Line 1 (or HB1) was located 10 feet west of the building corner; Line 2 (or HB2) was located 40 west of the building corner. Line 3 (or HB3) was originally planned to be placed approximately 70 feet west of the building corner. The position was changed because contamination was not obvious or apparent in samples collected along the HB2 line (based on visual observations, no odors, and field monitoring instrumentation). Thus, HB3 was moved to approximately 23 west of the building corner to narrow in on any contamination that could be present at depth. Note: HB stands for 'horizontal boring'.

Three (3) depths were investigated along each line that crossed beneath the building (resulting in nine individual horizontal boreholes). Shallows depths ranged from approximately 10 to 11 feet below grade; the intermediate depth remained fairly constant among all three lines at 16 feet below grade; lowest depths ranged from approximately 21 to 25 feet below grade.

The pre-selected depths of the horizontal borings were reached with acceptable accuracy. After drilling the HB1 borings, which were drilled first, a more detailed understanding of the fill and soil formation sequences beneath the building was obtained. Coarse gravel was encountered at 24-25 feet which reduced the amount of material for lab analyses. This formation was less inclined to hold potential residual dnapl so a decision was made to slightly reduce the depth on the lowest borings to encounter the finer silt and clay material overlying the gravel. The driller had no difficulty recalculating the angle and depth of the drill head.

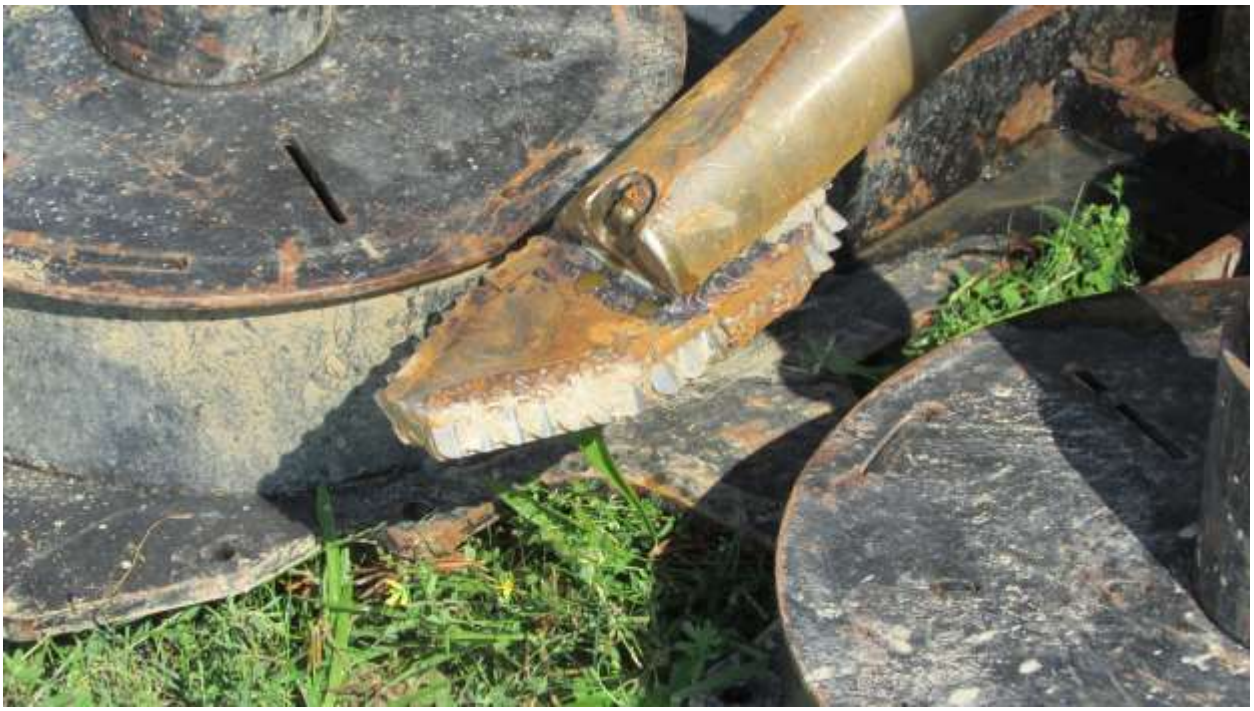
Two (2) discrete subsurface soil samples were collected from each borehole beneath the building: one sample was collected near the north building wall/foundation (five to 10 feet inward) and the other sample was collected further inward, approximately 25 to 43 feet south of the north wall (i.e., depending on drilling conditions and observations/monitoring of the first sample). Thus, a total of 18 primary samples were collected during the investigation.

Samples will be analyzed for Target Compound List (TCL) VOCs, SVOCs, and PCBs. For all zones where samples were retrieved, there was always adequate volume for the three analyses. In many cases, there was enough volume for duplicate and MS/MSD samples. In only two instances, samples were not retrieved due to problematic subsurface conditions (either coarse gravels or very soft, fluidized deposits).

Work was completed on schedule (actually, a little ahead of schedule). The subcontractor personnel from DTI were very professional and nice to work with. It is noted that this rig is one of their smallest, yet was able to push the corehead cutting through a small cobble without damaging the instrument. Overall, both of us were pleased with the horizontal drilling investigative technique.

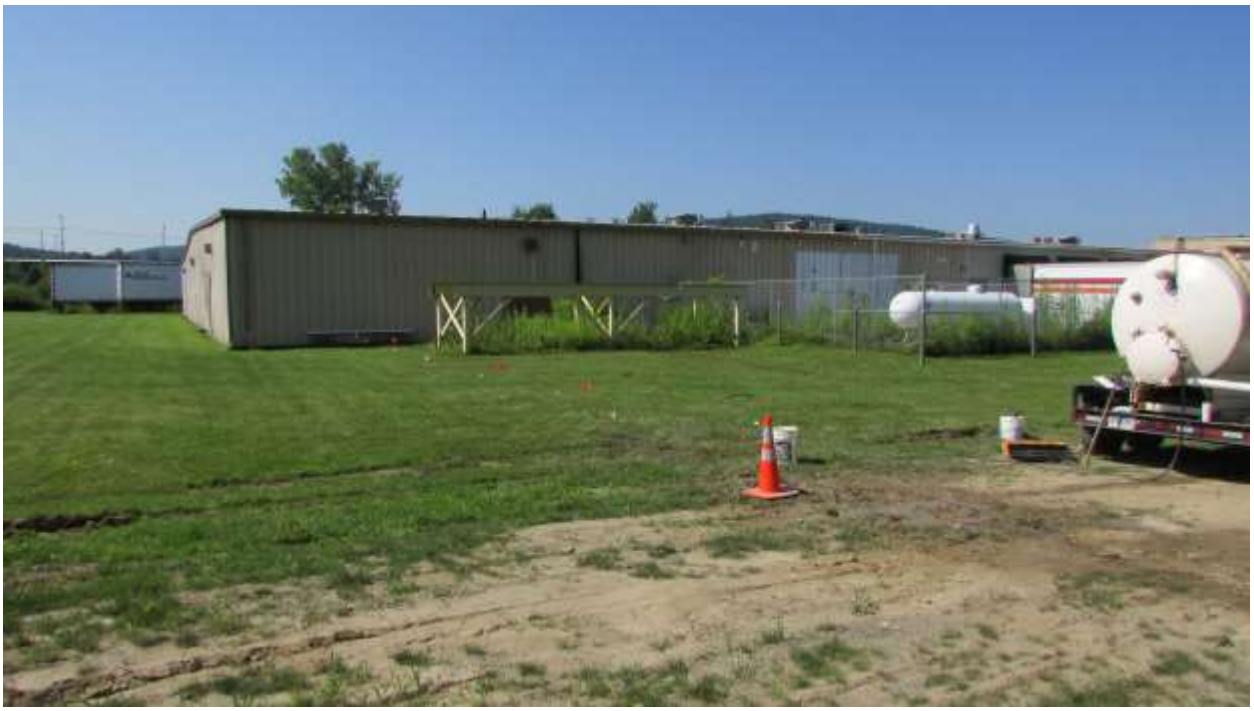
Figure 1 – Vestel, NY location of horizontal drilling July 2013

Photographs

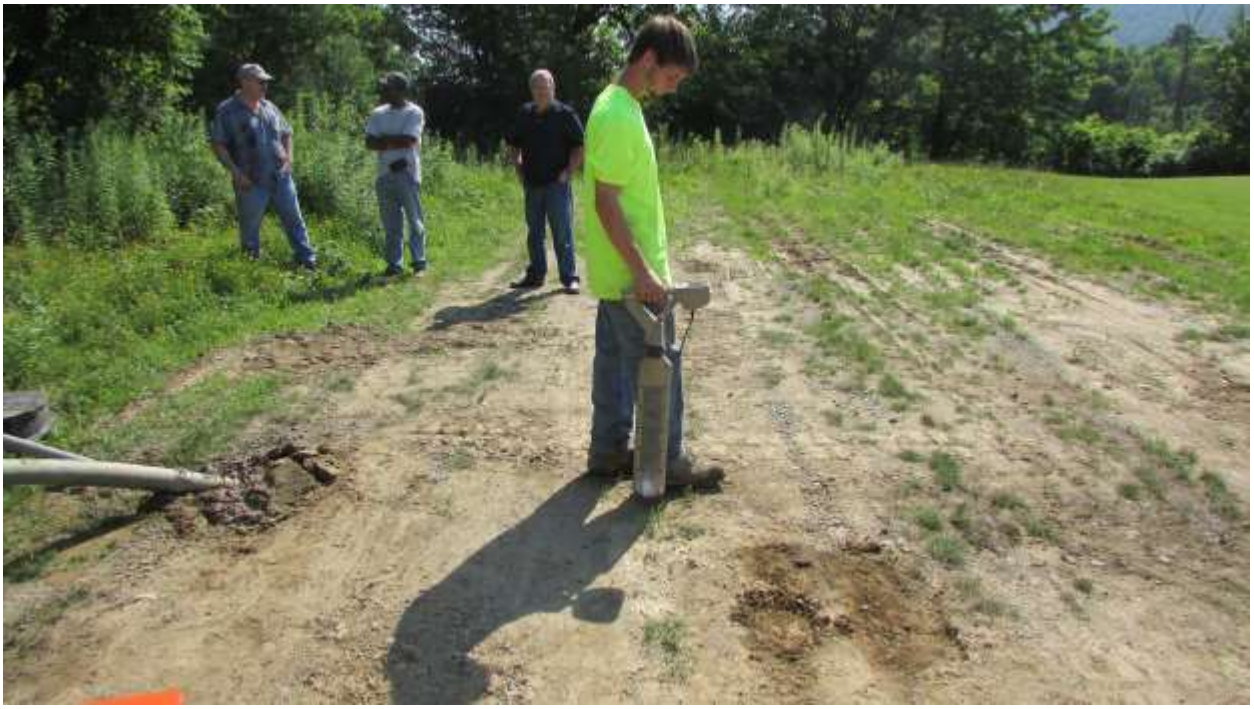


Horizontal Drilling - Detail of cutting tool

Directional Technologies, Inc rig at Vestal site.

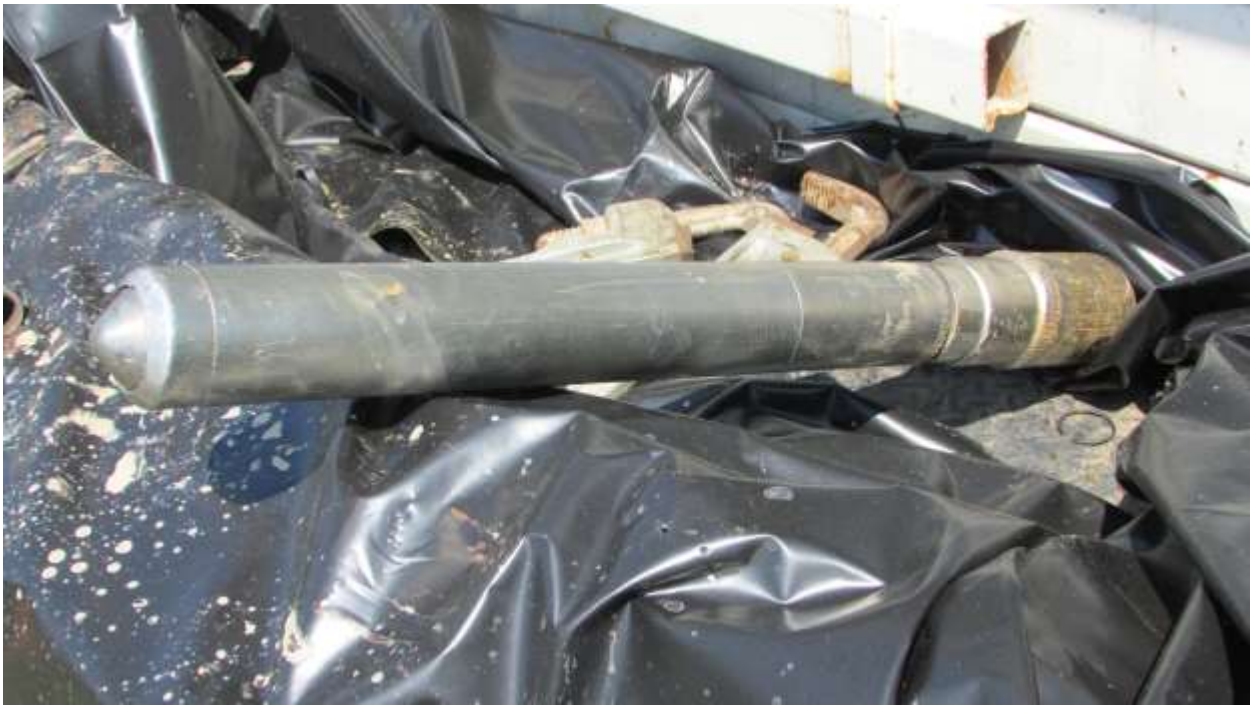


Vestal site, mark out area for horizontal drilling

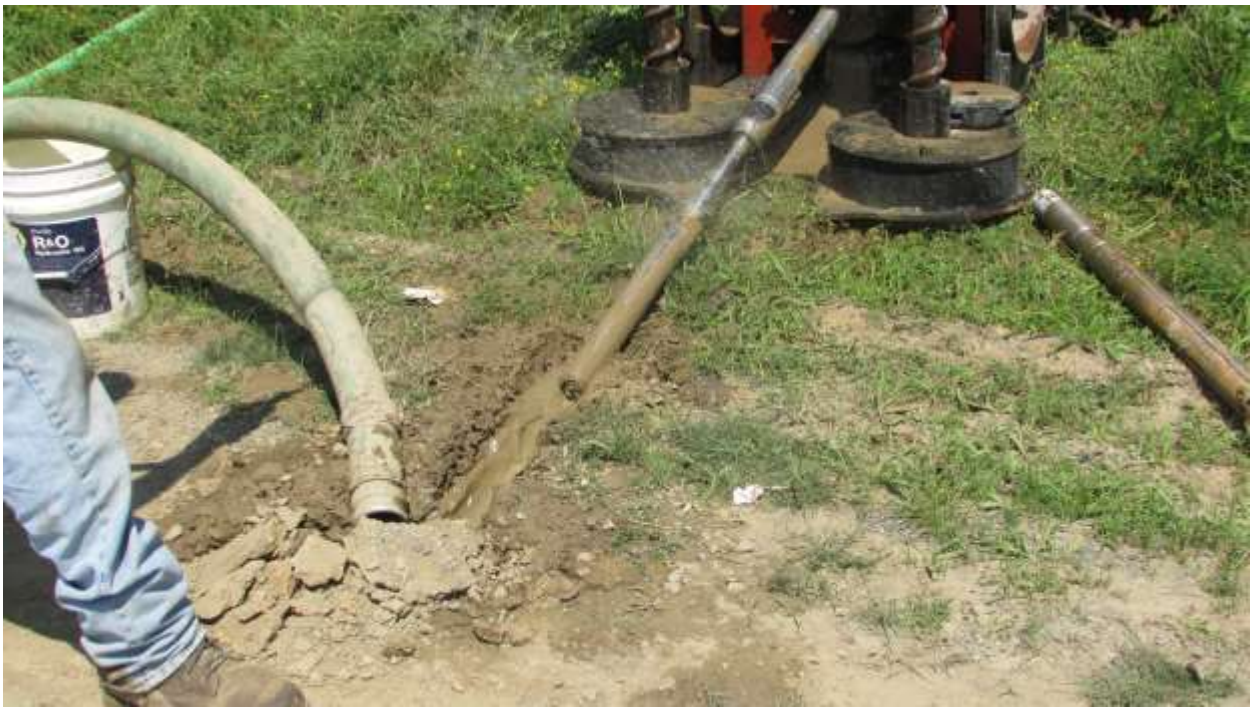


Using instrument to verify location and depth of drill head

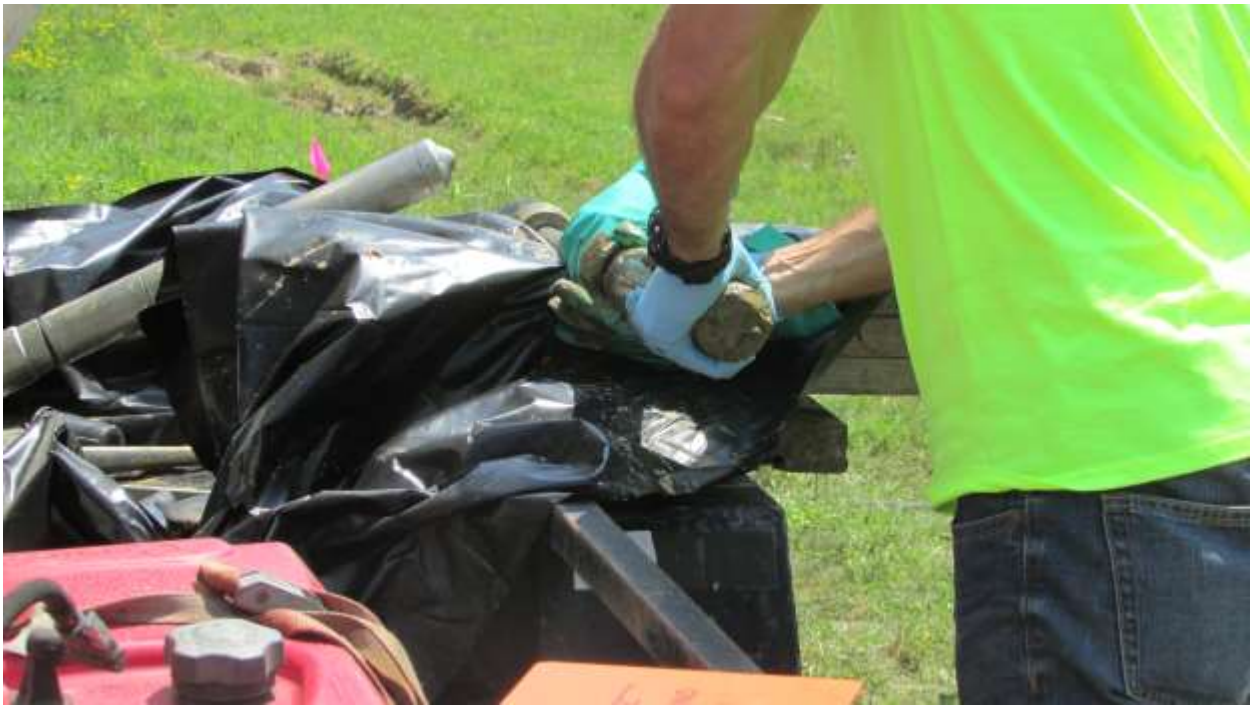
Detail of drill rig showing auto control for adding/removing drill pipe



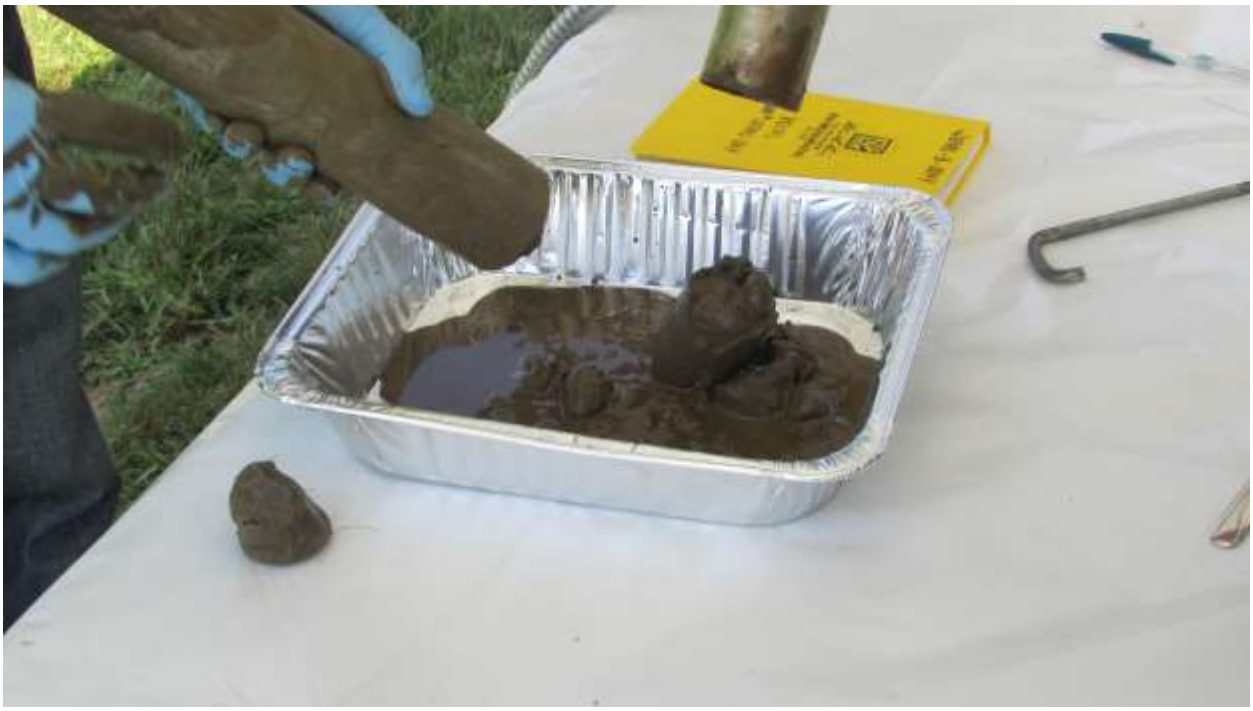
Sampling tool for horizontal drilling



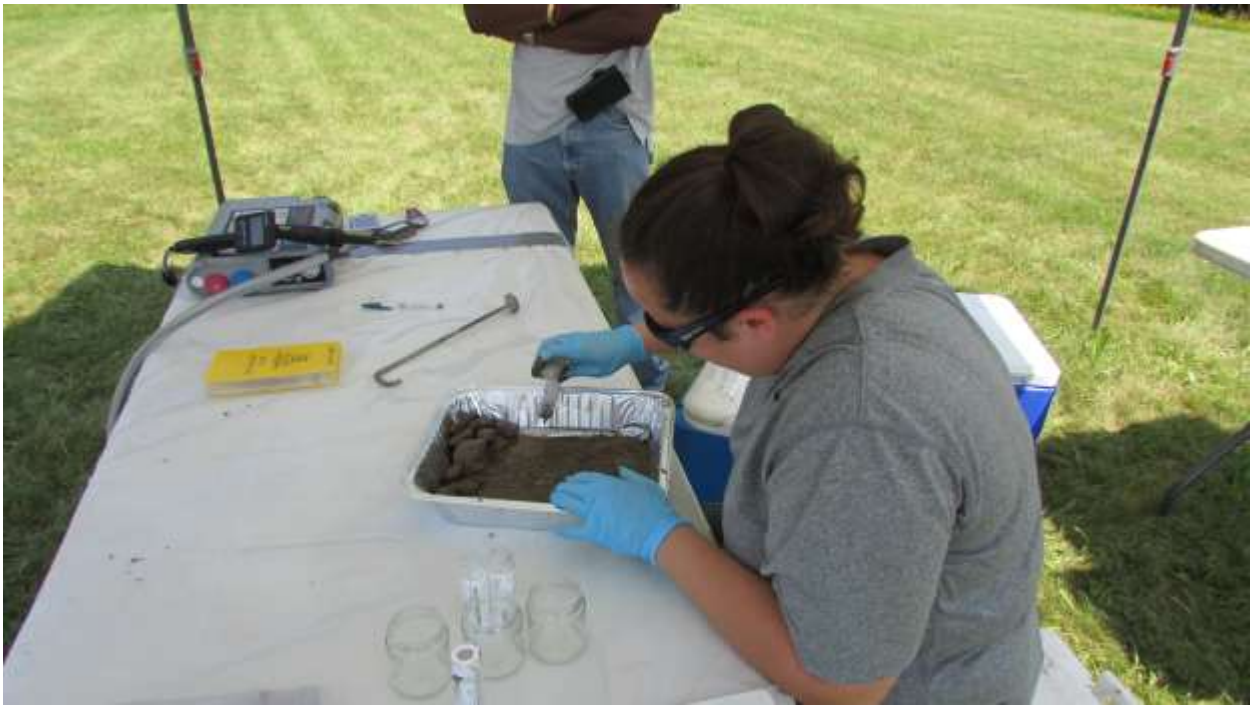
Extracted sampling tool from horizontal drilling



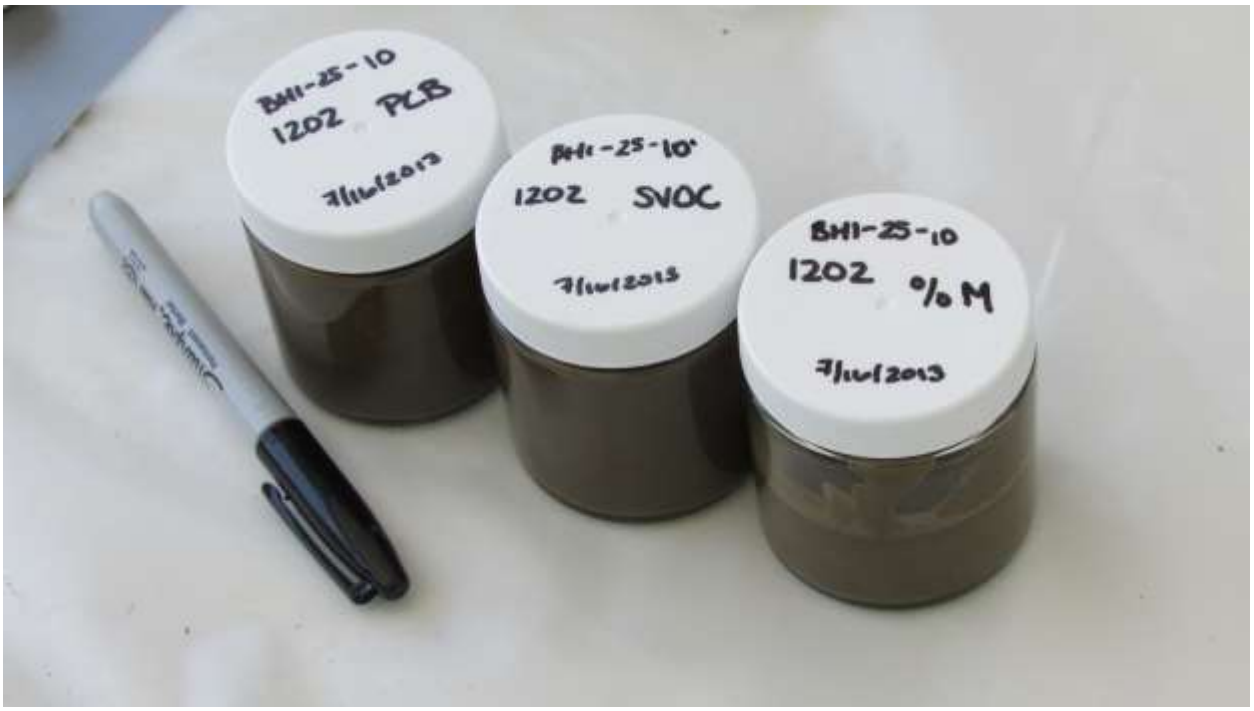
Opening sample tool after collection and extraction from hole



Emptying sample into preparation container

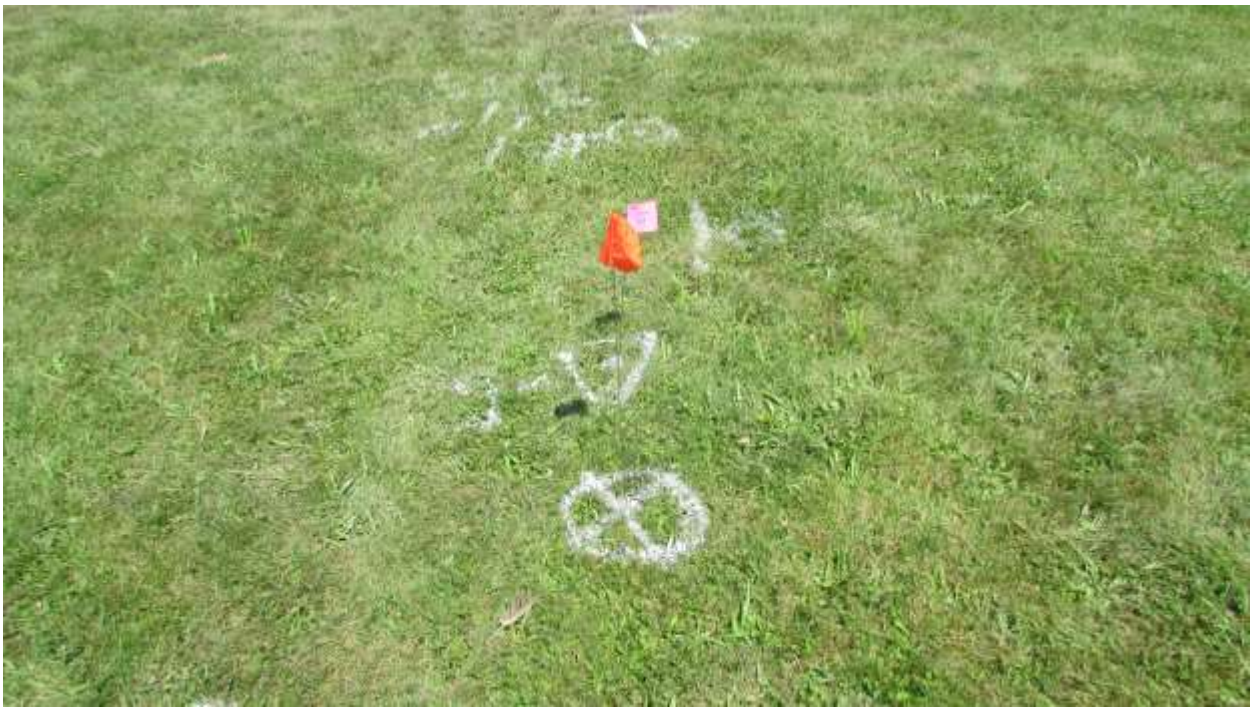


Collecting soil samples for lab analyses

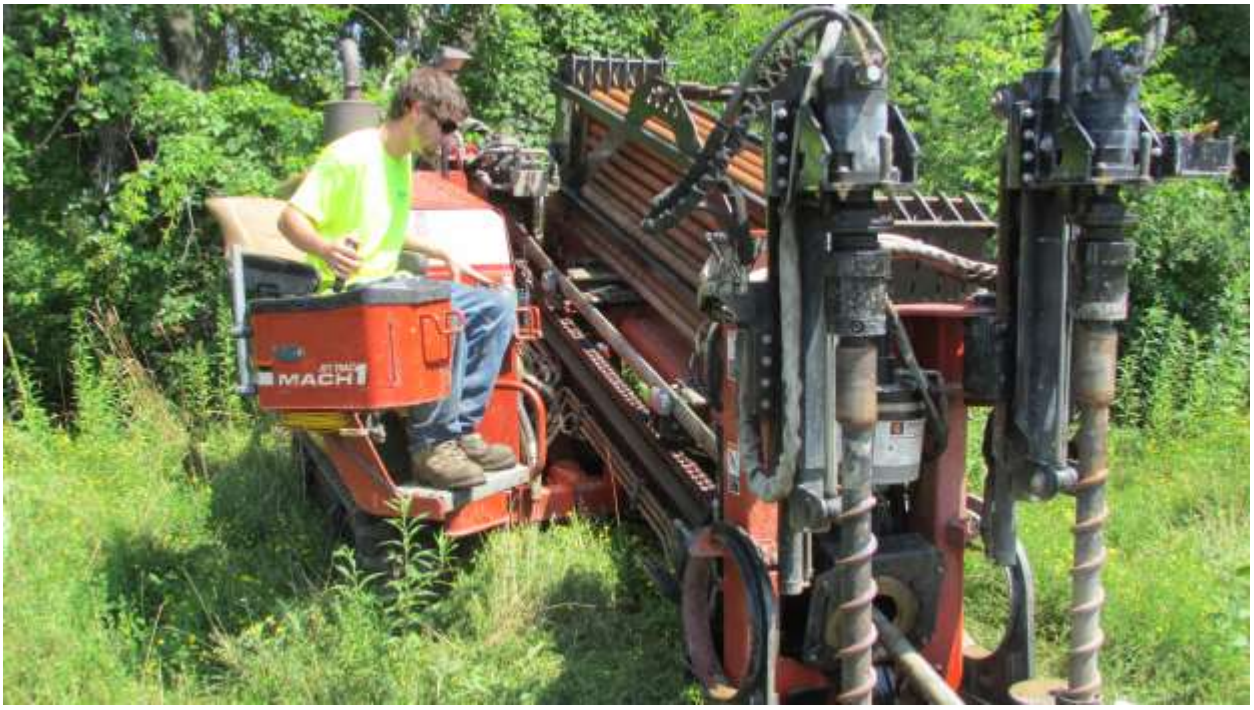


Completed sample collection

Horizontal drilling water and service trucks, Vestal site



Additional field mark-outs verifying location, depth and angle of drill head



Vestal Site, operator for horizontal drilling rig

Observing the horizontal drilling program, Vestal site