CDM Smith

Memorandum

To: *Mr. Mike Cirian, EPA*

From: *August Welch, Damon Repine, Sean Coan*

Date: *April 22, 2016*

Subject: Weekly Oversight Report for CFAC RI/FS Phase I - Week Ending 4/22/16

Oversight Activities and Observations

Below is a summary of the oversight activities and observations performed by CDM Smith during the soil gas screening and geophysical survey work being performed at CFAC on 4/21/16:

- Roux began installing soil gas probes in the West Landfill area and Wet Scrubber Sludge Pond. Colleen Owen with DEQ and Steve Ward with CFAC were on site to observe the installation of the soil gas probes. Amy Hoffman with Roux was performing the physical work and Wai Kwan with Roux was performing an internal audit of the procedure. The passive soil gas samplers (AGI probes) were installed over the last few days in the former drum storage area using a method similar to what is described below.

- The procedure for installing the soil gas probes was as follows:

  1) The worker used a hand auger to clear the hole to 1 foot bgs.

  2) Then the worker used a 4-foot long, 7/8-inch diameter rebar stake pounded with a 3 lb. drillers hammer to advance the hole to a total of 5 feet bgs or refusal. The boreholes were not advanced using mechanical means and the worker did not have a stake pulling device to extract the rebar from depth. CDM Smith noted that the best tools were not being used for the job and recommended using a T-Post driver or roto-hammer and stake puller to perform this work in the safest and most efficient manner. The recommendation was acknowledged by Roux but work continued using the existing tools that were on site.

  3) Once the rebar was extracted from the borehole, the AMS sampling probe was inserted into the bottom of the borehole using a slide hammer and the top was sealed with modeling clay.

  4) Once the soil probe was in-place, a helium shroud consisting of a 5-gallon bucket with holes for the tubing was placed over the top of the soil gas probe and a vacuum pump was used to purge the probe at approximately 150 cc/min for 4 minutes. Once the probe was purged after four minutes, helium gas was applied inside the shroud and the concentration of helium gas inside the shroud was measured with a

helium detector. After a period of approximately 60 seconds elapsed, the vacuum pump exhaust was then monitored for the presence of helium.

5) The landfill gas meter (with its own internal pump) was then attached to the gas probe and concentrations of CO, CO_2, CH_4, H_2S and O_2 were measured. Calibration documentation of the equipment used was not observed by CDM Smith; however, Roux stated that the equipment was factory calibrated and that documentation was available.

6) Lastly, a PID was connected to the tubing of the gas probe and the internal PID pump was used to extract air from the tubing and the organic vapor concentration was measured.

7) The soil gas probe was then removed from the borehole and the borehole was backfilled with bentonite chips.

- Four initial attempts to advance boreholes in the West Landfill area were unsuccessful and met refusal at 1.5 to 2 feet bgs. It was determined through hand auger clearance that there appears to be a structural cap on the West Landfill that consists of a gray clayey material mixed with fragmented gravel. Approximately 1.5 to 2 feet of topsoil and cobbles overlies the structural cap. Only one location out of five was advanced to 4 feet bgs; however, the rebar stake could not be extracted from the borehole due to the lack of proper equipment for removing the stake. No soil gas screening samples were able to be collected from the West Landfill. Roux reported that they have performed screening on the existing vents in the West Landfill and that no positive readings were observed.

- The crew moved to the Wet Scrubber Sludge Pond Area and were able to advance 4 soil gas probes to approximately 5 feet bgs. During the first two holes, I observed Roux use modelling clay to seal the upper portion of the borehole prior to performing the extraction. However, during the next two holes Roux did not use modeling clay to seal the borehole prior to sampling. I asked Roux why they were not using the clay seal and the worker stated that when she inserted the gas probe that it felt "tight" and an elective decision was made by Roux to rely on the helium tracer test to demonstrate a good seal was made. I observed the tracer test procedure and confirmed that approximately 60 seconds passed between the application of the helium to the shroud and the measurement of the pump exhaust for helium. Given the low extraction flow of 150 cc/min, I did not feel that adequate time was given between application of the helium gas and the measurement of the pump exhaust to provide a defensible argument that a good seal was made. I suggested that going forward they apply the helium to the shroud at the start of the purge and then check the concentration of helium in the shroud after the 4 minute purge was complete and then measure the pump exhaust after the 4 minutes had elapsed. Roux agreed to do this going forward. Installation of the last soil gas probe occurred at the end of the day and Roux's implementation of the recommended corrective actions was not observed by CDM Smith. Roux did not explicitly agree to use a clay seal at the top of the soil gas probe at every location. CDM Smith will follow-up with Roux via telephone and confirm if the SOP of placing a clay seal at the top of each soil gas probe was followed at every location.

- None of the 4 soil gas probes installed in the Wet Scrubber Sludge Pond area contained any notable concentrations of landfill gases or organic vapors. One of the locations contained a black sludge material in the upper 18 inches that was encountered during hand augering. The sludge did not contain any odors or notable concentrations of organic vapors.

- Roux did not provide any indication of their next plans for soil gas screening in the West Landfill area since the initial attempts were unsuccessful. CDM Smith recommends soil gas screening in that area be abandoned for the time being due to the apparent presence of a structural cap at 2 feet bgs. Future soil gas screening may be conducted (if needed) when the direct push drill rig is on site next month.

- Spectrum Geophysics completed the ER/IP survey across Transect D-D'. Preliminary data from the transects appeared good. The data indicated a high resistivity/low induced polarization zone that rose up steeply from the east and then flattened out at approximately 40-50 feet beneath the Wet Scrubber Sludge Pond and West Landfill areas. Initial interpretations were that this represents a bedrock ridge and that bedrock may be present beneath the Wet Scrubber Sludge Pond and West Landfill at a relatively shallow depth of 40-50 feet bgs. Previously collected data from Transect E-E' shows a low resistivity/high induced polarization zone at approximately 50 feet bgs that may indicate a discontinuous perched water zone. A Figure with an explanation of the initial interpretation of results is attached. Ground truthing of the results by reviewing existing well logs and comparing to the geophysical data will aid in the interpretation. Preliminary results of the ER/IP survey are promising and will likely provide valuable information for planning the drilling program during Phase I as well as provide useful information on the subsurface structure and hydraulic control of the groundwater flow regime.

Photographic Narrative

A brief description of each attached photograph is provided as follows:

1. View, looking east from the West Landfill towards the Wet Scrubber Sludge Pond.
2. Photograph of 4-foot rebar stake in the West Landfill that could not be extracted.
3. Photograph of the top of the soil gas probe with clay seal.
4. Photograph of the soil gas screening instruments.
5. Photograph of the helium shroud setup.
6. Photograph of the AMS soil gas probe.
7. Photograph of the geophysical survey work station.
8. Photograph of the AGI control box for the ER/IP survey.

Oversight Schedule

The upcoming schedule for oversight is as follows:

- CDM Smith plans to check in with Roux via telephone over the next week to gauge progress on the soil gas screening and geophysical survey. We would like to obtain the data from the geophysical surveyor when it becomes available.

- Provide a weekly report on Friday 4/29 to EPA summarizing activities and new information obtained by telephone conversations with Roux.

- CDM Smith's next site visit is scheduled for the start of the drilling program on approximately 5/18.

Attachments:

Photographs Numbered 1 through 8
Figure 1 – Preliminary Geophysical Interpretation