



Engineers ♦ Environmental Scientists ♦ Surveyors

November 7, 2018

Environmental Protection Agency
Attn: Richard Hull, Remedial Project Manager
United States Environmental Protection Agency
Region 1 – New England
5 Post Office Square – Suite 100
Boston, Massachusetts 02109-3912

Re: Revised Timeline | Deep Bedrock Investigation

Dear Mr. Hull:

On behalf of the Coakley Landfill Group (CLG) and in response to the US Environmental Protection Agency's (EPA's) letter dated October 29, 2018, CES, Inc. is providing an update to the timeline included in the May 31, 2018 *Revised Draft Deep Bedrock Investigation Work Plan*.


As requested by the EPA, the attached Timeline includes all activities included in the Draft Work Plan, as well as activities included in EPA's conditional approval letter dated July 17, 2018. The revised timeline was prepared based on discussions with key subcontractors, assumed review and approval timeframes with EPA and New Hampshire Department of Environmental Services (DES), and experience gained from activities completed to date. Nonetheless, schedules for specific activities may be affected by issues that are difficult to predict such as: obtaining access agreements from property owners, changes in subcontractor availability, analytical laboratory turnaround time, agency personnel availability for calls and meetings, and unforeseen weather delays.

However, the revised timeline reflects our best current estimate for remaining tasks.

If you have any questions, please feel free to contact either of the undersigned or Peter Britz of the CLG.

Sincerely,
CES, INC


Michael Deyling, PG
Project Manager


Christopher Buckman, PG
Senior Geophysicist

Cc: Peter Britz, CLG
Andrew Hoffman, DES

TABLE 3
BEDROCK INVESTIGATION TIME LINE AND SCHEDULE OF ACTIVITIES

2012

- ◆ Initiate sampling 346 BHR for VOC
- ◆ Initiate sampling for 1,4-dioxane at R-3 and 346 BHR

2013

- ◆ Initiate sampling 339 and 415 BHR for VOC and 1,4-dioxane
- ◆ Sample 10 residences for 1,4-dioxane (four as part of regular sampling and six new residences)

May/June 2016

- ◆ Sample 14 off-site water supply wells for 1,4-dioxane, arsenic, manganese (10 from 2013 sampling, and four new residences)

July 2016

- ◆ Sample 18 off-site water supply wells for 6 PFAS (14 from May/June 2016 sampling and four new residences)

January 2017

- ◆ Sample 19 off-site water supply wells for 1,4-dioxane, arsenic, manganese, and six PFAS (18 from July 2016 sampling and one new)

May 2017

- ◆ Chinburg Well - Installation of water level dataloggers
- ◆ Chinburg Well - Downhole geophysical logging

September 2017

- ◆ Sample 23 off-site water supply wells for 1,4-dioxane, arsenic, manganese, and six PFAS (19 from January 2017 sampling and four new)

December 2017

- ◆ Chinburg well – Interval Packer Sampling – eight zones

April 2018

- ◆ Sample 23 off-site water supply wells for 1,4-dioxane, arsenic, manganese, and six PFAS (same as September 2017 sampling)

May 2018

- ◆ Existing open borehole bedrock monitoring well reconnaissance
- ◆ Fracture trace analysis at bedrock outcrops in north and west portions of GMZ
- ◆ Performed electrical resistivity surveys, seismic refraction, and ground-penetrating radar surveys near western GMZ boundary

June 2018

- ◆ Drilling contractor mobilized to the Site and commenced deep bedrock drilling efforts for well couplets MW-20, MW-21 and MW-22.

July 2018

- ◆ Complete bedrock drilling July 30

August 2018

- ◆ Complete borehole geophysical logging of installed well couplet borings.
- ◆ Provide interval packer sampling interval memorandum to USEPA and NHDES

September 2018

- ◆ Semiannual sampling round initiated.
- ◆ Concurrence from USEPA and NHDES for packer sampling intervals

October 2018

- ◆ Complete Fall 2018 sampling round.
- ◆ Perform interval packer sampling within identified hydraulically active fracture intervals within the new well couplet borings and analyzed for arsenic, manganese, 1,4-dioxane, and six PFAS compounds as outlined in the project SAP.

November 2018

- ◆ Negotiate Access Agreements with property owners to investigate open bedrock boreholes
- ◆ Complete review of groundwater analytical results from interval packer sampling and borehole geophysical data. Make recommendations to USEPA and NHDES for monitoring well construction at MW-20, 21 and 22 bedrock borings.
- ◆ Establish and survey surface water gauging stations
- ◆ Quarterly water level monitoring of well couplets to assess vertical gradients.
- ◆ Sample overburden monitoring wells (MW-20, 21 and 22)

December 2018

- ◆ Complete LiDAR data interpretation to refine location of drainage divides in the vicinity of the Coakley Landfill.
- ◆ Install monitoring wells at the three couplet locations (MW-20, 21 and 22).
- ◆ Elevation survey of new bedrock and overburden wells (MW-20, 21, 22)
- ◆ Initiate downhole geophysical logging at existing bedrock open borehole wells.
- ◆ Obtain access agreement to the golf course property to conduct fracture trace analysis on bedrock outcrops.
- ◆ Complete field fracture analysis at bedrock outcrops on golf course property.

January 2019

- ◆ Install water level dataloggers in each new well for a period of 30 days to assess any water level (or pressure) responses to pumping that is associated with nearby water supply wells or golf course irrigation wells.
- ◆ Quarterly water level monitoring of well couplets to assess vertical gradients
- ◆ Initiate packer sampling in existing bedrock open hole borings.

February 2019

- ◆ Continue interval packer sampling at open bedrock boreholes

March 2019

- ◆ Submit open borehole interval packer sampling analytical results to USEPA and NHDES. Provide recommendations for conversion of select open boreholes to discrete monitoring wells or for abandonment of the well.
- ◆ Convert the Chinburg well into a long-term monitoring well based on interval packer sampling results completed in December 2017.

April 2019

- ◆ Quarterly water level monitoring of well couplets to assess vertical gradients
- ◆ Convert selected open bedrock borings to discrete monitoring wells

June 2019

- ◆ Prepare a proposal to conduct a limited pumping test utilizing bedrock wells to determine fracture connectivity.

August 2019

- ◆ Annual sampling event (groundwater, surface water, seep, sediment)
- ◆ Conduct pumping test if deemed feasible.

November 2019

- ◆ Submit draft deep bedrock investigation report. *Note that individual task memorandum/reports are provided to USEPA and NHDES as tasks are completed.*