SVE System — Extracting Vapours and Value

Michelle Heffernan and Jason Hampson, Trace Associates

Trace Associates Inc. (Trace) provided a client in Central Alberta with an innovative and cost effective remedial solution to address a condensate pipeline release. Trace personnel conducted assessment activities on the spill site and identified condensate impacts to a depth of 10 metres (m), with an impacted soil volume of 25,000 cubic metres (m³). Assessment activities were combined with remedial pilot testing to work toward a defined, end point of spill remediation and cost-effective site closure. This presentation will include an overview of the methods used to develop the remedial approach and the site conditions that led to the implementation of an in-situ approach:

- Large volume of impact (25,000 m³) to an extended depth (10 m).
- Assessment identified light end hydrocarbons as the only contaminant of concern.
- Groundwater was not present in the area of impact and soil impacts were present in very coarse-grained material with a fine-grained confining layer below.
- High costs associated with a “dig and dump” scenario due to large volume and extended depth of soil impact.

Throughout the process, Trace reviewed various remedial options. Following identification of the initial site conditions, pilot scale testing for a potential vapour extraction system (VES) scenario was built into the follow-up assessment activities.

Pilot testing was conducted by Sequoia Environmental Remediation Inc. in conjunction with Trace during the final impact delineation assessment, which was required in order to receive regulatory buy in on the remedial option. Following the successful pilot tests on shallow and deep impacts, a full-scale treatment system was approved by the client and applicable regulators and was installed on the Site in January 2016.

Since installation, the system has been monitored monthly and annual groundwater monitoring for 2016 is pending. The monthly monitoring of the system identified the following:

- The SVE system is successfully extracting soil vapour, and therefore, removing contaminant mass.
- Groundwater is being produced during vacuum operation on the deep monitoring wells.

Challenges identified included the following:

- Water produced by the system during winter months created freezing issues which limited valve mobility.
- Vacuum on the deep wells was shut down in winter months; thus reducing system functionality.

Further system optimization is required and in progress to manage the water production; however, early monitoring results suggest that the system is indeed removing contaminant mass as intended.

Trace and the client are working closely with the appropriate regulators throughout the project to provide ongoing status updates. A plan for monitoring soil/groundwater and confirming remediation success was prepared and approved by the regulator.

Ms. Michelle Heffernan, BSc, PAg
Michelle Heffernan is a Partner and a Special Projects Manager with Trace, and has over nine years of experience in conducting environmental site assessments, remediation, reclamation, and groundwater monitoring related to oil and gas, industrial, and land development activities. At Trace, Michelle specializes in management of large scale, complex assessment and remediation projects and is involved in the strategic planning of the firm.

Mr. Jason Hampson, BSc, PAg
Jason is a Partner and Principal Scientist with Trace, and has over 16 years of experience in conducting Environmental Site Assessments, remediation, risk management plans, environmental liability assessments, and groundwater monitoring related to oil and gas, industrial, and land development activities. At Trace, Jason specializes in management of large scale, complex assessment and remediation projects and is involved in the strategic planning of the firm.