

APPLICATION UNDER S.46 OF THE *ENVIRONMENTAL PROTECTION ACT*

Project Duration
2 Years

Project Cost
\$ 220,000



Project Description

Terrapex was contracted to undertake the technical requirements in support of an application under Section 46 of the Environmental Protection Act for a former industrial landfill. The site comprises 3.9 hectares, and was historically used as a quarry, and an industrial landfill for calcium hydroxide sludge, clean fill and construction debris. Subsequent use of the site as a snow dump and temporary storage of street sweepings and decanting and disposal of algae skimmings was also identified. The Section 46 application was undertaken to allow redevelopment of the site as a concrete batching facility prior to the elapse of 25 years since the closure of the landfill.

Terrapex completed a Phase I and a Phase II Environmental Site Assessment (ESA) for the site in 2005. The technical evaluation of the site in support of the S.46 application included a geophysical investigation, an intrusive environmental investigation, a supplemental intrusive environmental investigation and subsurface vapour monitoring.

The geophysical investigation was undertaken to assess the vertical and lateral variations in the subsurface electrical conductivity to assist in the determination of the horizontal and vertical extents of the former quarry and landfill. A terrain conductivity survey was conducted using a Geonics EM31-MK2 to map the electrical conductivity variations across the surface of the site. Three electrical resistivity tomography surveys were conducted using a SYSCAL R1 plus multi-electrode resistivity system to identify the depth to bedrock and the thickness of the material above the landfill.

An intrusive environmental investigation and a supplemental investigation were completed to characterize the nature of waste materials placed at the site, to assess the potential hazards related to landfill leachate generation and migration and to evaluate the hydrogeological setting of the site.

A total of fifteen boreholes were advanced to depths ranging between 2.9 and 11.6 m below ground surface. Eight boreholes were instrumented as multi-level monitoring wells using Solinst “Continuous Multi-channel Tubing” (CMT) polyethylene tubing, and three discreet screened intervals were completed for each monitoring well. Over 140 soil and groundwater samples were submitted for various analyses including inorganic and metals parameters, petroleum hydrocarbons, volatile organic compounds, polycyclic aromatic hydrocarbons, and polychlorinated biphenols.

Impacts including concentrations of electrical conductivity, acetone, petroleum hydrocarbons, pH and mercury were identified in soil or groundwater within the landfilled area. The hydrogeological assessment included the completion of hydraulic conductivity testing and the monitoring and interpretation of geochemical parameters in groundwater.

Twelve vapour monitoring probes were installed at depths ranging between 1.8 and 2.0m below ground surface. Routine monitoring of vapour concentrations of methane, hydrogen sulphide, general combustible vapours, carbon monoxide, and oxygen was conducted. A total of twelve subsurface gas samples were also collected for various analyses including methane, volatile organic compounds, acetylene and hydrogen sulfide. Significant concentrations of methane were identified at the site. Real-time methane monitors are to be installed at the site, and ongoing vapour monitoring of both on and off-site locations continues.

The Ministry of the Environment approved the Section 46 application on April 15, 2008.

