

Full-scale STARx Hottpad™ to Treat Petroleum Hydrocarbon-Impacted Soils Generated Through the Creation of a Realigned River Channel

Port Lands Redevelopment in Toronto

Overview

The Port Lands Area is an 880 acre, historically industrialized, brownfield site that is being redeveloped into new public spaces and naturalized to control water flow and manage sediment. Formerly the area was used for industries including petroleum refining and storage, equipment manufacturing, steel foundries, liquid and solid waste management, vehicle maintenance/repair operations, and municipal services. The redeveloped area will include parks, flood protection, bridges and structures, roads and municipal infrastructure (IMAGE 1).



IMAGE 1: Rendering of the planned redevelopment of the Port Lands.

Pilot testing of both STAR (in situ) and STARx (ex situ) was conducted in 2018 to assess the treatment of petroleum hydrocarbon impacted soil as a more sustainable and cost-effective alternative to off-site disposal (IMAGE 2). The pilot STAR and STARx systems consisted of a system trailer, heating elements for ignition, air distribution system to support the smoldering combustion reaction, as well as a vapor collection and treatment system.



IMAGE 2: Hottpad™ pilot-scale unit used to treat contaminated soils.

Conclusions

The STAR and STARx technologies are rapid, safe, and low-cost treatment options for hydrocarbon-impacted soils.

The full-scale STARx Hottpad™ plant selected for soil remediation at the Port Lands Site:

- Was designed to treat 150,000 tonnes over an 18-month operational period;
- Was a cost-effective, sustainable alternative to off-site disposal; and,
- Was able to meet site-specific soil criteria for on-site soil re-use.

Full-Scale Project

Savron was part of a team selected for the remediation of soils to be excavated from the new river channel. The Hottpad™ Plant constructed for this project consisted of four individual pads operating concurrently, with a total batch capacity of 1000 m³ (i.e., 250 m³ per pad) (IMAGE 3).



IMAGE 3: STARx Hottpad Plant capable of treating soils to site-specific re-use criteria

Despite a preponderance of low-permeability soils (silts and clays) and challenges associated with the characterization of highly variable soil concentrations, the Hottpad™ plant was able to effectively remediate excavated soils to meet site-specific (CBRA1 and MECP Table 3) criteria for on-site re-use (IMAGE 4).

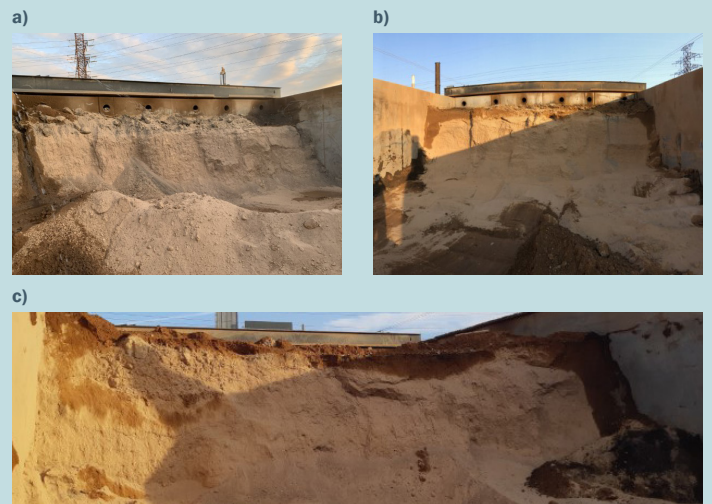


IMAGE 3: a-c Examples of excavated soils following STARx treatment meeting site-specific (CBRA1 and MECP Table 3) criteria for on-site re-use.

The volume of soils designated for STARx Hottpad™ treatment was 150,000 tonnes, to be processed over an 18-month operational period. However, the soil re-use criteria were revised to accelerate the timeline for project completion, and STARx operations were terminated as a result.