

The Challenge:

- An industrial site with soil and groundwater petroleum hydrocarbon and VOC contamination – persistent residual levels of petroleum hydrocarbons (PHC) and volatile organic compounds (VOCs)
- Working through sub-zero Canadian winter conditions to meet the stakeholders' time schedules on budget

The OxyTek Solution:

- OxyTek-L™ was applied to the contaminated zones - less expensive than conventional landfill practices. Residual PHC and VOC levels were reduced to instrument method detection limits (0.002 ppm) meeting Table 1 Ont. Reg. 153 criteria
- OxyTek-L™ treated the impairment during sub-zero temperatures, on time, and below conventional landfill costs



View of site during treatment of soil stockpiles.

Background:

This 9.75 acre property was previously a chemical manufacturing plant and contained facilities for chemical blending, a machine shop, paint booths, various paint and solvent storage areas, repair garages, and various underground storage tanks (USTs) and aboveground storage tanks (ASTs) that had been removed from the site).

A Phase II ESA delineated groundwater impacts associated with xylene, toluene and ethylbenzene, and soils impairment associated with 1,1 dichloroethylene, benzene, xylene and toluene, and copper and SAR. This ESA estimated 1,090 m³ of soil required treatment. The Morrison Creek culvert is located on the south end of the property. Due to the Creek's location, MOE Reg. 153 Table 1 criteria applied to the area within 30 m of the creek, and Table 3 criteria applied elsewhere on the property.



Chemical oxidation of soils in sub-zero winter conditions

Process:

OxyTek-L™ was applied using conventional excavators and backhoes. During the course of the soils and groundwater treatment, two abandoned underground storage tanks were uncovered and the extent of impairment increased to 5,267 m³.

The project commenced on December 10, 2007 and was completed February 6, 2008. Despite the harsh sub-zero winter conditions, the OxyTek-L™ solution was successful in reducing levels of soil and groundwater contamination to meet Ontario Reg. 153 Table 1 criteria - Concentrations of the BTE parameters were successfully reduced to instrument method detection limits of 0.002 parts per million (ppm).



**OxyTek™ Case Study 1000101:
Former Chemical Manufacturing Site, Oakville, Ontario**

Soil and Groundwater Concentrations Pre-Treatment and Post-Treatment using OxyTek-L™

SOIL (reported in parts per million (ppm)):				
Sample ID	Depth	Parameter	Pre-Treatment	Post-Treatment
BH1 – SS2B	1.83 – 2.44 m	Benzene	0.010	0.002
		Toluene	0.005	0.002
		Xylene	0.006	0.002
BH5 – SS2A	1.22 – 1.83 m	1,1 Dichloroethylene	0.003	0.002
BH8 – SS3	2.44 – 2.59 m	Benzene	0.009	0.002
		Toluene	0.004	0.002
		Xylene	0.003	0.002
BH9 – SS1A	0.15 – 0.61 m	Toluene	0.005	0.002
		Xylene	0.004	0.002
A4-VS4-WW	0.0 - 4.2 m	F2 PHC	250	10
		F3 PHC	3,200	10
		F4 PHC	2,100	10
GROUNDWATER (reported in parts per billion (ppb)):				
Sample ID	Depth	Parameter	Pre-Treatment	Post-Treatment
BH2-MW2	--	Ethylbenzene	130	0.1
		Toluene	7	0.2
		Xylenes	250	0.1

All values in ug/kg – ppm – parts per million MDL – method detection limit

< – below detection limit **Parameter exceedence**

*MOE O.Reg. 153/04 – Table 1 – Full Depth Background Site Condition Standards and Table 3 - Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition for Industrial / Commercial Property Use