Remediation of PHCs and VOCs at a Former Dry Cleaner Site Using RegenOx®, ORC Advanced®, and ORC® Filter Socks

Former Dry Cleaning Site Redeveloped to Serve as New Home to Non-Profit Serving Homeless in Chilliwack B.C. Area

Project Highlights

- Introduction of RegenOx® and ORC Advanced® following *in situ* treatment using PulseOx[1] resulted in the reduction in the initial concentrations of PHCs and dry cleaning chemicals in a sand and gravel aquifer, meeting site remediation goals
- Upon completion of remedial efforts, the project was awarded three British Columbia Ministry Environment instruments

Project Summary

A building occupied by a former dry cleaning business (1960s) located in Chilliwack, British Columbia was acquired by Ruth & Naomi's Mission, (www.ranmission.ca) a non-profit organization serving Chilliwack. Environmental investigations to support the redevelopment of the former dry cleaner building revealed contamination of the soil and groundwater beneath the site and the offsite alley with petroleum hydrocarbons (PHCs) and dry cleaning related chemicals. Since the remedial excavation onto the offsite alley was not considered to be practical, RegenOx, along with ORC Advanced, was utilized for the *in situ* treatment of soil and groundwater within the excavation to reduce the remaining PHC and dry cleaning chemical concentrations.

Following treatment with RegenOx, reduction in the concentrations of PHC and dry cleaning related compounds were observed in soil and groundwater samples. RegenOx was additionally injected within the alley to treat the offsite plume. As a result, all post-remediation concentrations are below the applicable commercial land use standards. Additionally, ORC socks were applied to assist natural attenuation of any residual contaminants in groundwater. The successful investigation and remedial effort received three British Columbia Ministry of Environment instruments and now safely serves as a resource center and shelter.

Concentrations

- Volatile Petroleum Hydrocarbons VPH (up to 3,400mg/kg)
- $EPH_{10\text{-}19}$ (8,200 mg/kg)
- Ethylbenzene (33mg/kg)
- Total Xylenes (160 mg/kg)
- Perchloroethylene (7µg/g)
- Trichloroethylene (2.8 mg/kg)
- VPHw (110mg/L)
- LEPH (5.6 mg/L)
- Ethylbenzene (2.14 mg/L)
- Toluene (2.7mg/L)
- Naphthalene (410µg/L)
- Perchloroethylene (2.76 mg/L)
- Xylenes (6.78mg/L)
- Vinyl Chloride (349 µg/L)

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Site Details

Site Type: Former Dry Cleaning Business

Contaminant of Concern: PHCs and VOCs

Remediation Approach: Chemical Oxidation to remediate Petroleum Hydrocarbons, Dry Cleaning compounds and degradation products

Soil Type: Sand and Gravel

Treatment Area: 600m^2 (1968 ft^2)

Technology Used:

REGEN Ox

ORC ADVANCED OXYGEN RELEASE COMPOUND

REGENESIS®

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Technology Description

RegenOx is a percarbonate-based *in situ* chemical oxidation technology that rapidly destroys petroleum hydrocarbons and chlorinated contaminants through powerful chemical reactions. It directly oxidizes contaminants while a catalytic component generates oxidizing free radicals to destroy the target compounds.

ORC Advanced is a proprietary formulation of food-grade, calcium oxy-hydroxide that produces a controlled release of molecular oxygen to enhance aerobic biodegredation.

ORC Filter Sock is a permeable filter sock containing calcium oxy-hydroxide based chemical which produces a controlled release of molecular oxygen (17% by weight) when hydrated.

Results

PHC and dry cleaning compounds were reduced in concentrations to groundwater standards following the application of RegenOx and ORC Advanced, facilitating the redevelopment of the former dry cleaning business to house the not-for-profit homeless shelter, Ruth and Naomi's Mission, serving the Chilliwack, B.C. community. Upon completion of investigation and remedial efforts, the project was awarded three British Columbia Ministry Environment instruments. Up to 200+ homeless are served dinner daily by this organization which provides both shelter and recovery programs to men and women, assisting them in their reintegration into the community and work place.

[1] PulseOx is a registered trademark of APT Water, Inc.

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