

Large-scale In Situ Enhanced Reductive Dechlorination of a 6 Hectare Site

Treatment of chlorinated solvents at a complex site with sensitive receptors



Summary

Chlorinated solvents were used for a number of years at a former manufacturing facility in Italy. This has resulted in contamination of the groundwater underlying a large proportion of this 6ha site. Groundwater concentrations of up to 155,000 µg/L TCE presented an unacceptable risk to both on- and off-site receptors and it was determined that active remediation was required. A remediation approach was designed based on targeted excavation of highly impacted soils, plume treatment through Enhanced Reductive Dechlorination (ERD) and the installation of a down-gradient treatment zone to prevent further contamination of the river beyond the site boundary.

Treatment

ERD of the chlorinated solvents was achieved through a grid of direct push injections, introducing a suite of REGENESIS products into the subsurface. The site was first divided into different areas based on the distribution of contamination and differing permeabilities. A tailored product mix and dosage was then created for each area. Our wide-distribution substrate (3DMe) was used in the up-gradient zones on a widely spaced injection grid, to minimise injection cost, while providing optimum treatment of the contamination. The down-gradient treatment zone required application very close to the river at the site boundary. A mixture of low volume, high viscosity (HRC) products were used here to prevent contaminant egress from the site for up to five years from a single injection while remediation of the source area is completed upgradient.

What's Special?

- Over 500 direct injection points were used to apply a range of substrates across 10,000 m² of the site;
- The on-site activities were successfully completed in only 6 months. Remediation will occur over several years, with no further site attendance or operational costs beyond validation sampling;
- Remediation is intended to reach stringent clean-up targets at both the site boundary and within the property were required by the regulator;
- The wide range of REGENESIS injectable substrates allowed for a tailored design solution. Product mix and dosages were designed for each part of the site, providing the most accurate and cost effective solution.

Remediation Details

Site Type:

Former Factory; Brownfield Redevelopment

Project Driver:

Compliance with Regulatory Standards

Remediation Approach:

In-Situ Enhanced Anaerobic Biostimulation via Direct Push Injection

Technologies:

3-D Microemulsion[®], HRC Primer[®], HRC[®] and HRC-X[®]

Geology

	Bedrock
	Gravel
X	Sand
X	Silt
X	Clay

Medium

X	Groundwater
	Saturated Soil
	Vadose Zone

COC

	Petro HCs
	Petro LNAPL
X	Chlorinated VOCs
	Metals

COC Concentration Levels:

Up to 150,000 µg/L

Treatment Level:

Varied between 2 m to 11 m BGL

Treatment Area:

approx. 10,000 m²