

Operational Petrol Filling Station, Emilia Romagna, Northern Italy

In-Situ Chemical Oxidation and Bioremediation Treat TPH and BTEX



Summary

Leakages from underground storage tanks (UST) at an operational petrol filling station located in a densely populated urban area in Northern Italy, resulted in significant TPH and BTEX contamination (with concentrations up to 1,000 µg/L and 100 µg/L respectively), impacting the soil and groundwater.

Contamination was migrating off-site and presenting an unacceptable risk to off-site receptors, resulting in a remediation requirement to reduce contaminant levels to below 350 µg/L TPH and 1 µg/L BTEX.

Application Design and Treatment

The application design for the 65m² target area comprises of 8 injection points arranged in a 3 x 3 m grid spacing, which is being carried out over 2 phases. The first phase consists of the injection of RegenOx (oxidiser); the second of a further dose of RegenOx, followed by ORC-Advanced.

Regulatory Acceptance Despite Low Permeability Aquifer

Upon injection into the subsurface, the In Situ Chemical Oxidation (ISCO) reagents are required to come into physical contact with the contaminant in order to cause the desired chemical reaction, and for this reason are typically applied to higher fluid volumes. Application can be challenging in low permeability formations.

Despite the extremely low permeability within the sites' sandy silt aquifer, our in-situ remedial approach proved the most appropriate remedial option, successfully gaining regulatory acceptance. Monitoring data show reductions in contaminant concentrations after treatment. Monitoring is still ongoing.

Remediation Details

Site Type:

Operational Petrol Station

Project Driver:

Posed unacceptable risk to human health

Remediation Approach:

In-Situ Chemical Oxidation
Enhanced Bioremediation

Technologies:

RegenOx[®], ORC-Advanced[®]

Geology

	Bedrock
	Gravel
X	Sand
X	Silt
	Clay

Medium

X	Groundwater
	Saturated Soil
	Vadose Zone

COC

X	Petro HCs
	Petro LNAPL
	Chlorinated VOCs
	Metals

COC Concentration Levels:

TPH - 1,000 µg/L

BTEX - 100 µg/L

Treatment Depth:

1 m to 4 m BGL

Volume Treated (m³):

65m² x 3 m = 195 m³

Remediation Cost:

€25.000