

Operational Army Airforce Base, Northern Italy

Enhanced Aerobic Bioremediation Treats Hydrocarbon Contamination



Summary

Significant hydrocarbon groundwater contamination was discovered during the dismission of a former petrol fueling station inside an Army Airforce Base in Northern Italy. Resulting from leaking underground storage tanks (UST) the contamination consisted of TPH, Xylene and Ethyl Benzene at concentrations up to 7,000 µg/L, 650 µg/L and 400 µg/L respectively.

Furthermore, as the Airfield is active, a remedial option was required that would not disrupt site activities.

Treatment

Enhanced aerobic bioremediation was deemed to be the most appropriate remedial option, due to the fact it causes the least amount of disturbance in both application and operation.

ORC-Advanced was applied via Direct-Push injection over two phases. The first phase took place in December 2012 and consisted of 40 injection points. The second phase was carried out 6 months later in June 2013 and consisted of 30 injection points.

To date, contaminants are decreasing in concentrations and monitoring is ongoing.

Benefits: Project Cost Savings and Minimising Disturbance

Pilot tests and initial remedial designs were carried out using a basic commodity oxygenate. Despite savings being realised in product costs, the commodity oxygenate did not have the advanced features of ORC-Advanced. Therefore, to reach remedial targets, the fieldwork required to apply the commodity chemical would have involved three applications and twice as many injection points, resulting in greater project costs and disturbance to site activities.

Remediation Details

Site Type:

Army Airforce Base

Project Driver:

Site development

Remediation Approach:

Enhanced Bioremediation

Technologies:

ORC-Advanced®

Geology

	Bedrock
	Gravel
X	Sand (fine)
	Silt
	Clay

Medium

X	Groundwater
	Saturated Soil
	Vadose Zone

COC

X	Petro HCs
	Petro LNAPL
	Chlorinated VOCs
	Metals

COC Concentration Levels:

TPH up to 7,000 µg/L

Xylene - 650 µg/L

Ethyl Benzene - 400 µg/L

Treatment Depth:

4.5m to 9m BGL

Volume Treated (m³):

1,080m² x 4.5 m = 4,860 m³

Remediation Cost:

€150,000