



PetroFix *in situ* PRB replaces cut-off wall design to benefit redevelopment project

CASE STUDY

Remediation project wins 'Brownfield Redevelopment Project of the Year' in Ground Engineering Awards



Fig. 1 Site view © Cundall

INTRODUCTION

A former storage and distribution depot in Coventry, UK, was to be redeveloped into student residential apartments and a landscaped riverside walkway. The soils and groundwater were impacted with petroleum hydrocarbons from previous site usage, which included a petrol filling station across part of the site.

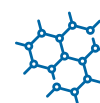
Cundall created a multi-phased remediation strategy with **Alto Construct** to deal with the soils and **REGENESIS** to target groundwater remediation. The soils were to be excavated and removed from site for asbestos removal and bioremediation.

The remaining groundwater contamination would be addressed using absorbant socks to removal residual Light Non-Aqueous Phase Liquid (LNAPL). This was to be followed by the installation of a PetoFix activated carbon permeable reactive barrier at the edge of the site. This will adsorb and promote the biological degradation of high levels of dissolved phase contamination, protecting the river adjacent the site.



SITE TYPE

Storage and distribution depot incl. petrol filling station



CONTAMINANTS

TPH: LNAPL and high dissolved phase (50,000 µg/L)



PROJECT DRIVER

Redevelopment to residential properties



GEOLOGY

Made ground and alluvium



TREATMENT

In Situ Sorption and Enhanced Bioremediation



TECHNOLOGIES

PetoFix™

DESIGN METHODOLOGY AND APPLICATION

The PetroFix permeable reactive barrier (PRB) was placed along the downgradient, northern site boundary. In this location it could continue to work for years, without being disturbed by the site development, avoiding disruption to the construction programme.

REGENESIS Remediation Services applied PetroFix in a 40m long barrier using direct push injection.

This involved driving hollow rods 3.5m into the ground and injecting, under low pressure, the requisite dose of PetroFix liquid. The rods were then pulled by 0.3m and another dose applied. This was repeated until the entire vertical target zone had been treated (to 1.5mBGL). The rods were then pulled out and the next injection point completed 1.5m along the barrier line, so that the radii of influence from each point intersected providing an unbroken barrier.

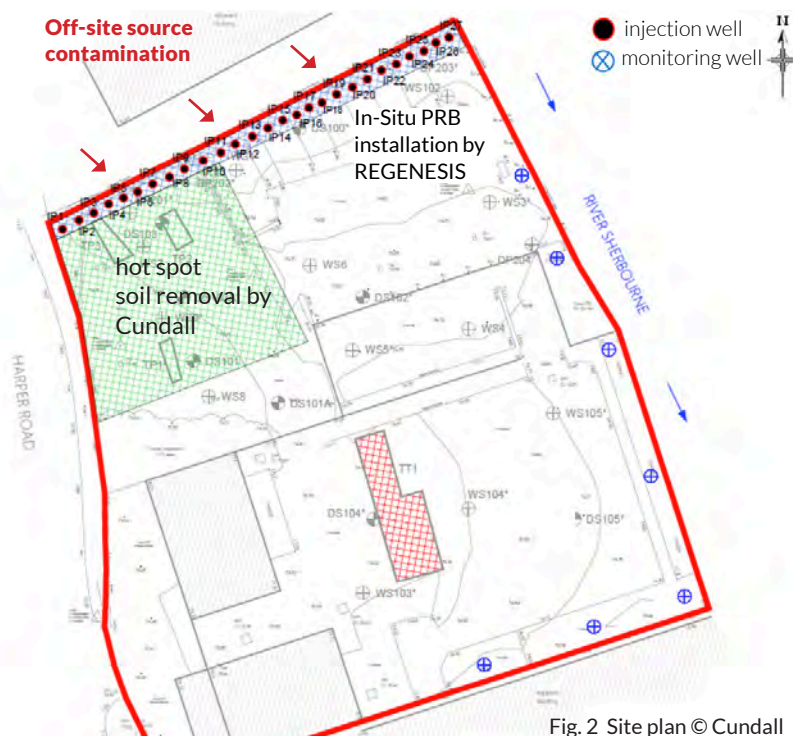


Fig. 2 Site plan © Cundall



Fig. 3 Groundwater remediation works by REGENESIS Remediation Services

The process was repeated, coating the subsurface soil matrix and transforming the soils at the edge of the site from an impacted aquifer into a purifying filter. Once in place the PetroFix barrier immediately began sorption and biological degradation of the contaminant influx.

The works were completed within five days, with a very small working footprint, which allowed construction to continue. Once in place, no further access, power or maintenance activities were required, with the barrier providing immediate and long-term treatment.



BROWNFIELD REDEVELOPMENT PROJECT OF THE YEAR

GE Awards Judges' Quote:

“Through the implementation of alternative remediation measures in the form of a liquid curtain wall, the submission demonstrated collaborative working, regulatory compliance, reduced programme and significantly reduced quantities of soil sent to landfill, ultimately minimising environment impact.

Everything was completed on budget and two weeks ahead of schedule which was very impressive. It was an alternative and innovative method.”

REGENESIS is proud to have played a part in this award-winning project, supporting Cundall and Alto Construct with a detailed remedial design and implementation of the innovative treatment of petroleum hydrocarbons. Cundall collected the award for Brownfield Redevelopment Project of the Year at the Ground Engineering Awards on 4th Nov 2020, in an online ceremony.



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