

PROJECT CASE STUDY

# IN-SITU REMEDIATION OF AN MOD ASSET

EXPERT KNOWLEDGE / UNPARALLELED DELIVERY



**REDS**  
GROUP



REDS Group was commissioned to redevelop a Motor Transport Fuel Installation (MTFI) facility at a MOD site in South West England.

Conditional planning permission had been granted for the redevelopment which comprised the removal of former below ground fuel tanks and construction of new above-ground fuel tank and dispensing island.

REDS environmental consultants supported the project, addressing the requirements of a number of specific environmental planning conditions that had been imposed.

## PROJECT SCOPE

During the redevelopment works, a previously unrecorded former below ground tank installation was encountered with associated residual hydrocarbon contamination.

The former tank vault had been backfilled with poorly compacted mass concrete and remnants of the former forecourt infrastructure, with a section of the former foundation structure also remaining in-situ. These all needed to be removed to provide a suitable foundation platform for the new tanks. Initial remedial works were carried out as part of the redevelopment works with removal of free phase hydrocarbons and grossly contaminated soils comprising a contaminant source removal strategy.

Geology was proved to comprise clay soils to ~3.5m depth, overlying sand and gravel units. Impact of underlying groundwater in the deeper sand and gravel had occurred, with lateral migration of a hydrocarbon plume identified to the south of the site.

Due to the depth of the residual contamination, we concluded further excavation of contamination to be unsustainable. We completed a revised Detailed Quantitative Risk Assessment to derive suitable site-specific remedial targets for the site and inform the remedial strategy to address the residual contamination of underlying groundwater.





## PROJECT WORKS

### REMEDIATION

We designed a remedial strategy for the site based on in-situ treatment of residually impacted groundwater using a combination of In-Situ Chemical Oxidation (ISCO) and Oxygen Releasing Substrate (ORS). This allowed the redevelopment of the new fuel installation to be completed and the site opened for use.

Initial treatment of the residual hydrocarbon plume to the south of the new fuel installation was completed using In-Situ Chemical Oxidation (ISCO). We constructed temporary injection wells and additional sentinel monitoring wells at the site and then injected reagents into the underlying gravel aquifer using our chemical mixing and injection system via the installed treatment well network.

Due to the confined nature of the underlying aquifer, injection of the reagent solution was completed daily into each location over the course of three days to ensure suitable volumes were introduced into the residual hydrocarbon plume. Each location was then injected with clean water to further distribute the reagent into the aquifer.





## PROJECT WORKS REMEDATION

The final phase of our in-situ remedial treatment work was completed via follow-on treatment of underlying saturated soils and groundwater using Oxygen Releasing Substrate (ORS). These are designed to release oxygen directly into the dissolved phase contaminant plume over a 9 to 12 month period, enabling aerobic microbes to significantly accelerate rates of bioremediation, without loss of oxygen to the atmosphere.

Again, the ORS was injected into the underlying gravel aquifer in solution using our chemical mixing and injection system. We then removed the temporary injection wells and reinstated the concrete pavement at each location.

All works were completed by REDS operatives and supervised by the REDS Environmental Consultancy, who carried out verification monitoring throughout the remedial treatment process.





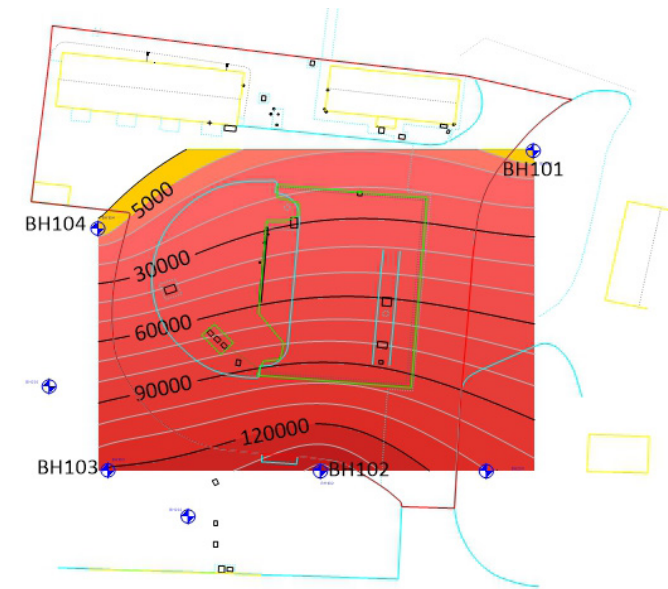
## PROJECT WORKS VERIFICATION

Post-remedial verification monitoring was completed during a series of return visits to the site. Groundwater samples were collected using low-flow sampling techniques and key groundwater parameters reviewed to confirm natural attenuation processes were active.

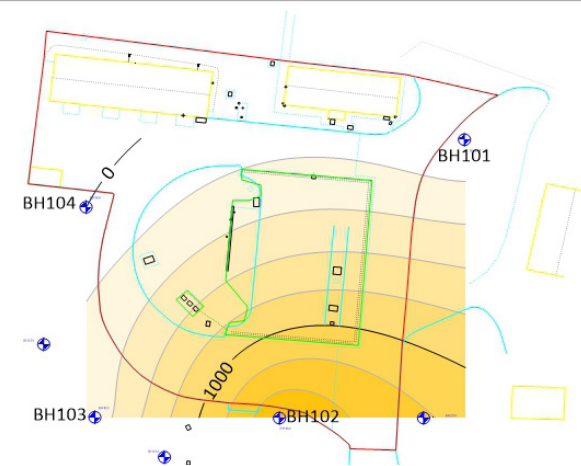
Dissolved hydrocarbons fell rapidly following our remedial works, reducing in concentration by >95%. None of the hydrocarbon concentrations recorded in groundwater post-remediation were found to exceed the site-specific remedial target levels for the site.



## FIGURES SHOWING HYDROCARBON CONCENTRATIONS IN GROUNDWATER BEFORE AND AFTER REMEDIAL WORK



Concentrations before.

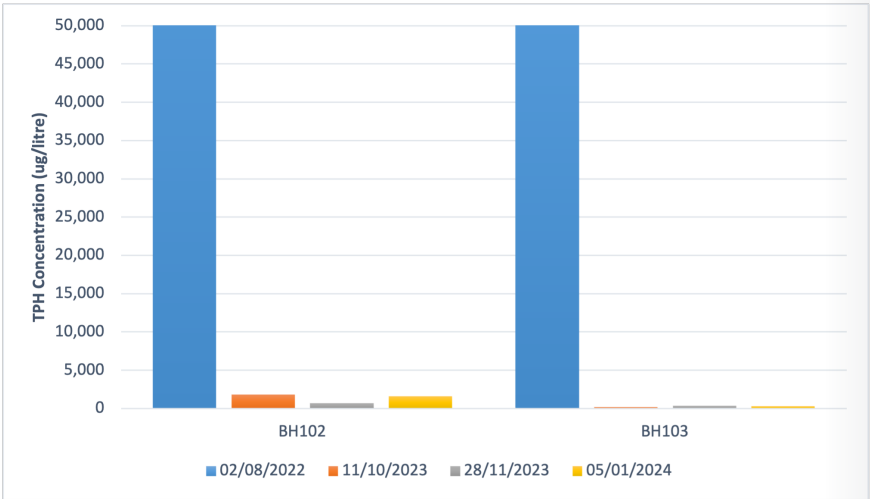


Concentrations after.

# PROJECT RESULT

We concluded the site did not pose a potential risk to identified receptors and was suitable for ongoing commercial use.

We submitted our verification monitoring report to the Local Planning Authority for review and all outstanding planning conditions were discharged in full.



Graph showing reduction in hydrocarbon concentration in groundwater following remediation work.

# CONTACT US

At REDS, we believe our people are our strongest asset. Our in-house proficiency and experience ensure that all projects are delivered in accordance with current legislation, on time, within budget and often exceeding expectations.

REDS Environmental Consultancy hold £5M Professional Indemnity insurance and extensive experience in the investigation, assessment and remediation of contaminated soil and groundwater. We offer pragmatic, commercially focused solutions and are able to call on all divisions within REDS to offer a full 'cradle to grave' service for all aspects of contamination risk management.

For more information about any of our services, or to obtain a quotation for your project, please call us on **0333 444 0004** or email **contact@redsgroup.co.uk**

## ACCREDITATIONS

REDS Group are proud to be UKAS ISO 45001, ISO 14001 Certified and ISO 9001 Certified.





**RESPONSE, ENVIRONMENTAL  
& DECOMMISSIONING  
SERVICES**

