



Case Summary:

In-Situ Remediation by Product Only Recovery and Groundwater Pump & Treat

Telluric Land Remediation Ltd is currently undertaking in-situ remediation of an operational manufacturing site in South Wales. A large plume of free phase oil contamination exists beneath the factory buildings. The oil is recovered using automatically operated product-only pumps. Groundwater pumping promotes enhanced recovery of oil by creating cones of depression at the points of capture. Groundwater is treated above ground by passing through a bioreactor followed by activated carbon polishing.



Light rolling oils entered the subsurface environment from a leaking above-ground storage tank and migrated in the direction of groundwater flow. The free product plume footprint was estimated to cover an area of approximately 5,000m².

The proposed solution was the installation of interlinked abstraction wells with a deep groundwater pump, intended to induce a cone of depression, and a shallow floating skimmer pump for oil recovery. This arrangement increases the rate of oil recovery and helps prevent further migration of the contamination plume.

Twelve abstraction wells were drilled to 8.0m and each fitted with a pneumatic product-only skimming pump and an electrically operated groundwater pump. The groundwater pumps are fitted with variable rate controls and pressure transducers. This allows the pumps to operate at variable rates to automatically maintain a specified degree of drawdown.

Case Summary No. C817/1

The groundwater treatment plant comprises a fixed film submerged bed bioreactor, a filtration unit for the removal of suspended solids and an activated carbon polishing unit. This plant configuration provides an environmentally friendly solution with protection against exceeding the discharge consent provided by the polishing unit. The bioreactor typically removes over 95% of dissolved petroleum hydrocarbons. This results in a much lower requirement for activated carbon and associated disposals. Additionally, the likelihood of a sudden breakthrough of elevated levels of contamination is significantly reduced.

To date over 50 million litres of groundwater have been abstracted and treated and approximately 160,000 litres of recovered oil have been removed from site for recycling.

Abstraction boreholes and pumping equipment are located in chambers which are flush with the factory floor. This allows normal operation of the factory throughout the remediation works.

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