

Remediation

Air Sparging – Norwich, Norfolk

Ecologia was contracted to remediate a residential property just outside Norwich after an attempted theft of domestic heating oil from an above ground oil storage tank. This resulted in approximately 1,900 litres of kerosene impacting the underlying soils and groundwater.

Significant residual contamination remained within the groundwater after an initial phase of remedial works consisting of the excavation of approximately 80 tonnes of impacted soils from around the oil storage tank. More than 3,000 litres of contaminated groundwater were also removed from the excavated area. The contaminated soil and water were disposed of in accordance with waste legislation.



A technology options appraisal was carried-out by Ecologia; this identified air sparging as the most appropriate technology for remediation of the residual contamination. Air is generally sparged into the groundwater to facilitate biodegradation of dissolved phase hydrocarbons when oxygen depleted conditions prevail. Air sparging cannot be used to remediate free phase hydrocarbons; however, it is a useful in situ technique to deal with dissolved phase hydrocarbons and is significantly cheaper than more traditional approaches such as excavation and off site disposal.

After liaising with the Environment Agency Ecologia, designed and constructed a bespoke, compact, air sparging treatment unit capable of operating from a standard 13 Amps single phase domestic electricity supply. The unit was located in a discrete location in the garden and connected to nine sparging wells installed to 4 m below ground level (bgl). The wells were positioned along the southern site boundary as this area was most impacted by the contamination and designed to intersect the underlying water table resting approximately 0.8 m bgl.

The treatment unit comprised a blower (to create the air flow for sparging) and a Programmable Logic Controller (PLC) coupled to a modem, enabling telemetric monitoring and operation of the system from the Ecologia Office. This meant the system could be run automatically and any errors or faults could be detected immediately.

The air sparging system increased the dissolved oxygen concentrations in the contaminated groundwater plume by up to six fold. Aerobic conditions were maintained over a 4 month period resulting in accelerated microbial degradation of hydrocarbons to concentrations below the proposed groundwater remedial targets. After further consultation, the Environment Agency required rebound monitoring in order to ensure that remediation had been achieved.

The laboratory results for the rebound monitoring revealed that the dissolved phase hydrocarbons in the groundwater remained below the agreed remedial targets.

The contract was undertaken by Ecologia as a fixed priced sum and completed within the original programme timescales. This was achieved with minimal disruption to the occupiers of the property.