

Remediation

Dual Phase Extraction – Hot Water Injection

Ecologia was instructed to undertake the remediation of groundwater, free phase oil and contaminated fill material surrounding the foundations of a domestic property in Oxfordshire. An options appraisal was undertaken and we determined that, to facilitate rapid reoccupation of the property, a vapour barrier membrane should be installed throughout the ground floor of the property to prevent vapour ingress, thus reducing the risk to human health. A dual phase extraction and injection system was operated concurrently with the membrane installation to remove free phase oil and contaminated groundwater trapped within the fill material surrounding the foundations.

The remediation system was designed and manufactured in Kent by Ecologia. We used a high vacuum system combined with vertical 'slurper' and injection wells positioned adjacent to the structural walls at the property; this was fully automated and telemetrically controlled. Each extraction well was connected to a high vacuum system which allowed our staff to monitor the system daily from our offices, giving a high level of maintenance and rapid fault repair.

Extraction wells were drilled near the foundation footings by our drilling team to facilitate the removal of free phase oils, contaminated groundwater and soil vapour from a single well with no down-hole pumps. Injection wells were also drilled in order to flush out the contamination within the fill material around the foundation footings to towards the extraction wells.

The extracted groundwater was treated through a sequential filter before being re-injected below the building. To further enhance the system the treated groundwater was heated prior to being re-injected into the fill material surrounding the buildings foundations thereby significantly increasing recovery of free phase oil and volatile hydrocarbons and decreasing the treatment period. This technique proved particularly effective during the winter months when lower temperatures can hinder the efficiency of more traditional dual phase extraction systems.

The treatment system separated and treated the vapour phase before being discharged to atmosphere. The exhaust discharge was automatically monitored with a VOC detector and the system was capable of alerting the project manager by SMS and shutting itself down if a VOC breakthrough was detected. The liquid phase was separated and oils were collected in 200 litres drums and disposed of using a licensed contractor.



Water heater located within a small shed in the rear garden of the domestic property.



Multiphase extraction system located outside the property.



Water heater used to heat treated water ready for re-injection beneath the property