Closing Petroleum Sites - Ground Water Bioremediation with Petrox®

Petrox® bioremediation has been used to remediate sites quickly and effectively without negative byproducts. While every site is unique, this case study provides a basis for confidently selecting Petrox® bioremediation to close your project.

Convenience Store, Hamilton County, Florida, FDEP ID 8518526

After three underground storage tanks were removed from the location of a convenience store, investigation showed that petroleum contamination was present in small area near the former dispenser island. The vadose-zone contaminated soil was excavation and disposed off-site. Ground water monitoring showed that the ground water impact was limited to a small area near the source of contamination. The decision was made to close the site by applying Petrox® bioremediation to the ground water.

Ground Water Contamination

The ground water contamination was in a shallow water table aquifer that had a medium permeability. The contamination was a suite of BTEX, PAHs and TRPH. The main contaminants were ethyl benzene, xylene, naphthalene, methylnaphthalene isomers and TRPH. The table below summarizes the contaminant concentrations.

Remediation Design

Petrox® bioaugmentation was selected to treat the ground water contamination, but a pilot study was completed in July 2012 to verify applicability. The pilot application was one drum of Petrox® and 50 pounds of EHC-O™ as an oxygen supplement. These amendments were applied to the ground water through direct-push injection around the impacted monitoring well. The pilot study showed applicability to the site by reducing the concentrations of BTEX compounds up to 92%, naphthalene 84%, methylnaphthalene isomers 10%, and TRPH by 85%.

The follow up monitoring showed that there was no contaminant rebound following the pilot study. However, the contaminant levels were still over the GCTL standards. A follow up application of one drum of Petrox® and 25 pounds of EHC-O™ to the same area was completed in August 2013. Post treatment results show that the contaminant concentrations were all reduced to below the GCTLs.

Results

The following table summarizes the contaminant concentrations in the impacted monitoring well.

Sampling Date	Ethyl Benzene (µg/L)	Total Xylene (µg/L)	Naphthalene (µg/L)	TRPH (µg/L)	1-methyl naphthalene (µg/L)	2-methyl naphthalene (µg/L)
4/27/12 Pre-treatment	853	1,104	381	16,600	32	43
6/18/13 Post pilot treatment	391	39	54	4,100	27	38
6/18/13 Post second treatment	<1.0	1.9	4.6	703	4.8	3.8

The post-treatment monitoring shows that the cleanup goals were met. The consultant will petition for site closure after completion of the monitoring period. The cost for the Petrox® used in treatment of the ground contamination was approximately $2,000.

Conclusions

Every site presents unique challenges, but the combined use of an oxygen supplement and bioaugmentation with petroleum-degrading, beneficial microbes removes much of the uncertainty regarding remedial performance. CL Solutions provides site evaluations and background biological testing to determine whether a site is appropriate for Petrox® bioremediation. Contact CL Solutions to discuss your site at msaul@cl-solutions.com or 513-284-5940.