

Combined Remedies Replace Costly Mechanical Remediation Systems

RegenOx[®] and ORC[®] Advanced Treat MTBE/TBA at Five Active California Service Stations

Project Highlights

- In situ chemical oxidation (ISCO), enhanced aerobic biodegradation replaced costly mechanical remediation systems.
- Underground infrastructure required extra precaution when applying remediation reagents on each site.
- Site closure or review of site closure at all five service stations.



Five active service stations in California were treated with RegenOx and ORC Advanced.

Project Summary

Five sites in Orange County, CA were selected for remediation using ISCO and enhanced aerobic biodegradation. All of the selected sites were gasoline service stations that were contaminated with low levels of hydrocarbons methyl tertiary butyl ether (MTBE) and elevated levels of the MTBE biodegradation daughter product tertiary butyl alcohol (TBA). The initial remediation approach consisted of soil vapor extraction, air sparging and dual phase extraction; however, contaminant concentrations remained elevated, impeding regulatory closure.

The decision was made to transition from mechanical-based remediation systems using a combination of ISCO and enhanced aerobic biodegradation to achieve site closure criteria with various regulatory agencies.

Site Type: Service Stations

Contaminant of Concern: MTBE/TBA

Remediation Approach: ISCO, Enhanced Aerobic Bioremediation

Soil Type: Silty Sand

Technology Used: RegenOx, ORC Advanced

Remediation Approach

Initial mass reduction was achieved using mechanical systems, however concentrations remained too high for regulatory closure. The goal was to reduce the remaining levels of petroleum hydrocarbons, MTBE and TBA using RegenOx and ORC Advanced. The service station included up to three direct-push injection applications of the reagents into areas where underground infrastructure was present on each site. RegenOx and ORC Advanced are both highly compatible with subsurface infrastructure so it was more of a challenge from a physical injection vantage. O&M strategy required monitoring of REDOX and microbial shifts. All five sites have been closed or under review for closure under the local regulatory agencies.

Technology Description

RegenOx is an advanced chemical oxidation technology that destroys contaminants through powerful, yet controlled chemical reactions and not through biological means. This product maximizes in situ performance while using a solid alkaline oxidant that employs a sodium percarbonate complex with a multi-part catalytic formula.

Advanced Formula Oxygen Release Compound (ORC Advanced[®]) is a proprietary formulation of food-grade, calcium oxyhydroxide that produces a controlled-release of molecular oxygen for periods of up to 12 months upon hydration.