

**CASE STUDY – LESSONS LEARNED USING IN SITU CHEMICAL OXIDATION
IN THE PRESENCE OF RESIDUAL PHASE FUEL OIL**

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An In-Situ Chemical Oxidation (ISCO) remediation was conducted at a residential property in New Jersey to address residual fuel oil contamination associated with the release from an underground storage tank. The release was immediately between two residential structures, thereby making removal via excavation in-practical. Bench tests were initially conducted to determine contaminant destruction efficiencies and oxidant demand. A series of tests were conducted at various oxidant concentrations and treated samples were analyzed for semi-volatile organics and TPH to determine contaminant destruction efficiencies. Review of these results supported the conclusion that ISCO was a feasible remedial technology for the site; however, the Complications arose during the initial phase of the remediation, where free phase hydrocarbons were present in several of the ISCO injection wells; a result that was inconsistent with the pre-remediation, site characteristic investigations. Interim measures were implemented to mitigate the free phase product in advance to the ISCO injections, via short term pump, treatment and re-injection in the perimeter wells. Once free phase product was removed from the existing well network, the ISCO injection was implemented, with positive results observed in ground water quality two months after the injection. However, after a significant precipitation event, free phase hydrocarbons were again present within the well network, showing the importance of proper pre-remediation planning and characterization for the successful implementation of ISCO remedial programs. Subsequent investigating confirmed a pocket of free product was beneath one of the residential structures that was inaccessible during pre-remediation delineation. The following actions to address the residual source of free phase product, in light of the presence of a persistent source, are illustrated along with the post injection performance monitoring data.

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