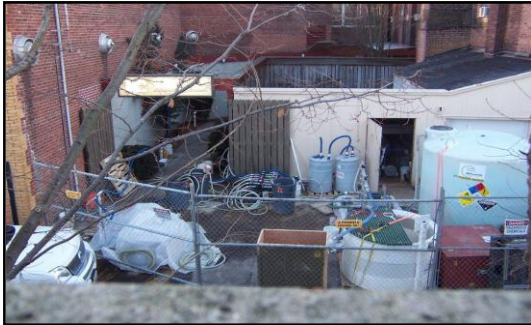




CORPORATE:

3203 Audley Street
Houston, TX 77098
Phone (713) 585-7000
Fax (713) 585-7049

6 Fuel Oil NAPL Remediation Using In Situ Chemical Oxidation Historic Building in North Attleboro, Massachusetts



MEC^x, LLC (MEC^x) conducted an in situ chemical oxidation (ISCO) application at a historic building in North Attleboro, Massachusetts. The site was affected by #6 fuel oil released from a leaking underground storage tank. Total petroleum hydrocarbons (TPH) in the form of non-aqueous liquid (NAPL) was the primary driver for remediation. The average soil baseline TPH concentration for the site was 13,750 mg / kg (ppm). NAPL thickness varied across the site, with observed thicknesses ranging between 1 to 30 inches. The baseline volume of NAPL in the treatment area was estimated by the project consultant to be approximately 2,000 gallons. The affected zone was located between

14 to 20 feet below ground surface (bgs) and consisted of fine to coarse grained sands with some silt. The site specific remedial objective established for the site was to reduce measurable NAPL in all monitoring wells on site to ½ - inch or less.

In February 2007, MEC^x performed a two-week ISCO application using sodium persulfate activated by catalyzed hydrogen peroxide (CHP). The application was performed through six ISCO temporary application wells installed across the treatment area. MEC^x field personnel monitored the effects of the reagent application in adjacent monitoring wells to evaluate the performance of the technology at the site and to maintain control of the reactions. Groundwater in the target wells and other monitoring points in the vicinity of the application were monitored for dissolved oxygen, pH, specific conductance, temperature, oxidation / reduction potential and static water level. Subsurface ISCO reaction temperatures were also monitored real-time throughout the application process.

Due to the treatment area's close proximity to several occupied buildings, MEC^x installed and operated a temporary subsurface vapor recovery system during the ISCO application. The purpose of this system was to provide redundant pressure control to ensure that vapor migration or intrusion into the sublevels of the adjacent buildings did not occur during the ISCO application. This vapor recovery system was a backup system to MEC^x's primary pressure control system which consists of pressure management via controls at application wells.

Several weeks after completion of the ISCO field application, post-treatment monitoring was conducted by the project consultant to evaluate the effectiveness of the ISCO application. A summary of the pre and post – ISCO data is provided below:

Parameter	Pre-ISCO (Baseline)	Post-ISCO Value
Estimated NAPL volume	2,000 gallons	600 gallons
Average NAPL thickness	1 to 30 inches	< ½-inch
Average TPH concentration in soils	13,750 mg/Kg	8,500 mg/KG

Based on the significant reductions in NAPL thickness and TPH concentrations in soils as a result of the ISCO application, the client has received approval from the State of Massachusetts to close the site with a use limitation placed on the deed to limit its future use. However, at the client's request, MEC^x is currently evaluating the feasibility of conducting a supplemental ISCO application at the site that would further reduce TPH concentrations in soil to levels that would provide for closure of the site with no use limitations. MEC^x anticipated conducting a supplemental application in the Fall of 2007.

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