

ISCO CASE STUDY: USE OF CATALYZED HYDROGEN PEROXIDE FOR TREATMENT OF MTBE AND TBA, WOODLAND HILLS, CA

INTRODUCTION

In March 2008, JAG Consulting Group, Inc., implemented a Catalyzed Hydrogen Peroxide (CHP) groundwater treatment at a former UST site in Woodland Hills, California. A high vacuum dual phase extraction (HVDPE) system was previously operated at the site to remediate the soil and groundwater beneath the site. The HVDPE system was successful in removing most of the contamination under the site, but elevated levels of BTEX, MTBE, and TBA were still present in two wells on-site. Because of its short timeframe and cost effectiveness, in-situ chemical oxidation (ISCO) using the Catalyzed Hydrogen Peroxide was selected to remediate the groundwater plume.

PROJECT BACKGROUND

The Site was a typical UST facility encompassing a small corner lot. Low to elevated levels of MTBE and TBA plume (approximately 4,000 square feet) were still present at the site. The ISCO injections were completed with minimal disruption to the active car repair business occupying the site. The shallow groundwater zone consists primarily of silty clay with thin interbedded lenses of sand and gravel.



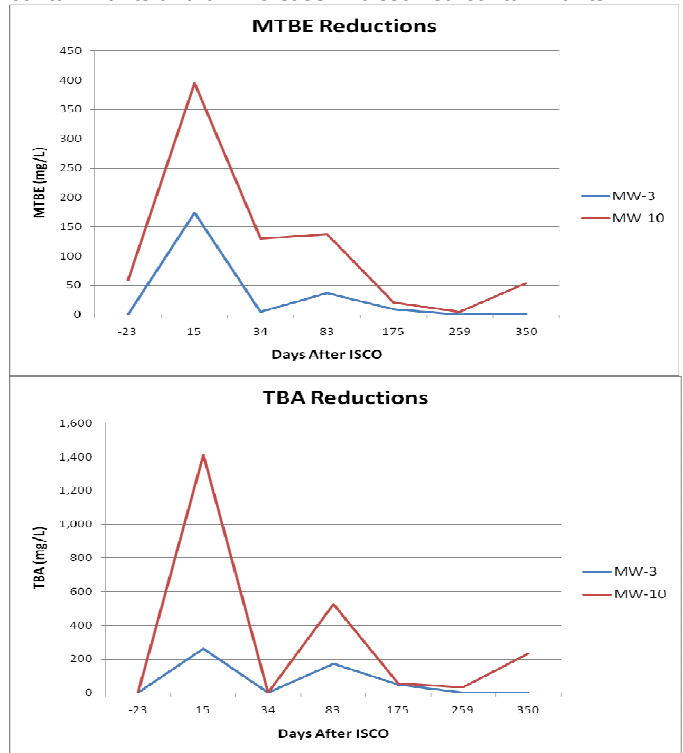
ISCO DESIGN

The ISCO injection was designed to include 11 injection wells with an overlapping radius of influence of approximately 13 feet each. The injection wells were screened at depths of 10 to 20 feet. Injection rates were low, on the average of about 0.25 gallons per minute, due to the vigorous reaction of the peroxide. Approximately 2,900 gallons of 10% hydrogen peroxide were injected and then catalyzed using a low pH ferrous iron solution (Fenton's type reaction). The injections were performed simultaneously into all eleven injection wells using a manifold system.

The chemical oxidation process can be described as a controlled, moderate-high temperature, and low-pressure application. In-situ temperatures between 120 and 150 degrees Fahrenheit were continuously monitored and maintained using thermocouples and data-loggers during the injections, which ensured the optimal generation of hydroxyl radicals and desorption of contaminants from the soil.

ISCO EFFECTIVENESS

An overall MTBE reduction of 92%, a TBA reduction of 91%, and a benzene reduction of 93% was achieved as a result of the ISCO injections. Graphs of the MTBE and TBA reductions for a one year period following the ISCO injections are presented below. Note the initial increases in MTBE and TBA concentrations after 15 days is due to the desorption of contaminants and an increase in dissolved contaminants.



In October 2009, this site received a No Further Action (Final Closure) from the Los Angeles Water Quality Control Board.

CONTACT INFORMATION

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