

# ISCO CASE STUDY: IRON ACTIVATED SODIUM PERSULFATE TREATMENT OF MTBE IN GROUNDWATER, CAMP PENDLETON MARINE CORPS BASE, CA

**INTRODUCTION**

In March and July 2009, JAG Consulting Group completed two injections of iron activated sodium persulfate for treatment of MTBE at a gas station UST site at the Camp Pendleton Marine Corps Base, CA. The sodium persulfate was activated using chelated iron (EDTA). The work was performed under a Waste Discharge Requirements (WDR) Permit issued by the San Diego Regional Water Quality Control Board.



**PROJECT BACKGROUND**

An extensive MTBE plume had migrated off-site from a gas station UST site and extended over 200 feet in length along Christianitos Road. The soils at the Site consisted primarily of sands, gravels, and some silts to a depth of 40 feet. The depth to groundwater at the Site was approximately 30 feet below ground surface (bgs).

**ISCO DESIGN**

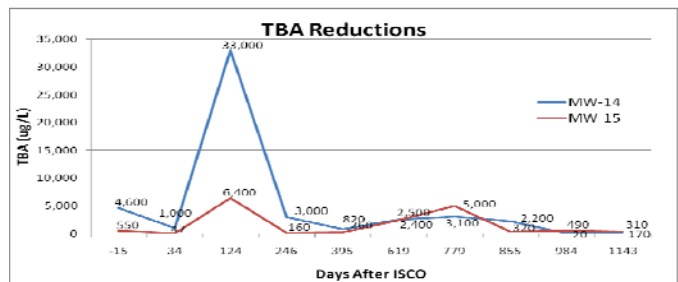
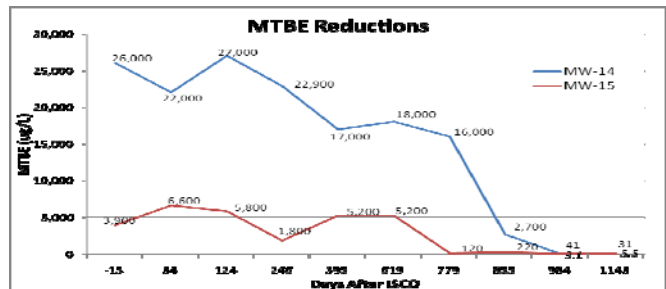
Eight injection wells were constructed in a linear fashion along the length of the MTBE plume over 10,000 µg/L. The injection wells were screened from approximately 30 feet to 40 feet below ground surface (bgs). Each well was estimated to have a radius of influence of approximately 15 feet each.

Over the duration of this project, a total of 14,000 gallons (16,000 pounds of sodium persulfate and 4,000 pounds of iron EDTA) were mixed into solution and injected into the groundwater. The injections were completed over two injection events approximately 4

months apart. During the injections, JAG Consulting provided water quality measurements of pH, dissolved oxygen, ORP, conductivity, and temperature in nearby monitoring wells, which helped to determine whether oxidizing conditions were being achieved throughout the treatment zone.

**ISCO EFFECTIVENESS**

Following the ISCO injections, quarterly sampling of five monitoring wells was performed to track the progress of VOC cleanup. A declining trend in MTBE was measured in all the monitoring wells over the first 6 months. However, due to the location of the monitoring wells (outside of the radius of influence), the declining trend in MTBE was slower and longer than usual and continued for nearly three years. During this extended period, a bio-stimulation effect and the gradual downgradient migration of the treated groundwater resulted in continuing declines in wells MW-14 and MW-15 (as shown in figures below). In October 2011, two and one-half years after the injection events, the MTBE levels had declined to levels below the cleanup level (less than 100 µg/L).



This ISCO project highlighted the importance of establishment of adequately located monitoring wells within the radius of influence. The San Diego RWQCB issued a Closure of the Site (No Further Action) in late 2013.

**CONTACT INFORMATION**

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