CASE STUDY: FULL SCALE ISCO TREATMENT USING POTASSIUM PERMANGANATE, LA MIRADA , CA

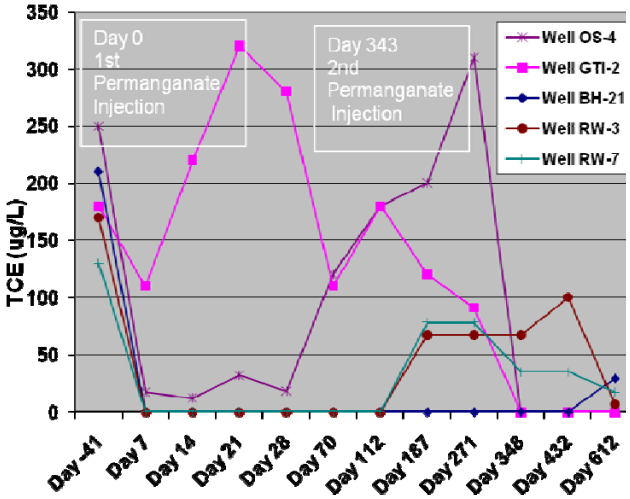
From April 2008 to March 2009, JAG Consulting Group completed a successful full scale ISCO treatment on a large TCE and 1,1-DCE plume using potassium permanganate ($KMnO_4$). The ISCO treatment was performed under a General WDR permit issued by the Los Angeles RWQCB.

SITE DESCRIPTION

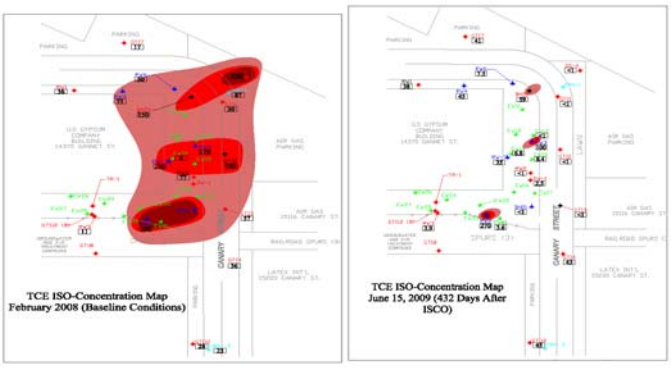
The project site is a moderate size industrial facility located in La Mirada, CA. TCE leaking from an underground storage tank caused extensive groundwater contamination at the site. A comprehensive site characterization was completed at the site to fully delineate the extent of TCE contamination. The TCE plume measured nearly 350 feet long and 150 ft wide at the time of the permanganate treatment. A total of nine injections were utilized for the full scale treatment. Seven existing monitoring wells were used as injection wells to minimize costs.

FULL SCALE $KMnO_4$ TREATMENT

The Full Scale permanganate treatment was performed by mixing and injecting over 35,000 gallons of 3% permanganate into the injection wells in March 2008. Significant reductions in the TCE levels to below 50 µg/l were measured in five monitoring wells following the permanganate treatment as shown in the graph below.



In April 2009 (Day 343), a second injection of 6,600 gallons of permanganate was injected into off-site well OS-4 and three other wells. An immediate reduction in TCE in well OS-4 from over 300 µg/l to non-detectable was monitored after this injection. Overall, the TCE plume has been reduced by over 95% in size. The map below illustrates the size of the TCE plume before and after treatment.



PUSH-PULL TECHNOLOGY

A radius of influence of 15 to 20 feet was initially confirmed by measurement of field water quality parameters following KMnO4 treatment. As a means of extending the radius of influence, four down-gradient wells located various distances away from the injection wells were pumped for several days after the injections were completed. Using this push-pull technique, the permanganate solution attained an expanded radius of influence of over 60 feet. This push-pull technique was very useful in minimizing the number of injection wells required to treat the off-site plume. Based on the success of the permanganate treatment, a meeting with the Los Angeles RWQCB has been scheduled to discuss closure of the site.

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