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Use of Innovative In-Situ Remediation Strategies to Achieve Cleanup of a Complex Site

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Over the past 25 years, multiple in-situ remediation technologies have been implemented at a large, complex groundwater site in Los Angeles County, CA. The timely availability of these innovative technologies has allowed the site to be remediated in a more rapid and cost effective fashion. Site complexities involving the presence of two distinct groundwater plumes (one benzene and one chlorinated plume), has required continual implementation of new remediation technologies over time.

Initiated in 1995, a groundwater pump and treat system (considered state of the art at the time) operated over a ten year period and was effective in reducing the overall size of the two plumes. However, the remaining groundwater contaminant levels still required more focused treatment to attain cleanup levels. Starting in 2007, several in-situ chemical oxidation (ISCO) injection events were performed. For the benzene plume, injections of hydrogen peroxide and later with sodium persulfate, were performed which ultimately achieved a nearly complete removal of benzene (less than 5 µg/L).

For the TCE, 1,1-DCE, and 1,4-dioxane plume, multiple injections of potassium permanganate were performed over a two year period. Significant reductions in TCE, 1,1-DCE, and 1,4-Dioxane were achieved, but the contaminant levels plateaued at approximately 100 µg/L.

In 2015, robust aerobic populations of methane oxidizing bacteria and mono-oxygenase enzymes were confirmed at the site which were co-metabolizing the remaining levels of TCE, 1,1-DCE, and 1,4-dioxane. To achieve the final cleanup of the chlorinated compounds, a monitored natural attenuation (MNA) strategy was implemented with the approval of the Los Angeles Water Quality Control Board. Since 2015, the TCE, 1,1-DCE, and 1,4-dioxane in key wells have attenuated by more than 50% due to aerobic microbiological degradation. JAG is currently in negotiation with the Los Angeles Water Board to obtain final site closure.