

## **Impacts of capping contaminated sediments at groundwater-surface water interfaces**

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**Abstract.** Contaminated sediments are emerging as a major cost liability for the petroleum industry. In response, Colorado State University (CSU) and Chevron initiated a new research thrust in 2015 exploring solutions for managing sediment impacted by petroleum facilities through the primary object of assessing current remediation strategies. Current best practices for sediment remediation include dredging, capping, and sequestration. These technologies are appropriate for stabilizing persistent contaminants such as metals and polychlorinated biphenyls (PCBs). However, capping and sequestration may limit natural attenuation of degradable contaminants through oxygen preclusion and/or increased oxygen demand exerted by sorbent materials. Further, the aerobic and biologically diverse nature of groundwater-surface water interfaces, where many contaminated sediment sites are located, are not leveraged through the capping approach. Laboratory experiments will elucidate the impact of various capping materials and inform a one-dimensional, multi-component model for capped sediments. A dissolved phase column study examining the impacts of four different capping materials is currently underway; oxidation-reduction potential, pH, and contaminant concentration data are being collected and analyzed. Additionally, a non-aqueous phase liquid (NAPL) column study is being assembled to determine the time-to-breakthrough of contaminants capped with the same selection of capping materials. A video of NAPL transport through the capped columns will also be generated through this experiment. Collectively, the data will shed light on the perceived vulnerabilities associated with capping contaminated sediments.