

Continuous Delivery of Reagents in Enhanced Reductive Dechlorination (ERD) Remedial Strategies and the Potential for Biofouling

Kelli Jo Rehder, Elena Moreno-Barbero and Jay Erickson
ARCADIS, Highlands Ranch, Colorado

Abstract. Continuous remediation reagent delivery via recirculation allows large volumes of reagent to be delivered in three dimensions throughout *in situ* contaminant treatment zones. Recirculation facilitates this continuous delivery by providing a source of supplemental water and hydraulic control. Although continuous delivery offers many advantages by controlling the distribution of reagents, it also presents several challenges that may not be present in more typical batch-type injection approaches. For example, it requires a higher level of control and monitoring and creates nutrient-rich conditions within the injection well and filter packs that favor rapid microbial growth and biofilm formation. This potentially limits the proper function of the well and could ultimately cause severe losses in well efficiency. To highlight the advantages and related challenges associated with a continuous recirculation approach, a case study is presented. Enhanced Reductive Dechlorination (ERD) is one of the selected technologies applied to a 5,000 m long trichloroethene (TCE) plume in the Ogallala aquifer of west Texas, facilitated by the continuous reagent delivery of organic carbon in the form of molasses. Although the technology is successfully remediating TCE *in situ*, biofouling has proved to be a significant challenge to successful long-term operation. Currently-applied well fouling controls and alternative treatment options that are being evaluated will be discussed.