

Addressing High Concentration Solvent Sites (DLNAPL) with a Combined-Remedy: Emulsified Oil and ZVI

Brad Elkins and Jean Paré, CHEMCO

The use of in situ chemical reduction (ISCR) and enhanced in situ bioremediation (EISB) for treating recalcitrant compounds in groundwater has become a cornerstone in the environmental industry over the last decade. They are also sought-after during Brownfield redevelopment projects because they require no on-site infrastructure, have a relatively low cost of implementation and provide long remediation life typically on the order of years for a single application.

It is common that practitioners will use one or the other at any given site when addressing chlorinated solvents like Tetrachloroethene (PCE). In fact, these technologies are often married together because they share a similar redox state and do not directly compete in the subsurface. However due to this popularity sometimes one technology or the other is not appropriately applied. EISB for example can have inefficiencies when groundwater conditions are acidic, or the plume is co-mingled with both ethene and ethane compounds. Whereas ISCR reagents (zero valent iron) must come into direct contact with the contaminant in order to degrade it into less chlorinated daughter products.

In this presentation we will explore both the strengths and weakness of both technologies. It will cover example site conditions and limitations that must be overcome for either technology to result in a successful outcome. Finally, we will share a case study from a California dry cleaner where both EISB and ISCR were deployed in tandem resulting in several orders of magnitude decrease in PCE.

Jean Paré

Jean Paré has a degree in Chemical Engineering from Laval University. He has been involved for the last 22 years in the evaluation, development, design, and promotion of both conventional and innovative environmental technologies. As Vice President with Chemco Inc., his responsibilities include the remediation design, techno-economical analysis and technology supply for chemical oxidation and reduction, soil washing, and enhanced bio-remediation. Last year, he worked with over 400 sites applying his expertise to various types of organic and inorganic contaminants in soil and groundwater. He is also involved with many environmental organizations such as CLRA, CBN, ESAA, BCEIA and Réseau-Environnement where he is an active technical committee member and regular technical speaker.