

## Dispelling Myths and Extolling the Virtues of the Emulsified Zero Valent Iron (EZVI) Technology

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**Background/Objectives.** EZVI is a unique ISCR halogenated DNAPL destruction technology that utilizes the combined effects of biological, chemical and physical processes to provide rapid mass flux abatement and direct destruction of free phase and residual source materials. The EZVI technology was first implemented for full-scale DNAPL remediation in 2005. Since then, it has been utilized at many sites across the USA, Canada and the EU.

**Approach/Activities.** There are multiple products and formulations of EZVI that are commercially available under the NASA EZVI patent. But many of these are not EZVI, as we define. Hence, it is imperative that the remedial practitioner understand the composition of the product that they are purchasing in order to be sure that it will perform as desired and that it is compatible with site-specific remedial objectives.

**Results/Lessons Learned.** In situ DNAPL destruction utilizing the EZVI technology is frequently utilized among seasoned professionals as the positive effects of rapid mass flux abatement and source area destruction are realized. During the presentation, the following topics will be discussed:

- i. When is EZVI a remedial option? – Guidelines for the effective use of EZVI will be presented, including product formulation, dosing and implementation options for vadose and saturated soils.
- ii. How does EZVI product composition vary and what are the consequences? – Various key parameters for the technology will be discussed, including ZVI particle size, emulsion type, and the associated remedial implications.
- iii. What are the most recent advances to EZVI technology? – Important advancements will be discussed, including antimethanogenic properties, enhanced reactivity, enhanced emulsion stability (longevity), and decreased emulsion viscosity.
- iv. Cost and Benefit Analysis – Cost and benefits will be discussed for the EZVI-CH<sub>4</sub> product.