

# Cascade Chemistries

## SOURCEKILL<sup>SM</sup>



### WHAT IS SOURCEKILL?

SourceKill is the most reactive and DNAPL specific chemistry on the market today. Offered exclusively by Cascade Environmental, it is manufactured by TEA Inc. the first and US leader to providing this engineered in situ chemistry solution for DNAPL.

### HOW DOES IT WORK?

SourceKill involves placing micro-scale zero valent iron (ZVI) particles into a surfactant-stabilized, biodegradable water-in-oil emulsion. This emulsion is injected into the DNAPL-contaminated zones. The DNAPL is then pulled (sequestered) into the emulsion where the CVOC's react with the ZVI. Through a process known as chemical reduction, primarily through the beta elimination pathway, the DNAPL and its daughter products are degraded into ethene, ethane and other hydrocarbons. The by-products are finally broken down through biological activities in the subsurface.



### Advantages for distribution, contact & residence time

SourceKill can be emplaced into target DNAPL zones, typically in a grid pattern through direct push, sonic or straddle-packed boreholes either by pneumatic or hydraulic fracturing into either lower and/or higher K zones.

### Benefits of ZVI biotic/abiotic reactions and...

- Injected as neat solution, at 10% to 20% of pore space while requiring no dilution.
- High persistence in the subsurface, 5 to 10 years (or more), to account for DNAPL diffusion into the EZVI.
- Optimized propriety manufacturing process resulting in EZVI consistent with the NASA patent.
- Can be integrated into combined spatial remedies with other chemistries including bioremediation, chemical oxidation/reduction, or sequestration.

For more information, visit  
[www.cascade-env.com/  
cascade-chemistries](http://www.cascade-env.com/cascade-chemistries)

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### TURNKEY SOLUTIONS

While effective chemistries are a key part of successful remediation solutions, Cascade's turnkey solution meets the overall in situ remediation objective "to make contact with contaminant mass for a long enough period of time to achieve destruction." Cascade adds significant value to the application of SourceKill by providing:

- High resolution design optimization through our MiHPT subsurface technologies to identify target zones based on mass, lithology, and hydraulic conductivity.
- Screening of DNAPL sites using our expert rules framework
- Advanced pneumatic and hydraulic fracturing technologies with high flow and pressure pumping systems to optimize contact.
- Client design support for dosing and critical injection parameters, including spacing and injection volumes and concentrations based on geology and hydraulic conductivity. Bench-scale and field design optimization services available.



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