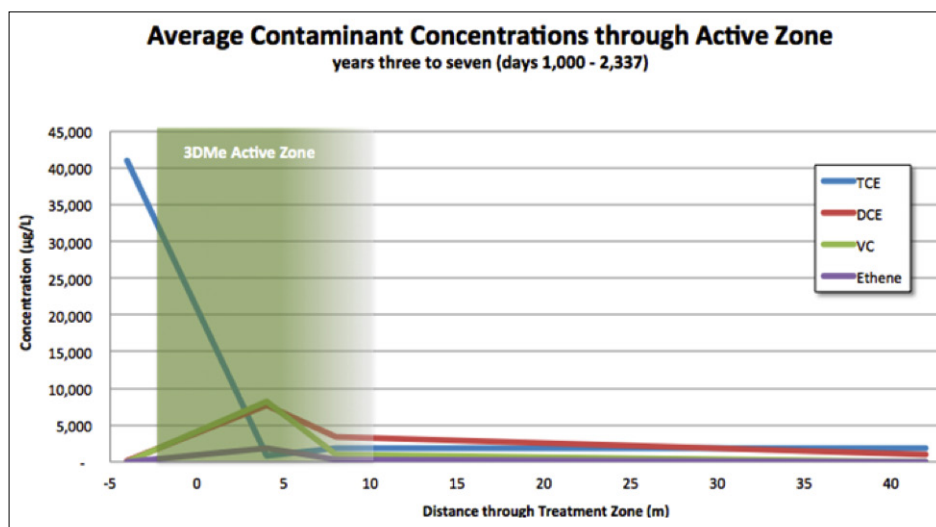


Pilot Study: Treatment of Chlorinated Solvents in Limestone Bedrock

A Barrier Treatment Demonstrates Longevity of 3-D Microemulsion



Summary

A large volume of a limestone bedrock aquifer was impacted with chlorinated solvents from industrial activity on the site. The TCE contamination had accumulated in a highly impacted 'source' area, with concentrations indicative of DNAPL. The dissolved phase plume from the contamination extended over a kilometre downgradient and presented a risk to nearby water abstraction points.

Treatment

By drilling wells to the bottom of the contaminant plume at 50mBGL, 3DMe could be injected into the source area on a widely spaced injection grid and in the plume area in a series of barriers. As 3DMe self-distributes in the subsurface, the number of injection points could be minimised, making the treatment economically viable.

It was decided that a pilot study should be completed prior to the main works and 3DMe was injected into two wells on the edge of the source area in order to provide a barrier effect, which could be monitored downgradient. Due to economic conditions, development of the site was postponed and the length of the pilot trial effectively became extended.

The graph shows a plot of the average concentrations of chlorinated solvents in the wells transecting the barrier over a period between 3 to 7 years. It can be seen that the barrier has produced the full reductive dechlorination of an ongoing influx of approximately 40,000µg/L for this entire time.

What's Special?

- The ability of 3DMe to self-distribute has allowed the remediation to be designed on a wide (10m) spacing, reducing the drilling and application cost and making treatment affordable for this very large site.
- The pilot study has shown that 3DMe can fully reductively dechlorinate solvent contamination in a limestone bedrock and that no build-up of breakdown products occurs.
- The pilot study shows that 3DMe provides a controlled release of electron donor for an extended period from a single application.

Remediation Details

Site Type:

Industrial

Project Driver:

Development

Remediation Approach:

Injection into Wells

Technologies:

3-D Microemulsion® (3DMe)

Geology

X	Bedrock
	Gravel
	Sand
	Silt
	Clay

Medium

X	Groundwater
	Saturated Soil
	Vadose Zone

COC

	Petro HCs
	Petro LNAPL
X	Chlorinated VOCs
	Metals

COC Concentration Levels:

40,000 µg/L

Treatment Level:

25 m BGL

Treatment Area:

Small pilot study on
5 Hectare site