

# Free Product Removal Injection – BTEX

Active Gas Station – Davison, MI

## Two Rounds of DPT Injection

**Project Summary:** ORIN successfully implemented Free Product Removal (FPR) in-situ chemical oxidation using catalyzed sodium persulfate to treat LNAPL, contaminated soil, and groundwater. Treatment chemistry was injected while the Geoprobe rods were raised throughout the target interval. A vac truck was present to remove LNAPL and desorbed contaminants while providing hydraulic control. Approximately 2,400 gallons of 20% sodium persulfate catalyzed with PermeOx Plus was injected into 47 DPT injection locations. A second polish injection was needed to achieve site cleanup goals. In June of 2011, 24 DPT points were injected with approximately 1,200 gallons of 20% catalyzed sodium persulfate treatment

Exceeds 78% Reduction

### Site Conditions:

#### Groundwater Contaminants –

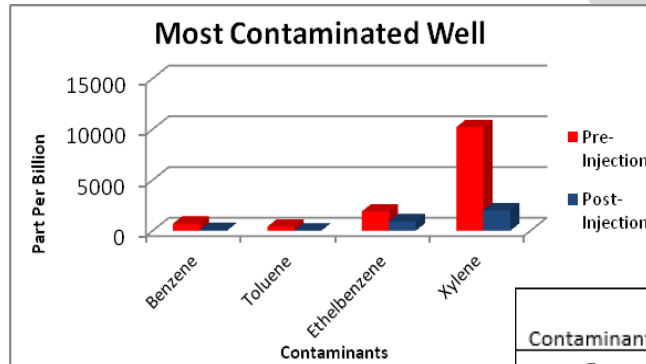
- Benzene: 700 µg/L
- Toluene: 400 µg/L
- Ethylbenzene: 1,900 µg/L
- Xylene: 10,200 µg/L
- LNAPL: up to 8.5 inches

#### Impacted Matrix –

- Clay and Silty Clay
- 4 to 8 ft-bgs

#### Treatment Chemistry –

- Catalyzed Sodium Persulfate and PermeOx Plus



Contaminant	Pre-Injection	1 Year Post-Injection	Percent Reduction
B	700	60	91.4
T	400	<50	>87.5
E	1,900	930	51.1
X	10,200	2,010	80.3

**Project Results:** The catalyzed sodium persulfate treatment chemistry removed the free product and reduced the dissolved phase BTEX concentrations at the most contaminated well by an average of 78%, between pre-injection and post-injection sampling. Additionally, subsequent sampling events have observed no measurable LNAPL. The residual PermeOx Plus catalyst will continue to provide an oxygen source promoting bioremediation.