

PCE MASS REDUCTION & PLUME ATTENUATION: BOS 100® INJECTIONS AT A MANUFACTURING FACILITY

ABSTRACT

Historical manufacturing activities resulted in cVOC impacts to soil and groundwater at an active manufacturing facility in the Northeast United States. Groundwater remediation was conducted as part of a combined remedy with soil vapor extraction (SVE). In the end, BOS 100® was selected due to oxidant demand, no daughter product generation, and cost. Groundwater site objectives were reached in less than 12 months.

CHALLENGES & OBJECTIVES

The site is an operating manufacturing facility and injections needed to be conducted inside and outside of the main warehouse. Inside of the warehouse, space limitations, injection point access, and forklift traffic were challenges that had to be addressed. Outside of the warehouse, managing site traffic for forklifts and freight trucks was paramount. The remedial objective was to reduce PCE and total cVOC concentrations at the source area from historic high PCE concentrations of 47,000 ug/L.

- Trap & Treat® was selected in a comparative performance evaluation versus chemical oxidation and enhanced bioremediation, primarily due to total oxidant demand and cost.
- Site design was based on both activated carbon and metallic iron demand.
- Injected 16,900 lbs of BOS 100® at 90 locations outside and 109 locations inside of the main warehouse building.
- Remediation activities were sequenced and completed in 19 days while scheduled around active manufacturing and warehousing operations, including maintaining active forklift lanes.

PROJECT SNAPSHOT

Key Dates

- MIP Survey, Soil Sampling, & Bench Scale Testing: 2013
- Remedial Investigation Feasibility Study: 2015
- Implementation: November to December 2017

Lithology: Low permeability silt and glacial till; aquitard at 20 ft bgs

Depth to Groundwater: 8 ft bgs

Contaminant: PCE, dissolved phase groundwater impacts of 2,200 to 12,000 ug/L (pre-injection baseline)

RESULTS

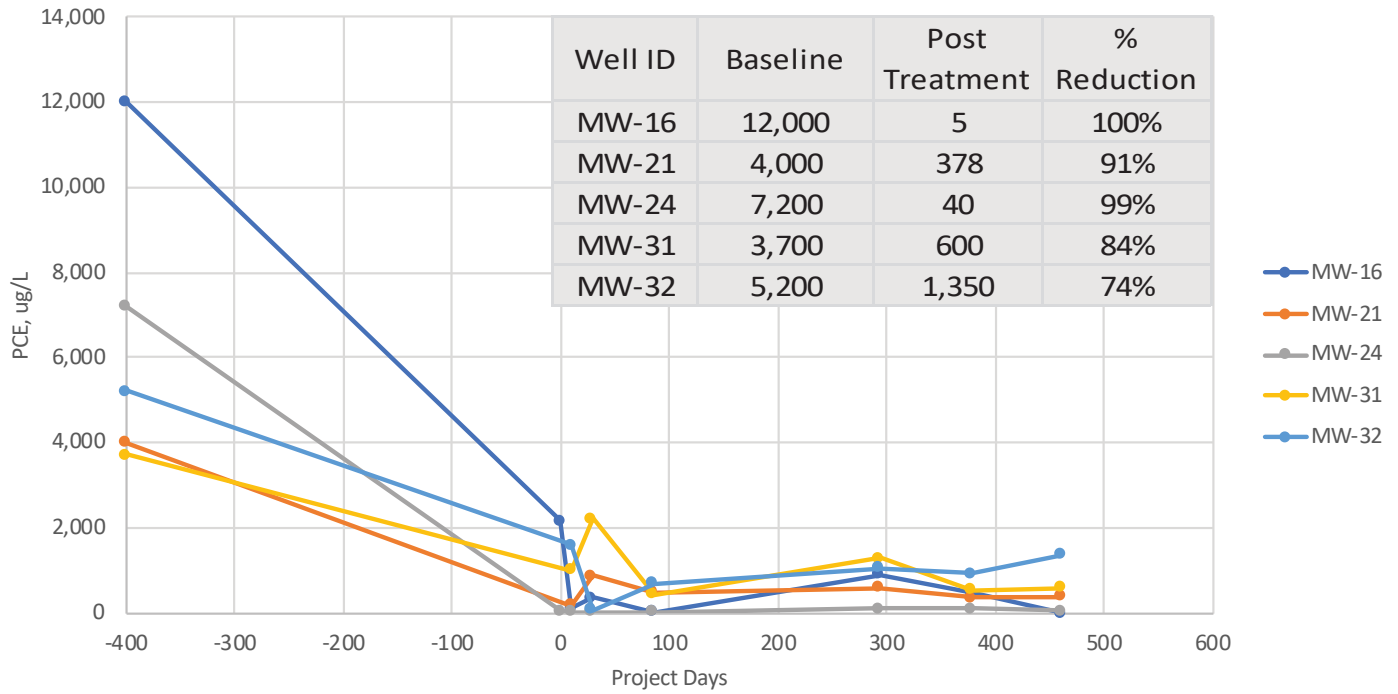
- 88-99% reduction in PCE occurred within three weeks post-injection.
- 12 months post-injection all monitoring wells in treatment area registered less than 1,000 ug/L objective for PCE.
- RPI laboratory was utilized during injection and post-injection to monitor PCE concentrations, dissolved gases, chloride generation, and other geochemical parameters.

DIAGRAMS

Figure 1. Interior BOS 100® Injections



Figure 2. PCE Concentrations versus Time



Acknowledgements: AECOM and ISOTEC (RPI Group Installer)