

CAT 100 and BOS 100® Address DNAPL and Mass Flux at Manufacturing Site



Summary

- Location: Indiana, USA
- Source treatment area: 5,400 ft² (502 m²)
- Permeable reactive barrier length: 375 ft (114 m)
- Lithology: Mix of silt and sand
- Depth to water: 5 to 8 ft (1.5 to 2.4 m) below grade
- COCs: PCE, TCE, cis-1,2 DCE, VC
- Implementation method: Direct push
- Technologies: BOS 100® and CAT 100

Challenges and Objective

The site is a manufacturing facility from 1912 with historic activities like steel stamping, machining, cleaning, degreasing, heat treating, electroplating, painting, and assembly. Multiple contamination sources resulted in soil and groundwater containing chlorinated volatile organic compounds (CVOCs) that risked offsite migration and vapor intrusion. Dense non-aqueous phase liquid (DNAPL) was detected in at least two areas. Groundwater ranged from 5 to 8 ft (1.5 to 2.4 m) below grade; impacts extended to 30 ft (9.1 m). The objectives were: Stage 1—implement an interim remedial measure (IRM) to reduce DNAPL-level CVOCs; Stage 2—install a permeable reactive barrier (PRB) to limit offsite CVOc migration.

Approach

Earlier ERD efforts reduced PCE and TCE, but daughter products persisted. CAT 100 was used for CVOC mass reduction, followed by a PRB along the boundary with the BOS 100 technology. Contaminant mass and reagent loading were determined using the Remedial Design Characterization (RDC) approach. This included the advancement of 37 soil borings and the collection of 79 groundwater samples.

Results

After treatment, CVOCs in perimeter and off-property wells met residential standards, and source area CVOCs dropped 90-100%, except vinyl chloride in one well, which decreased over time. Increased ethylene and dissolved chloride indicated thorough dechlorination. Microbial diagnostics showed sustained optimal levels for 5 years post injection. The site remains under long-term monitoring.

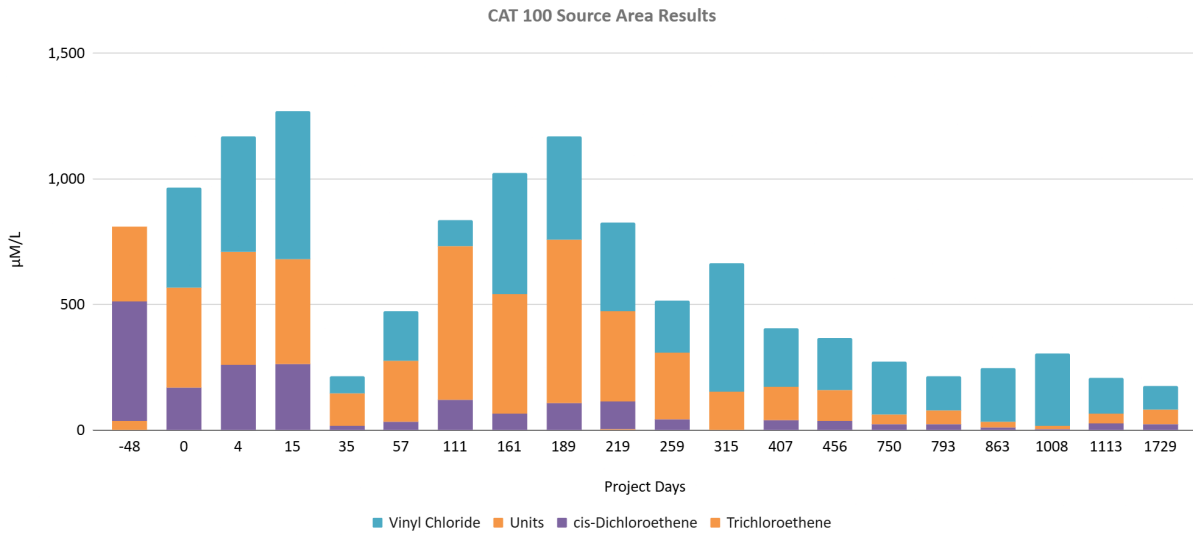


Figure 1. Molar Stack Plot of Source Area Monitoring Well