

Chlorinated Aerospace Facility Demonstration

Background: A national consulting firm selected the ART In-Well Technologies, following a thorough feasibility study, as the most viable remedial alternative to treat soils and groundwater at a former aerospace facility. The subsurface at the site was impacted by chlorinated compounds to a depth of approximately 60 feet below grade surface (bgs), groundwater was encountered at approximately 30 feet. The hydraulic conductivity at the site is assumed to exceed 10^{-5} cm/second. The site has an existing Pump and Treat (P&T) system that has operated since 1990, and had reached asymptotic removal trends.

ART Demonstration: To confirm the ART Technologies applicability and efficacy to treat soil and groundwater at the site, a one well demonstration (pilot) study was performed by the site consultant in collaboration with ART. A single-well demonstration unit was leased from ART and was delivered, installed and operated for 90 days in late 2014. Baseline sampling and periodic monitoring including field geochemical parameters, water levels, contaminant analytical data and effluent vapor sampling were performed.

Results: Results indicate a reduction in volatile organic compounds (VOC) concentrations at the piezometers within 30 feet of the ART treatment well and observed geochemical changes at least 40 feet from the remedial well. The table below summarizes the percent reduction at the monitoring points during the pilot test, and their relative distances to the ART treatment well.

Monitoring Point Analytical Results

Monitoring Point	% VOC Reduction (during Pilot Test)	Distance from ART-1 (feet)
PZ-1	95%	5
GW06	94%	10
PZ-2	91%	11
PZ-3	83%	30
PZ-4	4%	40

Radius of Influence

Observed contaminant concentration and geochemical trends demonstrated that within 90 days the ART system established a circulation cell, flushing the treatment zone to mobilize and strip VOCs. This process allowed for transport of VOCs to the treatment well and removal from the subsurface.

- Vacuum influence measured at least 40 feet from remedial well.
- 83% contaminant reduction at 30 feet from remedial well **in just 90 days**.
- DO increase observed at least 40 feet while system operational.
- ORP increase observed during operations 40 feet from remedial well, returned to baseline after shut down.

Consultant Conclusion:

Based on trends in geochemistry and COC concentrations, the ART pilot test was successful at removing contamination from the vadose and saturated zones within the treatment area. The geochemical changes observed in the monitoring points in conjunction with the increased rate in mass removal during the pilot demonstrated the ART system established a circulation cell, flushing the treatment zone to mobilize and strip VOCs from the surrounding formation. Full-scale implementation of the ART Technologies represents a viable option for augmenting or replacing the existing P&T system and reducing the remediation timeframe for the site.

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