

VOC and 1,4 Dioxane Case History

ART In-well Remediation Technology

Accelerated Remediation Technologies, LLC (ART) was secured by a major aerospace company to implement the ART In-Well Technology at a 1,4-dioxane impacted site in North Carolina. The client and consultant elected to install the ART In-Well Technology in a single well in the source area to evaluate its ability to treat VOCs and 1,4-dioxane. ART worked closely with the client's consultant to configure and install the ART Technology in a saprolitic soil over fractured bedrock.

The ART Demonstration Well was installed in the source area where 1,4-dioxane concentrations exceeded 43,000 µ/L. Two monitoring wells were positioned 10 and 20 feet downgradient from the ART well. The 1,4-dioxane concentrations in the adjacent groundwater monitoring wells and in extracted vapors were analyzed. Groundwater results for 1,4 dioxane are listed below. Analytical testing of the vapor stream indicated that significant amounts of 1,4-dioxane and other chlorinated compounds were being stripped from the subsurface.

	MW-1	MW-2	Vapor
Distance from ART Well	10 feet	20 feet	
Initial Concentrations (µg/L)	25,000	28,000	490
30 Days Concentrations (µg/L)	7,500	2,600	740
60 Days Concentrations (µg/L)*	27,000	7,700	ND
90 Days Concentrations (µg/L)	7,400	2,400	1,100

* Evaluation of sampling procedures indicates that results for this round may be inaccurate.

The integrated remediation concepts employed by the ART Technology result in multiple, in-situ stripping passes of each unit of water, flushing of the vadose zone and circulation within the soil/water column. Accordingly, it is believed that the flexibility of the ART design enabled the treatment of each unit of water several times to compensate for the low stripability of 1,4-dioxane. Further, for total VOC recovery, the single ART well outperformed a 10 SVE and 6 sparge point system that had been operating since 1994 (see below).

System	1,1,1-TCA	1,1-DCA	1,1-DCE	PCE	TOTAL (lbs.)
AS/SVE	0.06	0.07	0.06	0	0.19
ART Well*	8.06	0.37	0.58	0.38	9.39

*similar time period as AS/SVE system

Summary: The ART Technology proved that it effectively and cost efficiently reduced 1,4-dioxane concentrations in surrounding wells by more than 90% in a few weeks. At this site, the ART approach has been deemed to be more cost efficient than groundwater extraction and surface treatment technologies and has outperformed the existing AS/SVE system. The ART Technology has now been approved by the state as the primary remediation method for the site.

For Additional Information Contact:

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