HNF-41053-VA
Revision 0

Use of Narrow-Diameter, Direct-Push Wells to Characterize and Remediate Carbon Tetrachloride in the 200 West Area, Hanford Site, Washington

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

CH2MHILL
Plateau Remediation Company

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CH2M HILL Plateau Remediation Company

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JEBratton 4/23/2009
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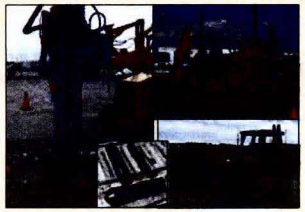
Ken Moser, Wes Bratton, and Virginia Rohay

The Hydraulic Hammer Rig (HHR) direct-push technology (Fig. 1) has been successfully used to characterize carbon tetrachloride in the vadose zone at the 216-Z-9 Trench (Figs. 2 and 3). Three of the HHR holes were completed as ¾-in. ID SVE wells (Fig. 3).



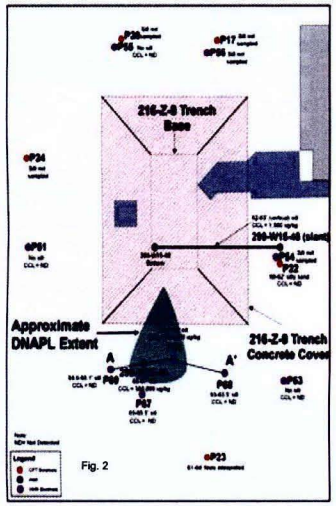


Fig. 2

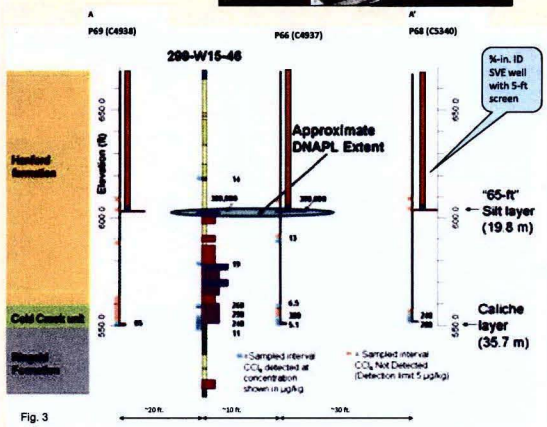
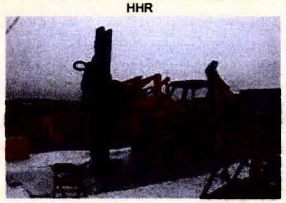


Fig. 3

Compared to traditional drilled wells, the HHR wells have several advantages (Table 1). The main HHR limitations are penetration depth (~120 ft to Cold Creek Unit) and the need to pre-select soil sample depths based on adjacent wells or geophysical logs.

Table 1: SVE Well Comparison

Installation Method	HHR 	Drilling 
Speed	~2 days	Weeks or more
Well diameter	¾-in.	2- to 8-in. typical
Cuttings/IDW	Minimal	Significant
SVE radius of influence	30 ft	120 ft
Cost	<$10,000	$200,000 or more
Depth limits	~120 ft (to Cold Creek Unit)	Your DQOs or project budget!

Monitoring results from the three narrow diameter wells (Fig. 4) led to incorporating the wells into the SVE system at the 216-Z-9 Trench in 2007 (Figs. 5, 6, and 7).

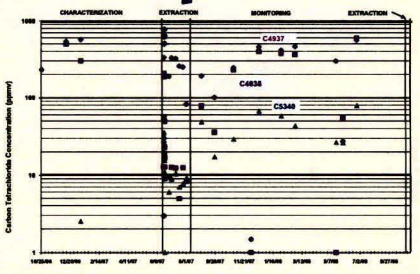


Fig. 4

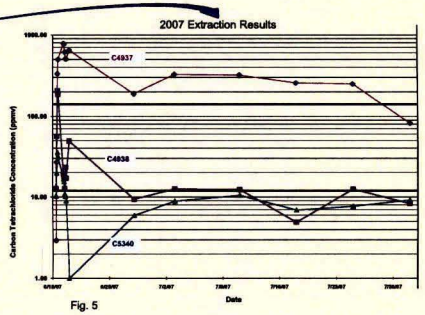


Fig. 5

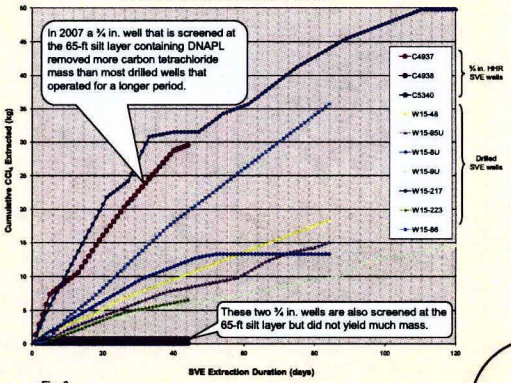


Fig. 6

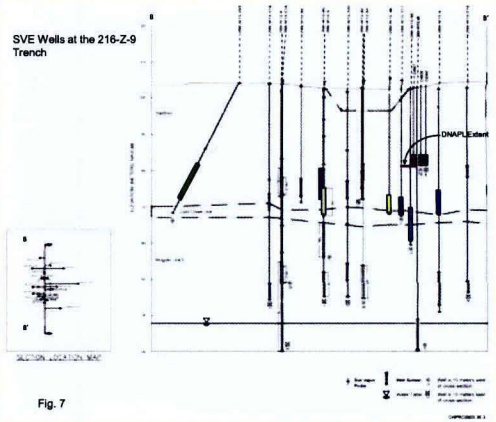


Fig. 7

In 2008, a vacuum test of these narrow diameter wells (Fig. 8) indicated that they have a radius of influence of about 30 ft.

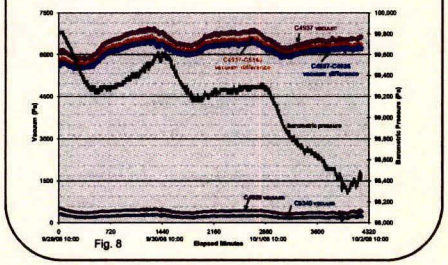
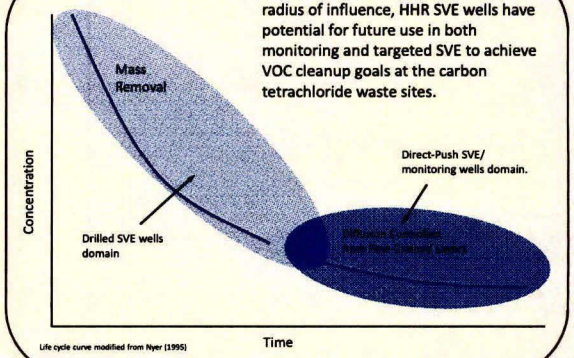


Fig. 8

Conclusions:

Based on their favorable performance and radius of influence, HHR SVE wells have potential for future use in both monitoring and targeted SVE to achieve VOC cleanup goals at the carbon tetrachloride waste sites.



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