

A.1 Technology Name

Bio-Trap® Sampler

A.1.1 Source

Shaw Environmental, Inc., Haley & Aldrich, Inc., and Microbial Insight, Inc., 2010, *Final Bio-Trap® Study Report, McCormick and Baxter Superfund Site, Stockton, California*, April.

A.1.2 Summary

Media:	Groundwater
Study Type:	NA
Technology:	Accumulation
Peer Reviewed:	Yes
Publication Date:	April 2010

A.1.3 Site Description

- Superfund site in Stockton, CA associated with former McCormick and Baxter Creosoting Company wood preservation activities resulting in groundwater contamination plume to a depth greater than 200 feet within discontinuous sand layers within shallow aquifer and sandy gravels/gravelly sands of upper part of deep aquifer.
- Naphthalene is primary risk driver, other chemicals include acenaphthene and pentachlorophenol.
- In-situ Stable Isotope Probing study using Bio-Trap® samplers baited with naphthalene-carbon-13 as contaminant tracer and installed in various monitoring wells within, side-gradient and downgradient of naphthalene plume and within methanogenic and sulfate-reducing conditions in the aquifer.

A.1.4 Remedial Phase

Remedial phase pre-bench scale microcosm study using Bio-Trap® samplers to determine whether biodegradation of naphthalene is occurring in groundwater under methanogenic or sulfate-reducing conditions, whether a bench study should be performed, and optimum locations for collecting bench study groundwater and soil samples.

A.1.5 Outcome

Naphthalene-carbon-13 tracer detected in biodegradation end products (new microbial mass and carbon dioxide). All 19 locations tested were positive for carbon-13 in the biomass indicating indigenous microorganisms metabolized the carbon in the naphthalene-carbon-13. Carbon-13 results for carbon dioxide also confirmed the carbon metabolism by indigenous microorganisms at seven of the 19 locations which were positive for naphthalene degradation. Locations with detectable carbon-13 above the acceptance threshold for carbon dioxide were

31 detected in methanogenic, sulfate-reducing and iron to sulfate-reducing conditions. These
32 findings supported moving forward with the bench scale microcosm study.

33 **A.1.6 References**

34 Shaw Environmental, Inc., Haley & Aldrich, Inc., and Microbial Insight, Inc., 2010, *Final Bio-*
35 *Trap® Study Report, McCormick and Baxter Superfund Site, Stockton, California*, April.

36 Shaw Environmental, Inc., Haley & Aldrich, Inc., and Microbial Insight, Inc., 2009, *Sampling*
37 *and Analysis Plan, Bio-Trap® Use and Analyses, McCormick and Baxter Microcosm Study,*
38 *McCormick and Baxter Superfund Site, Stockton, California*, Final, Stockton, California,
39 March 13.