M-1000H★
Biodegradation Lab Study

SUBSTANCE: PCE Contaminated water

TESTING: Groundwater samples were obtained to perform a four week biodegradation study. The study was conducted such that each sampling point had a sterilized sample, a control sample, and test samples with bacteria only, with nutrients only, and with bacteria and nutrients.

The samples were incubated at 35°C in containers sealed to minimize any volatilization. Samples were analyzed by U.S. EPA method 8260 for volatile organics.

RESULTS: The following compounds were found in the samples: 2-butanone, acetone, benzene, ethylbenzene, m,p xylenes, methylene chloride, 0-xylenes, t1,2 dichloroethene, tetrachloroethene (PCE), toluene, and trichloroethene. No vinyl chloride was detected in any sample prior to treatment.

The principal contaminants found were 2-butanone (methyl ethyl ketone) at 12,000 micrograms per liter and tetrachlorethene (PCE) at 49,000 micrograms per liter. All other contaminants were in the in the 200 micrograms per liter or less range. Volatilization appeared to be minimal as levels of 2-butanone and methylene chloride in the control were maintained throughout the incubation period.

Good evidence for biodegradation of the various pollutants was found. The M-1000H★ treated samples consistently produced levels lower than the uninoculated controls. The level of biodegradation ranged from >99% for 2-butanone to >97% for tetrachloroethene by week four. (see table below)

		2-butanone	tetrachloroethene
	Starting concentrations	12,000	49,000
Day 7	Control	10,000	17,000
	Bacteria	<100	4,000
Day 14	Control	14,000	270
	Bacteria	<100	11
Day 21	Control	9,200	27
	Bacteria	<100	<5
Day 28	Control	12,000	210
	Bacteria	<100	<5

Methylene chloride exhibited the least amount of biodegradation (19% decline), and by week four was the only pollutant out of eleven still detected in the samples. Vinyl chloride was not detected in any of the samples following treatment.