

C A M B R I A

ENVIRONMENTAL
PROTECTION

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March 30, 2000

Ms. Eva Chu
Alameda County
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Tom Bauhs - Chevron Contact
925-842-8898

Re: **Hydrogen Peroxide Injection**
Former Chevron Service Station 9-7127
Grant Line Road at Interstate 580
Tracy, California



Dear Ms. Chu:

On behalf of Chevron Products Company (Chevron), Cambria Environmental Technology, Inc. (Cambria) is pleased to submit this report describing hydrogen peroxide injection into groundwater monitoring wells MW-1 and MW-3 at the above referenced site (Figure 1). The objective of the hydrogen peroxide injection is to reduce the concentration of hydrocarbons in groundwater beneath the site. The site background and details of the hydrogen peroxide injection are presented below.

SITE BACKGROUND

The site is a former Chevron service station located in a primarily agricultural area at the intersection of Grant Line Road and Interstate 580 in Tracy, California. To date, eight groundwater monitoring wells have been installed on- and off-site.

Site Setting, Geology, and Hydrology: The site is essentially flat, approximately 300 feet above mean sea level, and is located about 50 miles east of San Francisco Bay. Site lithology primarily consists of low to moderate estimated permeability clayey sands and sandstone. Groundwater is encountered about 15 feet below grade and flows to the north/northeast at a gradient of 0.006.

Oakland, CA
San Ramon, CA
Sonoma, CA
Portland, OR

HYDROGEN PEROXIDE INJECTION

To reduce hydrocarbon concentrations in soil and groundwater where the highest concentrations have been found, Cambria mobilized to the site on December 15, 1999 and injected hydrogen peroxide into groundwater monitoring wells MW-1 and MW-3. Work was conducted in accordance with Cambria's August 4, 1999 *Hydrogen Peroxide Injection Workplan*. The workplan was verbally approved by Ms. Eva Chu of the Alameda County Department of Environmental Health (ACDEH).

**Cambria
Environmental
Technology, Inc.**

2694 Bishop Drive
Suite 105
San Ramon, CA 94583
Tel (925) 275-3200
Fax (925) 275-3204

Site Safety Plan: Cambria prepared a site safety plan to protect site workers. The plan was kept on site and reviewed and signed by all site workers.

Permits: No permits were needed for the hydrogen peroxide injection.

Hydrogen Peroxide Injection: Cambria selected groundwater monitoring wells MW-1 and MW-3 for hydrogen peroxide injection. Before injecting peroxide into the wells, Cambria sealed the wellheads and injected compressed air into the wells to fracture the formation around the wells to provide a dispersed pathway for the peroxide. Up to 25 pounds per square inch (psi) of compressed air was injected into each well for up to 20 minutes. After the air injection, Cambria pressure injected hydrogen peroxide into the wells. A specially-fabricated 15-gallon air compressor receiver tank was filled with hydrogen peroxide and plumbed to the wellhead of each injection well. Approximately 15 psi of compressed air was applied to the receiver tank to inject peroxide into the well.

Various concentrations of hydrogen peroxide were injected into the wells. For well MW-1, Cambria injected ten gallons of 3.5 percent peroxide solution into the well, followed by ten gallons of 9 percent solution, ten gallons of 17.5 percent solution, and eight gallons of 35 percent solution. For well MW-3, Cambria injected ten gallons of 3.5 percent peroxide solution, followed by ten gallons of 9 percent solution, and twenty-six gallons of 17.5 percent solution.

For approximately two hours after each injection event, Cambria monitored the temperature and visual effects of oxidation in the wells. Temperature in the wells was measured using a down-hole probe. In well MW-1, the temperature increased to a maximum of 130 degrees Fahrenheit (deg. F). To reduce the temperature in the well, Cambria added ten gallons of water to the well. After water was added to well MW-1, the temperature in the well dropped to 110 deg. F. Observed water temperature in well MW-3 did not exceed 90 deg. F.

Water Disposal: No waste water was generated during the hydrogen peroxide injection.

temp is dependant on iron in solution

Pvc melts at ~ 140° F

effective radius ^{in formation} dependant on organic material.

Fenton's reagent to create OH⁻ Only added if no Fe in solution.

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Not recommend at active stations or where there are subsurface conduits.

Ms. Eva Chu
March 30, 2000

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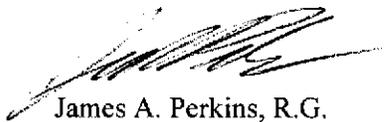
CLOSING

We appreciate the opportunity to work with you on this project. Please call Brian Busch at (925) 973-3128 if you have any questions or comments.

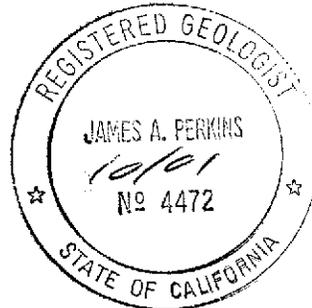
Sincerely,
Cambria Environmental Technology, Inc.



Brian Busch
Project Environmental Scientist

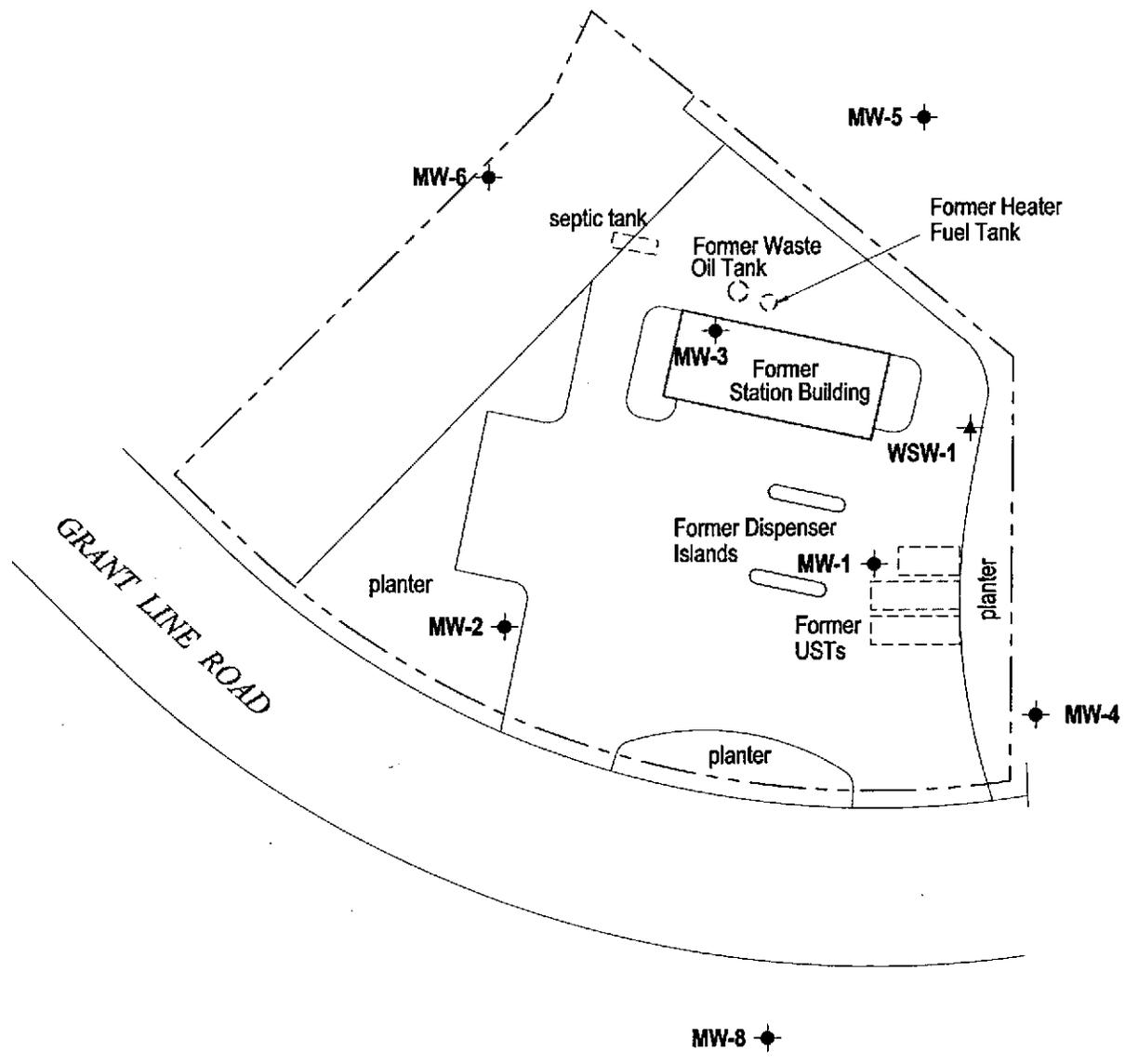


James A. Perkins, R.G.
Principal Remediation Manager



cc: Mr. Brett Hunter, Chevron Products Company

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EXPLANATION

MW-1 ◆ Monitoring well location

WSW-1 ▲ Water Supply Well (Livestock)

0 25 50
Scale (ft)

FIGURE 1

Former Chevron Service Station No. 9-7127
 Grant Line Road at Interstate 580
 Tracy, California



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Site Map