PACIFIC
ENVIRONMENTAL
GROUP, INC.

June 2, 1997
Project 325-055.1A

Mr. Phil Briggs
Chevron Products Company
P.O. Box 5004
San Ramon, California 94583

Re: **Work Plan**
Chevron Service Station 9-1851
451 Hegenberger Road at Edgewater Road
Alameda, California

Dear Mr. Briggs:

This letter, prepared by Pacific Environmental Group, Inc. (PACIFIC) on behalf of Chevron Products Company (Chevron), presents a work plan to investigate and evaluate the potential impacts if any, of methyl tert-butyl ether (MtBE) confirmed in groundwater at the site referenced above. The scope of work will propose the evaluation of preferential migration pathways, the possibility of commingled plumes, and identification of any sensitive receptors. Following the identification any existing preferential pathways, commingled plumes, and/or sensitive receptors, the extent of MtBE in groundwater will be determined. The work plan is presented in response to the May 1, 1997 letter from the Alameda County Health Care Services Agency (ACHCSA).

This work plan includes a site background, discussion, proposed scope of work, and schedule.

SITE BACKGROUND

Site Description

The site is located at the northwest corner of the intersection of Hegenberger Road and Edgewater Drive in Alameda, California (Figure 1). The site is located approximately 1,700 feet east of San Leandro Creek which flows towards San Francisco Bay. Land use near the site is generally commercial and industrial. The locations of the station building and pump islands and underground storage tank (UST) complexes are shown on Figure 2. The UST complex in the southeast corner of the property includes three 10,000-gallon fuel tanks. The waste oil tank is located immediately west of the station.

building. A methanol UST is located north of the station building and is part of a State of California program.

Previous Investigations

Previous investigations at the site have been conducted by Gettler-Ryan, Inc. In October 1995, Gettler-Ryan completed four groundwater monitoring wells (Wells MW-1 through MW-4) and advanced one soil boring (Boring SB-1). The wells were screened from approximately 3 to 15 feet below ground surface (bgs) and the boring was terminated at 6 feet bgs. Soil samples were collected at the capillary fringe in each of the borings.

A brief discussion of the findings of these investigations is summarized below:

- The lithology encountered during the site investigation has indicated that the western portion of the site is underlain by soils consisting of silty clay or clay to between approximately 3 or 4 feet bgs. Sand with gravel was then encountered to between approximately 6 to 7 feet bgs. Clay and silty clay was then encountered to the total depth explored of 16.5 feet bgs. Lithology on the eastern portion of the site is more variable. Boring SB-1 encountered clay and fat clay to 5 feet bgs. The boring was then terminated at 6 feet bgs after intersecting silty clay with lenses of clayey sand. The boring for Well MW-4 encountered silty clay to approximately 8 feet bgs. A layer of silty sand extended between approximately 8 and 10.5 feet bgs. Clay and silty clays were then encountered to the maximum depth of 16.5 feet bgs. Sand with gravel was not encountered in either Boring SB-1 or Well MW-4.

- During drilling in 1995, groundwater was encountered between 4 and 6 feet bgs. Quarterly groundwater monitoring has been performed since the wells were installed and has ranged from 2.81 to 5.33 feet bgs. Based on gauging data obtained from the groundwater monitoring wells, the groundwater flow direction at the site varies from west to southeast at an average gradient of 0.01 foot per foot. Historic flow directions and gradients are shown on Figure 2.

- Analytical results of soils have indicated that only minor concentrations of petroleum hydrocarbon concentrations are present, and were only detected in one boring (the boring for Well MW-2) located near the waste oil tank. Well MW-2 at 5.5 feet reported the only concentration of total purgeable petroleum hydrocarbons calculated as gasoline (TPPH-g) in soil at 8.4 parts per million (ppm). The sample also reported 2,100 ppm total oil and grease, and 77 ppm total extractable petroleum hydrocarbons calculated as diesel (TEPH-d). Chloroform was reported at 9.2 ppm, but no other halogenated

organic compounds were detected. No benzene was detected in any sample analyzed.

- Groundwater analytical results also indicate that concentrations of petroleum hydrocarbons are generally limited to Well MW-2. During the most recent monitoring event (March 20, 1997) Well MW-2 reported 140 parts per billion (ppb) TPPH-g and 8.2 ppb benzene. TEPH-d was reported at 3,400 ppb, however the laboratory indicated that the chromatogram pattern indicated an unidentified hydrocarbon. Vinyl chloride and MtBE were detected at 3.2 and 58 ppb, respectively.

- All wells have reported detectable concentrations of MtBE in groundwater. The maximum concentrations of MtBE have been reported from Well MW-4 located immediately south of the UST complex. The maximum concentration of MtBE was detected in Well MW-4 on December 17, 1996 at 11,000 ppb. Well MW-3 is located adjacent to the methanol UST (upgradient and lateral to the gasoline USTs) and reported 430 ppb MtBE on March 20, 1997. Well MW-1 located at the southwest corner of the property has reported up to 940 ppb MtBE, but 76 ppb MtBE was reported during the most recent monitoring event.

DISCUSSION

Concentrations of MtBE in groundwater have been confirmed at the site and are currently undefined. MtBE is known to migrate with groundwater flow and commonly flows toward discharge locations (such as wells, or streams). In comparison to petroleum hydrocarbon plumes, MtBE plumes are typically narrow with relatively small transverse dispersion. In order to define the extent of the MtBE plume, it is necessary to understand groundwater flow patterns which will affect plume shape and location. Groundwater flow patterns are complex at the site as evidenced by the variable flow directions (Figure 2). Groundwater flow patterns are affected by local geology, and localized and variable recharge beneath and downgradient of the site.

? No

SCOPE OF WORK

The proposed scope of work is designed to evaluate groundwater flow patterns (preferential migration pathways), the possibility of commingled plumes, and identify possible receptors. Following the evaluation of groundwater flow patterns, commingled plumes, and/or sensitive receptors, the extent of MtBE in groundwater will be determined.

don't have)

- **File Review.** PACIFIC will review ACHCSA and Regional Water Quality Control Board files. The file review will be performed to

note current cleanup std from 35-700 ppb exceeded here.

determine if a commingled plume is present from nearby sites. Additionally, boring logs and groundwater monitoring data will be reviewed to aid in determining groundwater flow patterns. Unocal

- **Well Survey.** A 1/2-mile radius well survey will be performed to evaluate potential sensitive receptors. Additionally, identification of groundwater pumping wells will aid in determining groundwater flow patterns.
- **Utility Survey.** A utility survey will be performed to determine existing preferential migration pathways.
- **Sensitive Receptor Survey.** San Leandro Creek is located 1,700 feet to the west of the site. PACIFIC will identify any other existing sensitive receptors downgradient of the site their beneficial uses.
- **Report.** A report will be prepared which presents the findings of the above scope of work. Based on the findings of the investigation, a decision will be made to determine if additional research/investigation is necessary to evaluate the potential impact of MtBE concentrations in groundwater.
- Verify no releases have occurred recently, looks like there's been a recent release.

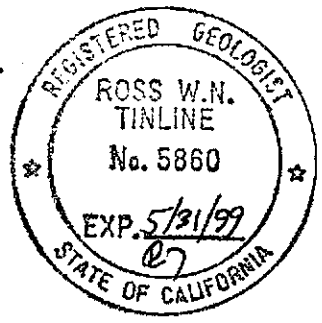
SCHEDULE

Upon approval of the work plan by Chevron and ACHCSA, PACIFIC will immediately commence the scope of work. The above described report will be submitted to Chevron within 4 weeks after commencement.

If you have any questions regarding the contents of this letter, please call.

Sincerely,

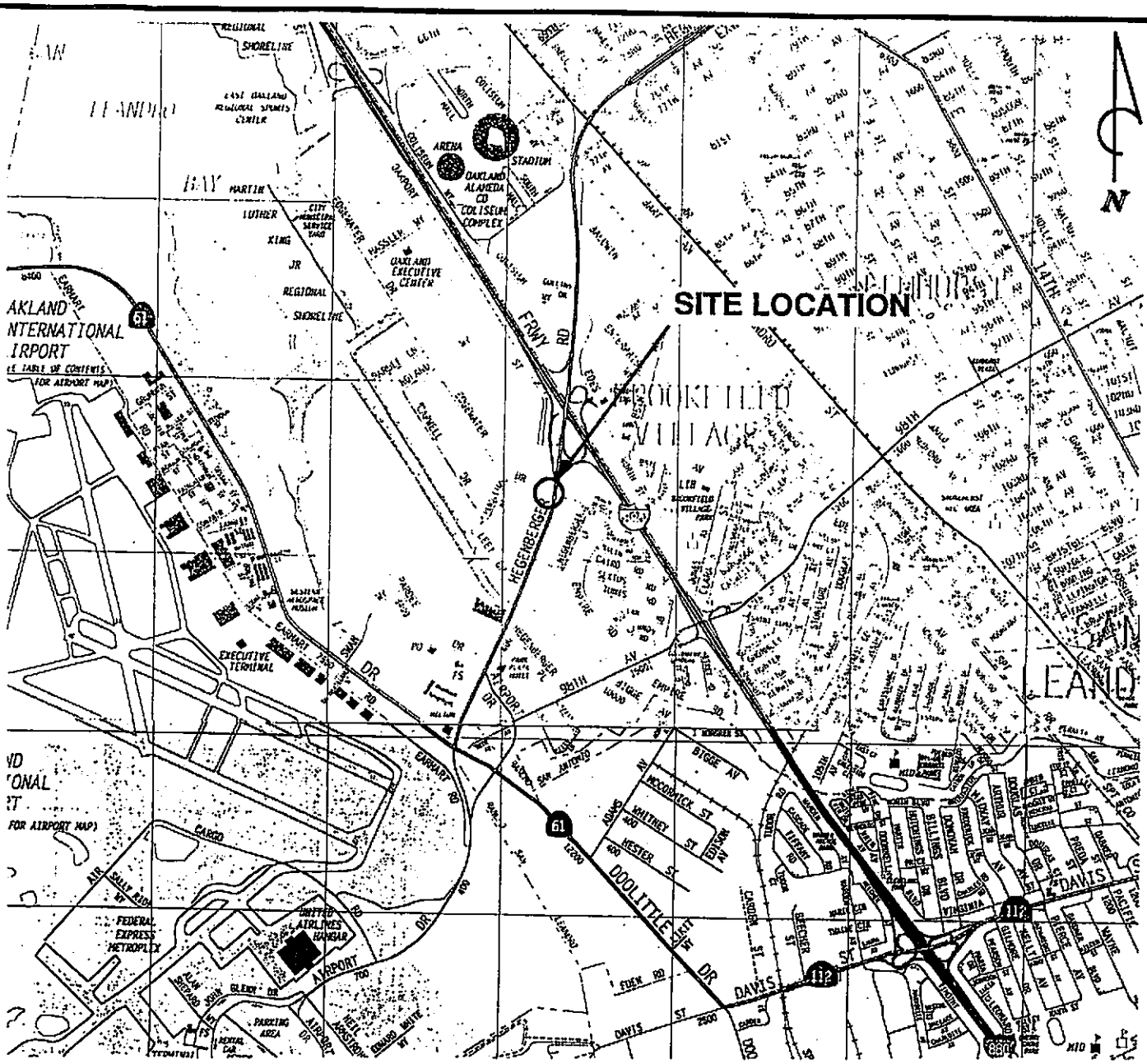
Pacific Environmental Group, Inc.



Ross Tinline
Project Geologist
RG 5860

Attachments: Figure 1 - Site Location Map
Figure 2 - Site Map

cc: Mr. Barney Chan, Alameda County Health Care Services Agency



REFERENCES:
THE THOMAS GUIDE
TITLED: SAN FRANCISCO/ALAMEDA/CONTRA COSTA COUNTIES
DATED: 1997 PAGES: 780 and 770

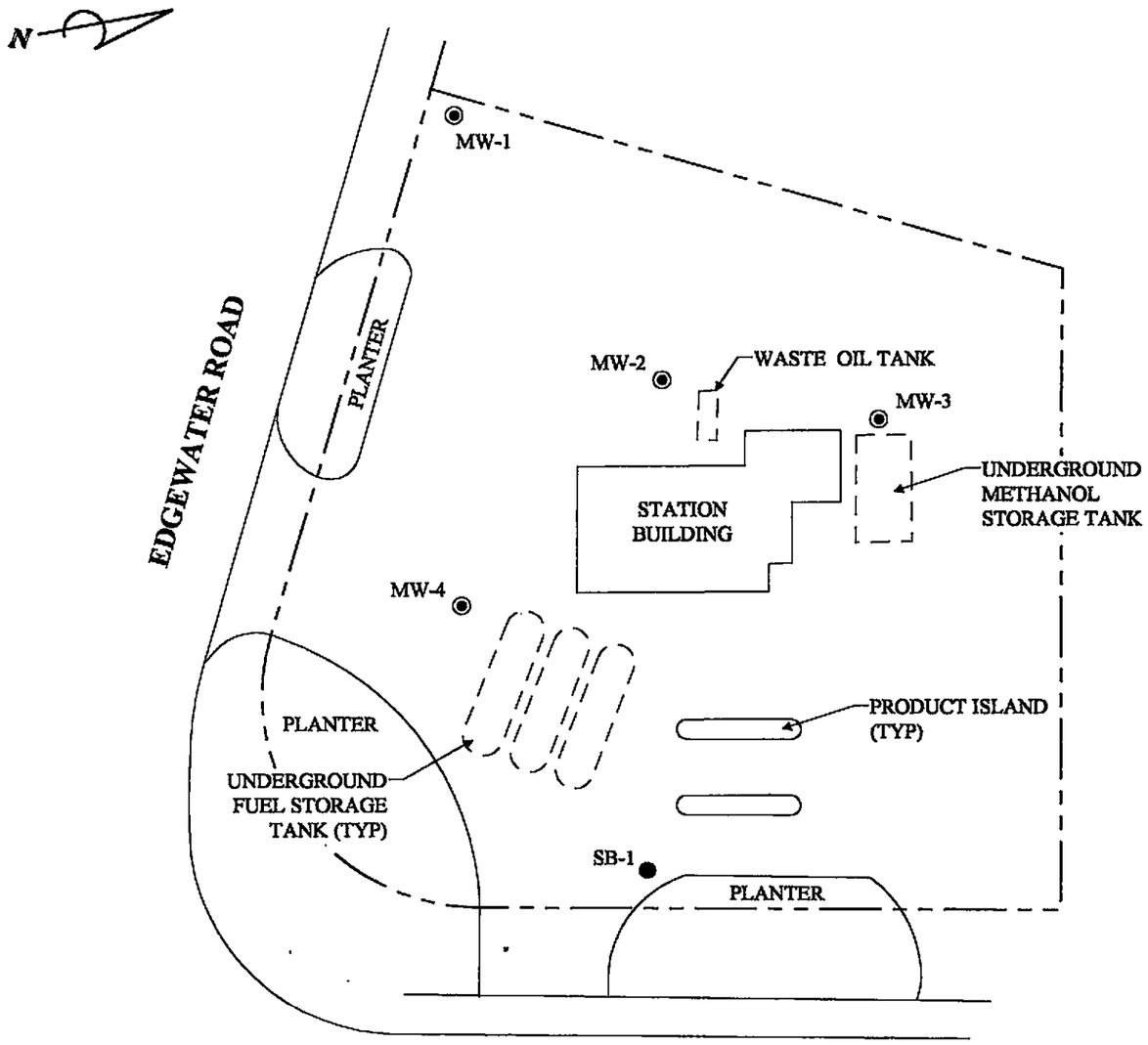
SCALE IN FEET
2000 0 2000

PACIFIC ENVIRONMENTAL GROUP, INC.

CHEVRON SERVICE STATION 9-1851
451 Hegenberger Road at Edgewater Road
Oakland, California

SITE LOCATION MAP

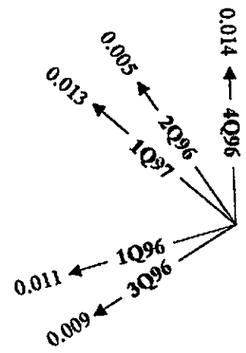
FIGURE: 1
PROJECT: 325-055.1A



LEGEND

MW-1 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

SB-1 ● SOIL BORING LOCATION AND DESIGNATION



HISTORIC FLOW DIRECTIONS AND GRADIENTS

SCALE

0 30 60 FEET

Reference: 328/055/Sitemp30.vsd

PACIFIC ENVIRONMENTAL GROUP, INC.

TITLE:

SITE MAP

PREPARED FOR:

CHEVRON SERVICE STATION 9-1851
451 Hegenberger Road at Edgewater Road
Oakland, California

DATE: 5-30-97 | PROJECT: 325-055.1A | FIGURE: 2