PACIFIC
ENVIRONMENTAL
GROUP, INC.

December 27, 1994
Project 310-038.1A

Mr. Dave Camille
Unocal Corporation
2000 Crow Canyon Place
San Ramon, California 94583

Re: Unocal Service Station 5430
1935 Washington Avenue at Castro Street
San Leandro, California

Dear Mr. Camille:

This letter presents a work plan prepared by Pacific Environmental Group, Inc. (PACIFIC) on behalf of Unocal Oil Company of California (Unocal) to drill and install one off-site and three on-site groundwater monitoring wells at the site referenced above. The investigation is being conducted by Unocal to further delineate the extent of petroleum hydrocarbon impact to groundwater beneath the site. Included in this work plan are discussions of the site background, previous investigations, proposed scope of work, well installation procedures, reporting, and scheduling.

BACKGROUND

Site History

The site is located at the southwest corner of the intersection of Washington Avenue and Castro Street in San Leandro, California, and has been an active Unocal service station since 1965. Unleaded gasoline products are currently stored in two 10,000-gallon underground fiberglass gasoline storage tanks, located in a common excavation in the north-central portion of the property (Figure 1). These tanks were installed in 1981, to replace the tanks originally installed at the time of construction of the service station. The new tanks were installed in the same excavation which contained the original gasoline tanks. During station construction in 1965, a 280-gallon underground waste oil storage tank was installed in a separate excavation in the southwest portion of the site. This waste oil storage tank is apparently still in use at the site. There are two product

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islands located in the east-central portion of the site, and two service bays located within the station building in the western portion of the site.

Previous Soil and Groundwater Investigations

Five exploratory soil borings and three groundwater monitoring wells were installed in August 1993. The results of the investigation are presented in a PACIFIC *Soil and Groundwater Investigation Report*, dated December 2, 1994. Soil analytical results were non-detect for total petroleum hydrocarbons calculated as gasoline (TPH-g), benzene, toluene, ethylbenzene, and xylenes (BTEX compounds), except beneath the product island area, where TPH-g concentrations of up to 200 parts per million were detected in capillary fringe zone soils at depths of about 30 feet.

Groundwater has been monitored since August 1993. Depth to water has fluctuated between approximately 30 and 33 feet below ground surface, and groundwater flow has been generally westerly at a very shallow gradient. TPH-g concentrations in site wells have ranged from non-detect to 23,000 parts per billion (ppb). Benzene concentrations in site wells have ranged from non-detect to 1,000 ppb. Upgradient Well U-3, which is in the vicinity of the pump islands, has consistently had the greatest concentrations of TPH-g and benzene. Downgradient Well U-1 has had the lowest concentrations of TPH-g and benzene, and appears to delineate the downgradient extent of hydrocarbon impact from the pump island area. Groundwater analytical data from the September 1994 sampling event are shown on Figure 1.

not necessarily

PROPOSED SCOPE OF WORK

To further delineate the extent of hydrocarbon-impacted groundwater, PACIFIC proposes to perform a soil and groundwater investigation which includes the installation of four groundwater monitoring wells. The proposed well locations are shown on Figure 1. The well locations are based on current understandings of the groundwater flow regime and the distribution of dissolved-phase hydrocarbons. The proposed scope of work includes soil and groundwater sampling, surveying all new wells for horizontal and vertical control, and reporting to document the results of the soil and groundwater investigation.

WELL INSTALLATION PROCEDURES

Exploratory Boring Procedures

The borings for the monitoring wells will be drilled using 8-inch diameter hollow-stem auger drilling equipment. The borings will be drilled to approximately 40 feet below ground surface. The borings will by logged by a PACIFIC geologist using the Unified

Soil Classification System and standard geologic techniques. Soil samples for logging and chemical analysis will be collected at minimum 5-foot depth intervals by advancing a California-modified split-spoon sampler with brass liners into undisturbed soil beyond the tip of the auger. The sampler is driven a maximum of 18 inches using a 140-pound hammer with a 30-inch drop.

Soil samples will be analyzed in the field for volatile organic compounds using a photo-ionization detector (PID). All samples collected from the borings will be submitted for analysis. Soil samples for chemical analysis will be retained in brass liners, capped with Teflon and plastic end caps, and sealed in zip-lock plastic bags. These samples will be placed in a cooler on dry ice for transport to the laboratory accompanied by chain-of-custody documentation. The temperature of the cooler will be recorded upon delivery to the laboratory.

All down-hole drilling equipment will be steam-cleaned prior to drilling and between boring locations. All residual soils obtained from drilling operations will be stockpiled on site and covered with plastic sheeting until laboratory analyses are completed and the results evaluated. Arrangements will then be made for disposal to an appropriate landfill based on the detected gasoline concentrations.

Monitoring Well Installation

The borings will be converted to groundwater monitoring wells by the installation of 2-inch diameter Schedule 40 PVC casing and 0.020-inch factory-slotted well screen. Well screen will be placed through the saturated zone and extend approximately 15 feet into the saturated zone. Depth to water beneath the site fluctuates between 30 and 33 feet, therefore, the total depth of each proposed well will be approximately 40 feet. Approximately 25 feet of 2-inch diameter solid Schedule 40 PVC will be connected to the screened section. Graded sand pack (RMC 2 x 12) will be placed in the annular space across the screened interval, and will extend approximately 1 foot above the screen. A 1-foot bentonite seal will be placed above the sand pack. A neat cement seal will be placed from the bentonite to ground surface. A locking cap and protective vault box will be installed on top of each well.

40 - 25 = 15' of screen

Following well installation, the wells will be developed through surging and pumping repeatedly until water removed from the wells is relatively free of sediments. The monitoring wells will be surveyed for location and elevation relative to mean sea level by a state-licensed surveyor.

Laboratory Procedures

Selected soil samples will be analyzed in the laboratory for the presence of TPH-g, BTEX compounds, and TPH calculated as diesel (TPH-d) by EPA Methods 8015, 8020,

and 5030. The samples will be examined using the purge and trap technique, with final detection by gas chromatography using a flame-ionization detector as well as a PID. All analyses will be performed by a California State-certified laboratory.

REPORT PREPARATION

After receipt of analytical data from the laboratory, the information collected during this investigation will be evaluated and assembled into a well installation report. The report will include boring logs, well locations, soil analytical data, survey data, certified analytical reports, chain-of-custody documentation.

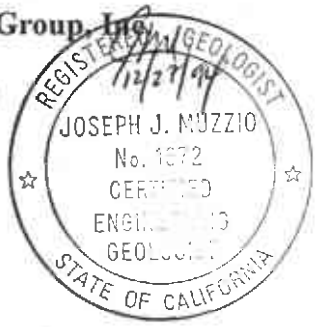
SCHEDULE

PACIFIC anticipates the investigation will commence within approximately 4 weeks following approval of this work plan by Unocal and the Alameda County Environmental Health Care Agency. A report documenting the findings of the soil and groundwater investigation will be submitted approximately 6 to 8 weeks after completion of all field activities.

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

Sincerely,

Pacific Environmental Group, Inc.



Joseph Muzzio
Project Geologist
CEG 1672

Attachments: Figure 1 - Proposed Well Location Map

cc: Mr. Scott Seery, Alameda County Environmental Health Care Agency
Mr. John Jang, Regional Water Quality Control Board - S.F. Bay Region

HAYS STREET

298 | 296 Residence | PARKING | YARD | 266 RESIDENCE | EMPTY LOT | EMPTY LOT

CASTRO STREET

SIDEWALK

291 | 277 | 265 | CYPRESS MANOR CONDOMINIUMS

N

DRIVEWAY

APPROACH

UNDERGROUND FUEL STORAGE TANKS

PLANTER

U-2
1,000 * /44

STATION BUILDING

CANOPY

APPROACH

WASTE OIL TANK

U-1
ND/[illegible]

U-3
12,000/370

PRODUCT ISLANDS

CARPORT

CARPORT

PLANTER

APPROACH

CAR WASH

PARKING LOT

WASHINGTON AVENUE

SIDEWALK

1904 THE MUTT HUTT

1926 RESIDENCE

1940 AUTO SERVICE

AUTO SERVICE

AUTO SERVICE PARKING LOT

LEGEND

U-2 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

⊕ PROPOSED GROUNDWATER MONITORING WELL LOCATION

1,000/44 TPH-g/BENZENE CONCENTRATION IN GROUNDWATER, IN PARTS PER BILLION, 9-6-94

ND NOT DETECTED

* HYDROCARBONS DETECTED DID NOT APPEAR TO BE GASOLINE

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
0 30 60 FEET

UNOCAL SERVICE STATION 5430
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PROPOSED WELL LOCATION MAP

FIGURE: 1
PROJECT: 310-038.1A