

June 21, 1991
Project No. RC05002

Ms. Nancy Vukelich
Chevron U.S.A. Inc.
2410 Camino Ramon
P.O. Box 5004
San Ramon, CA 94583-0804

SUBJECT: Site Assessment Work Plan, Chevron Service Station #9-6607, 2340 Otis Drive, Alameda, California.

Dear Ms. Vukelich,

Geraghty & Miller, Inc. (Geraghty & Miller) presents this work plan for site assessment activities at the Chevron U.S.A. Inc. (Chevron) service station referenced above (Figure 1). The primary goals of this work plan are to characterize the extent to which petroleum hydrocarbons detected in the subsurface during tank removal activities have affected the soils and ground water beneath the site and to provide information for future remedial actions should they be necessary.

OBJECTIVES

This investigation work plan has been developed to accomplish the following objectives:

- To define hydrogeologic conditions beneath the site.
- To determine the extent and level at which petroleum hydrocarbons have affected the soil and ground water.
- To identify well installation locations that will provide the necessary hydrogeologic data and also be useable for remedial activities, should such activities be required.

BACKGROUND

In preparing this background section and determining the scope of work for the site, Geraghty & Miller has reviewed a report by Blaine Tech Services, Inc. (Blaine Tech), identified as Report No. 910409-J-1 (no date indicated), which documents excavation and sampling in association with the removal of three gasoline tanks and one waste oil tank.

Blaine Tech reports that on February 14, 1991, the day of the tank removal, a sheen was observed on the surface of the standing water in both the gasoline tank excavation pit and the waste oil tank excavation pit, and that no holes were observed in any of the tanks upon visual inspection. Results of the six soil samples collected from the gasoline tank excavation pit by Blaine Tech showed petroleum hydrocarbons in each of the samples at levels below 100 parts per million (ppm). The two soil samples collected from the waste oil tank pit excavation had concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations ranging from 0.0072 ppm benzene (Sample #8) to 0.061 xylenes (Sample #7). Of these soil samples, only Sample #7 showed concentrations of total oil & grease, at a level of 3,200 ppm. Two water samples were also collected, one from the standing water in the gasoline tank pit, and the other from the standing water in the waste oil tank pit. The text of the Blaine Tech document reports that the water sample from the gasoline tank pit was identified as #10, but the Tank Removal Diagram shows Sample #10 to have been collected from the waste oil tank pit, and Sample #9 to be the sample collected from the gasoline tank pit. Laboratory analyses of Samples #9 and #10 showed dissolved total petroleum hydrocarbon (TPH) as gasoline concentrations of 3,000 ppb and 48,000 ppb respectively.

On February 22, 1991, additional excavation of the waste oil tank was conducted to remove soil from the area where Soil Sample #7 had been collected. Following the lengthening of the tank pit excavation by approximately 2 to 3 feet, Blaine Tech collected another soil sample (Sample #1). The laboratory analysis of this sample also showed concentrations of total oil & grease at 260 ppm. Additional excavation was conducted on February 26, 1991, and another soil sample was collected and analyzed. This time the laboratory analysis did not detect any concentrations of total oil & grease.

The product lines were excavated on February 28, 1991. At this time, Blaine Tech collected fourteen soil samples from beneath the dispenser pumps and various locations

along the piping runs. BTEX concentrations were detected in each of the samples, except Samples #3 and #14, at levels ranging from 0.006 ppm toluene (Sample #7) to 920 ppm xylenes (Sample #11). TPH as gasoline ranged from ND (Samples #3, #4, #7, and #14) to 5,700 ppm (Sample #13). Additional excavation and soil sampling were performed on March 7, 1991. The BTEX concentrations in the samples collected on March 7 ranged from 0.012 ethylbenzene (Sample #2) to 17 ppm xylenes (Sample #3), and TPH as gasoline concentrations ranged from non-detect to 150 ppm.

SCOPE OF WORK

TASK 1: PREPARATION OF SITE ASSESSMENT WORK PLAN

This Site Assessment Work Plan was prepared to define the scope of work to be conducted at Service Station #9-6607.

TASK 2: PREPARATION OF A SITE SAFETY PLAN

Geraghty & Miller will prepare a site-specific health and safety plan to address the potential hazards typical to petroleum hydrocarbon site assessments. The health and safety plan will be reviewed and signed by all Geraghty & Miller personnel and subcontractors working on site.

TASK 3: LOCATION OF UNDERGROUND UTILITIES

Prior to any subsurface assessment activities, proposed well locations will be cleared for underground utilities by a professional utility locating service. The utilities underlying the sidewalk and street bordering the site will be located by the individual companies who own these utilities. Geraghty & Miller will notify these companies by calling the Underground Service Alert.

TASK 4: EXPLORATORY DRILLING, SOIL SAMPLING, AND WELL INSTALLATION

Prior to the commencement of drilling activities, all necessary permits will be obtained for the installation of the ground-water monitor wells.

Four borings will be drilled on site at the approximate locations shown in Figure 2. These borings (MW-1 through MW-4) will be converted into shallow ground-water monitor wells. Based on the depth to water encountered during tank removal activities,

Geraghty & Miller anticipates that the monitor wells will be completed to a depth of approximately 25 feet below grade. The strategy behind the monitor well locations and construction details has been designed to define the presence and extent of soil and ground-water contamination in the vicinity of the underground storage tank cluster and the former location of the waste oil tank. To achieve this goal, proposed Wells MW-1 and MW-2 will be installed in locations anticipated to be hydraulically downgradient of the underground storage tanks, MW-3 will be installed in the anticipated upgradient direction, and MW-4 will be positioned near the former location of the underground waste oil tank.

The proposed ground-water monitor wells will be screened from the bottom of each boring to approximately 2 feet above first encountered ground water unless ground water is encountered at a depth greater than 10 feet. In this case the well will be screened from the bottom of each boring to approximately 5 feet above first encountered ground water. The ground-water monitor wells will be completed with 4-inch diameter Schedule 40 PVC casing and screen. The exploratory borings for the ground-water monitor wells will be drilled using 10-inch diameter hollow-stem auger drilling equipment. Prior to the drilling of each boring, the equipment that will enter the borehole will be steam cleaned. All of the wellheads will be protected by Chevron-approved traffic-rated utility boxes.

Soil samples will be collected during drilling at 5-foot depth intervals by advancing a modified California split-spoon sampler, equipped with brass liners, into the undisturbed soil beyond the tip of the auger. The sediment encountered during drilling will be logged by a Geraghty & Miller geologist. If the depth to water encountered during drilling does not correspond to a planned 5-foot sampling point, an additional soil sample will be obtained as close to the ground-water level as possible. Field hydrocarbon vapor (HV) tests will be performed on soil samples collected from each sampling interval, using an OVM 580 PID or a Gastech™ combustible gas analyzer. Results of the HV tests will be used to help select soil samples for laboratory analysis. Soil samples for laboratory analysis will be retained in the brass liners, sealed with Teflon™ tape and plastic end caps, placed in plastic zip-lock bags, and transported on ice to Superior Analytical Laboratories, Inc., located in San Francisco, California. Appropriate chain-of-custody documentation will accompany the soil samples to the laboratory. The exploratory drilling and well installations will be performed in accordance with the guidelines of the Alameda County Flood Control and Water Conservation District and with the standard policies and protocols of Chevron and Geraghty & Miller.

During drilling, an attempt will be made to segregate the soil generated from the drilling activities into a plastic-lined soil bin, based on the results of the HV tests. At the completion of drilling, a sample of the soil in the bin will be collected and submitted to the laboratory for analysis. Based on the results of this analysis, Geraghty & Miller will make recommendations to Chevron concerning the appropriate method of disposal.

TASK 5: WELL DEVELOPMENT AND GROUND-WATER SAMPLING

Following completion, the ground-water monitor wells will be developed, either by mechanical pumping or by surging and bailing. The purged water will be stored on site in 55-gallon drums for proper disposal by Chevron. After development, the ground water within the monitor wells will be allowed to equilibrate for 1 week before water samples will be collected from these wells.

Prior to the purging of the monitor wells in preparation for ground-water sampling, depth-to-water and liquid-phase hydrocarbon thickness measurements will be collected from each of the wells. This data will help to determine the localized ground-water flow direction and whether any monitor wells contain liquid-phase hydrocarbons and thus should not be sampled for dissolved hydrocarbons.

Prior to sampling, a minimum of four casing volumes of water will be purged from each well using a purge pump, unless the well is pumped dry prior to pumping four casing volumes. In this case, the monitor well will be sampled after it has recharged by 80%. The purged water will be monitored for temperature, pH, and specific conductance in order to verify that a representative sample of the formation water is obtained. The ground-water samples for laboratory analysis will be collected into appropriate United States Environmental Protection Agency (USEPA) approved containers and transported on ice to a state-certified laboratory along with appropriate chain-of-custody documentation. The water generated in purging the wells will be contained in 55-gallon drums and stored on site for proper disposal by Chevron.

TASK 6: SURVEY WELLHEADS

The top of casing and ground surface elevation relative to mean sea level for all wells will be determined by a professional land surveyor. Also, each well will be surveyed with northings and eastings for horizontal control within an accuracy of 1 foot.

TASK 7: LABORATORY ANALYSIS

Soil samples submitted to Superior Analytical Laboratories, Inc. will be analyzed for TPH as gasoline (USEPA Method 8015, modified) and BTEX (USEPA Method 8020). At least one soil sample will be analyzed for organic lead following the analytical method described in the Department of Health Services (DHS) Leaking Underground Fuel Tank (LUFT) Manual. In addition, the samples collected from the soil boring for MW-4 will be analyzed for TPH as diesel (USEPA Method 8015); oil and grease (Standard Method 503 D & E); chlorinated hydrocarbons (USEPA Method 8240); and cadmium, chromium, lead, zinc, and nickel (USEPA Method 200.7). Ground-water samples will be analyzed for TPH as gasoline (USEPA Method 8015, modified), BTEX (USEPA Method 8020), and organic lead (DHS-LUFT). The ground-water sample collected from MW-4 will also be analyzed for TPH as diesel (USEPA Method 8015) and chlorinated hydrocarbons (USEPA 624).

TASK 8: REPORT PREPARATION

Following completion of field and laboratory activities, Geraghty & Miller will prepare a site assessment report, summarizing the site hydrogeologic conditions and laboratory analytical results. The report will include drill logs, a geologic cross-section, a ground-water flow map, and, if necessary, a dissolved hydrocarbon plume map.

SCHEDULE

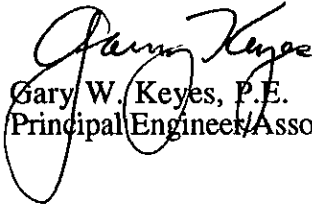
It is anticipated that the appropriate subcontractors and materials can be scheduled within approximately 2 weeks following authorization from Chevron to proceed with the project. Field activities, including drilling, soil sampling, well development, and water sampling will require approximately 2 weeks to complete. Laboratory analytical results will be received 2 weeks following completion of the field activities. The assessment report will be submitted to Chevron within 4 weeks following receipt of all laboratory data.

Geraghty & Miller is pleased to be of service to Chevron. All project information, reports, correspondence, and findings will be kept strictly confidential. If you have any questions regarding this work plan, please do not hesitate to call.

Sincerely,
GERAGHTY & MILLER, INC.



Kelly A. Kline
Senior Geologist/Project Manager



Gary W. Keyes, P.E.
Principal Engineer/Associate

Attachments: References

Figure 1 - Site Location Map
Figure 2 - Site Plan

REFERENCES

Blaine Tech Services, Inc. No date. Report No. 910409-J-1, Chevron Station 96607.



Reference: USGS Oakland East and West Quadrangles
 Scale: 1: 24,000

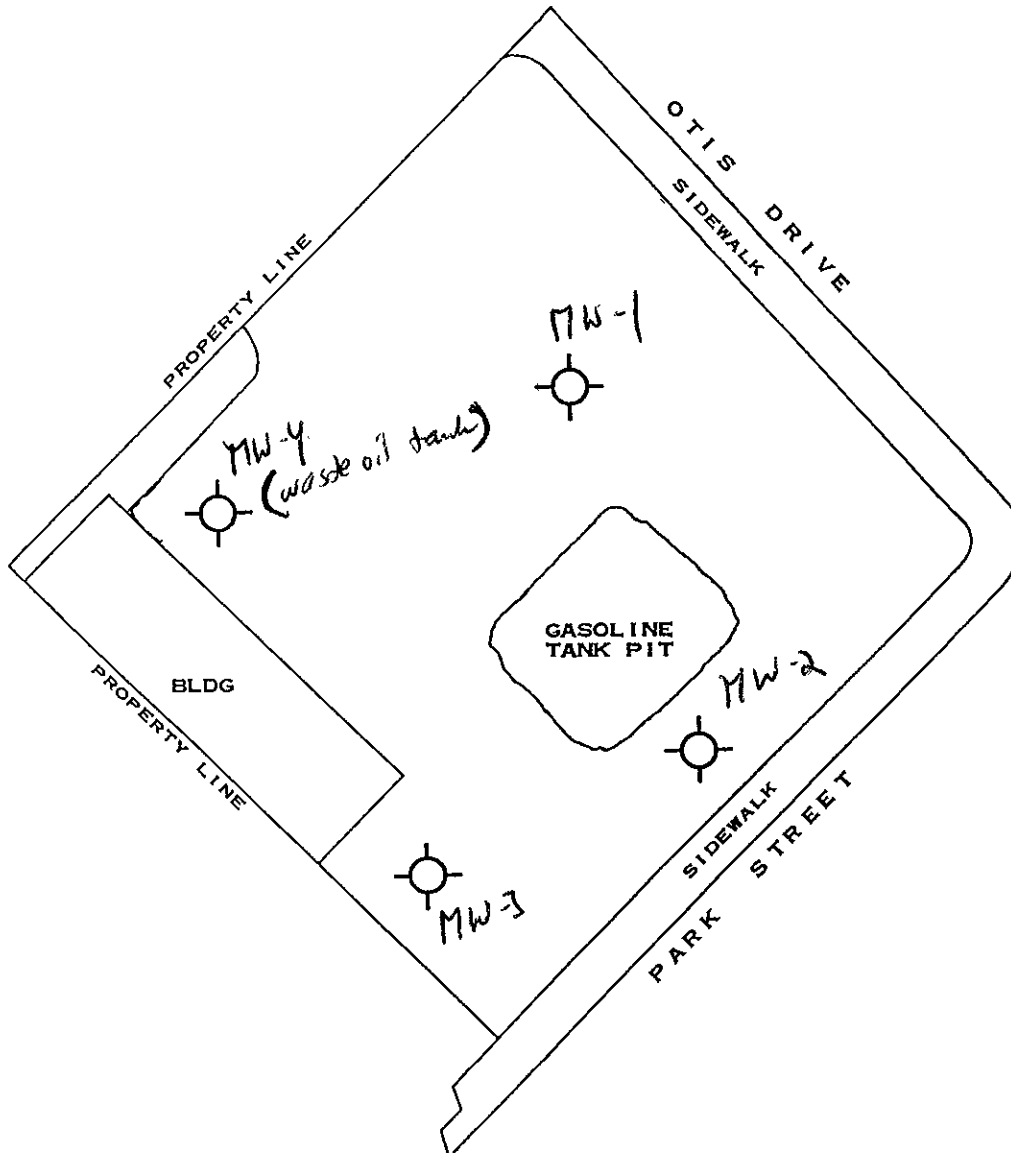


Project No. RC05001


SITE LOCATION MAP
 Chevron Service Station # 9-6607
 2340 Otis Drive
 Alameda, California

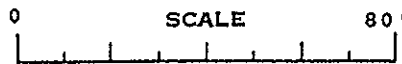
FIGURE

1



EXPLANATION

 Proposed Well Location



Site plan obtained from Blaine Tech Services, Inc. Report No. 910409-J-1



Project No. RC05001

SITE PLAN

Chevron Service Station # 9-6607
2340 Otis Drive
Alameda, California

FIGURE

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