ALTON GEOSCIENCE
THE RESULTS TEAM

August 21, 1991

Ms. Cynthia Chapman
Alameda County Health Agency
80 Swan Way
Oakland, California 94621

Subject: Transmittal of Revised Scope of Work
for Supplemental Site Investigation and
Remedial Planning Study
BP Oil Corporation Service Station No. 11109
4280 Foothill Boulevard
Oakland, California

Dear Ms. Chapman:

On behalf of BP Oil Corporation, Alton Geoscience is pleased to submit this Revised Scope of Work for Supplemental Site Investigation and Remedial Planning Study, BP Oil Corporation Service Station No. 11109, 4280 Foothill Boulevard, Oakland, California.

Please call us if you have any questions regarding this project.

Respectfully submitted,

ALTON GEOSCIENCE

Brady Nagle
Project Manager

Enclosure

cc: Peter DeSantis, BP Oil Corporation (without enclosure)

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REVISED PROPOSED SCOPE OF WORK
FOR
PHASE II - SUPPLEMENTAL SITE INVESTIGATION
AND REMEDIAL PLANNING STUDY

BP Oil Corporation
BP Oil Service Station No. 11109
4280 Foothill Boulevard
Oakland, California

INTRODUCTION

This work plan presents the revised proposed scope of work to conduct a Phase II - Supplemental Site Investigation and Remedial Planning Study of hydrocarbons in the subsurface at BP Oil Station 11109, located at 4280 Foothill Boulevard, Oakland, California. The original scope of work was presented in the proposal dated August 6, 1990.

The revisions to the work plan are based on (1) the results and findings of the recent quarterly ground water monitoring and sampling completed by Alton Geoscience, (2) the recent tank and product line removal and soil excavation, and (3) the replacement of Monitoring Well MW-1.

The primary intent of the proposed supplemental investigation is to: (1) define the nature and extent of subsurface contamination, and (2) develop an appropriate course of action for further investigation and/or remediation.

PROJECT BACKGROUND

Mobil Oil Corporation contracted Target Environmental Services in March 1989 to conduct a soil gas survey at the site as part of a property transfer program to investigate the potential of subsurface hydrocarbon contamination onsite. The survey revealed the presence of detectable concentrations of petroleum hydrocarbon constituents in the soil vapor samples.

Isoconcentration contour maps and chromatogram data generated during the survey suggest two potential sources of hydrocarbon contamination of the subsurface soil; one west of the main building, and one between the eastern dispenser island and the underground storage tanks field. Contaminant migration to the southwest appears to be limited. The southeastern extent of the soil gas hydrocarbon plume was not defined since it extended beyond the limits of the survey and property.

In April 1989, two 2-inch diameter ground water monitoring wells were installed at the site by Rittenhouse-Zeman and Associates of Bellevue, Washington. Soil samples taken from unspecified depths during well construction were analyzed for total petroleum hydrocarbons (TPH) with benzene, toluene, ethylbenzene, and total xylenes (BTEX) distinction. The results of the analysis showed 15 parts per million (ppm) TPH in the soil sample from Boring B-1. Borings B-1 and B-2 were converted into Monitoring Wells MW-1 and MW-2. The only ground water sample analyzed was from MW-1, it was analyzed for BTEX, and the results indicated 860 parts per billion (ppb) benzene in the ground water sample.

In January 1990, two 4-inch-diameter ground water monitoring wells, MW-3 and MW-4, were installed onsite by Alton Geoscience. Soil samples from the borings drilled for well installations were taken at five-foot intervals, and analyzed for total petroleum hydrocarbon as gasoline (TPH-G) with BTEX distinction. The soil sample from MW-4 from a depth of 25 feet was the only soil sample with any detectable levels of TPH-G and total xylenes. A trace (0.04 foot thickness) of free floating product was observed in Monitoring Well MW-1. Ground water samples from the other three wells onsite were analyzed and found to contain up to 1,400 ppb TPH-G and up to 15 ppb benzene in MW-3.

In August 1990, BP Oil Company authorized Alton Geoscience to conduct a supplemental site investigation as presented in the proposal dated August 6, 1990. However, a delay in implementing the proposed scope of work was experienced due to tank replacement and soil excavation/aeration activities at the site.

In September 1990, three underground fuel storage tanks and the associated dispenser island and product lines were removed for replacement. Soil samples were collected for tank closure and to verify the adequacy of the subsequent soil excavation. Analysis of soil samples detected up to 910 ppm TPH-G in a soil sample collected beneath the underground fuel storage tanks. Soil samples collected at the limit of excavation detected up to 140 ppm TPH-G at a depth of 16 feet below grade.

SCOPE OF WORK

Alton Geoscience proposes to perform the required supplemental site investigation in accordance with the applicable regulations and guidelines of the Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) and

the Alameda County Health Agency (ACHA). The scope of work is as follows:

Part 1 - Phase II - Supplemental Site Investigation and Remedial Planning Study

Task A: Review Available Information and Acquire Necessary Permits

Alton Geoscience will collect and review information pertinent to the site including ongoing investigative work at nearby sites. Prior to commencement of field work, Alton Geoscience will procure all necessary encroachment, street excavation, and drilling/ground water well construction permits, schedule the field activities, and locate underground utility lines.

Task B: Install Ground Water Monitoring Wells

To investigate the lateral and vertical extent of soil and ground water contamination, five additional exploratory soil borings will be drilled using a CME-75 drill rig equipped with 8, 10, and 12-inch-diameter hollow stem augers.

Procedures for drilling, soil sampling, well installation and development, and water sampling and analysis will be according to the applicable requirements and guidelines of the RWQCB and the ACWD.

During drilling, soil samples will be collected at 5-foot intervals beginning at five feet below grade. Soil samples will be obtained through a split spoon sampler lined with stainless steel tubes. The samples recovered for analysis will be sealed airtight with Teflon tape and plastic caps, and placed immediately into an iced cooler.

Soil borings will be converted to ground water monitoring wells to a depth of about 15 feet below the top of the first saturated zone encountered unless a competent clay zone is encountered. It is anticipated that ground water will be encountered at a depth of about 20 to 30 feet below grade. The wells will be constructed of clean, PVC pipe in accordance with the requirements of the RWQCB and the ACWD. The top of each well will be secured with water tight locking caps and street boxes finished flush with the ground surface.

The casing diameters and locations of the proposed monitoring wells are as follows:

- One onsite 6-inch-diameter monitoring/recovery well will be installed near the former location of MW-1.
- One onsite 4-inch-diameter monitoring/recovery well will be installed in the vicinity of the replaced underground fuel storage tanks.
- One onsite 2-inch-diameter monitoring well will be installed in the southwestern-most corner of the site.
- One offsite 2-inch-diameter monitoring well will be installed in High Street upgradient from the replaced underground fuel storage tanks.
- One offsite 2-inch-diameter monitoring well will be installed in Foothill Boulevard downgradient from the site.

The locations of the proposed ground water monitoring wells are shown in the attach site plan.

Task C: Develop, Sample, and Survey Ground Water Monitoring Wells

The ground water monitoring wells will be properly developed and sampled in accordance with the RWQCB guidelines. Water samples will be collected in sterile containers and transported to a state certified laboratory for analysis. Each well will be surveyed from top of casings to within 0.01 foot accuracy relative to a common datum and an established benchmark with respect to location and elevation.

Task D: Analyze Soil and Ground Water Samples

Soil and ground water samples will be transported to a California-certified laboratory and analyzed for TPH-G with BTEX distinction and for organic lead using the appropriate EPA methods. The samples will be analyzed on a one week turnaround time.

Task E: Perform Aquifer Analysis and Testing

Depending on the site-specific condition, a one-day pumping test will be performed to calculate hydrogeologic characteristics of the aquifer, including hydraulic conductivity and/or transmissivity and capture zone. A laboratory permeability test of selected soil samples collected during installation of monitoring wells will also be conducted.

Task F: Analyze Data and Laboratory Results

Upon completion of the sample analysis and aquifer analysis and testing, a detailed analysis of results and available information will be conducted to determine the extent and nature of subsurface contamination. This includes interpretation of geologic and hydrogeologic information and assessment of the potential short and long-term impacts of contamination on the beneficial uses of ground water and surface water.

Based on the results of the investigation and data analysis, Alton Geoscience will develop an appropriate course of action by considering one or a combination of the following:

1. Further site characterization to adequately define the extent of subsurface contamination.

2. Remediation of subsurface contamination.

Task G: Conduct Feasibility Study and Conceptual Design of Remediation Plan

Based on the results of the above tasks, a detailed feasibility study of alternative technologies for remediation of ground water is conducted. The study will include a detailed evaluation of alternative technologies, considering technical, economic, environmental, and legal factors. Economic comparison of alternatives will consider both capital and operating costs as well as the present worth or life cycle cost of each alternative.

Upon selection of the appropriate remediation alternative, a conceptual design of the selected system is prepared including process layout, design parameters, engineering cost estimate, equipment

manufacturer's specifications, and estimated implementation schedule.

Task H: Prepare Supplemental Site Investigation Report and Remedial Work Plan

A report presenting our findings, conclusions, and recommendations will be prepared and submitted to BP Oil Company for review and approval prior to submittal to the ACHA and the RWQCB. The report will include all the information required by the regulatory agencies, a detailed description of the remediation system design, a summary of permitting requirements, operation and maintenance protocol, and an estimated implementation schedule.

Two copies of the preliminary draft report, including remedial work plan, will be submitted to BP Oil Company. Upon receipt of comments, Alton Geoscience will prepare the final report and submit five copies to BP Oil Company.

Part 2 - Quarterly Monitoring Program

In accordance with the ACWD and the RWQCB requirements, ongoing monitoring and sampling of ground water shall be conducted for the duration of the investigation and remediation. At minimum, the wells will be monitored and sampled for a period of 12 months after completion of the investigation. Sampling and analysis of the ground water will be performed on a quarterly basis (four quarters). The need for further ground water monitoring and sampling will be determined based on the results of the supplemental site investigation.

Each monitoring and sampling event will involve measurement of water levels. Quarterly ground water samples will be analyzed in a California-certified laboratory for the same constituents specified in Task D. Prior to collection of samples, each well is purged following standard procedures. Purged ground water will be stored in containers for proper disposal.

Results of each monitoring event will be submitted in a quarterly report. The report summarizing the results and findings of the preceding monitoring and sampling event will be submitted no later than the fifteenth day of the following month.

SITE SAFETY PLAN

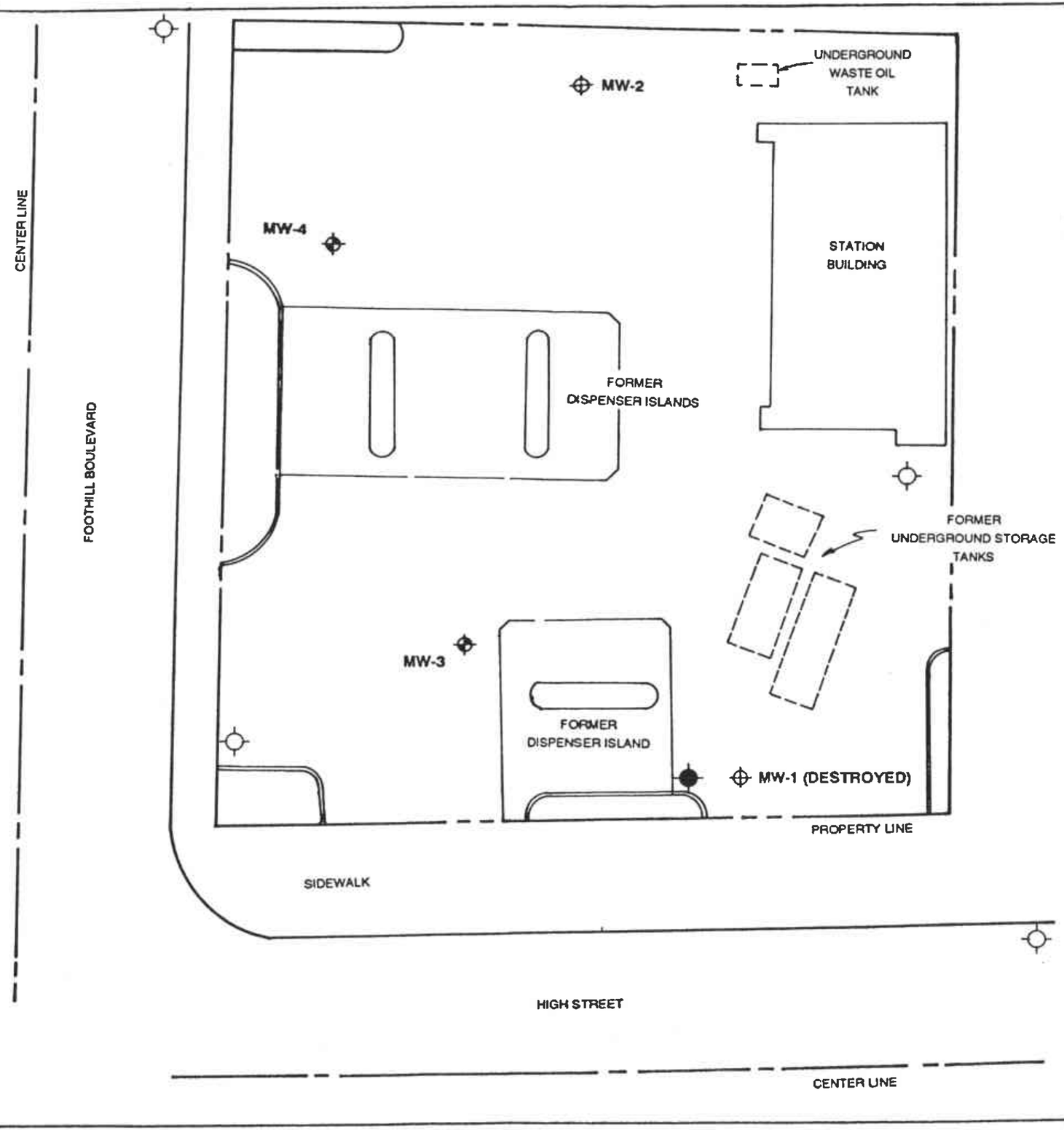
All field procedures and activities related to the conduct of the site investigation work will be in accordance with the site safety plan (SSP) developed for the project. The site safety plan complies with applicable requirements of the California Department of Health Services and the Federal and State Occupational Safety and Health Administration (OSHA and Cal-OSHA).

IMPLEMENTATION SCHEDULE

The site investigation work proposed herein will be completed and a report submitted within 80 days after receipt of written approval of the proposed scope of work for supplemental preliminary site investigation and remedial planning study. The schedule for completing tasks after encroachment permit approval is as follows:

Tasks	Estimated Days Until Completion
- Soil Borings/Well Installation	20
- Well Development/Sampling	25
- Sample Analysis	40
- Aquifer Analysis and Testing	45
- Data Analysis	60
- Feasibility Study/Remediation Design	70
- Report Preparation	80

This schedule may be subject to revision depending on timely receipt of work plan approval and information required to complete the site investigation. Any changes to the schedule will be communicated in advance to the appropriate agencies and parties involved.



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SCALE IN FEET

LEGEND

- GROUND WATER MONITORING WELL BY ALTON GEOSCIENCE
- GROUND WATER MONITORING WELL BY OTHERS
- PROPOSED GROUND WATER MONITORING WELL LOCATION
- PROPOSED GROUND WATER RECOVERY WELL LOCATION

FIGURE 1

REVISED SITE PLAN

BP OIL SERVICE STATION NO. 11109
4280 FOOTHILL BOULEVARD
OAKLAND, CALIFORNIA

ALTON GEOSCIENCE PROJECT NO. 30-0248

ALTON GEOSCIENCE
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