EXXON COMPANY, U.S.A.

ENVIRONMENTAL ENGINEERING

G. D. GIBSON
SENIOR ENVIRONMENTAL ENGINEER

January 23, 1990

Exxon RAS 7-0104
1725 Park Street
Alameda, California

Mr. Ariu Levy
Alameda County Enviromental Health Department
Hazardous Materials Division
80 Swan Way, Suite 200
Oakland, California 94621

Dear Mr. Levy:

Attached for your review and comment is a copy of a work plan by Harding Lawson Associates, Novato, California to perform a Phase III Ground-Water Investigation aquifer testing program at the above referenced site in the City of Alameda. This additional work is required in order to properly design the on-site ground water remediation system.

Should you have any questions or concerns after your review, please contact me at (415) 246-8768. We would like to proceed with this work as soon as possible. Thank you.

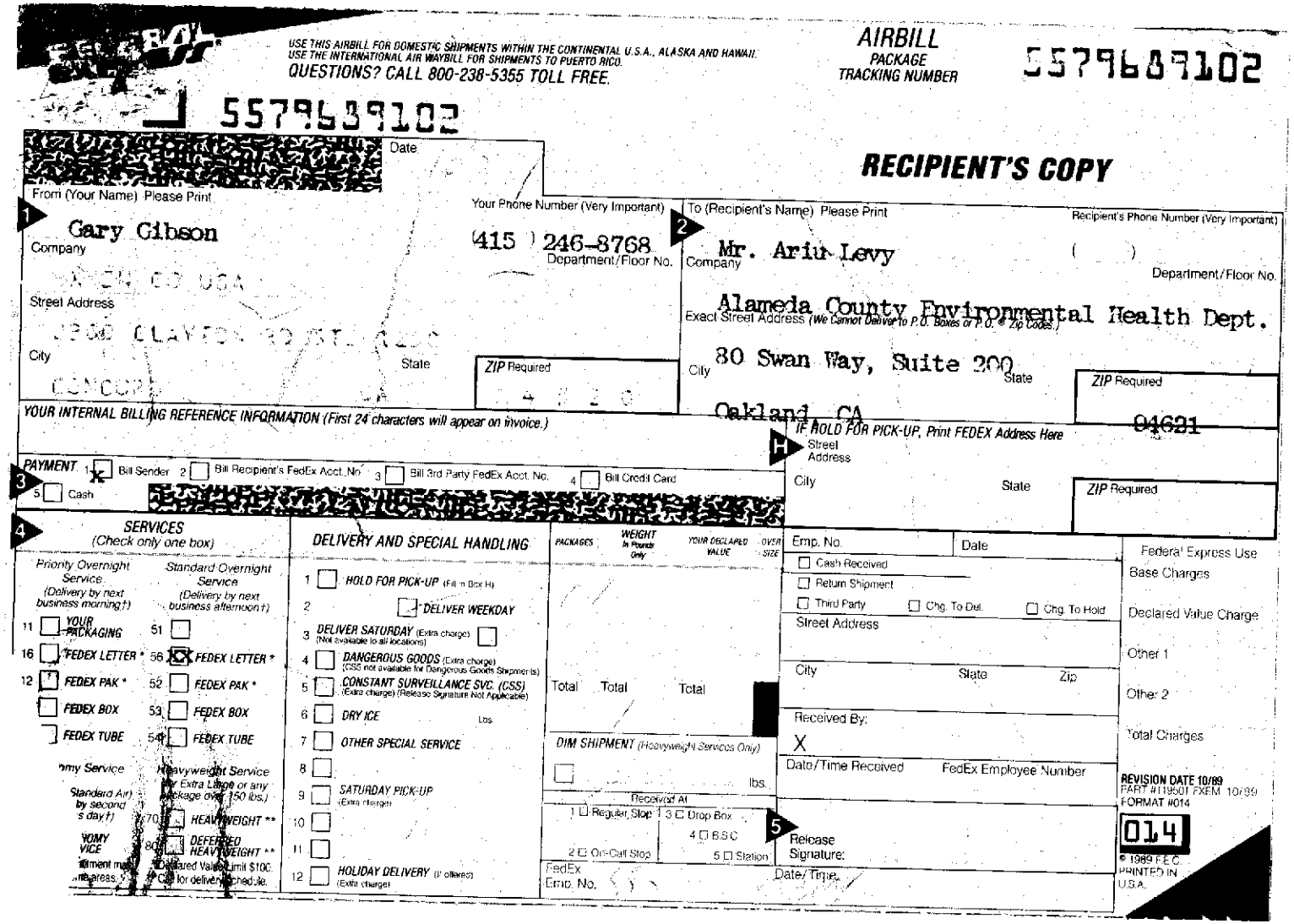
Sincerely,

Gary D. Gibson

GDG:lp
0610E
Attachment

c - w/attachment:
Mr. J. K. Hunter
Mr. S. R. Ritchie - San Francisco Bay Region Water Quality Control Board

w/o attachment:
Mr. J. R. Hastings
Mr. L. W. Lindeen
Mr. M. Thompson - Alameda County Office of the District Attorney
Ms. S. M. Watson - Harding Lawson Associates



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[illegible]

Your Phone Number (Very Important)
415) 246-8768
Department/Floor No.

To (Recipient's Name) Please Print
Mr. Ariu Levy
Company
Alameda County Environmental Health Dept.
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.)
80 Swan Way, Suite 200
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Oakland, CA
State
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January 17, 1990

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Exxon Company, U.S.A.
P.O. Box 4032
Concord, California 94524

Attention: Mr. Gary Gibson

Gentlemen:

Work Plan
Phase III Ground-Water Investigation
Exxon Station R/S #7-0104
1725 Park Street
Alameda, California

Harding Lawson Associates (HLA) is pleased to present this work plan to perform a Phase III ground-water investigation at Exxon Station R/S #7-0104, located at 1725 Park Street, Alameda, California (site). This work plan is in response to elevated concentrations of petroleum hydrocarbon constituents detected at the site during HLA's previous investigations.

BACKGROUND

The site was formerly occupied by a Regal Service Station owned by Wickland Oil Company, Sacramento, California. In 1986, the station was remodeled and three double walled fiberglass tanks were installed. The tanks were used to store regular, unleaded, and premium unleaded gasoline. No information regarding the testing of soil and/or ground-water at the time of tank removal could be obtained by HLA.

A Sensitive Receptor-Risk Assessment Survey for the site was prepared by Engineering Science and Technology, Inc. (EA) in May 1988. The EA study identified 5 monitoring wells, an industrial water well, and an irrigation well within 1/2 mile of the site.

HLA was subsequently contracted by Exxon to perform a Phase I evaluation of petroleum hydrocarbons at the site. The results of that evaluation were submitted to Exxon in a letter report dated June 24, 1988. As part of the evaluation, three monitoring wells (MW-1 through MW-3) were installed at the site (Plate 1). Review of laboratory results of soil samples collected at the site indicates that total petroleum hydrocarbons (TPH) calibrated to gasoline were present in concentrations ranging from 11 parts per million (ppm) to 1,400 ppm. Ground-water samples were also collected

from each of the wells at the site and analyzed for TPH calibrated to gasoline, and for benzene, toluene, ethylbenzene, and xylenes (BTEX). A maximum concentration of 110 ppm TPH as gasoline was detected in Monitoring Well MW-2 located downgradient of the tank field. Review of laboratory analytical results of water sampled from Well MW-1, located upgradient of the tanks and pump islands, showed TPH as gasoline at a concentration of 27 ppm.

On the basis of the results obtained during our Phase I investigation, HLA performed a Phase II investigation to further evaluate the extent of petroleum hydrocarbons present at the site. The results of the Phase II investigation were presented to Exxon in a report titled *Phase II Evaluation of Petroleum Hydrocarbons, Exxon Service Station R/S #7-0104, 1725 Park Street, Alameda, California*, dated March 21, 1989. As part of that investigation, HLA installed three additional monitoring wells at the site (MW-4 through MW-6).

Review of laboratory results of soil samples collected from MW-4 through MW-6 indicates that TPH as gasoline was present in concentrations ranging from 0.6 ppm to 490 ppm. Ground water from all six wells was sampled on January 17 and 18, 1989. Analytical results showed concentrations of TPH as gasoline ranging from 5.3 to 38 ppm. The highest concentrations were detected in ground-water samples collected from Wells MW-6, located adjacent to the tank field, and MW-2, located downgradient of the tank field.

SCOPE OF WORK

The objective of HLA's Phase III ground-water investigation will be to further evaluate potential on-site source areas, obtain hydraulic parameters of the uppermost aquifer at the site, and provide preliminary recommendations for on-site ground-water remediation activities.

Soil Boring and Monitoring Well Installation Program

On January 4, 1990, one soil boring was drilled (MW-7) and soil samples collected (Plate 1). The boring was drilled using a hollow-stem auger drill rig to a depth of 19 feet below ground surface (bgs). Soil samples were collected at approximately 5-foot intervals or at significant changes in lithologies. Field observations of color and odor were recorded on the boring logs by an HLA geologist under the supervision of a California registered geologist. A portable organic vapor analyzer (OVA) was used to screen soil samples for the presence of volatile organic compounds. All soil samples were collected using methods approved by the RWQCB. Each sample was retained in the sampling tube, taped, labeled, placed in a cooler, and transported under chain of custody control to the analytical laboratory. One soil sample was analyzed on the basis of maximum OVA readings or product odors. The soil sample was analyzed for TPH as gasoline per EPA Method 8015 and BTEX per EPA Method 8020 by NET Pacific,

Inc. (NET), Santa Rosa, California. NET is a California state-certified laboratory for the analyses requested.

The boring was converted to a ground-water monitoring well by installing 4-inch-diameter PVC well screen and casing from the bottom of the boring to the ground surface. The well screen extends from approximately 4 to 19 feet bgs. The well screen slot size is 0.020 and the filter pack is #3 Lonestar sand. The filter pack was placed by pouring the sand down the annulus between the well screen and inside of the hollow-stem auger, and extends from the bottom of the well bore to approximately 6 inches above the top of the screened interval. An approximately 6-inch layer of bentonite was placed above the filter pack and hydrated with water. The remaining annular space was backfilled with a concrete/bentonite grout. A locking well cap was connected to the top of the 4-inch well casing. The well was completed at ground surface in a traffic approved monitoring well vault. Detailed drilling procedures and well construction will be presented in a report presenting the results of the aquifer testing program.

The top of all well casings at the site will be surveyed by a registered land surveyor to obtain elevations relative to the mean sea level datum for data correlation.

Sampling of Monitoring Well

Following installation, Monitoring Well MW-7 was developed until relatively clear water was obtained. A ground-water sample was then be collected from the well. The new monitoring well will also be sampled when the other six wells are sampled as part of a quarterly sampling program currently underway at the site. Prior to water sample collection, the water level in the well was measured with an oil/water interface probe to an accuracy of 0.01 foot. The ground water was then monitored for floating hydrocarbons with a lucite bailer. No floating product was observed in the well. The well was then purged a minimum of three casing volumes with a centrifugal pump. Measurements of pH, conductivity, and temperature were taken of the extracted water during purging. Ground-water samples were collected with a stainless steel bailer and decanted into 40-milliliter volatile organic analysis (VOA) vials. The samples were stored in a refrigerated environment until delivery under chain of custody to the analytical laboratory.

The samples were analyzed for TPH as gasoline and BTEX on a standard 2-week turnaround basis. The analytical results are pending and will be presented in the aquifer testing report. The results of the quarterly sampling events will be submitted to Exxon under separate cover.

Decontamination Procedures

All equipment that may have come in contact with potentially contaminated soil or water was decontaminated prior to and after use. Decontamination consisted of steam

cleaning or phosphate-free detergent wash and water rinse. The rinse water was contained in 55-gallon drums on site pending receipt of laboratory analytical results. All soil, ground water, and decontamination fluids produced during this investigation will be disposed of according to state regulations.

Slug Testing Program

To assess advective transport rates of ground-water flow at the site and aid in the design of a ground-water extraction system, aquifer hydraulic properties will need to be evaluated. An aquifer testing program consisting of a step-drawdown test, constant rate discharge test, and water level recovery data, was initially proposed to estimate aquifer characteristics of transmissivity and hydraulic conductivity. However, based on initial pumping rates of <2 gallons per minute (gpm) in Wells MW-7 and MW-1, the effectiveness of a pump test would be severely limited. HLA therefore proposes to conduct a series of slug tests to estimate aquifer characteristics of transmissivity and hydraulic conductivity at the site. The slug test represents a method of estimating the saturated hydraulic conductivity of aquifer materials of a single well, and appears to be more appropriate for use at the Alameda site because of the low permeability materials that comprise the uppermost aquifer. Slug tests will be performed in Wells MW-1, MW-2, MW-6, and MW-7. Two tests will be performed in each well to assess reproducibility of the data.

Report Preparation

On the basis of the data collected during the subject and previous investigations, HLA will prepare a Phase III hydrogeologic report to evaluate the extent of ground-water contamination and provide preliminary recommendations for ground-water remediation activities at the site. To aid in the design of an effective ground-water extraction system, the computer programs CAPTURE and EQUIPLOT will be run using the aquifer hydraulic parameters derived from our aquifer testing program. These analytical models will be used to simulate appropriate ground-water extraction locations(s) recommended to facilitate cleanup activities at the site.

This work plan should be submitted to the RWQCB and the County for their review prior to the start of the aquifer testing program. HLA will incorporate their comments, if any, into the work plan prior to proceeding with the slug testing program.

If you have any questions, please call us at 415/892-0821.

Yours very truly,

HARDING LAWSON ASSOCIATES

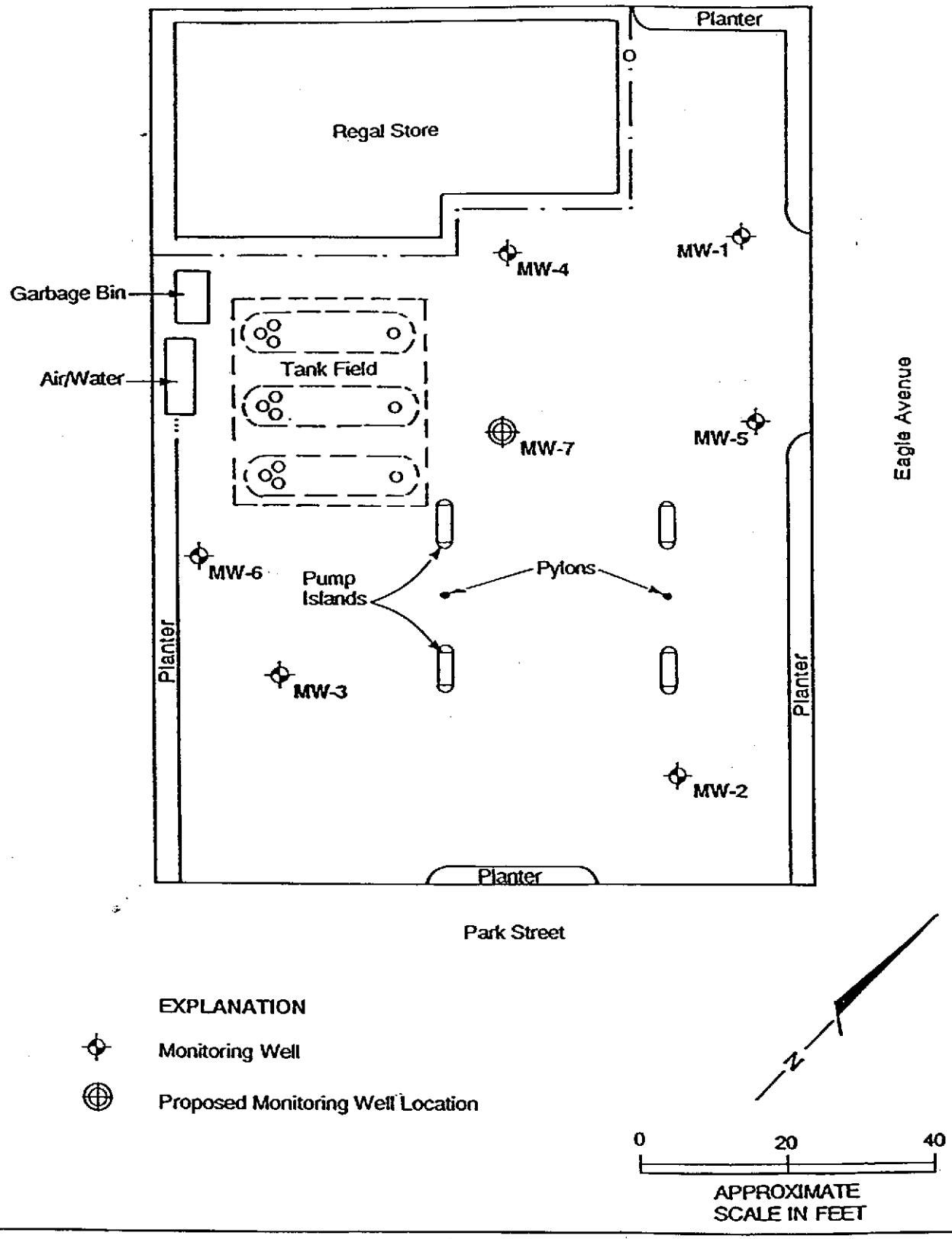
S. Michelle Watson
Project Geologist

Michael L. Siembieda
Associate Geologist

REGISTERED GEOLOGIST
MICHAEL L. SIEMBIEDA
No: 4007
STATE OF CALIFORNIA

SMW/MLS/rmc/E11351-CT

Attachment: Plate 1



Harding Lawson Associates
Engineering and Environmental Services

Site Plan and Proposed Monitoring Well Location
Phase III Evaluation of Petroleum Hydrocarbons
Exxon
Alameda, California

PLATE 1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
MOI	89004,753.02		11/89		