

PRELIMINARY SITE INVESTIGATION

**Exxon Company, U.S.A.
Service Station No. 7-0236
6630 East 14th Street
Oakland, California**

Project No. 30-491

4/25/91

Prepared for:

**Exxon Company, U.S.A.
1200 Smith Street, Suite 2726
Houston, Texas**

Prepared by:

Alton Geoscience, Inc.

April 25, 1991

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1.0 INTRODUCTION

Exxon Company, U.S.A. retained Alton Geoscience, Inc. to conduct a Phase I - Preliminary Site Investigation at Exxon Service Station No. 7-0236, located at 6630 East 14th Street, Oakland, California. The site vicinity map is shown in Figure 1.

1.1 Purpose and Scope

As stated in the proposal dated February 25, 1991, the primary intent of the preliminary site investigation work was to: (1) assess the nature and extent of subsurface contamination, if any; (2) develop an appropriate course of action for further investigation and/or remediation in accordance with the requirements of the regulatory agencies (Alton, 1991).

The tasks performed under this site investigation included the following:

- Conducting a preliminary hydrogeologic assessment and water well survey.
- Obtaining necessary permits.
- Installation of three exploratory soil borings for conversion into three 4-inch-diameter ground water monitoring wells.
- Collection and analysis of soil and ground water samples for the specified hydrocarbon constituents.
- Analysis of data and laboratory results and preparation of a technical report presenting the results, findings, and conclusions of the investigation.

The above tasks and related field and sampling activities were performed in accordance with the requirements of the Alameda County Environmental Health Services Department (ACEHSD) and the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), (RWQCB, 1989).

1.2 Site Location and Description

The Exxon Company, U.S.A. service station is located on the east side of East 14th Street, between 66th Avenue and Havenscourt Avenue, Oakland, California. The site is presently an operating Exxon Company, U.S.A. service station with three underground, single-walled, fiberglass fuel

storage tanks and one underground, fiberglass waste oil storage tank. Figure 2 shows the layout of the station and underground tanks.

A sensitive receptors survey was conducted to identify nearby environmental elements and land uses that may be affected by or affect the subsurface environment at the site. The findings of the survey are as follows:

- The properties adjacent to the site are a mixture of residential and commercial developments. South of the site, across Havenscourt Boulevard, is a former service station. Havenscourt Junior High School is located southwest of the site, across East 14th Street. A small commercial center is located north of the site across 66th Avenue. The areas northwest, northeast, and east of the site are residential developments.
- A review of RWQCB files revealed that the former service station, located south of the Exxon service station, has had confirmed releases of hydrocarbon constituents to the subsurface.
- There are no known municipal or private water supply wells within a 1/2-mile radius of the site.
- Lion Creek is the nearest body of surface water, located approximately 1,500 feet southwest of the site.
- Havenscourt Junior High School is the nearest school, located approximately 150 feet west of the site.

A copy of the sensitive receptors survey and results of the well survey are presented in Appendix A.

1.3 Regional Geology

The site is located approximately 25 feet above mean sea level, as shown on the USGS Topographic Map, East Oakland Quadrangle - 7.5 Minute Series, presented in Figure 1. The site is located in the area underlain by Quaternary alluvium consisting of weakly consolidated clay, silt, sand, and gravel. The formation includes minor deposits of Holocene and late Pleistocene beach sand and marine terrace deposits, up to 50 meters in thickness. Underlying the Quaternary alluvium is the Franciscan Formation, consisting of mainly well-indurated sandstone and shale including greenstone, chert, limestone, conglomerate, and metamorphic rock. This geologic unit is generally highly deformed and sheared with

blocks of various lithologies in a matrix of clay materials (Department of Water Resources, 1968 and 1973).

1.4 Regional Hydrogeology

The site is within the Alameda Bay Plain Ground Water Basin. The ground water in this alluvial basin flows regionally to the west. According to Alameda County Public Works Office, there are no municipal or private water supply wells within a 1/2-mile radius of the site. Municipal water supply in Oakland is provided by the East Bay Municipal Utilities District, which obtains its water from the Mokelumne River.

2.0 FIELD METHODS

This investigative work included drilling three soil borings, as outline in the drilling and soil sampling protocol shown in Appendix B. The borings were used for the installation of Monitoring Wells MW-1, MW-2, and MW-3, following the design and installation procedures shown in Appendix C. Prior to commencement of drilling activities, Well Permit Number 91126 was obtained from the ACEHSD. A copy of the permit is provided in Appendix D.

2.1 Soil Borings and Sampling

On March 13, 1991, Alton Geoscience, Inc. supervised the drilling of three exploratory soil borings for the purpose of installing three ground water monitoring wells at the site. The three borings were drilled using 10-inch-diameter, hollow-stem augers to depths ranging from 26.5 to 30 feet below grade. All drilling activities were performed by West Hazmat Drilling Corporation of Rancho Cordova, California, using a CME-75 truck mounted drilling rig.

During drilling, soil samples were collected at 5-foot intervals, using a modified California split-spoon sampler lined with clean brass sleeves. The soil samples were retained in the brass sleeves and immediately covered with aluminum foil, capped with plastic end caps, wrapped with tape, and immediately placed in an iced cooler for transport to the analytical laboratory.

Each soil boring was logged using the Unified Soil Classification System. Other soil characteristics such as color, consistency, and combustible gas levels were also noted in the boring logs. The boring logs are presented in Appendix E.

2.2 Ground Water Monitoring Well Construction

Monitoring Wells MW-1, MW-2, and MW-3 were constructed of clean, 4-inch-diameter, flush threaded, Schedule 40 polyvinyl chloride (PVC) blank casing and 0.020-inch, slotted PVC casing, to depths of 25 to 26 feet below grade. The slotted portions of the well casings were 20 feet in length. Well installation procedures are presented in Appendix C, while well construction details are included in the boring logs presented in Appendix E.

2.3 Monitoring Well Development and Sampling

Well development and sampling procedures were conducted in accordance with the RWQCB and ACEHSD guidelines. A description of Alton Geoscience, Inc. general field procedures for well development and sampling is presented in Appendix F.

Monitoring Wells MW-1, MW-2, and MW-3 were developed on March 14, 1991. Prior to well development, an electronic interface probe was used in each well to check for the presence of floating product. The monitoring wells were developed using either a 4-inch-diameter bailer or a double-diaphragm pump. During development, the pH, temperature, and conductivity of the purged water were recorded. Monitoring Well MW-1 was developed by removing approximately 9 casing volumes of water. Monitoring Wells MW-2 and MW-3 were developed by removing approximately 4 casing volumes of water.

The monitoring wells were sampled on March 15, 1991. Prior to sampling, the wells were purged of 4 casing volumes of water using a 4-inch-diameter bailer. During purging of the wells, pH, specific conductivity, and temperature measurements were taken at regular intervals and recorded. Stabilization of these parameters indicated that formation water had entered the well. Field observations during well development and purging prior to sampling are presented in the water sampling survey forms included in Appendix F.

Following well development and purging, ground water samples were collected in accordance with RWQCB guidelines and the standard protocol described in Appendix F. Ground water samples were collected in clean containers and transported in an iced cooler to the analytical laboratory for analysis following proper chain of custody procedures.

2.4 Ground Water Level Monitoring and Surveying

A permanent mark at the top of casing of each monitoring well was surveyed on March 27, 1991, in reference to a common datum selected onsite. The datum was assigned an arbitrary elevation of 100.00 feet above mean sea level. The purpose of the survey was to determine the relative top of casing elevations of the three ground water monitoring wells for use in calculating the water table elevation at each well. The water table elevation data are used to estimate the general direction of ground water flow and the average hydraulic gradient in the shallow aquifer beneath the site. The depth to ground water in the wells was measured on March 15, 1991 from the top of the well casing to the nearest 0.01 foot, using an electronic sounder. The survey data and calculated ground water elevations are presented in Table 1.

3.0 ANALYTICAL METHODS AND RESULTS

All laboratory analyses of soil and ground water samples were performed by a California-certified analytical laboratory, using standard test methods of the U.S. Environmental Protection Agency (EPA) and the California Department of Health Services (DHS). Superior Analytical Laboratory of Martinez, California, analyzed the soil and ground water samples.

3.1 Soil Analysis

Selected soil samples from Borings MW-1, MW-2, and MW-3 were analyzed for the following constituents:

- TPH-G using EPA Methods 5030/8015
- BTEX constituents using EPA Methods 5030/8020

The results of the laboratory analysis of soil samples are presented in Table 2; the official laboratory reports and chain of custody records are included in Appendix G.

3.2 Ground Water Analysis

The ground water samples collected from the monitoring wells were analyzed for the following constituents:

- TPH-G using EPA Methods 5030/8015
- BTEX constituents using EPA Methods 5030/8020

Due to their proximity to the waste oil tank, ground water samples from MW-2 and MW-3 were additionally analyzed for the following constituents:

- Total petroleum hydrocarbons as diesel (TPH-D) using EPA Method 8015
- Total oil and grease (TOG) using standard Method 5520F
- Halogenated volatile organic compounds (HVOC) using EPA Method 601

The results of the laboratory analysis of the ground water samples collected are presented in Table 3, while the official laboratory report and chain of custody records are included in Appendix G.

4.0 HYDRAULIC AND GEOLOGIC CHARACTERISTICS

A discussion of the hydraulic and geologic characteristics of the site, based on the site geology and hydrogeology, is presented below.

4.1 Site Geology

Review of the boring logs generated during this subsurface investigation indicate that the stratigraphy beneath the site is relatively consistent both vertically and horizontally. Clay and silty clay underlie the asphalt and road base from 1 to 15 feet below grade, except in MW-3, where the clay ends at approximately 10 feet below grade. A water-bearing sandy clay was encountered below the silty clay extending to 25 feet below grade in all three borings. This unit was underlain by clay in MW-1 and silty clay in MW-2 and MW-3 to the total depths of the borings.

4.2 Site Hydrogeology

Ground water was first encountered during the drilling and sampling of Borings MW-1, MW-2, and MW-3 at depths between 16 and 18 feet below grade. After well development, the ground water stabilized between approximately 7.5 and 9 feet below grade in the monitoring wells.

The ground water elevations in the monitoring wells were calculated using top of casing survey data and water level measurements recorded on March 15, 1991, as shown in Table 1. A ground water elevation contour map, based on interpretation of the March 15, 1991 water level data, is shown in Figure 2.

The data indicates that shallow ground water has an average hydraulic gradient of 0.03 foot per foot across the site, with a calculated flow direction generally to the south.

5.0 DISCUSSION OF RESULTS

The results of the field activities and laboratory analysis of soil and ground water samples collected during this investigation are discussed below.

5.1 Soil Analysis

Nine soil samples were collected for analysis as part of this site investigation to assess the nature and extent of hydrocarbons in the soil at the site. The analytical results are summarized in Table 2 and discussed below.

- TPH-G was detected in Boring MW-2 at depths of 6 and 11 feet below grade, at 2 and 98 ppm, respectively.
- Varying concentrations of BTEX constituents were detected in most of the samples from Borings MW-2 and MW-3.

5.2 Ground Water Analysis

The results of laboratory analysis of ground water samples collected from the monitoring wells on March 15, 1991 were used to assess the nature and extent of hydrocarbons detected in ground water at the site. The results of the laboratory analysis are summarized in Table 3 and discussed below:

- Analysis of ground water samples from MW-2 and MW-3 detected 1,700 and 3,100 ppb of TPH-G, respectively, and corresponding concentrations of BTEX constituents.
- TPH-D was detected in the water samples from MW-2 and MW-3 at concentrations of 120 and 160 ppb, respectively.
- Analysis of ground water samples from MW-2 and MW-3 for HVOCs detected the presence of methylene chloride at concentrations of 1 and 21 ppb, respectively.

6.0 FINDINGS AND CONCLUSIONS

The findings and conclusions of this preliminary site investigation are summarized below:

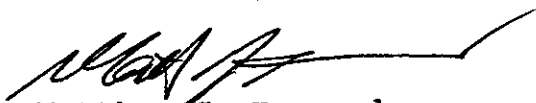
- The highest concentrations of adsorbed and dissolved-phase hydrocarbons appear to be located near the center of the site and west of the underground fuel tanks.
- The extent of dissolved-phase petroleum hydrocarbon constituents in the ground water cannot be assessed at this time. It appears that the dissolved-phase hydrocarbons detected at the site may extend offsite in a westerly direction.
- The ground water elevation contour map developed from water level and survey data indicates an average hydraulic gradient of approximately 0.03 foot per foot across the site, with a calculated flow direction generally to the south.
- Soil types encountered at the site during drilling and sampling generally consisted of a water-bearing sandy clay unit, both overlain and underlain by clay to silty clay.
- Methylene chloride was detected in two ground water samples at concentrations of up to 21 ppb, however, methylene chloride is used for laboratory extraction and it is likely that the chemical originated in the laboratory.

This report was based on currently available data and was developed in accordance with current hydrogeologic and engineering practices.

ALTON GEOSCIENCE



William Shipp
Staff Geologist



Matthew J. Hopwood
Project Manager



Al Sevilla
R.C.E. No. 26932
Regional Manager

REFERENCES

REFERENCES

Alton Geoscience, Inc. Proposed Work Plan for Site Assessment, February 25, 1991a.

California Regional Water Quality Control Board. Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks, July 1, 1988 and Revised April 3, 1989.

Department of Water Resources. Bulletin No. 118-1, 1968 and 1973.

FIGURES

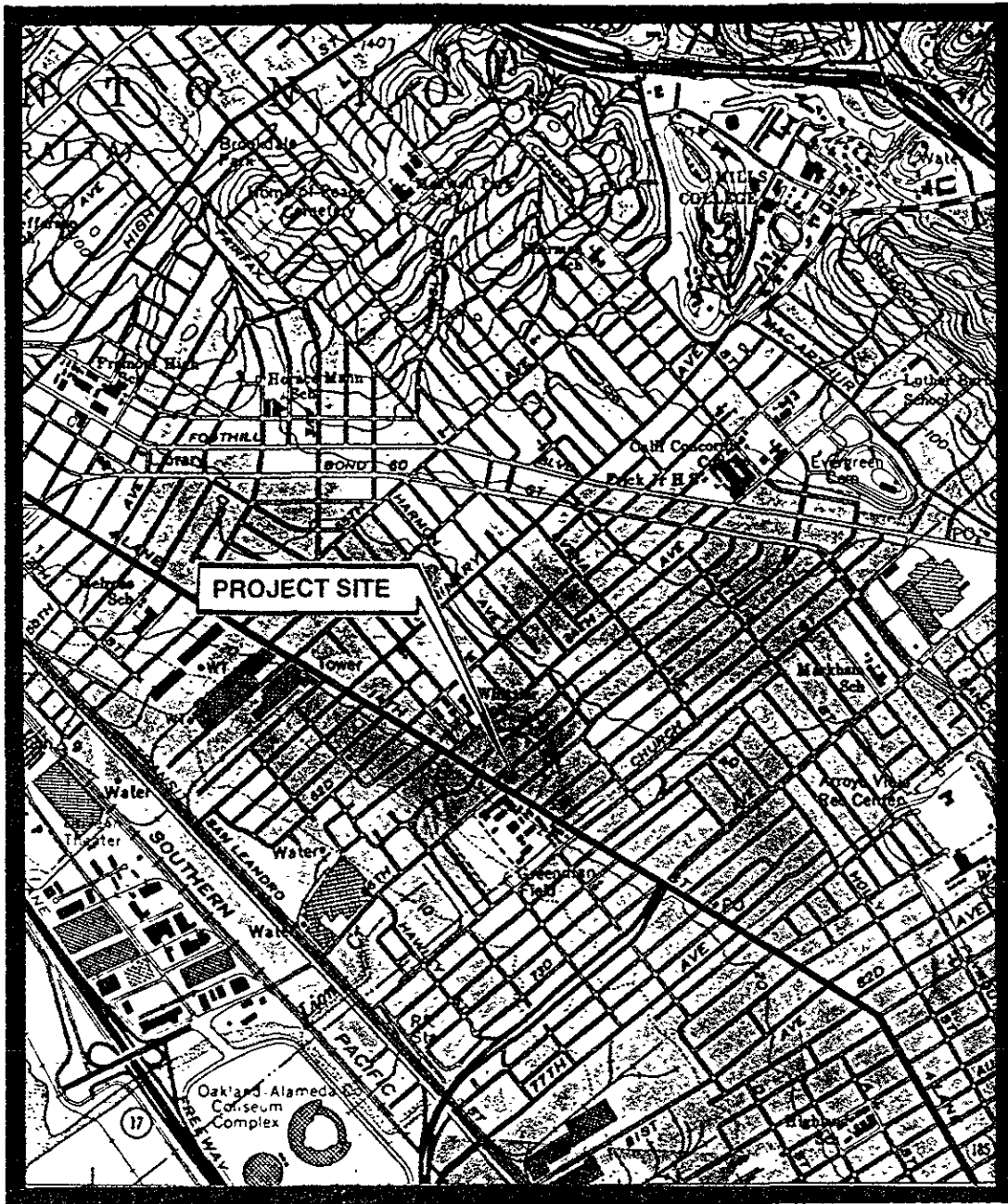


FIGURE 1: SITE VICINITY MAP

**EXXON COMPANY, U.S.A.
 SERVICE STATION NO. 7 - 0236
 6630 EAST 14TH STREET
 OAKLAND, CALIFORNIA**

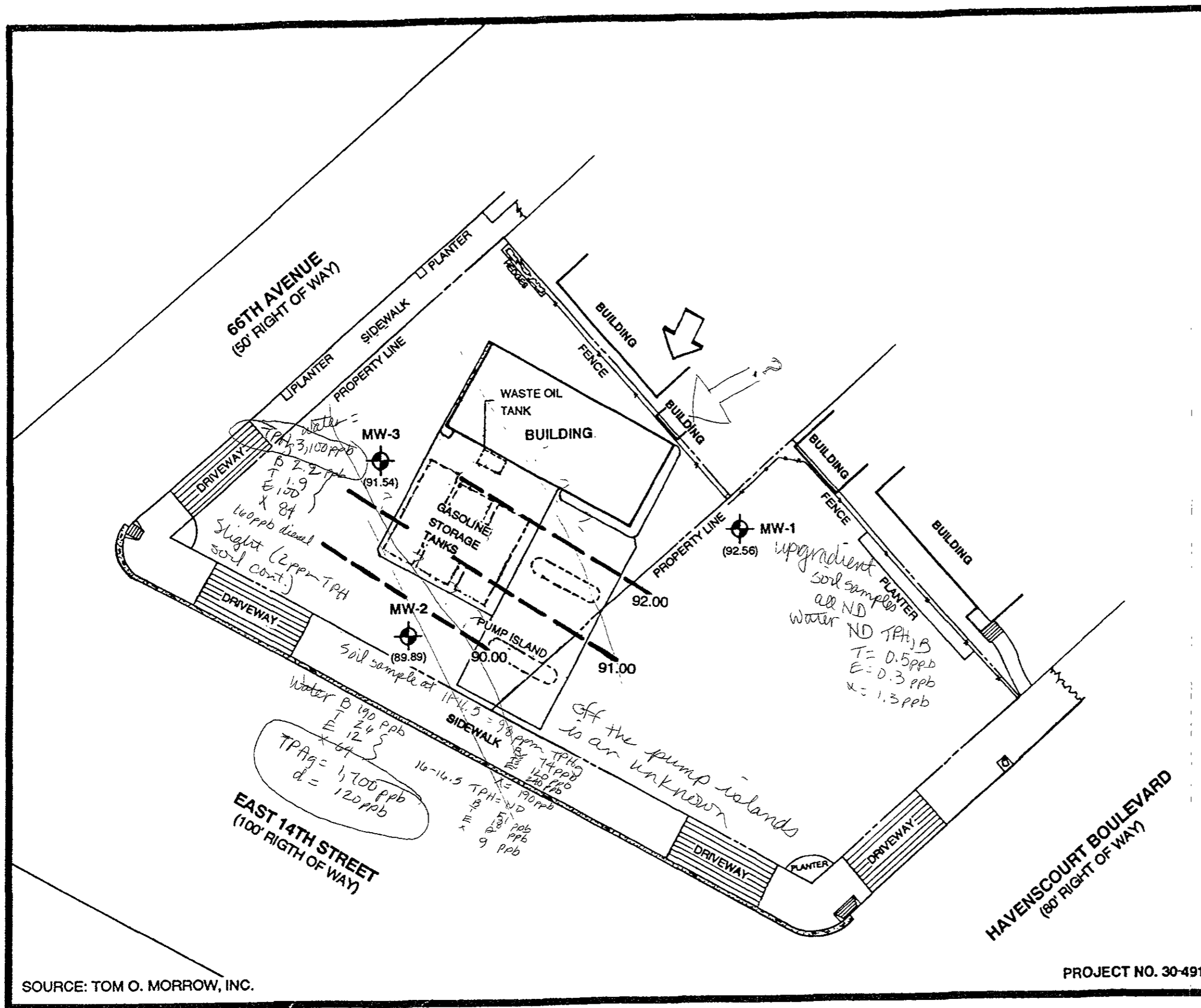
PROJECT NO. 30 - 491



**SOURCE: U.S.G.S. MAP OAKLAND EAST QUADRANGLE
 CALIFORNIA. 7.5 MINUTE SERIES (TOPOGRAPHIC)
 PHOTOED 1959. PHOTOREVISED 1980**



ALTON GEOSCIENCE
 1000 Burnett Ave., Ste. 140
 Concord, CA 94520



LEGEND:

- GROUND WATER MONITORING WELL
- (91.54) GROUND WATER ELEVATION
- 91.00 - GROUND WATER ELEVATION CONTOUR
- GENERAL DIRECTION OF GROUND WATER FLOW

Notes:

1. Contour lines are interpretive based on water level reading recorded on 3/20/91.
2. Contour interval 1.0 ft.
3. Average Hydraulic Gradient = 0.03 ft./ft.

FIGURE 2: GROUND WATER ELEVATION CONTOUR MAP

EXXON COMPANY, U.S.A.
 SERVICE STATION NO. 7 - 0236
 6630 EAST 14th STREET
 OAKLAND, CALIFORNIA

ALTON GEOSCIENCE
 1000 Burnett Ave., Ste. 140
 Concord, CA 94520

SOURCE: TOM O. MORROW, INC.

TABLES

TABLE 1 - SURVEY AND WATER LEVEL MONITORING DATA

Exxon Service Station No. 7-0236
6630 East 14th Street
Oakland, California

Alton Geoscience, Inc. Project No. 30-491

Well Number	Relative Top of Casing Elevation (in feet)	Depth to Water Level (in feet)	Relative Water Level Elevation (in feet)
Date of Measurement - 3/15/91			
MW-1	100.00	7.44	92.56
MW-2	98.94	9.05	89.89
MW-3	99.38	7.84	91.54

Note:

Top of casing elevations for all wells surveyed relative to MW-1 which was assigned an arbitrary elevation of 100.00 feet.

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS FOR SOIL SAMPLES

Exxon Company, U.S.A.
 Exxon Service Station No. 7-0236
 6630 East 14th Street
 Oakland, California

Alton Geoscience, Inc. Project No. 30-491

Well No.	Depth (in feet)	TPH-G	B	T	E	X
Concentrations in Parts Per Million						
Date of Sampling - March 13, 1991						
MW-1	6-6.5	ND<1	ND<0.003	ND<0.003	ND<0.003	ND<0.003
MW-1	11-11.5	ND<1	ND<0.003	ND<0.003	ND<0.003	ND<0.003
MW-1	16-16.5	ND<1	ND<0.003	ND<0.003	ND<0.003	ND<0.003
MW-2	6-6.5	2	0.008	0.018	ND<0.003	0.025
MW-2	11-11.5	98	0.074	0.12	0.24	0.19
MW-2	16-16.5	ND<1	0.051	ND<0.003	0.018	0.009
MW-3	6-6.5	ND<1	0.009	ND<0.003	ND<0.003	0.01
MW-3	11-11.5	ND<1	ND<0.003	ND<0.003	ND<0.003	0.018
MW-3	16-16.5	ND<1	ND<0.003	ND<0.003	ND<0.003	0.004

Note:

TPH-G = Total petroleum hydrocarbons

B = Benzene

T = Toluene

E = Ethylbenzene

X = Xylenes

ND = Not detected above the reported method detection limits

NA = Not analyzed

TABLE 3 - SUMMARY OF ANALYTICAL RESULTS OF GROUND WATER SAMPLES

Exxon Company, U.S.A.
 Exxon Service Station No. 7-0236
 6630 East 14th Street
 Oakland, California

Alton Geoscience, Inc. Project No. 30-491

Well Number	Date of Sampling	TPH-G	TPH-D	B	T	E	X	TOG	Methylene Chloride
Concentrations in Parts Per Billion									
MW-1	03/15/91	ND<50	---	ND<0.3	0.5	0.3	1.3	---	---
MW-2	03/15/91	1,700	120	190	2.6	12	64	ND<5000	1*
MW-3	03/15/91	3,100	160	2.2	1.9	100	84	ND<5000	21*

Note:

- TPH-G = Total petroleum hydrocarbons as gasoline
- TPH-D = Total petroleum hydrocarbons as diesel
- B = Benzene
- T = Toluene
- E = Ethylbenzene
- X = Xylenes
- TOG = Total oil and grease
- ND = Not detected above reported detection limits
- = Not analyzed
- * = Methylene chloride is a laboratory extraction agent

APPENDIX A
SENSITIVE RECEPTORS SURVEY

**SENSITIVE RECEPTORS SURVEY
SITE SURVEY AND LITERATURE SEARCH**

Client: Exxon Company, U.S. A. Project No.: 30-0491
Station No.: 7-0236
Location: 6630 East 14th Street
City/State: Oakland CA

I. Provide answers to the following questions:

- A. Is there a public water supply well within 2500 feet? Y/N No
If Yes, Distance _____ ft.
- B. Is there a private water supply well within 1000 feet? Y/N No
If Yes, Distance _____ ft.
- C. Is there a subway within 1000 feet? Y/N No
If Yes, Distance _____ ft.
- D. Is there a basement within 1000 feet? Y/N Unknown
If Yes, Distance _____ ft.
- E. Is there a school within 1000 feet? Y/N _____
If Yes, Distance -200 ft.
- F. Is there a surface body of water within 1000 feet? Y/N No
If Yes, Distance _____ ft.
Name _____

II. Describe type of local water supply.

Public: _____

- Suppliers Name: East Bay Municipal Utilities District
- Suppliers Source: _____
- Distance to Site: _____

Private: _____

SENSITIVE RECEPTORS SURVEY
SITE SURVEY AND LITERATURE SEARCH

Page 2

III. Distance to Nearest Adjacent Properties:

Residential	<u>25</u> ft.
Commercial	<u>60</u> ft.
Industrial	<u>3,500</u> ft.
Hospital	<u>-2miles</u> ft.
School (<u>Havencourt Junior High</u>)	<u>150</u> ft.
Name	

IV. Aquifer Classification, if available.

Class I	- Special Ground Waters	_____
	- Irreplaceable Drinking Water Source	_____
	- Ecologically Vital	_____
Class II	- Current and Potential Drinking Water Sources	_____
Class III	- Not Potential Source of Drinking Water	<u>Class III</u>

V. Describe observation wells, if any.

Number	Y/N	<u>Three</u>
Free Product?		<u>No</u>

VI. Signature of Preparer: 

Date: 7/27 4/2/91

VII. Sketch of Site

APPENDIX B
DRILLING AND SOIL SAMPLING

APPENDIX B

DRILLING AND SOIL SAMPLING

Soil borings/monitoring wells were drilled using 10-inch-diameter, continuous-flight, hollow-stem augers. To avoid cross-contamination, the augers were steam cleaned prior to drilling each boring.

Soil samples were obtained for soil description, field hydrocarbon vapor testing, and laboratory analysis. Samples were collected at 5-foot intervals from Borings MW-1, MW-2, and MW-3.

Soil samples collected at 5-foot intervals were retrieved ahead of the lead auger using an 18-inch-long by 2-inch-diameter split spoon sampler lined with 1.5-inch-diameter brass sample sleeves. The sampler and sample tubes were washed with a sodium tripolyphosphate solution and rinsed before each sampling event. The sampler was driven by a 30-inch free fall of a 140-pound hammer. Blow counts were recorded for three successive 6-inch intervals.

Upon retrieval from the 18-inch sampler, the sample sleeves were removed and securely sealed with aluminum sheeting and polyurethane caps. The bottom sample sleeve was removed and capped. The sample was labeled with sample identification, sample depth, engineer's initials, and date of collection. The soil sample was kept in an iced cooler prior to and during transport to a California-certified laboratory.

The remaining soil recovered was described in accordance with the Unified Soil Classification System. For each soil type, field estimates of density/consistency, moisture, color, grading, and soil type were recorded on the boring logs.

APPENDIX C
MONITORING WELL INSTALLATION PROCEDURES

APPENDIX C

MONITORING WELL INSTALLATION PROCEDURES

Included in this appendix are monitoring well installation and construction details for monitoring wells installed as part of this study.

Monitoring wells were constructed of 4-inch-diameter, flush-threaded, Schedule 40, PVC, blank and screened (0.020-inch slot size) casing. The annular space surrounding the screened portion was backfilled with No. 3 Monterey sand (filter pack) to approximately 1 foot above the top of the screened section. A 1/2-foot-thick, bentonite, annular seal was placed above the filter pack and the remaining annulus was grouted with neat cement to the surface. Utility boxes were installed slightly above grade to minimize infiltration of surface waters. Locking, water-tight well caps were installed to ensure the integrity of the well.

APPENDIX D
PERMIT



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94566 (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT Exxon Service Station No. 7-0236
1230 East 14th Street
Oakland, CA

PERMIT NUMBER 91126

LOCATION NUMBER

CLIENT
Name Exxon Company, USA
Address 1200 Smith St., # 2726 Phone
City Houston Zip 77002

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT
Name Alton Geoscience, Inc.
Address 1000 Burnett Ave., #140 Phone (415) 682-1582
City Concord Zip 94520

A. GENERAL

- 1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling log and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER WELLS, INCLUDING PIEZOMETERS

- 1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

- C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.
D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.
E. WELL DESTRUCTION. See attached.

TYPE OF PROJECT
Well Construction Geotechnical Investigation
Cathodic Protection General
Water Supply Contamination
Monitoring X Well Destruction

PROPOSED WATER SUPPLY WELL USE
Domestic Industrial Other
Municipal Irrigation

DRILLING METHOD:
Mud Rotary Air Rotary Auger X
Cable Other

DRILLER'S LICENSE NO. C-57 554 979

DESIRED PROJECTS
Drill Hole Diameter 10 in. Maximum
Casing Diameter 4 in. Depth 50 ft.
Surface Seal Depth 15 ft. Number 3

GEOTECHNICAL PROJECTS
Number of Borings Maximum
Hole Diameter in. Depth ft.

ESTIMATED STARTING DATE 3/13/91
ESTIMATED COMPLETION DATE 3/14/91

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE William A. Shipp Date 3/5/91

Approved Wyman Hong Date 6 Mar 91
Wyman Hong

APPENDIX E
BORING LOGS

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY
BORING



PROJECT NO. 30-491 DATE DRILLED 03/13/91
 CLIENT Exxon Company, U.S.A.
 LOCATION 14th St. & 66th Ave., Oakland
 LOGGED BY W. Shipp APPROVED BY _____

BORING NO. _____
 WELL NO. MW-1

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 100.00'

DRILLING METHOD CME 75 HOLE DIAM. 10"
 SAMPLER TYPE Modified split spoon
 CASING DATA 4" PVC, 0.020' slots
 DRILLER West Hazmat Drilling Corp.

BLOWS PER 1/2 FOOT	CGI (PPM) *	SAMPLE	DEPTH (FR)	Well Construction	USCS PROFILE	DEPTH TO WATER	7.44'		
						DATE	3/15/91		
						TIME	0900		
						DESCRIPTION			
			0	Christy Box					
			2						
			4						
20,28,32	0		6	4" sch. 40 PVC Casing	CL				3" Asphalt, 5" Road Base <i>screened from 6 + 26'</i>
			8						CLAY: dark gray, moist, hard, medium plastic, 10% silt, 1-2% angular medium-grained sand, 1% organics.
12,18,18	0		10						SILTY CLAY: medium brown, moist, hard, medium plastic, 5% angular sand, 1% angular gravel to 1/2".
			12						
12,15,18	0		16	4" sch. 40 PVC .020 Slot	SC				SANDY CLAY: brown, wet, hard, low plasticity, medium to coarse grained sand, 5% angular gravel to 1".
			18						
8,16,21			20						Same, becomes saturated, gravels to 1/4".
			22						
			24	End Cap					
13,18,20			26						CLAY: brown, moist, hard, medium plastic, 10% silt, 3% medium grained sand, 1-2% organics.
12,18,24			28						Same as above.
7,14,18			30	Partial Collapse	CL				Same, becomes very stiff, 1-2% gravel.
			32						
			34						

- Portland Cement
- Sand #3 Lonestar
- Bentonite Pellets
- Driven interval
- Sample
- Water level encountered during drilling
- Stabilized water level

BORING TERMINATED AT 29.5 FEET BELOW GRADE

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY
BORING



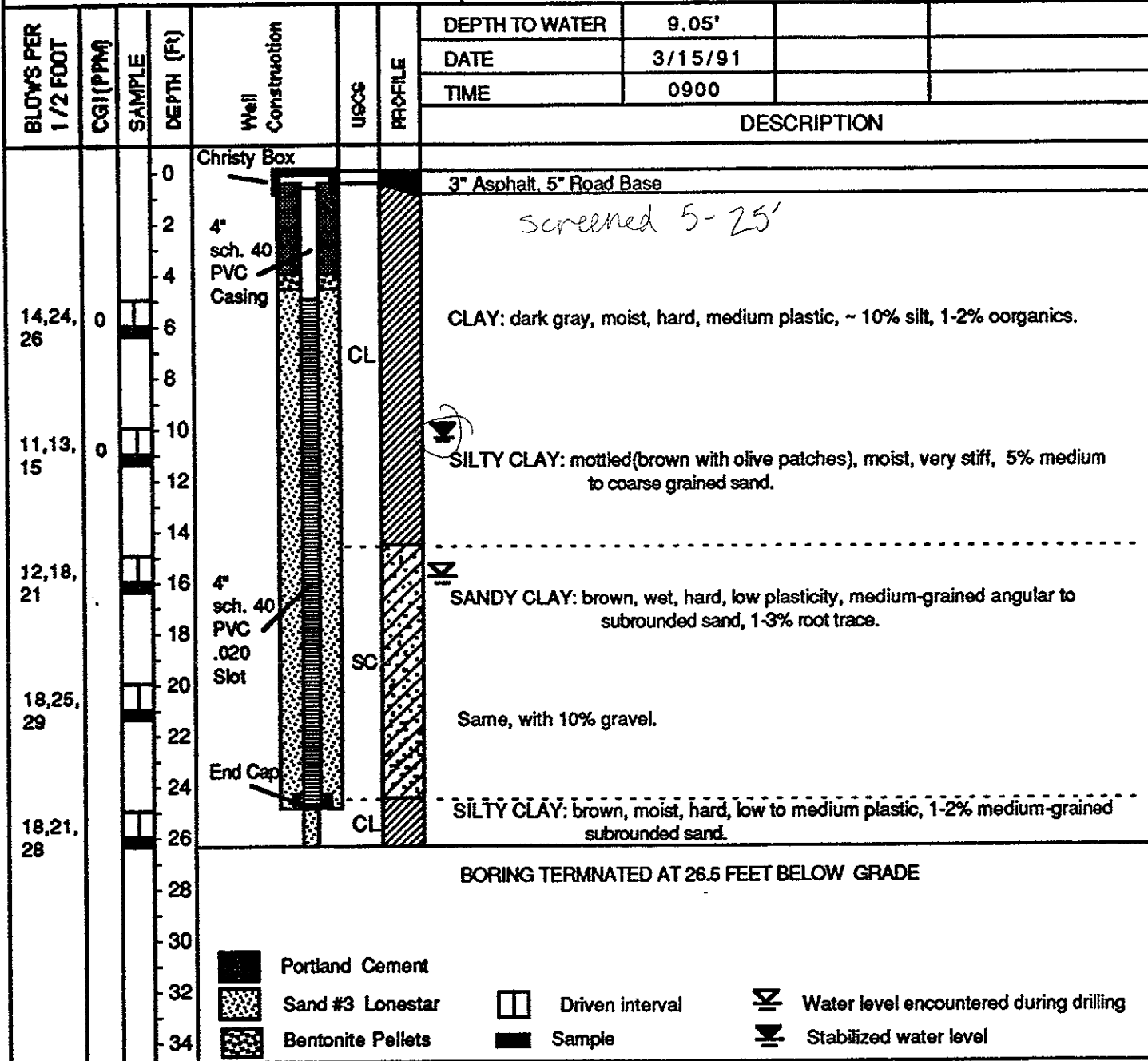
PROJECT NO. 30-491 DATE DRILLED 03/13/91
 CLIENT Exxon Company, U.S.A.
 LOCATION 14th St. & 66th Ave., Oakland
 LOGGED BY W. Shipp APPROVED BY _____

BORING NO. _____
 WELL NO. MW-2

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 98.94'

DRILLING METHOD CME 75 HOLE DIAM. 10"
 SAMPLER TYPE Modified split spoon
 CASING DATA 4" PVC, 0.020' slots
 DRILLER West Hazmat Drilling Corp.



ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING



PROJECT NO. 30-491 DATE DRILLED 03/13/91
 CLIENT Exxon Company, U.S.A.
 LOCATION 14th St. & 66th Ave., Oakland
 LOGGED BY W. Shipp APPROVED BY _____

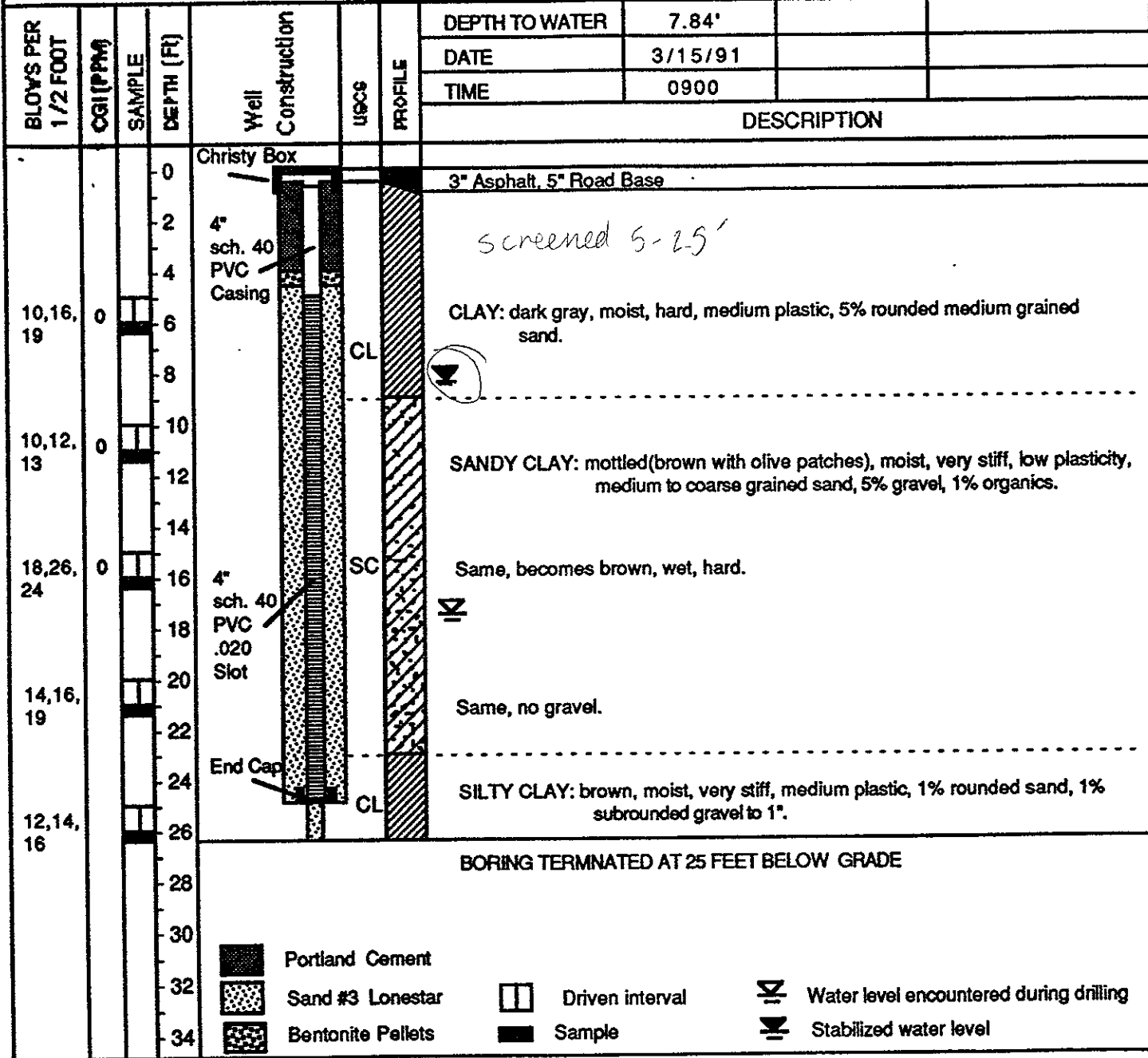
BORING NO.

 WELL NO.
 MW-3

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 99.38'

DRILLING METHOD CME 75 HOLE DIAM. 10"
 SAMPLER TYPE Modified split spoon
 CASING DATA 4" PVC, 0.020" slots
 DRILLER West Hazmat Drilling Corp.



APPENDIX F

**WELL DEVELOPMENT, WATER SAMPLING
PROCEDURES, AND FIELD SURVEY FORMS**

APPENDIX F

WELL DEVELOPMENT, WATER SAMPLING PROCEDURES, AND FIELD SURVEY FORMS

All purging and ground water sampling equipment was cleaned prior to use to minimize cross-contamination between wells. All equipment in contact with ground water was triple-rinsed prior to each sampling event in successive baths consisting of tripolyphosphate solution, tap water, and deionized water. Prior to sampling, the well was developed and purged in accordance with EPA protocol. During purging, pH, temperature, and electroconductivity were measured periodically until these parameters stabilized, indicating formation water had entered the well casing. The purged water was pumped into barrels prior to disposal or recycling at an appropriate waste disposal facility.

Ground water samples were collected by lowering a clean 2-inch-diameter, bottom-fill, Teflon bailer just below the water level in the well. The samples were carefully transferred from the check-valve-equipped Teflon bailer to zero-headspace, 40-milliliter glass containers fitted with Teflon-sealed caps and one-liter amber-glass bottles. All samples were inverted to ensure that entrapped air was not present. Each sample was labeled with sample number, well number, sample date, and geologist's initials. The samples remained on ice prior to laboratory analysis.

ALTON GEOSCIENCE, INC.
Well Development and
Water Sampling Field Survey

Project # 30-0471 Site: EXXON Date: 3/14/91

Well: MW-1 Sampling Team: DONNIE BURR

Well Development Method: PUMP

Sampling Method: _____

Describe Equipment Decontamination Before Sampling: Triple Rinse

Well Development/Well Sampling Data

Total Well Depth: 25.90 feet Time: _____ Water level Before Pumping: 7.50

Water Column	Casing Diameter		Volume	Factor	Volume to Purge
	2-inch	4-inch			
<u>18.4</u> feet x 0.16		<u>0.65</u>	<u>11.96</u>	<u>10</u>	<u>119.6</u>

Depth Purging From: _____ feet. Time Purging Begins: _____

Notes on Initial Discharge: _____

Time	Volume	pH	X1000 Conductivity	T	Notes
<u>11:30</u>	<u>24</u>	<u>7.96</u>	<u>2.00</u>	<u>65.6</u>	<u>LT BROWN</u>
<u>12:35</u>	<u>48</u>	<u>7.42</u>	<u>1.89</u>	<u>61.3</u>	<u>" "</u>
<u>1:00</u>	<u>72</u>	<u>9.02</u>	<u>1.76</u>	<u>64.0</u>	<u>CLEAR</u>
<u>3:11</u>	<u>96</u>	<u>8.86</u>	<u>1.27</u>	<u>59.4</u>	<u>" "</u>
	<u>120</u>				

Time Field Parameter Measurement Begins: _____

	Rep #1	Rep #2	Rep #3	Rep #4
pH	_____	_____	_____	_____
Conductivity	_____	_____	_____	_____
Temperature (F)	_____	_____	_____	_____

Presample Collection Gallons Purged: _____

Time Sample Collection Begins: _____

Time Sample Collection Ends: _____

Total Gallons Purged: _____

Notes: Well dry out at 55 gal at 12:53 Back on well at 2:00
out at 75 gal at 1:24 back on well at 3:00 out at 20 gal
back on at 3:10

ALTON GEOSCIENCE, INC.
Well Development and
Water Sampling Field Survey

Project # 30-0491 Site: EXUN . Date: 3/14/91

Well: MW-2 Sampling Team: Donnie Burel

Well Development Method: PUMP

Sampling Method: _____

Describe Equipment Decontamination Before Sampling: Triple Pump

Well Development/Well Sampling Data

Total Well Depth: 25.00 feet Time: _____ Water level Before Pumping: 10.00

Water Column	Casing Diameter	Casing Diameter		Volume	Factor	Volume to Purge
		2-inch	4-inch			
<u>15.</u> feet x	0.16		<u>0.65</u>	<u>9.75</u>	<u>10</u>	<u>97.5</u>

Depth Purging From: _____ feet. Time Purging Begins: _____

Notes on Initial Discharge: _____

Time	Volume	pH	¹¹⁰⁰⁰ Conductivity	T	Notes
<u>2:20</u>	<u>19.5</u>	<u>8.45</u>	<u>2.68</u>	<u>65.4</u>	<u>LT Brown</u>
<u>2:37</u>	<u>39</u>	<u>8.09</u>	<u>2.64</u>	<u>65.4</u>	<u>" "</u>
_____	<u>58.5</u>	_____	_____	_____	_____
_____	<u>76.</u>	_____	_____	_____	_____
_____	<u>97.5</u>	_____	_____	_____	_____

Time Field Parameter Measurement Begins: _____

	Rep #1	Rep #2	Rep #3	Rep #4
pH	_____	_____	_____	_____
Conductivity	_____	_____	_____	_____
Temperature (F)	_____	_____	_____	_____

Presample Collection Gallons Purged: _____

Time Sample Collection Begins: _____

Time Sample Collection Ends: _____

Total Gallons Purged: _____

Comments: Well dry up at 2:35 at 40 Gal back on well at 2:40

ALION GEOSCIENCE, INC.
Well Development and
Water Sampling Field Survey

Project # 30-0491 Site: EXXON Date: 3/14/80

Well: MW-3 Sampling Team: Donnie Burt

Well Development Method: PUMP

Sampling Method: _____

Describe Equipment Decontamination Before Sampling: Triple Rinse

Well Development/Well Sampling Data

Total Well Depth: 24.85 feet Time: _____ Water level Before Pumping: 7.90

Water Column	Casing Diameter		Volume	Factor	Volume to Purge
	2-inch	4-inch			
<u>16.95</u> feet x 0.16		<u>0.65</u>	<u>11</u>	<u>10</u>	<u>110</u>

Depth Purging From: _____ feet. Time Purging Begins: _____

Notes on Initial Discharge: _____

Time	Volume	pH	Conductivity	T	Notes
<u>1:34</u>	<u>22</u>	<u>7.75</u>	<u>2.20</u>	<u>64.3</u>	<u>CLEAR</u>
<u>1:37</u>	<u>44</u>	<u>7.62</u>	<u>2.36</u>	<u>63.3</u>	<u>" "</u>
_____	<u>66</u>	_____	_____	_____	_____
_____	<u>88</u>	_____	_____	_____	_____
_____	<u>110</u>	_____	_____	_____	_____

Time Field Parameter Measurement Begins: _____

	Rep #1	Rep #2	Rep #3	Rep #4
pH	_____	_____	_____	_____
Conductivity	_____	_____	_____	_____
Temperature (F)	_____	_____	_____	_____

Presample Collection Gallons Purged: _____

Time Sample Collection Begins: _____

Time Sample Collection Ends: _____

Total Gallons Purged: _____

Comments: Well dry out at 95 gal at 1:40 Incon well at 1:50 got out 3 Dal back in well at 3:22 still dry

ALTON GEOSCIENCE, INC.
Water Sampling Field Survey

WELL # MW-1 PROJECT # 30-0491 LOCATION OAKLAND DATE 3/16/91
 SAMPLING TEAM Donnie Burel SAMPLING METHOD: BAILER PUMP
 DECONTAMINATION METHOD: TRIPLE RINSE W/TSP AND DEIONIZED WATER
 STEAM CLEAN

WELL DATA:
 DEPTH TO WATER 7.49 ^{ft}
 TOTAL DEPTH 25.90 ^{ft}
 ST. WATER COL 18.46 ^{ft}

diam	gal/ft
2 in	X0.16
3 in	X0.36
4 in	X0.63
6 in	X1.44

Volume of Water Column 12 gal
 Volumes to Purge 4 Vol
 Total Volume to Purge 48 gal

CHEMICAL DATA:

T (F)	SC/umhos	pH	Time	Comments	Volume (gal)
67.3	7.09	4.91	10:54	clean	9
66.0	6.82	4.79	10:57	"	18
65.9	7.35	4.70	10:59	"	27
65.2	7.94	4.65	11:00	"	36
66.3	6.97	4.63	11:05	"	45
ACTUAL VOLUME PURGED					<u>48</u> /gal

COMMENTS: meth X100

ALTON GEOSCIENCE, INC.
Water Sampling Field Survey

WELL # MW-2 PROJECT# 30-0491 LOCATION OAKLAND DATE 3/18/91
 SAMPLING TEAM Donnie Burel SAMPLING METHOD: BAILER PUMP
 DECONTAMINATION METHOD: TRIPLE RINSE W/TSP AND DEIONISED WATER
 STEAM CLEAN

WELL DATA:

DEPTH TO WATER 9.05 ft
 TOTAL DEPTH 24.58 ft
 WT. WATER COL 15.93 ft

CONVERSION	
diam	gal/ft
2 in	X0.16
3 in	X0.36
4 in	X0.65
6 in	X1.44

Volume of Water Column 18 gal
 Volumes to Purge 2 Vol
 Total Volume to Purge 41 gal

CHEMICAL DATA:

T (F)	SC/unhos	pH	Time	Comments	Volume (gal)
64.2	10.00	4.54	1116	clear	8.2
66.1	9.79	4.51	1118	"	16.4
66.2	9.70	4.50	1120	"	24.8
67.0	9.87	4.74	1123	"	32.8
65.5	9.89	4.57	1127	"	41
ACTUAL VOLUME PURGED					1 gal

COMMENTS: meter X100 Slow Producer!

ALTON GEOSCIENCE, INC.
Water Sampling Field Survey

WELL # MW-3 PROJECT 30-0491 LOCATION OAKLAND DATE 3/15/81
 SAMPLING TEAM Donnie Burel SAMPLING METHOD: BAILER PUMP
 DECONTAMINATION METHOD: TRIPLE RINSE W/TSP AND DEIONISED WATER
 STEAM CLEAN

WELL DATA:

DEPTH TO WATER 7.84ft
 TOTAL DEPTH 24.86ft
 WT. WATER COL 17.02ft

CONVERSION	
diam	gal/ft
2 in	X0.16
3 in	X0.36
4 in	X0.69
6 in	X1.44

Volume of Water Column 11 gal
 Volumes to Purge x 4 Vol
 Total Volume to Purge 44 gal

CHEMICAL DATA:

T (F)	SC/unhos	pH	Time	Comments	Volume (gal)
72.6	8.92	4.72	1141	Clear	8.0
70.2	8.48	4.53	1143	"	16.0
69.2	9.69	4.42	1146	"	24.0
69.0	8.27	4.42	1149	"	32.0
68.6	8.24	4.40	1153	"	40.0

ACTUAL VOLUME PURGED ~~44.0~~ gal
44.0

COMMENTS: meter X 100

APPENDIX G

**ANALYTICAL METHODS, OFFICIAL LABORATORY REPORTS,
AND CHAIN OF CUSTODY RECORDS**

APPENDIX G

ANALYTICAL METHODS, OFFICIAL LABORATORY REPORTS, AND CHAIN OF CUSTODY RECORDS

This appendix includes copies of the official laboratory reports and chain of custody records for soil and ground water samples selected for laboratory analysis.

Chain of custody protocol was followed for all samples. The chain of custody form(s) accompanies the samples from the sampling locality to the laboratory, providing a continuous record of possession prior to actual analysis.

SUPERIOR ANALYTICAL LABORATORIES, INC.

825 ARNOLD, STE. 114 • MARTINEZ, CALIFORNIA 94553 • (415) 229-1512

DOHS #319
DOHS #220

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 82697
CLIENT: Alton Geoscience
CLIENT JOB NO.: 30-491 0005

DATE RECEIVED: 03/20/91
DATE REPORTED: 03/27/91

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (mg/L) Gasoline Range
1	MW-1	ND<0.05
2	MW-2	1.7
3	MW-3	3.1

mg/L - parts per million (ppm)

Method Detection Limit for Gasoline in Water: 0.05 mg/L

QAQC Summary:

Daily Standard run at 2mg/L: RPD Gasoline = <15
MS/MSD Average Recovery =96 %: Duplicate RPD = 8

Richard Srna, Ph.D.

Richard Srna
Laboratory Manager

OUTSTANDING QUALITY AND SERVICE

APR 01 1991

SUPERIOR ANALYTICAL LABORATORIES, INC.

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DOHS #319
DOHS #220

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 32697
CLIENT: Alton Geoscience
CLIENT JOB NO.: 30-491 0005

DATE RECEIVED: 03/20/91
DATE REPORTED: 03/27/91

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ug/L)			
		Benzene	Toluene	Ethyl Benzene	Xylenes
1	MW-1	ND<0.3	0.5	0.3	1.3
2	MW-2	190	2.6	12	64
3	MW-3	2.2	1.9	100	84

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: RPD = <15%
MS/MSD Average Recovery =92%: Duplicate RPD = <4

Richard Srna, Ph.D.

Richard Srna
Laboratory Manager

APR 01 1991

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DOHS #319
DOHS #220

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 82697
CLIENT: Alton Geoscience
CLIENT JOB NO.: 30-491 0005

DATE RECEIVED: 03/20/91
DATE REPORTED: 03/27/91

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 8015

LAB #	Sample Identification	Concentration (mg/L) Diesel Range
2	MW-2	0.12
3	MW-3	0.16

mg/L - parts per million (ppm)

Method Detection Limit for Diesel in Water: 0.05 mg/L

QA/QC Summary:

Daily Standard run at 200mg/L: RPD Gasoline = NA
RPD Diesel = 7
MS/MSD Average Recovery = 105%: Duplicate RPD = 6

Richard Srna, Ph.D.


Laboratory Manager

SUPERIOR ANALYTICAL LABORATORIES, INC.

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DOHS #319
DOHS #220

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 82697
CLIENT: Alton Geoscience
CLIENT JOB NO.: 30-491 0005

DATE RECEIVED: 03/20/91
DATE REPORTED: 03/27/91

ANALYSIS FOR TOTAL OIL AND GREASE by Standard Method 5520F

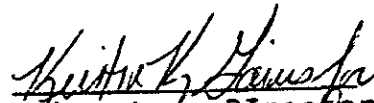
LAB #	Sample Identification	Concentration(mg/L) Oil & Grease
2	MW-2	ND<5
3	MW-3	ND<5

mg/L - parts per million (ppm)

Method Detection Limit for Oil and Grease in Water: 5mg/L

QAQC Summary: Duplicate RPD :1

Richard Srna, Ph.D.


Laboratory Director

SUPERIOR ANALYTICAL LABORATORY, INC.

1555 BURKE. UNIT I • SAN FRANCISCO. CA 94124 • PHONE (415) 647-2081

DHS #1332

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 53348-1
 CLIENT: Alton Geoscience
 JOB NO.: 30-491 0005

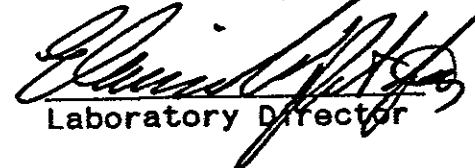
DATE SAMPLED: 03/15/91
 DATE RECEIVED: 03/20/91
 DATE ANALYZED: 03/22/91

EPA SW-846 METHOD 8010
 HALOGENATED VOLATILE ORGANICS
 SAMPLE: MW-2

Compound	MDL (ug/L)	RESULTS (ug/l)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene	0.5	ND
Methylene Chloride	0.5	1
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
Chloroform	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Carbon tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethylene	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
Cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene	0.5	ND
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
Cis-1,2-Dichloroethene	0.5	ND

MDL = Method Detection Limit
 ug/l = parts per billion (ppb)
 QA/QC Summary: Daily Standard RPD = <15%
 MS/MSD average recovery = 87% :MS/MSD RPD =< 8%

Richard Srna, Ph.D.



Laboratory Director

APR 01 1991

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DHS #1332

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 53348-2
 CLIENT: Alton Geoscience
 JOB NO.: 30-491 0005

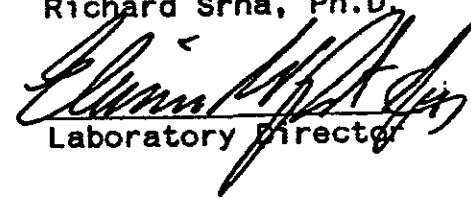
DATE SAMPLED: 03/15/91
 DATE RECEIVED: 03/20/91
 DATE ANALYZED: 03/22/91

EPA SW-846 METHOD 8010
 HALOGENATED VOLATILE ORGANICS
 SAMPLE: MW-3

Compound	MDL (ug/L)	RESULTS (ug/l)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene	0.5	ND
Methylene Chloride	0.5	21
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
Chloroform	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Carbon tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethylene	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
Cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene	0.5	ND
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
Cis-1,2-Dichloroethene	0.5	ND

MDL = Method Detection Limit
 ug/l = parts per billion (ppb)
 QA/QC Summary: Daily Standard RPD = <15%
 MS/MSD average recovery = 87% :MS/MSD RPD = < 8%

Richard Srna, Ph.D.



Laboratory Director



82697

PROJECT NUMBER: 30-491 0005

PROJECT NAME AND ADDRESS: *EXXON, 14th & 66th Oakland*

PROJECT MANAGER: *M. Hopwood*

SAMPLER'S SIGNATURE: *[Signature]*

LABORATORY:

REMARKS OR SPECIAL INSTRUCTIONS:

5- Day Turn Around

NOTE: PLEASE INDICATE VERBAL REQUESTS FOR ADDITIONAL ANALYSES IN THIS BOX.

SAMPLE NUMBER	SAMPLE DATE/TIME	LOCATION/ DESCRIPTION	SAMPLE MATERIAL	SAMPLE TYPE:		NUMBER OF CONTAINERS	SAMPLE PREP.			SOIL ANALYSIS				ANALYSIS									
				GRAB	COMP.		3510: SOLV. EXTR.	3810: HEAD SPACE	5030: PURGE & TRAP	TPH as Diesel	418.1: TPHC (IR)	8010: HALOCARBONS	8020: BTXE	DHS METHOD: TPHC (GC)	7420: TOTAL Pb	Total Oil and Grease	418.1: TPHC (IR)	601: HALOCARBONS	602: BTXE	DHS METHOD: TPHC (GC)	7421: TOTAL Pb	TPH-C/BTEX	
<i>MW-1</i>	<i>3-15-91</i>	<i>MW-1</i>	<i>Water</i>	X		<i>3</i>																	X
<i>MW-2</i>	<i>↓</i>	<i>MW-2</i>	<i>↓</i>	X		<i>10</i>					X				X		X						X
<i>MW-3</i>	<i>↓</i>	<i>MW-3</i>	<i>↓</i>	X		<i>10</i>					X				X		X						X

TOTAL NO. OF CONTAINERS:

RELINQUISHED BY: *[Signature]* RECEIVED BY: *William D. [Signature]* DATE/TIME: *3/20/90 1130* METHOD OF SHIPMENT:

RELINQUISHED BY: *William D. [Signature]* RECEIVED BY: *[Signature]* DATE/TIME: *3/20 1130* SHIPPED BY:

RELINQUISHED BY: *[Signature]* RECEIVED BY: *[Signature]* DATE/TIME: *3/20/91 137* COURIER:

SUPERIOR ANALYTICAL LABORATORIES, INC.

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DOHS #319
DOHS #220

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 82696
CLIENT: Alton Geoscience
CLIENT JOB NO.: 30-491 0005

DATE RECEIVED: 03/20/91
DATE REPORTED: 03/27/91

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ug/Kg)			
		Benzene	Toluene	Ethyl Benzene	Xylenes
1	MW-1 11-11.5	ND<3	ND<3	ND<3	ND<3
2	MW-1 16-16.5	ND<3	ND<3	ND<3	ND<3
3	MW-2 11-11.5	74	120	240	190
4	MW-2 16-16.5	51	ND<3	18	9
5	MW-3 11-11.5	ND<3	ND<3	ND<3	18
6	MW-3 16-16.5	ND<3	ND<3	ND<3	4
7	MW-1 6-6.5	ND<3	ND<3	ND<3	ND<3
8	MW-2 6-6.5	8	18	ND<3	25
9	MW-3 6-6.5	9	ND<3	ND<3	10

ug/Kg - parts per billion (ppb)

Method Detection Limit in Soil: 3 ug/Kg

QAQC Summary:

Daily Standard run at 20ug/L: RPD = <15%
MS/MSD Average Recovery = 87%: Duplicate RPD = <5%

Richard Srna, Ph.D.

APR 01 1991


Laboratory Manager

OUTSTANDING QUALITY AND SERVICE

SUPERIOR ANALYTICAL LABORATORIES, INC.

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DOHS #319
DOHS #220

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 82696
CLIENT: Alton Geoscience
CLIENT JOB NO.: 30-491 0005

DATE RECEIVED: 03/20/91
DATE REPORTED: 03/27/91

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (mg/Kg) Gasoline Range
1	MW-1 11-11.5	ND<1
2	MW-1 16-16.5	ND<1
3	MW-2 11-11.5	98
4	MW-2 16-16.5	ND<1
5	MW-3 11-11.5	ND<1
6	MW-3 16-16.5	ND<1
7	MW-1 6-6.5	ND<1
8	MW-2 6-6.5	2
9	MW-3 6-6.5	ND<1

mg/kg - parts per million (ppm)

Method Detection Limit for Gasoline in Soil: 1 mg/Kg

QAQC Summary:

Daily Standard run at 2mg/L: RPD Gasoline = <15
MS/MSD Average Recovery = 96%: Duplicate RPD = 3%

Richard Srna, Ph.D.


Laboratory Manager

APR 01 1991

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