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PRELIMINARY SITE ASSESSMENT REPORT

BP Oil Company
Service Station No. 11107
18501 Hesperian Boulevard
San Lorenzo, California

1/93

Project No. 10-060

January 1993

PRELIMINARY SITE ASSESSMENT REPORT

BP Oil Company Service Station No. 11107
18501 Hesperian Boulevard
San Lorenzo, California

Project No. 10-060

Prepared for:

BP Oil Company
Environmental Resource Management
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Tukwila, Washington

Prepared by:

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January 1993

Brady Nagle
Brady Nagle
Project Manager

Al Sevilla
Al Sevilla, P.E.
Principal

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ALBERTO SANCHEZ SEVILLA
26392
Exp. Date 3/31/94
CIVIL
STATE OF CALIFORNIA

TABLE OF CONTENTS

1.0 INTRODUCTION

BP Oil Company retained Alisto Engineering Group in September 1992 to conduct a preliminary site assessment at BP Oil Company Service Station No. 11107, 18501 Hesperian Boulevard, San Lorenzo, California. A site vicinity map is shown in Figure 1.

1.1 Purpose and Scope of Work

This work was performed to assess the nature and extent of petroleum hydrocarbons in the subsurface groundwater and/or soil at the site, if any, and to determine the appropriate courses of action to comply with applicable laws and regulations.

The tasks performed during the assessment included the following:

- Conducted a sensitive receptors survey.
- Drilled and logged exploratory soil borings and collected soil samples.
- Installed four groundwater monitoring wells, MW-1 through MW-4.
- Developed and surveyed the monitoring wells and collected groundwater samples.
- Analyzed the groundwater and soil samples and for specific hydrocarbon constituents.
- Analyzed the data and analytical results and prepared this report presenting the findings.

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

1.2 Site Location and Description

BP Oil Company Service Station No. 11107 is located on the southwest corner of the intersection of Hesperian Boulevard and Bockman Road, San Lorenzo, California. The site is presently an operating service station with three underground fuel storage tanks and one underground used oil tank. Refer to Figure 2 for the layout of the site and the locations of existing underground fuel storage tanks.

The properties in the immediate vicinity of the site are a mixture of residential and commercial developments. West and adjacent to the site is the Kwik Milady Dry Cleaners. Approximately 500 feet north of the site is a Unocal service station, including a car wash. North of the Unocal service station and approximately 1,000 feet north of the BP Oil Company service station is an ARCO Products Company service station with groundwater monitoring wells.

1.3 Sensitive Receptors Survey

A sensitive receptors survey was performed to identify nearby environmental elements and land uses that may affect or be affected by the BP Oil Company site. Results of the survey are presented in Appendix A.

2.0 FIELD METHODS

The following are the procedures and methods used during field activities:

2.1 Soil Boring Drilling and Sampling

Before drilling, a permit was acquired from the Alameda County Water Conservation District (Zone 7), a copy of which is presented in Appendix B. On October 22, 1992, four exploratory borings were drilled at the site to depths ranging from 26-1/2 to 31-1/2 feet below grade. Drilling activities were performed by Great Sierra Exploration Drilling Company of Union City, California, using a truck-mounted Mobile B-57 drilling rig equipped with 8-inch-diameter, hollow-stem augers. Boring B-1 was drilled in the vicinity of the underground used oil storage tank; B-2 was drilled in the vicinity of the dispenser islands; Boring B-3 was drilled in the vicinity of the dispenser islands and underground fuel storage tanks; and B-4 was drilled in the vicinity of the underground fuel storage tanks. Drilling and soil sampling procedures are presented in Appendix C.

Boring logs were prepared using the Unified Soil Classification System. They include a description of soil characteristics such as color, moisture, consistency, and field readings using an organic vapor meter. The boring logs are presented in Appendix D.

2.2 Monitoring Well Installation and Construction

Soil Borings B-1 through B-4 were converted into Monitoring Wells MW-1 through MW-4, in accordance with the field procedures for groundwater monitoring well installation presented in Appendix C. The wells were constructed with clean, 2-inch-diameter, flush-threaded, Schedule 40, polyvinyl chloride (PVC) blank casing and 0.010-inch slotted casing to depths ranging from 26 to 31 feet below grade. The locations of the wells are shown in Figure 2. Well construction details are included on the boring logs presented in Appendix D.

2.3 Monitoring Well Development and Sampling

Well development and sampling procedures were conducted in accordance with the guidelines of the ACHCSA and the RWQCB. Field procedures for groundwater monitoring well development and sampling are presented in Appendix E.

The monitoring wells were developed on October 27, 1992. Before development, each well was inspected for the presence or absence of free-floating product. The wells were developed by removing at least 10 casing volumes, or until groundwater was relatively free of sediment, by alternately using a surge block and pump.

To ensure that the groundwater sample was representative of the aquifer, the wells were purged of 3 well casing volumes before sample collection and while monitoring pH, specific conductivity, and temperature. The samples were then transported in an iced cooler to a state-certified laboratory following proper chain of custody procedures. Field observations during well development and sampling are presented in the sampling forms in Appendix F.

2.4 Groundwater Level Monitoring and Well Surveying

The monitoring wells were surveyed to the top of each well casing in reference to an established benchmark, with an elevation of 39.95 feet above mean sea level. On November 4, 1992, the depth to groundwater in the wells was measured from the top of the well casing to the nearest 0.01 foot, using an electronic sounder. The survey data and relative groundwater elevation measurements are presented in Table 1. The well elevation survey map is included in Appendix E, and a graphical interpretation of the groundwater gradient beneath the site is shown in Figure 2.

3.0 ANALYTICAL METHODS

Pace, Inc., a state-certified analytical laboratory, analyzed the groundwater and soil samples using standard test methods of the U.S. Environmental Protection Agency (EPA) and the California Department of Health Services.

The groundwater and soil samples were analyzed for the following:

- Total petroleum hydrocarbons as gasoline (TPH-G) using EPA Methods 5030/8015
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Methods 5030/8020

The groundwater sample from Monitoring Well MW-1 and soil samples from Boring B-1 were additionally analyzed for the following:

- Total petroleum hydrocarbons as diesel (TPH-D) using EPA Methods 5030/8015
- Total oil and grease (TOG) using EPA Method 5520DF
- Halogenated volatile organic compounds (HVOCs) using EPA Method 8010

Laboratory results for groundwater and soil samples are summarized in Tables 1 and 2, and the official laboratory reports and chain of custody records are included in Appendix G. The concentrations of petroleum hydrocarbons in the groundwater and soil are shown in Figures 3 and 4.

4.0 DISCUSSION OF RESULTS

The following are the results of field activities and laboratory analysis of groundwater and soil samples collected during this preliminary site assessment:

- During drilling, groundwater was encountered in the soil borings between approximately 20 and 22 feet below grade, and stabilized at approximately the same depths.
- Soil types encountered at the site generally consisted of silty sand to sandy silt to approximately 25 feet below grade, underlain by silty clay to clayey silt to the total depth of the borings. A 5-foot-thick gravelly sand lens was encountered in B-2 beginning at 9 feet below grade.
- Analysis of soil samples collected from Soil Boring B-3 at 21 feet below grade and B-4 at 16 and 20 feet below grade detected up to 51 parts per million (ppm) TPH-G and 0.4 ppm benzene.
- No free product or sheen was observed in any of the monitoring wells.
- Groundwater elevation data indicate a gradient of approximately 0.036 foot per foot in a general west-northwest direction across the site.
- TPH-G and benzene were detected in the groundwater samples collected from Monitoring Wells MW-3 and MW-4 at concentrations of up to 900 and 150 parts per billion (ppb).
- 1,1,1-Trichloroethane was detected at a concentration of 2.8 ppb in the groundwater samples collected from Monitoring Well MW-1 which is in the vicinity of the underground used oil tank.

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER ANALYSIS
BP OIL COMPANY SERVICE STATION NO. 11107
18501 HESPERIAN BOULEVARD, SAN LORENZO, CALIFORNIA

ALISTO PROJECT NO. 10-060

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	TPH-D (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	TOG (ppb)	HVOC (ppb)	LAB
MW-1	11/04/92	41.07	20.78	20.29	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5000	2.8 (c)	PACE
QC-1 (d)	11/04/92	41.07	20.78	20.29	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
MW-2	11/04/92	40.56	20.16	20.4	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE
MW-3	11/04/92	40.45	20.23	20.22	760	---	3.7	15	1.9	57	---	---	PACE
MW-4	11/04/92	39.24	19.18	20.06	900	---	150	4.1	0.8	53	---	---	PACE
QC-2 (e)	11/04/92	---	---	---	ND<50	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---	PACE

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
TPH-D	Total petroleum hydrocarbons as diesel
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
TOG	Total oil and grease
HVOC	Halogenated volatile organic compounds
ppb	Parts per billion
ND	Not detected above reported detection limits
---	Not analyzed
PACE	Pace, Incorporated

NOTES:

(a) Top of casing elevation for all wells was surveyed relative to an established benchmark with an elevation of 39.95 feet above mean sea level.

(b) Groundwater elevations in feet above mean sea level.

(c) 1,1,1-Trichloroethane

(d) Blind duplicate of MW-1

(e) Travel blank.

TABLE 2 - SUMMARY OF RESULTS OF SOIL SAMPLING AND ANALYSIS
BP OIL COMPANY SERVICE STATION NO. 11107
18501 HESPERIAN BOULEVARD, SAN LORENZO, CALIFORNIA

ALISTO PROJECT NO. 10-060

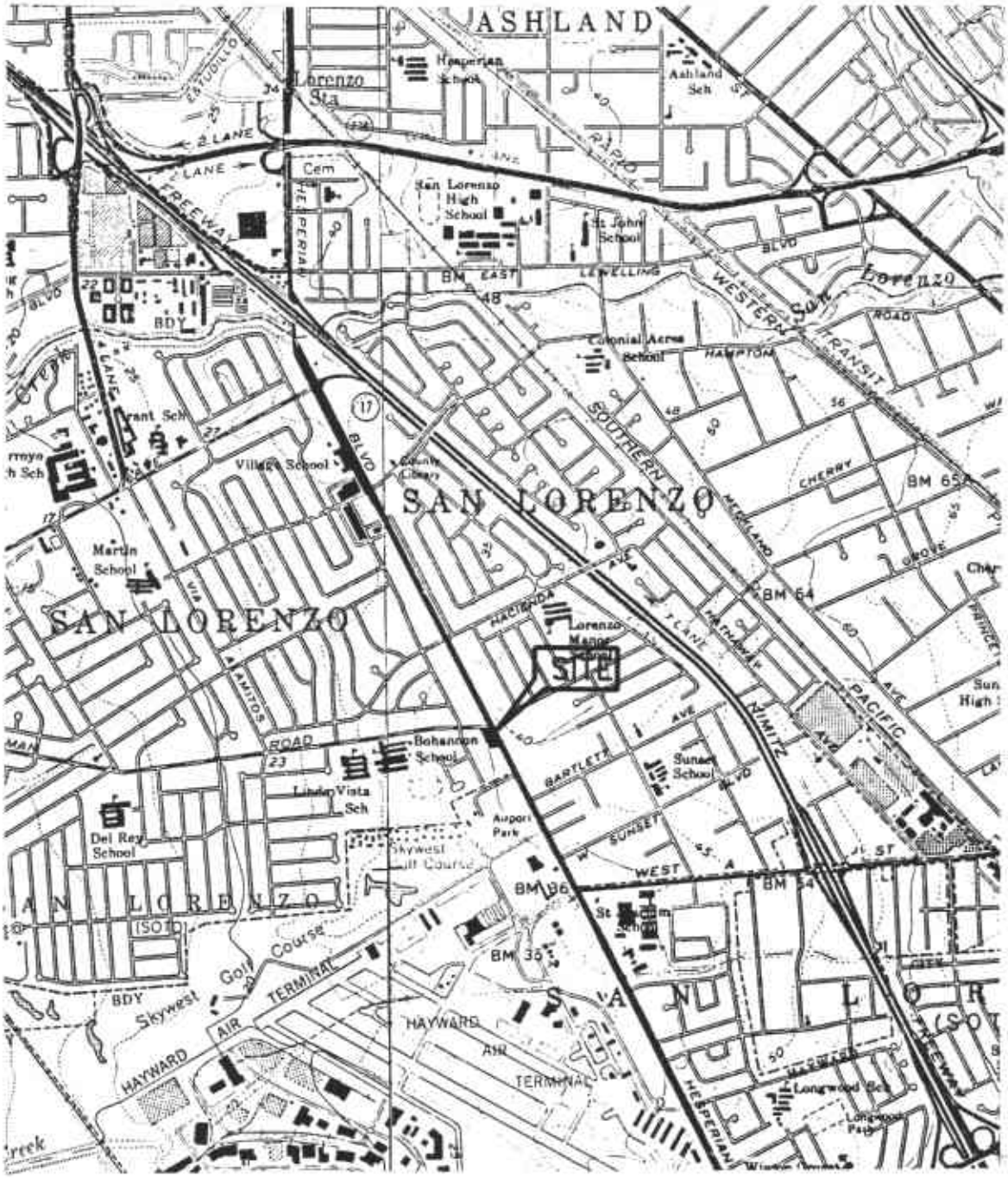
WELL ID	SAMPLE DEPTH (Feet)	DATE OF SAMPLING	TPH-G (ppm)	TPH-D (ppm)	B (ppm)	T (ppm)	E (ppm)	X (ppm)	HVOC (ppm)		TOG (ppm)	LAB
B-1	14.5	10/22/92	ND<1.0	ND<5.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND	(a)	ND<50	PACE
B-1	21	10/22/92	ND<1.0	ND<5.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND	(a)	ND<50	PACE
B-2	11	10/22/92	ND<1.0	---	ND<0.005	ND<0.005	ND<0.005	ND<0.005	---		---	PACE
B-2	16	10/22/92	ND<1.0	---	ND<0.005	ND<0.005	ND<0.005	ND<0.005	---		---	PACE
B-3	10	10/22/92	ND<1.0	---	ND<0.005	ND<0.005	ND<0.005	ND<0.005	---		---	PACE
B-3	21	10/22/92	51	---	0.21	0.38	0.76	3	---		---	PACE
B-4	16	10/22/92	1.8	---	0.31	0.009	0.051	0.1	---		---	PACE
B-4	20	10/22/92	24	---	0.4	0.42	0.35	1.5	---		---	PACE

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
TPH-D	Total petroleum hydrocarbons as diesel
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
HVOC	Halogenated volatile organic compounds
TOG	Total oil and grease
ppm	Parts per million
ND	Not detected above reported detection limits
PACE	Pace, Inc.
---	Not analyzed

NOTE:

(a) Various detection limits; see laboratory reports.



N

0 1000 2000

SCALE IN FEET

SOURCE:
USGS MAP, HAYWARD & SAN LEANDRO QUADRANGLES, CALIFORNIA, 7.5 MINUTE SERIES. 1959. PHOTOREVISED 1980.

FIGURE 1

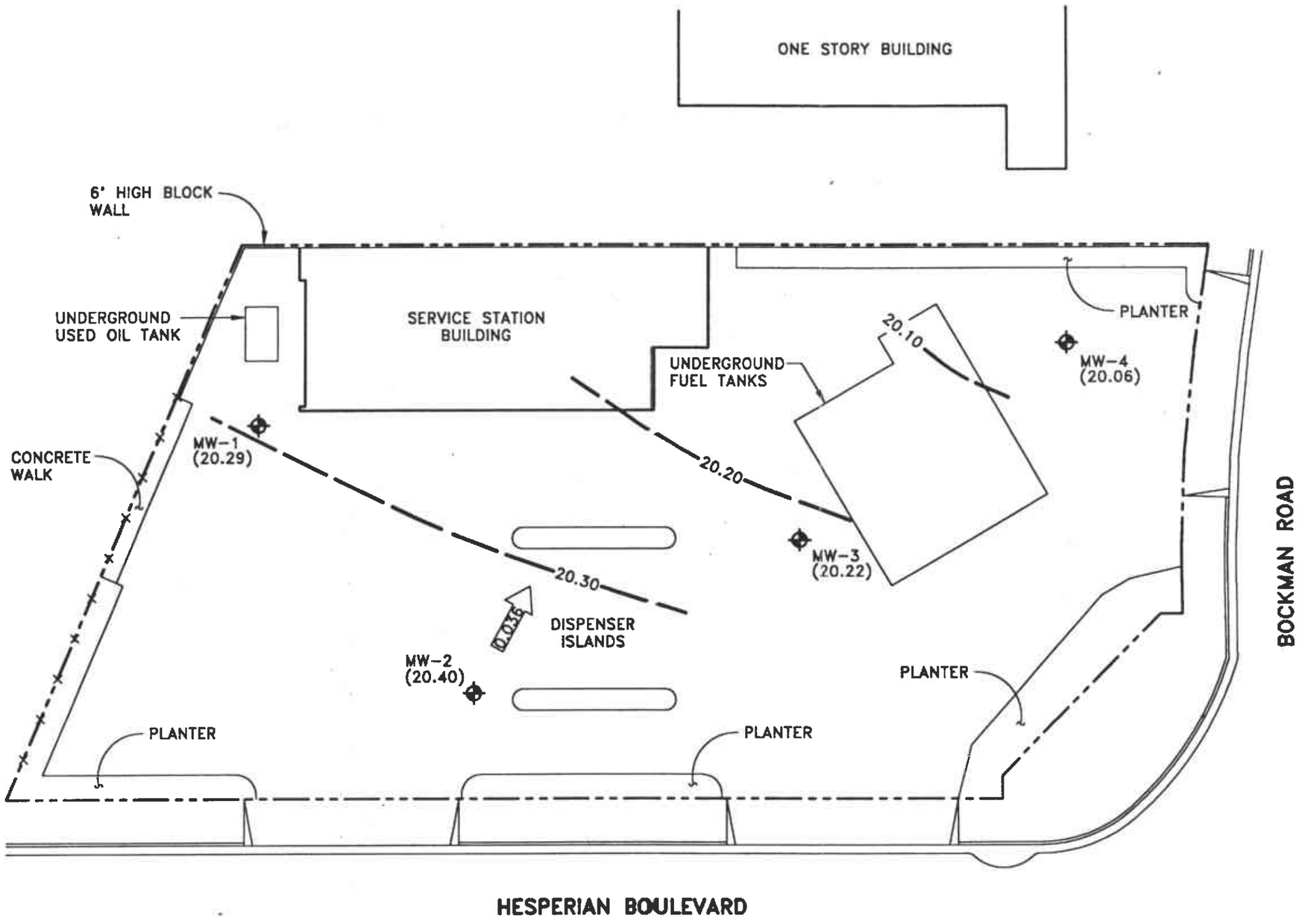
SITE VICINITY MAP

BP OIL SERVICE STATION NO. 11107
185601 HESPERIAN BOULEVARD
SAN LORENZO, CALIFORNIA

ALISTO PROJECT NO. 10-060

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

10060001F.DWG 12-2-92 JMB 1:1



N

0 20 40

SCALE IN FEET

LEGEND:

- GROUNDWATER MONITORING WELL
- (20.29) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 20.30 GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL – 0.10 FOOT)
- 0.036 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE

FIGURE 2

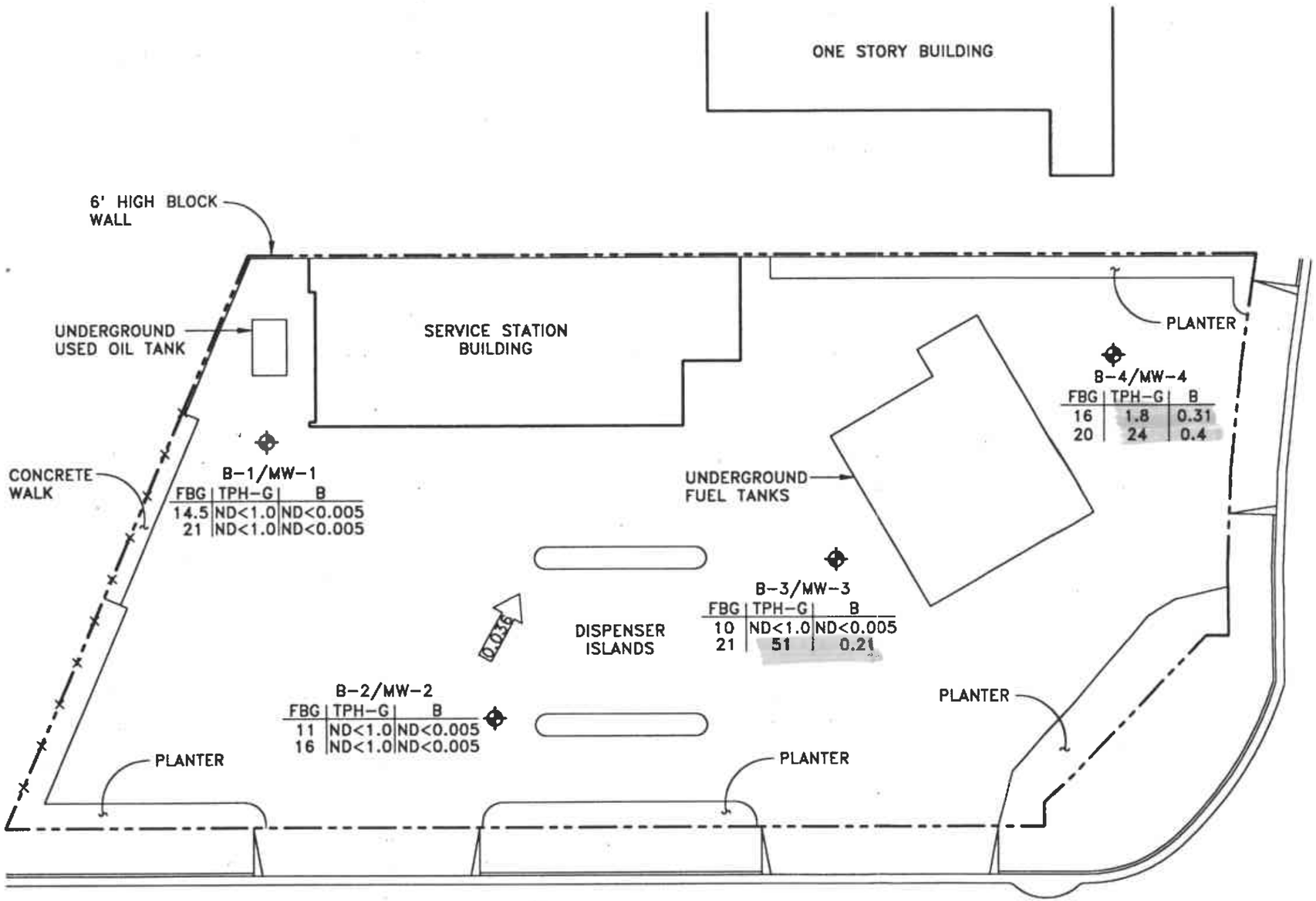
POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP (NOVEMBER 4, 1992)

BP OIL SERVICE STATION NO. 11107
18501 HESPERIAN BOULEVARD
SAN LORENZO, CALIFORNIA

PROJECT NO. 10-060

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

10060018.DWG 11-23-92 JWB 1=240



N

0 20 40

SCALE IN FEET

LEGEND:

⊕	SOIL BORING/GROUNDWATER MONITORING WELL
FBG	FEET BELOW GRADE
TPH-G	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE IN PARTS PER BILLION
B	BENZENE IN PARTS PER BILLION
ND	NOT DETECTED ABOVE REPORTED DETECTION LIMIT
0.036 ⇨	CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE

FIGURE 3

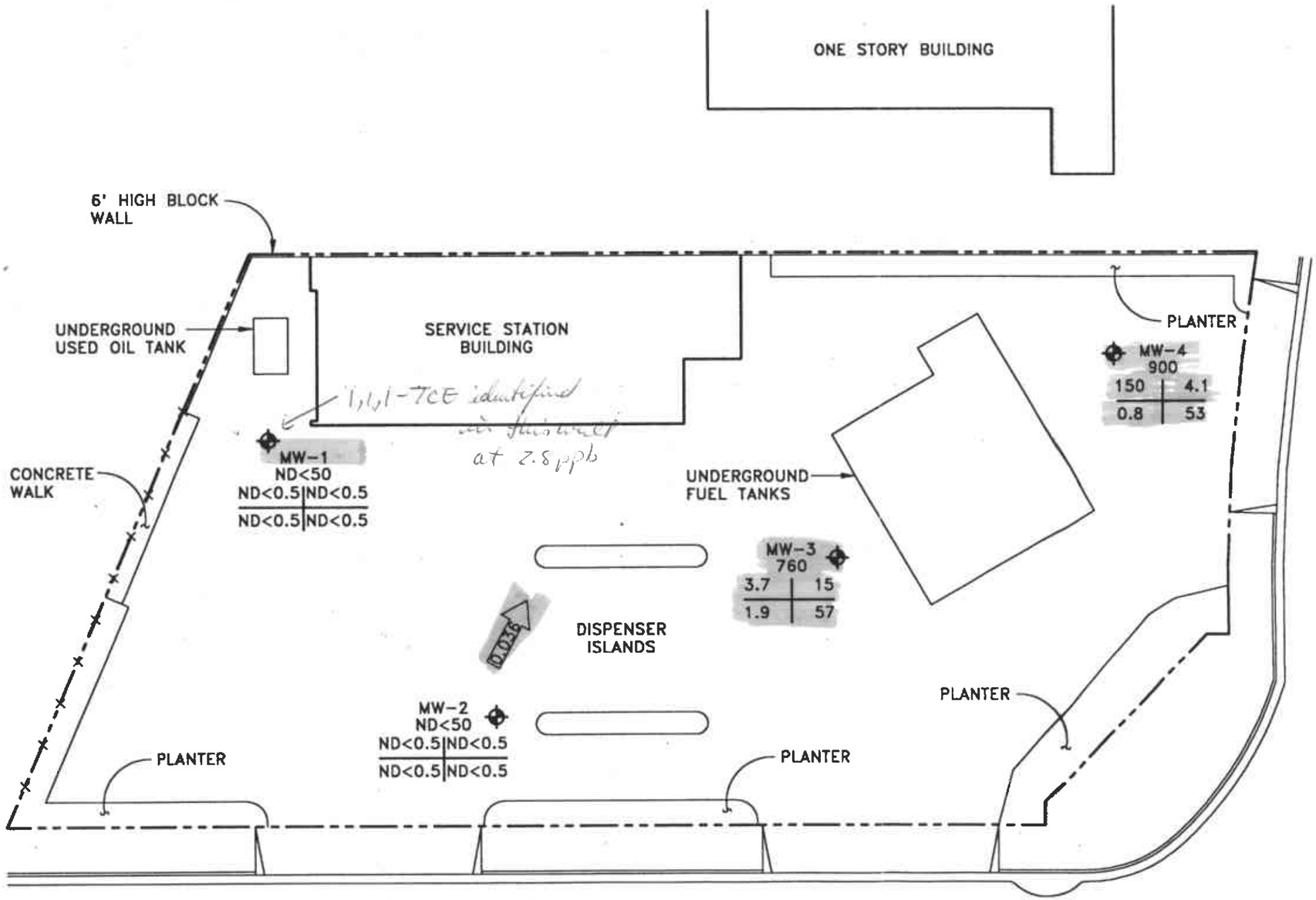
CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN SOIL (OCTOBER 22, 1992)

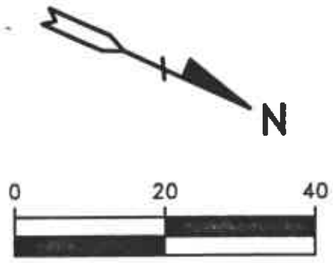
BP OIL SERVICE STATION NO. 11107
18501 HESPERIAN BOULEVARD
SAN LORENZO, CALIFORNIA

PROJECT NO. 10-060

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

10060101.DWG 11-25-92 JWB 1=240





LEGEND:

⊕	GROUNDWATER MONITORING WELL
TPH–G / B T / E X	CONCENTRATION OF CONSTITUENTS IN PARTS PER BILLION (PPB)
TPH–G	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES
ND	NOT DETECTED ABOVE REPORTED DETECTION LIMIT
0.036	CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE

FIGURE 4

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER (NOVEMBER 4, 1992)

BP OIL SERVICE STATION NO. 11107
18501 HESPERIAN BOULEVARD
SAN LORENZO, CALIFORNIA

PROJECT NO. 10-060

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

10060017.DWG 11-23-92 JMB 1=240

APPENDIX A

SENSITIVE RECEPTORS SURVEY

SENSITIVE RECEPTORS SURVEY
Site Survey and Literature Research

Store No: BP Oil Company Service Station No.11107
Location: 18501 Hesperian Boulevard
City/State San Lorenzo, California

I. Provide answers to the following questions:

a. Is a public water supply well within 2500 ft? (y/(n))
If yes, Distance (ft)_____

b. Is a private water supply well within 1000 ft? (y/(n))
If yes, Distance (ft)_____

c. Is a subway within 1000 ft? (y/(n))
If yes, Distance (ft)_____

d. Is a basement within 1000 ft? (y/(n))
If yes, Distance (ft)_____

e. Is a School within 1000 ft? ((y)/n)
If yes, Distance (ft) 700

f. Is a surface body of water within 1000 ft? (y/(n))
If yes, Distance (ft)_____

II. Describe type of local water supply:

Public
*Supplier's Name East Bay Municipal Utility District
*Supplier's Source Imported
*Distance to Site ----
Private ----

III. Aquifer Classification, if available:

_____ Class I: Special Ground Waters
Irreplaceable Drinking Water Sources
Ecologically Vital

_____ Class II: Current and Potential Drinking Water

X Class III: Not Potential Source of Drinking Water

IV. Describe observation wells, if any:

Number 2
Free Product _____(y/(n))

V. Signature of Preparer Ted Moise Date 12/7/92

10-060

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94566 • (415) 484-2800

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 18501 Hesperian
San Lorenzo CA

CLIENT
Name BP Oil Company
Address 6400 Southcenter Blvd Phone (206) 394-5246
City Tukwila CA Zip 98188

APPLICANT
Name Ted Moise
Alisto Engineering Group
Address 1000 Burnett Ave 420 Phone (510) 798-4870
City Concord CA Zip 94520

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection		General	
Water Supply		Contamination	
Monitoring	✓	Well Destruction	

PROPOSED WATER SUPPLY WELL USE

Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:

Mud Rotary ___ Air Rotary ___ Auger ✓
Cable ___ Other ___

DRILLER'S LICENSE NO. C57 610487

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 40 ft.
Surface Seal Depth ~5 ft. Number 5

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

ESTIMATED STARTING DATE 10/7/92
ESTIMATED COMPLETION DATE 10/10/92

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

APPLICANT'S SIGNATURE Ted Moise Date 10/2/92

FOR OFFICE USE

PERMIT NUMBER 92494
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

(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 logs 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.

Approved Wyman Hong Date 5 Oct 92
Wyman Hong

121989

APPENDIX C

FIELD PROCEDURES FOR SOIL BORING DRILLING AND SAMPLING AND GROUNDWATER MONITORING WELL INSTALLATION

FIELD PROCEDURES
FOR
SOIL BORING DRILLING, SOIL SAMPLING,
AND GROUNDWATER MONITORING WELL INSTALLATION

Soil Boring Drilling Procedures

The soil borings were drilled using 8-inch-diameter, continuous-flight, hollow-stem augers. To avoid cross-contamination, drilling equipment in contact with potentially contaminated material was decontaminated before and after each use by steam cleaning. Decontamination fluids were placed into properly labeled Department of Transportation approved drums for disposal.

Soil Sampling Procedures

During drilling, samples were collected beginning at 5 feet below grade and terminating at the total depth of each boring. Before and after each use, the sampler was washed using a phosphate-free detergent followed by tap water and deionized water rinses. Soil sampling was accomplished using a California-modified split-spoon sampler lined with appropriately sized brass tubes. A 140-pound slide hammer falling 30 inches was used to advance the sampler 18 inches ahead of the hollow-stem augers into undisturbed soil, and blow counts were recorded for every 6 inches of penetration to evaluate the consistency of the soil.

After retrieval from the augers, the sampler was split, the sample tubes removed, and a soil sample was selected for possible chemical analysis. The selected sample was retained within the brass tube, and both ends were immediately covered with Teflon sheeting and polyurethane caps. The caps were sealed with tape and labeled with the following information: Alisto Engineering project number, boring number, sample depth interval, sampler's initials, and date of collection. The soil sample was immediately placed in a waterproof plastic bag and stored in an ice chest containing blue or dry ice. Possession of the soil samples was documented from the field location to the state-certified analytical laboratory by using a chain of custody form.

Soil samples and, when representative, drill cuttings were described by Alisto Engineering personnel using the Unified Soil Classification System, and field estimates of soil type, color, moisture, density, and consistency were noted on the boring logs. The logs were reviewed by a civil engineer registered in the State of California.

Groundwater Monitoring Well Installation

The construction of the groundwater monitoring wells was based on the stratigraphy encountered in the soil borings. The well construction materials were introduced into the boring through the hollow-stem augers to centralize the well casing and minimize the possibility of native material entering the annular space of the well.

The 2-inch-diameter PVC well casing consisted of 0.010-inch slotted casing from the bottom of the boring to a depth interval above the highest anticipated water level, and solid casing was installed from the top of the slotted casing to approximately 6 inches below grade level. The casings, fittings, screens, and other components of the well construction were steam cleaned before installation.

The annular space surrounding the screened portion was backfilled with No. 2/12 Lonestar sand (filter pack) to approximately 2 feet above the top of the screened section. The monitoring well was then developed in accordance with the procedures described in Appendix E. After well development, an additional filter pack was added to the annulus to approximately 2 foot above the top of the screened well casing. An approximately 1-foot-thick interval of bentonite pellets was added to the annulus above the filter pack and hydrated with approximately 5 gallons of deionized water to minimize intrusion of well seal into the filter pack. The remaining annulus was sealed with a neat cement grout to the surface. A traffic-rated utility box was installed around the top of the well casing, and set in concrete. An expanding, watertight well cap and lock were installed on the top of the well casing to secure the well from surface fluid and tampering.

APPENDIX D

BORING LOGS AND WELL CONSTRUCTION DETAILS

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

LOG OF BORING B-1/MW-1

SEE SITE PLAN

ALISTO PROJECT NO: 10-060 DATE DRILLED: 10/22/92

CLIENT: BP Oil Company

LOCATION: 18501 Hesperian Boulevard, San Loenzo, California

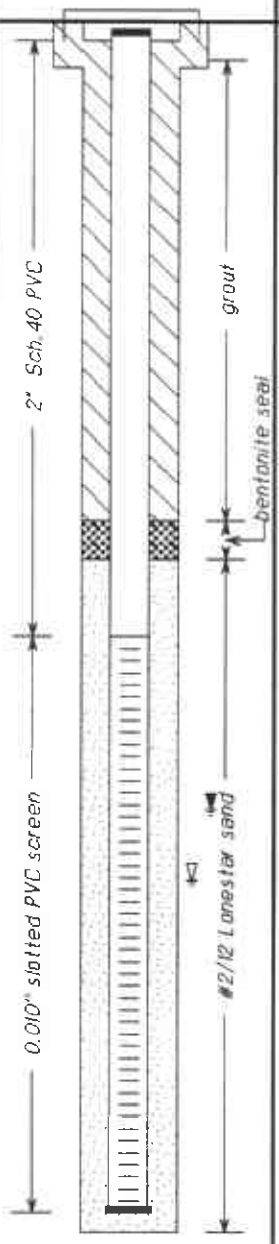
DRILLING METHOD: Hollow-stem Auger (8")

DRILLING COMPANY: Great Sierra Exploration CASING ELEVATION: 41.07 ' MSL

LOGGED BY: Ted Moise APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
					SW	2" Asphalt
						gravelly SAND: gray/green, damp, loose, fine- to coarse-grained sand.
					ML	sandy SILT: dark brown, damp, medium firm, abundant very fine- to medium-grained sand.
6,6,8	1.0	5			SM	silty SAND: tan/red, damp, loose, very fine- to medium-grained sand.
6,8,12	1.4					Same: fine-grained sand, gray/green from 7.75 to 8'.
6,7,8	1.2	10				Same.
7,9,10	0.9					Same: abundant silt.
8,8,10	1.1	15			ML	sandy SILT: tan, moist, stiff, abundant very fine-grained sand, minor clay.
12,15,22	1.3					Same: no clay.
4,4,4	1.8	20				Same: ten, moist, medium firm, abundant very fine-grained sand, minor clay.
7,5,6					SM	silty SAND: brown, wet loose, fine- to medium-grained sand,
					ML	minor silt. sandy SILT: tan, wet, stiff, very fine to fine-grained sand, minor clay.
5,6,12		25				clayey SILT from 25.5 to 28 feet.
7,10,12					SM	silty SAND: brown, wet, medium dense, very fine to fine-grained sand, abundant silt, minor clay.
8,8,11		30			ML	clayey SILT: brown, wet, very stiff, minor very fine-grained sand.

WELL DIAGRAM



ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

LOG OF BORING B-2/MW-2

SEE SITE PLAN

ALISTO PROJECT NO: 10-060 DATE DRILLED: 10/22/32

CLIENT: BP Oil Company

LOCATION: 18501 Hesperian Boulevard, San Lorenzo, California

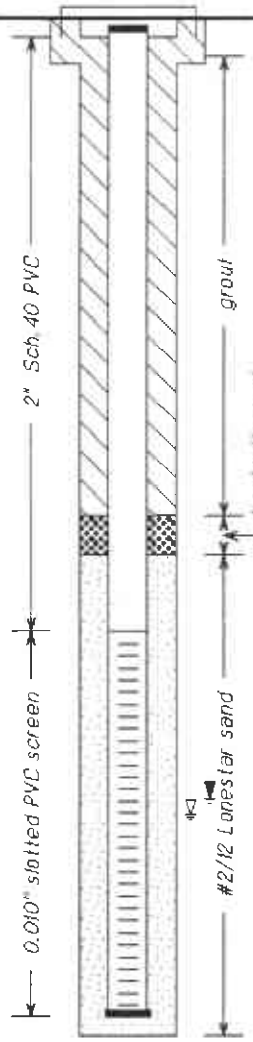
DRILLING METHOD: Hollow-stem Auger (8")

DRILLING COMPANY: Great Sierra Exploration CASING ELEVATION: 40.58 ' MSL

LOGGED BY: Ted Moise APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
					ML	2" Asphalt silty CLAY: black, damp, medium firm, minor very fine- to fine-grained sand.
8,7,9	0.1	5			SM	silty SAND: brown, damp, medium dense, fine- to medium-grained sand.
6,9,10	0.2	10			SW	gravelly SAND: tan, damp, medium dense, fine- to medium-grained sand, angular gravel to 1".
8,8,9	1.4	15			ML	sandy SILT: tan, damp, stiff, very fine- to fine-grained sand, minor clay.
10,11,15	1.4	20			SM	silty SAND: brown, wet, medium dense, abundant silt, minor clay, very fine- to fine-grained sand.
9,15,18					ML	clayey SILT: tan, wet, very stiff, abundant clay, minor very fine- to fine-grained sand.
20,20,30		25			CL	silty CLAY: tan, wet, hard, minor silt.
		30				

WELL DIAGRAM



ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

LOG OF BORING B-3/MW-3

SEE SITE PLAN

ALISTO PROJECT NO: 10-060 DATE DRILLED: 10/22/92

CLIENT: BP Oil Company

LOCATION: 18501 Hesperian Boulevard, San Lorenzo, California

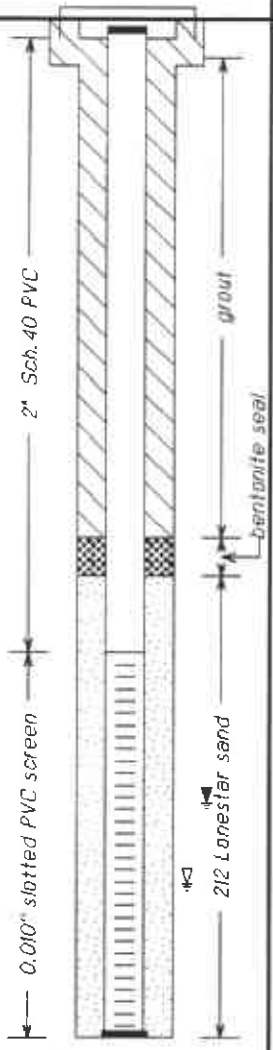
DRILLING METHOD: Hollow-stem Auger (8")

DRILLING COMPANY: Great Sierra Exploration CASING ELEVATION: 40.45' MSL

LOGGED BY: TM APPROVED BY: AS

BLOWS/6 IN.	PID VALUES	DEPTH feet	SOIL CLASS	GEOLOGIC DESCRIPTION
			SM	2" Asphalt
				silty SAND: brown/red, damp, loose, very fine- to medium-grained sand, minor silt, no clay.
7,9,13	1.0	5		Same.
4,4,5	1.2	10		Same: brown, damp, very fine- to fine-grained sand, abundant silt, minor clay.
8,7,8	3.0	15	ML	sandy SILT: tan/gray, damp, stiff, very fine-grained sand, minor clay.
7,8,10	14	20		clayey SILT: tan/gray, moist, stiff, minor very fine-grained sand.
8,12,17				Same: wet.
15,17,23		25	CL	silty CLAY: tan, damp, very stiff, minor silt.
		30		

WELL DIAGRAM



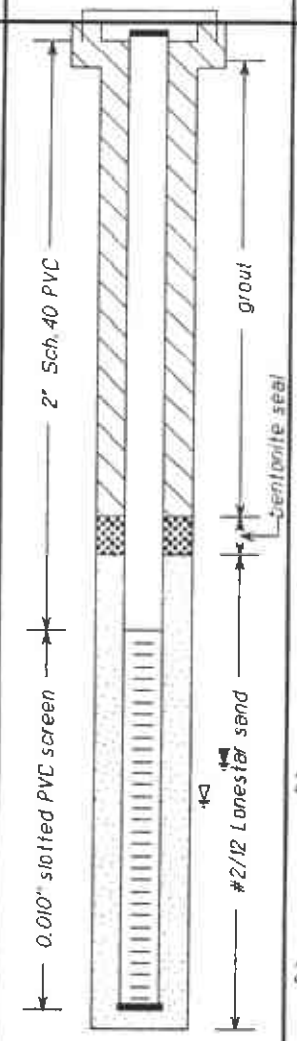
ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

LOG OF BORING B-4/MW-4

SEE SITE PLAN

ALISTO PROJECT NO: 10-060 DATE DRILLED: 10/23/92
CLIENT: BP Oil Company
LOCATION: 18501 Hesperian Boulevard, San Loenzo, California
DRILLING METHOD: Hollow-stem Auger (8")
DRILLING COMPANY: Great Sierra Exploration CASING ELEVATION: 39.24 ' MSL
LOGGED BY: Ted Moise APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	DEPTH feet	SOIL CLASS	GEOLOGIC DESCRIPTION
			SM	3" Asphalt
4,4,6	1.4	5		silty SAND: brown/red, damp, loose, fine- to medium-grained sand, minor silt, no clay.
6,7,7	1.8	10		Same: abundant silt.
4,4,4	20	15	ML	sandy SILT: gray, damp, medium firm, very fine- to fine-grained sand, minor clay.
3,4,6	187	20		Same: brown/gray, very moist
7,10,11				Same: brown, abundant clay.
10,20,23		25	CL	silty CLAY: brown, damp, hard, minor silt, minor very fine sand.
		30		



APPENDIX E

FIELD PROCEDURES FOR GROUNDWATER MONITORING WELL DEVELOPMENT AND SAMPLING, AND ELEVATION SURVEY MAP

FIELD PROCEDURES
FOR
GROUNDWATER MONITORING WELL DEVELOPMENT AND SAMPLING

Groundwater Monitoring Well Development

The groundwater monitoring wells were developed to consolidate and stabilize the filter pack to optimize well production and reduce the turbidity of subsequent groundwater samples. The well was developed during drilling before installation of the bentonite spacer and neat cement seal. Additionally, monitoring well development was accomplished by alternately using a surge block and pump to evacuate the water and sediments a minimum of 72 hours after installation of the cement seal. Development activities continued until the groundwater was relatively free of sediments and/or stabilization of pH, electrical conductivity, and temperature parameters was achieved. Well development fluids were placed into properly labeled Department of Transportation approved drums for disposal.

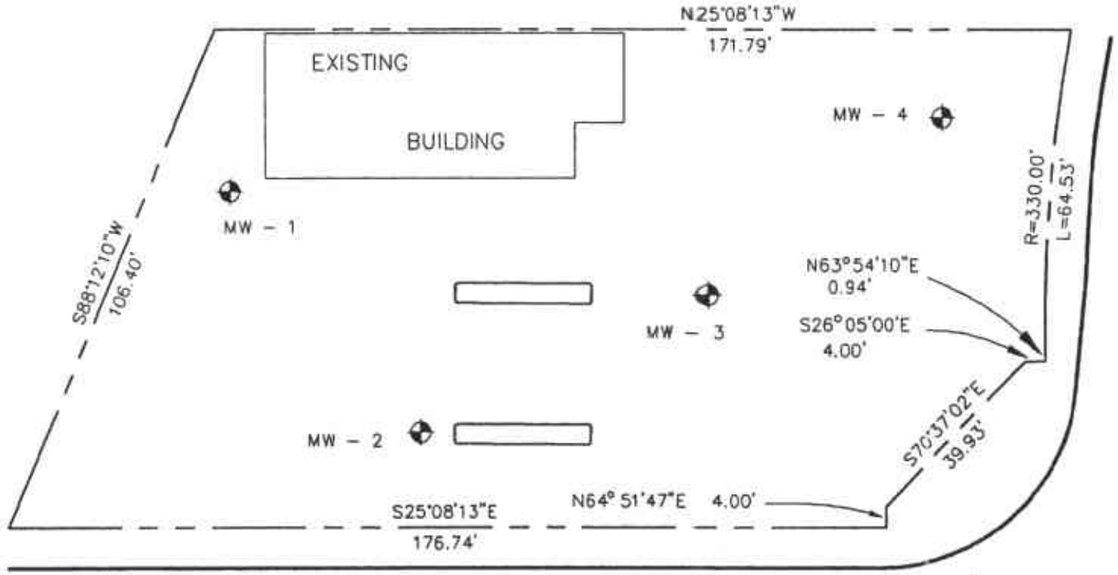
Groundwater Level Measurement

Before groundwater sampling activities, groundwater levels in each well at the site were measured from the permanent survey reference point at the top of the well casing. Groundwater in each well was monitored for the presence or absence of free-floating product or sheen. The depth to groundwater was measured to an accuracy of 0.01 foot from the top of the PVC well casing using an electronic sounder.

Groundwater Monitoring Well Sampling

To ensure that the groundwater sample was representative of the aquifer, the wells were purged of 3 casing volumes and the above parameters stabilized before sample collection. This purging was accomplished using a pump.

The groundwater samples were collected using a disposable bailer, and carefully transferred into the appropriate clean, glass, laboratory supplied containers. The sampling technician wore nitrile gloves at all times during purging and well sampling. The samples were clearly labeled with well number, site identification, date and time of collection, and sampler's initials, and transported in an iced cooler to a state-certified laboratory following proper preservation and chain of custody protocol.



BOCKMAN ROAD

HESPERIAN BOULEVARD

NOTE:
THIS IS NOT A SURVEY OF THE BOUNDARY.
ALL REPRESENTATIONS HEREIN ARE BASED
UPON RECORD INFORMATION.

LICENSED LAND SURVEYOR
ELLIOTT V. INGRAM
NO. 6357
EXPIRES 12/31/94
STATE OF CALIFORNIA

Elliott V. Ingram

NORTH

SCALE: 1" = 30'

MONITORING WELL ELEVATIONS	
MW – 1	41.07
MW – 2	40.56
MW – 3	40.45
MW – 4	39.24

LEGEND

MONITORING WELL

BENCHMARK
BRASS DISK ON TOP OF CURB AT S.W. RETURN OF HESPERIAN BLVD. AND BOCKMAN RD. ELEV. = 39.95

BP STATION NO. 11107
SAN LORENZO CALIF

MONITORING WELL LOCATIONS

NOVEMBER 18, 1992

ELLIOTT V. INGRAM
LAND SURVEYOR
1310 LA VISTA CONCORD, CA. 94521
(510) 689 - 4578

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

APPENDIX F

WATER SAMPLING FIELD SURVEY FORMS

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

Project Number: 10-060
Station Number: BP11107
Date: 10/27/92

Monitoring Well Development Form

Well Number: MW-1

Sampled by: Dan Birch

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

☒2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well Prior to Development: 30-70
Initial Water Level: 21.04

Total Depth of Well After Development: 30-70
Final Water Level: 21.41

Total Volume Purged: 17
Time Elapsed: 8

Subjective Evaluation of Well Production
☒Good OModerate OPoor

DEVELOPMENT METHOD:
☒Honda Pump
☒Disposable PolyTubing(31 ft)
ODisposable PVC Bailer(s)(____)
OOther_____

Subjective Analysis Prior to Development
SHEEN OYes ☒No
Product Thickness None (ft)
Depth to Product None (ft)

Calculated Purge Volume:

30-70 (Total Depth) - 21.04 (Water Level) = 9.66 x .16 (Well Vol. Fac.) = 1.55 x 10 (#of vol. to Purge) = 15.5 (gallons) Calculated Purge Volume

COMMENTS:

SUBJECTIVE ANALYSIS DURING DEVELOPMENT

Gallons Removed	Time	Black	Grey	Dark Brown	Light Brown	Clear	
5	1406				X		
10	1408				X		
17	1412				X		

SUSPENDED SAND & SILT

YES	NO
X	
X	
	X

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

Monitoring Well Development Form

Well Number: MW-2

Project Number: 10-060
Station Number: BP11107
Date: 10/27/92

Sampled by: Dan Birch

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

⊗2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well Prior to Development 25.04 Initial Water Level: 20.40

Total Depth of Well After Development 25.04 Final Water Level 20.74

Total Volume Purged: 11 Time Elapsed: 6

Subjective Evaluation of Well Production
⊗Good OModerate OPoor

DEVELOPMENT METHOD:
⊗Honda Pump
⊗Disposable PolyTubing(27 ft)
ODisposable PVC Bailer(s)(____)
OOther_____

Subjective Analysis Prior to Development
SHEEN OYes ⊗No

Product Thickness None (ft)

Depth to Product None (ft)

Calculated Purge Volume:

25.04 (Total Depth) - 20.40 (Water Level) = 4.64 x .16 (Well Vol. Fac.) = .74 x 10 (#of vol. to Purge) = 7.4 (gallons) Calculated Purge Volume

COMMENTS:

SUBJECTIVE ANALYSIS DURING DEVELOPMENT

Gallons Removed	Time	Black	Grey	Dark Brown	Light Brown	Clear	
3	1347			X			
5	1349			X			
8	1351				X		
11	1352				X		

SUSPENDED SAND & SILT

YES	NO
X	
X	
	X
	X

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

Monitoring Well Development Form

Well Number: MW-3

Project Number: 10-060
Station Number: BP 11107
Date: 10/27/92

Sampled by: Dan Birch

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

X 2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well Prior to Development 25.29
Initial Water Level: 20.52

Total Depth of Well After Development 25.29
Final Water Level 20.31

Total Volume Purged: 10
Time Elapsed: 6

Subjective Evaluation of Well Production
X Good O Moderate O Poor

DEVELOPMENT METHOD:
X Honda Pump
X Disposable PolyTubing(27 ft)
O Disposable PVC Bailer(s)(____)
O Other_____

Subjective Analysis Prior to Development
SHEEN O Yes X No

Product Thickness None (ft)

Depth to Product None (ft)

Calculated Purge Volume:

25.29 (Total Depth) - 20.52 (Water Level) = 4.77 x .16 (Well Vol. Fac.) = .76 x 10 (#of vol. to Purge) = 7.6 (gallons) Calculated Purge Volume

COMMENTS:

SUBJECTIVE ANALYSIS DURING DEVELOPMENT

Gallons Removed	Time	Black	Grey	Dark Brown	Light Brown	Clear		SUSPENDED SAND & SILT YES	SUSPENDED SAND & SILT NO
2	1331			X				X	
5	1333			X				X	
8	1335				X				X
10	1337				X				X

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

Monitoring Well Development Form

Project Number: 10-060
Station Number: BP11107
Date: 10/27/92

Well Number: MW-4

Sampled by: DAN BIRCH

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

⊗2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well Prior to Development 25.34 Initial Water Level: 19.43

Total Depth of Well After Development 25.34 Final Water Level 19.52

Total Volume Purged: 129. Time Elapsed: 6

Subjective Evaluation of Well Production
⊗Good OModerate OPoor

DEVELOPMENT METHOD:
⊗Honda Pump
⊗Disposable PolyTubing(26 ft)
ODisposable PVC Bailer(s)(____)
OOther_____

Subjective Analysis Prior to Development
SHEEN OYes ⊗No

Product Thickness None (ft)

Depth to Product None (ft)

Calculated Purge Volume:

25.34 (Total Depth) - 19.43 (Water Level) = 5.91 x .16 (Well Vol. Fac.) = 0.95 x 10 (#of vol. to Purge) = 9.5 (gallons) Calculated Purge Volume

COMMENTS:

SUBJECTIVE ANALYSIS DURING DEVELOPMENT

Gallons Removed	Time	Black	Grey	Dark Brown	Light Brown	Clear	
3	1305			X			
6	1307				X		
9	1309				X		
12	1311				X		

SUSPENDED SAND & SILT

YES	NO
X	
X	
	X
	X

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Well Number: MW-1

Project Number: 10-060
Station Number: BP11107
Date: 11/4/92

Sample Type: X Groundwater OTrip Blank ODuplicate of _____

Sampled by: Dan Birch

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

X 2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well 30-70 Initial Water Level: 20.78

Total Volume Purged: 5 Time Elapsed: 15

PURGE METHOD:
X Honda Pump
X Disposable PolyTubing(30 ft)
ODisposable PVC Bailer(s)(____)
OOther_____

Calculated Purge Volume:

30.70 (Total Depth) - 20.78 (Water Level) = 9.92 x .16 (Well Vol. Fac.) = 1.58 x 3 (#of vol. to Purge) = 4.76 (gallons) Calculated Purge Volume

Subjective Analysis Prior to Purging

SHEEN OYes X No | Depth to Product — (ft) | Product Thickness — (ft)

PARAMETER EQUIPMENT CALIBRATION

pH Meter #: 9112 Time: 0920
Solution pH 7.00 7 at 59 °F
Solution pH 4.00 4 at 59 °F
Solution pH 10.00 10 at 59 °F
Water Level Meter#: 10337

COMMENTS: Duplicate QC-1 was collected from this well.

SAMPLING METHOD

X PVC Disposable Bailer
OTeflon Bailer
OOther:_____

Time Sampled (24 hour clock) 2050

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)	Analysis Required	No. of	Container Type	Preservatives
1	2035	65.1	6.29	0.97	X EPA 601	3	VOA's	
3	2041	64.7	6.27	0.99	X TPH-G/BTEX	3	VOA's	HCl
5	2050	64.3	6.23	0.99	X TPH- Diesel	1	Amber Liter	
					X TOG 5520 BF	1	Amber Liter	H_2SO_4

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Project Number: 10-060
Station Number: BP11107
Date: 11/4/92

Well Number: MW-2
Sample Type: X Groundwater OTrip Blank ODuplicate of _____
Sampled by: _____

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

X 2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well 25.05 Initial Water Level: _____

Total Volume Purged: 4 Time Elapsed: 10

PURGE METHOD:
X Honda Pump
X Disposable PolyTubing(____ft)
ODisposable PVC Bailer(s)(____)
OOther_____

Calculated Purge Volume:

25.05 (Total Depth) - 20.16 (Water Level) = 4.89 x .16 (Well Vol. Fac.) = .78 x 3 (#of vol. to Purge) = 2.35 (gallons) Calculated Purge Volume

Subjective Analysis Prior to Purging

SHEEN OYes X No Depth to Product _____(ft) Product Thickness _____ (ft)

COMMENTS:

PARAMETER EQUIPMENT CALIBRATION

pH Meter #: 9112 Time: 0920
Solution pH 7.00 7 at 59 °F
Solution pH 4.00 4 at 59 °F
Solution pH 10.00 10 at 59 °F
Water Level Meter#: 10337

SAMPLING METHOD

X PVC Disposable Bailer
OTeflon Bailer
OOther:_____

Time Sampled (24 hour clock) 2020

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)
1	2010	64.9	6.25	0.92
2	2015	63.9	6.31	0.92
4	2020	64.1	6.35	0.92

	Analysis Required	No. of	Container Type	Preservatives
	EPA 601		VOA's	
X	TPH-G/BTEX	X	VOA's	HCl
	TPH- Diesel		Amber Liter	
	TOG 5520 BF		Amber Liter	H_2SO_4

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Well Number: MW-3

Project Number: 10-060
Station Number: BP11107
Date: 11/4/92

Sample Type: XGroundwater OTrip Blank ODuplicate of _____

Sampled by: DAN BIRCH

WELL PURGING

PURGE VOLUME

Casing Diameter (inches)	X2"	O3"	O4"	O4.5"	O6"	O____
Volume Factors:	0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well 25.29 Initial Water Level: 20.23

Total Volume Purged: 3 Time Elapsed: 13

PURGE METHOD:
XO Honda Pump
XODisposable PolyTubing(25 ft)
ODisposable PVC Bailer(s)(____)
OOther_____

Calculated Purge Volume:

25.29 (Total Depth) - 20.23 (Water Level) = 5.06 x .16 (Well Vol. Fac.) = .81 x 3 (#of vol. to Purge) = 2.42 (gallons) (Calculated Purge Volume)

Subjective Analysis Prior to Purging

SHEEN OYes XNo Depth to Product ____(ft) Product Thickness ____(ft)

COMMENTS:

PARAMETER EQUIPMENT CALIBRATION

pH Meter #: 9112 Time: 0920
Solution pH 7.00 7 at 59.0 °F
Solution pH 4.00 4 at 59.0 °F
Solution pH 10.00 10 at 59.0 °F
Water Level Meter#: 10337

SAMPLING METHOD

XOVC Disposable Bailer
OTeflon Bailer
OOther:_____

Time Sampled (24 hour clock) 1925

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)
1	1912	65.9	6.37	0.96
2	1920	64.7	6.29	0.96
3	1925	64.3	6.30	0.99

	Analysis Required	No. of	Container Type	Preservatives
	EPA 601		VOA's	
X	TPH-G/BTEX	3	VOA's	HCl
	TPH- Diesel		Amber Liter	
	TOG 5520 BF		Amber Liter	H_2SO_4

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Well Number: MW-4

Project Number: 10-060
Station Number: BP11107
Date: 11/4/92

Sample Type: X Groundwater O Trip Blank O Duplicate of _____
Sampled by: Dan Birch

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

O 2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well 25.34 Initial Water Level: 19.18

Total Volume Purged: 3 Time Elapsed: 11

PURGE METHOD:
X Honda Pump
X Disposable PolyTubing (25 ft)
O Disposable PVC Bailer(s)(____)
O Other_____

Calculated Purge Volume:

25.34 (Total Depth) - 19.18 (Water Level) = 6.16 x .16 (Well Vol. Fac.) = .98 x 3 (#of vol. to Purge) = 2.9 (gallons) Calculated Purge Volume

Subjective Analysis Prior to Purging

SHEEN O Yes X No Depth to Product _____(ft) Product Thickness _____ (ft)

COMMENTS:

PARAMETER EQUIPMENT CALIBRATION

pH Meter #: 9112 Time: 0920
Solution pH 7.00 7 at 59 °F
Solution pH 4.00 4 at 59 °F
Solution pH 10.00 10 at 59 °F
Water Level Meter#: 10337

SAMPLING METHOD

X PVC Disposable Bailer
O Teflon Bailer
O Other:_____

Time Sampled (24 hour clock): 1901

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)
1	1850	65.8	7.63	0.93
2	1856	64.7	7.01	0.93
3	1901	64.9	7.02	0.93

	Analysis Required	No. of	Container Type	Preservatives
	EPA 601		VOA's	
X	TPH-G/BTEX	3	VOA's	HCl
	TPH- Diesel		Amber Liter	
	TOG 5520 BF		Amber Liter	H_2SO_4

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Project Number: 10-060
Station Number: BP11107
Date: 11/4/92

Well Number: QC-1
Sample Type: OGroundwater OTrip Blank XDuplicate of MW-1
Sampled by: _____

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

O 2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well _____ Initial Water Level:_____

Total Volume Purged:_____ Time Elapsed:_____

PURGE METHOD:
O Honda Pump
ODisposable PolyTubing(____ft)
ODisposable PVC Bailer(s)(____)
OOther_____

Calculated Purge Volume:

_____ - _____ = _____ x _____ = _____ x _____ = _____(gallons)
Total Depth | Water Level | Well Vol. Fac. | #of vol. to Purge | Calculated Purge Volume

Subjective Analysis Prior to Purging

SHEEN OYes ONo | Depth to Product _____(ft) | Product Thickness _____ (ft)

PARAMETER EQUIPMENT CALIBRATION

pH Meter #:_____ Time:_____
Solution pH 7.00 _____at _____°F
Solution pH 4.00_____at _____°F
Solution pH 10.00 _____ at _____°F
Water Level Meter#:_____

COMMENTS: Purging, Parameter and sampling data from MW-1 applies to this sample

SAMPLING METHOD

OPVC Disposable Bailer
OTeflon Bailer
OOther:_____

Time Sampled (24 hour clock) 2055

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)		Analysis Required	No. of	Container Type	Preservatives
						EPA 601		VOA's	
					X	TPH-G/BTEX	3	VOA's	HCl
						TPH- Diesel		Amber Liter	
						TOG 5520 BF		Amber Liter	H_2SO_4

APPENDIX G

FIELD PROCEDURES FOR CHAIN OF CUSTODY DOCUMENTATION, OFFICIAL LABORATORY REPORTS, AND CHAIN OF CUSTODY RECORDS

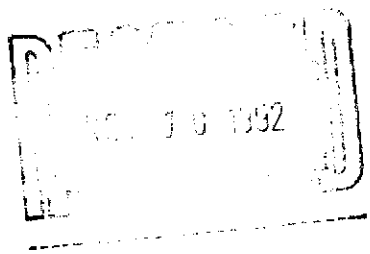
FIELD PROCEDURES
FOR
CHAIN OF CUSTODY DOCUMENTATION

Samples collected were properly handled in accordance with the California Department of Health Services guidelines. Each sample was properly labeled in the field, and immediately stored in coolers and preserved with blue or dry ice for transport to a state-certified laboratory for analysis.

The official chain of custody record accompanied the samples, and included the site and sample identification, date and time of sample collection, analysis requested, and the name and signature of the sampling technician. When transferring possession of the samples, the transferee signed and dated the chain of custody record.

pace
INCORPORATED
THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS



November 06, 1992

Mr. Brady Nagle
Alisto Engineering Group
1000 Burnett Ave., Ste. 420
Concord, CA 94520

RE: PACE Project No. 421026.504
Client Reference: BP Station # 11107

Dear Mr. Nagle:

Enclosed is the report of laboratory analyses for samples received October 26, 1992.

Footnotes are given at the end of the report.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Stephanie Matzo

Stephanie Matzo
Project Manager

Enclosures

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

pace INCORPORATED
THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Alisto Engineering Group
1000 Burnett Ave., Ste. 420
Concord, CA 94520

November 06, 1992
PACE Project Number: 421026504

Attn: Mr. Brady Nagle

Client Reference: BP Station # 11107

PACE Sample Number:			70 0235774	
Date Collected:			10/22/92	
Date Received:			10/26/92	
			B-1-14.5	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/04/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/04/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/04/92
Benzene	ug/kg wet	5.0	ND	11/04/92
Toluene	ug/kg wet	5.0	ND	11/04/92
Ethylbenzene	ug/kg wet	5.0	ND	11/04/92
Xylenes, Total	ug/kg wet	5.0	ND	11/04/92
OIL AND GREASE, SILICA GEL (LUFT)				
Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	ND	11/04/92
Date Extracted			10/30/92	
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/kg	20	ND	10/29/92
Chloromethane	ug/kg	20	ND	10/29/92
Vinyl Chloride	ug/kg	20	ND	10/29/92
Bromomethane	ug/kg	20	ND	10/29/92
Chloroethane	ug/kg	20	ND	10/29/92
Trichlorofluoromethane	ug/kg	20	ND	10/29/92
1,1-Dichloroethene	ug/kg	5.0	ND	10/29/92
Methylene Chloride	ug/kg	20	ND	10/29/92
trans-1,2-Dichloroethene	ug/kg	5.0	ND	10/29/92
cis-1,2-Dichloroethene	ug/kg	5.0	ND	10/29/92
1,1-Dichloroethane	ug/kg	5.0	ND	10/29/92
Chloroform	ug/kg	5.0	ND	10/29/92
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND	10/29/92
Carbon Tetrachloride	ug/kg	5.0	ND	10/29/92
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	10/29/92
Trichloroethene (TCE)	ug/kg	5.0	ND	10/29/92
1,2-Dichloropropane	ug/kg	5.0	ND	10/29/92

REPORT OF LABORATORY ANALYSIS

November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

PACE Sample Number:			70 0235774	
Date Collected:			10/22/92	
Date Received:			10/26/92	
Client Sample ID:			B-1-14.5	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Bromodichloromethane	ug/kg	5.0	ND	10/29/92
2-Chloroethylvinyl ether	ug/kg	5.0	ND	10/29/92
cis-1,3-Dichloropropene	ug/kg	5.0	ND	10/29/92
trans-1,3-Dichloropropene	ug/kg	5.0	ND	10/29/92
1,1,2-Trichloroethane	ug/kg	5.0	ND	10/29/92
Tetrachloroethene	ug/kg	5.0	ND	10/29/92
Dibromochloromethane	ug/kg	5.0	ND	10/29/92
Chlorobenzene	ug/kg	5.0	ND	10/29/92
Bromoform	ug/kg	5.0	ND	10/29/92
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	10/29/92
1,3-Dichlorobenzene	ug/kg	5.0	ND	10/29/92
1,4-Dichlorobenzene	ug/kg	5.0	ND	10/29/92
1,2-Dichlorobenzene	ug/kg	5.0	ND	10/29/92
Bromochloromethane (Surrogate Recovery)			118%	10/29/92
1,4-Dichlorobutane (Surrogate Recovery)			97%	10/29/92
EXTRACTABLE FUELS EPA 3550/8015				
Extractable Fuels, as Diesel	mg/kg	5.0	ND	11/03/92
Date Extracted			11/03/92	

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Mr. Brady Nagle
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November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

PACE Sample Number:			70 0235782	
Date Collected:			10/22/92	
Date Received:			10/26/92	
Client Sample ID:			B-1-21	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/04/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/04/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/04/92
Benzene	ug/kg wet	5.0	ND	11/04/92
Toluene	ug/kg wet	5.0	ND	11/04/92
Ethylbenzene	ug/kg wet	5.0	ND	11/04/92
Xylenes, Total	ug/kg wet	5.0	ND	11/04/92
OIL AND GREASE, SILICA GEL (LUFT)				
Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	ND	11/04/92
Date Extracted			10/30/92	
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/kg	20	ND	10/29/92
Chloromethane	ug/kg	20	ND	10/29/92
Vinyl Chloride	ug/kg	20	ND	10/29/92
Bromomethane	ug/kg	20	ND	10/29/92
Chloroethane	ug/kg	20	ND	10/29/92
Trichlorofluoromethane	ug/kg	20	ND	10/29/92
1,1-Dichloroethene	ug/kg	5.0	ND	10/29/92
Methylene Chloride	ug/kg	20	ND	10/29/92
trans-1,2-Dichloroethene	ug/kg	5.0	ND	10/29/92
cis-1,2-Dichloroethene	ug/kg	5.0	ND	10/29/92
1,1-Dichloroethane	ug/kg	5.0	ND	10/29/92
Chloroform	ug/kg	5.0	ND	10/29/92
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND	10/29/92
Carbon Tetrachloride	ug/kg	5.0	ND	10/29/92
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	10/29/92
Trichloroethene (TCE)	ug/kg	5.0	ND	10/29/92
1,2-Dichloropropane	ug/kg	5.0	ND	10/29/92
Bromodichloromethane	ug/kg	5.0	ND	10/29/92
2-Chloroethylvinyl ether	ug/kg	5.0	ND	10/29/92

REPORT OF LABORATORY ANALYSIS

November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

PACE Sample Number:			70 0235782	
Date Collected:			10/22/92	
Date Received:			10/26/92	
Client Sample ID:			B-1-21	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
cis-1,3-Dichloropropene	ug/kg	5.0	ND	10/29/92
trans-1,3-Dichloropropene	ug/kg	5.0	ND	10/29/92
1,1,2-Trichloroethane	ug/kg	5.0	ND	10/29/92
Tetrachloroethene	ug/kg	5.0	ND	10/29/92
Dibromochloromethane	ug/kg	5.0	ND	10/29/92
Chlorobenzene	ug/kg	5.0	ND	10/29/92
Bromoform	ug/kg	5.0	ND	10/29/92
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	10/29/92
1,3-Dichlorobenzene	ug/kg	5.0	ND	10/29/92
1,4-Dichlorobenzene	ug/kg	5.0	ND	10/29/92
1,2-Dichlorobenzene	ug/kg	5.0	ND	10/29/92
Bromochloromethane (Surrogate Recovery)			114%	10/29/92
1,4-Dichlorobutane (Surrogate Recovery)			86%	10/29/92
EXTRACTABLE FUELS EPA 3550/8015				
Extractable Fuels, as Diesel	mg/kg	5.0	ND	11/04/92
Date Extracted			11/03/92	

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REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle
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November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

PACE Sample Number:			70 0235790	
Date Collected:			10/22/92	
Date Received:			10/26/92	
Client Sample ID:			B-2-11	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/04/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	
Benzene	ug/kg wet	5.0	ND	11/04/92
Toluene	ug/kg wet	5.0	ND	11/04/92
Ethylbenzene	ug/kg wet	5.0	ND	11/04/92
Xylenes, Total	ug/kg wet	5.0	ND	11/04/92

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REPORT OF LABORATORY ANALYSIS

November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

PACE Sample Number:			70 0235804	
Date Collected:			10/22/92	
Date Received:			10/26/92	
Client Sample ID:			B-2-16	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/04/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/04/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/04/92
Benzene	ug/kg wet	5.0	ND	11/04/92
Toluene	ug/kg wet	5.0	ND	11/04/92
Ethylbenzene	ug/kg wet	5.0	ND	11/04/92
Xylenes, Total	ug/kg wet	5.0	ND	11/04/92

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November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

PACE Sample Number:			70 0235812	
Date Collected:			10/22/92	
Date Received:			10/26/92	
Client Sample ID:			B-3-10	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/04/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/04/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/04/92
Benzene	ug/kg wet	5.0	ND	11/04/92
Toluene	ug/kg wet	5.0	ND	11/04/92
Ethylbenzene	ug/kg wet	5.0	ND	11/04/92
Xylenes, Total	ug/kg wet	5.0	ND	11/04/92

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REPORT OF LABORATORY ANALYSIS

November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

PACE Sample Number:			70 0235820	
Date Collected:			10/22/92	
Date Received:			10/26/92	
Client Sample ID:			B-3-21	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/04/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	4000	51000	11/04/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/04/92
Benzene	ug/kg wet	20	210	11/04/92
Toluene	ug/kg wet	20	380	11/04/92
Ethylbenzene	ug/kg wet	20	760	11/04/92
Xylenes, Total	ug/kg wet	20	3000	11/04/92

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REPORT OF LABORATORY ANALYSIS

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November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

PACE Sample Number:			70 0235839	
Date Collected:			10/23/92	
Date Received:			10/26/92	
Client Sample ID:			B-4-16	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/04/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	1800	11/04/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/04/92
Benzene	ug/kg wet	5.0	310	11/04/92
Toluene	ug/kg wet	5.0	9.0	11/04/92
Ethylbenzene	ug/kg wet	5.0	51	11/04/92
Xylenes, Total	ug/kg wet	5.0	100	11/04/92

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November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

PACE Sample Number:			70 0235847	
Date Collected:			10/23/92	
Date Received:			10/26/92	
Client Sample ID:			B-4-20	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/04/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	24000	11/04/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/04/92
Benzene	ug/kg wet	5.0	400	11/04/92
Toluene	ug/kg wet	5.0	420	11/04/92
Ethylbenzene	ug/kg wet	5.0	350	11/04/92
Xylenes, Total	ug/kg wet	5.0	1500	11/04/92

These data have been reviewed and are approved for release.

Darrell Coen for,
Mark A. Valentini, Ph.D.
Regional Director

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Client Reference: BP Station # 11107

MDL Method Detection Limit
ND Not detected at or above the MDL.

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QUALITY CONTROL DATA

November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

EXTRACTABLE FUELS EPA 3550/8015
Batch: 70 16665
Samples: 70 0235774

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Extractable Fuels, as Diesel	mg/kg	5.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Extractable Fuels, as Diesel	mg/kg	5.0	33.3	67%	78%	15%

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QUALITY CONTROL DATA

November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

EXTRACTABLE FUELS EPA 3550/8015
Batch: 70 16684
Samples: 70 0235782

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Extractable Fuels, as Diesel	mg/kg	5.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Extractable Fuels, as Diesel	mg/kg	5.0	33.3	73%	75%	2%

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QUALITY CONTROL DATA

November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

HALOGENATED VOLATILE COMPOUNDS EPA 8010
Batch: 70 16614
Samples: 70 0235774, 70 0235782

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Dichlorodifluoromethane	ug/kg	20	ND
Chloromethane	ug/kg	20	ND
Vinyl Chloride	ug/kg	20	ND
Bromomethane	ug/kg	20	ND
Chloroethane	ug/kg	20	ND
Trichlorofluoromethane	ug/kg	20	ND
1,1-Dichloroethene	ug/kg	5.0	ND
Methylene Chloride	ug/kg	20	ND
trans-1,2-Dichloroethene	ug/kg	5.0	ND
cis-1,2-Dichloroethene	ug/kg	5.0	ND
1,1-Dichloroethane	ug/kg	5.0	ND
Chloroform	ug/kg	5.0	ND
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND
Carbon Tetrachloride	ug/kg	5.0	ND
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND
Trichloroethene (TCE)	ug/kg	5.0	ND
1,2-Dichloropropane	ug/kg	5.0	ND
Bromodichloromethane	ug/kg	5.0	ND
2-Chloroethylvinyl ether	ug/kg	5.0	ND
cis-1,3-Dichloropropene	ug/kg	5.0	ND
trans-1,3-Dichloropropene	ug/kg	5.0	ND
1,1,2-Trichloroethane	ug/kg	5.0	ND
Tetrachloroethene	ug/kg	5.0	ND
Dibromochloromethane	ug/kg	5.0	ND
Chlorobenzene	ug/kg	5.0	ND
Bromoform	ug/kg	5.0	ND
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND
1,3-Dichlorobenzene	ug/kg	5.0	ND
1,4-Dichlorobenzene	ug/kg	5.0	ND
1,2-Dichlorobenzene	ug/kg	5.0	ND
Bromochloromethane (Surrogate Recovery)			109%
1,4-Dichlorobutane (Surrogate Recovery)			101%

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QUALITY CONTROL DATA

November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

HALOGENATED VOLATILE COMPOUNDS EPA 8010
Batch: 70 16614
Samples: 70 0235774, 70 0235782

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
1,1-Dichloroethane	ug/kg	5.0	10.00	112%	132%	16%
Trichloroethene (TCE)	ug/kg	5.0	10.00	102%	108%	5%
1,1,2-Trichloroethane	ug/kg	5.0	10.00	118%	125%	5%
Tetrachloroethene	ug/kg	5.0	10.00	117%	125%	6%

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

OIL AND GREASE, SILICA GEL (LUFT)
Batch: 70 16674
Samples: 70 0235774, 70 0235782

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	667	93%	97%	4%

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QUALITY CONTROL DATA

November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

PURGEABLE FUELS AND AROMATICS
Batch: 70 16707
Samples: 70 0235820

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/kg wet	200	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/kg wet	1.0	ND
Toluene	ug/kg wet	1.0	ND
Ethylbenzene	ug/kg wet	1.0	ND
Xylenes, Total	ug/kg wet	1.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/kg wet	200	351	87%	92%	5%
Benzene	ug/kg wet	1.0	40.0	110%	106%	3%
Toluene	ug/kg wet	1.0	40.0	111%	110%	0%
Ethylbenzene	ug/kg wet	1.0	40.0	108%	106%	1%
Xylenes, Total	ug/kg wet	1.0	80.0	111%	111%	0%

Client Reference: BP Station # 11107

TPH GASOLINE/BTEX
Batch: 70 16658
Samples: 70 0235774, 70 0235782, 70 0235790, 70 0235804, 70 0235812
70 0235839, 70 0235847

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/kg wet	200	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/kg wet	1.0	ND
Toluene	ug/kg wet	1.0	ND
Ethylbenzene	ug/kg wet	1.0	ND
Xylenes, Total	ug/kg wet	1.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/kg wet	200	351	90%	91%	1%
Benzene	ug/kg wet	1.0	40.0	103%	99%	3%
Toluene	ug/kg wet	1.0	40.0	104%	101%	2%
Ethylbenzene	ug/kg wet	1.0	40.0	101%	98%	3%
Xylenes, Total	ug/kg wet	1.0	80.0	111%	106%	4%

Mr. Brady Nagle
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FOOTNOTES
for pages 12 through 18

November 06, 1992
PACE Project Number: 421026504

Client Reference: BP Station # 11107

MDL	Method Detection Limit
ND	Not detected at or above the MDL.
RPD	Relative Percent Difference

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CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: Alisto Engineering Group
Address: 1000 Burnett Ave. Suite 420
Concord CA 94520
Phone: (510) 798-4070

Report To: Brady Nagle
Bill To: BP Oil Co #11107 (10/29 JO) BPH 11107
P.O. # / Billing Reference: per Brady Nagle via fax 10-26-92
Project Name / No.: 10-060 / Hesperian & Beckman

Pace Client No.:
Pace Project Manager:
Pace Project No.: 421026.504
*Requested Due Date:

Sampled By (PRINT): Ted Moise
Sampler Signature: Ted Moise
Date Sampled: 10/22-23/92

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA	ANALYSES REQUEST: TPH-G/BTEX	T.O.G.	8010	TPH-D	REMARKS
1	B-1-14.5		Soil	23577.4	1					✓	✓	✓	✓	
2	B-1-21			78.2	1					✓	✓	✓	✓	
3	B-2-11			79.0	1					✓				
4	B-2-16			80.4	1					✓				
5	B-3-10			81.2	1					✓				
6	B-3-21	10/22/92		82.0	1					✓				
7	B-4-16	10/23/92		83.9	1					✓				
8	B-4-20			84.7	1					✓				

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT DATE	SHIPMENT METHOD RETURNED DATE
H/3			

Additional Comments

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ted Moise	Brady Nagle / Pace	10/26	8:00
	[redacted]	Jim Ogle / Pace	10/26	1345
			10/26	1705

ORIGINAL

SEE REVERSE SIDE FOR INSTRUCTIONS

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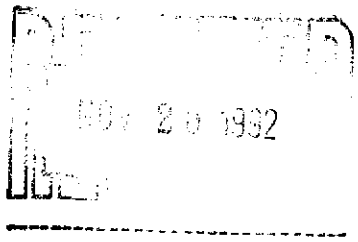
REPORT OF LABORATORY ANALYSIS



November 19, 1992

Mr. Brady Nagle
Alisto Engineering Group
1000 Burnett Ave., Ste. 420
Concord, CA 94520

RE: PACE Project No. 421106.512
Client Reference: BP Station # 11107

Dear Mr. Nagle:

Enclosed is the report of laboratory analyses for samples received November 06, 1992.

Footnotes are given at the end of the report.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

for Stephanie Matzo
Project Manager

Enclosures

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Alisto Engineering Group
1000 Burnett Ave., Ste. 420
Concord, CA 94520

November 19, 1992
PACE Project Number: 421106512

Attn: Mr. Brady Nagle

Client Reference: BP Station # 11107

PACE Sample Number:			70 0245745	
Date Collected:			11/04/92	
Date Received:			11/06/92	
Client Sample ID:			MW-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/10/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	11/10/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/10/92
Benzene	ug/L	0.5	ND	11/10/92
Toluene	ug/L	0.5	ND	11/10/92
Ethylbenzene	ug/L	0.5	ND	11/10/92
Xylenes, Total	ug/L	0.5	ND	11/10/92
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/L	2.0	ND	11/12/92
Chloromethane	ug/L	2.0	ND	11/12/92
Vinyl Chloride	ug/L	2.0	ND	11/12/92
Bromomethane	ug/L	2.0	ND	11/12/92
Chloroethane	ug/L	2.0	ND	11/12/92
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND	11/12/92
1,1-Dichloroethene	ug/L	0.5	ND	11/12/92
Methylene Chloride	ug/L	2.0	ND	11/12/92
trans-1,2-Dichloroethene	ug/L	0.5	ND	11/12/92
cis-1,2-Dichloroethene	ug/L	0.5	ND	11/12/92
1,1-Dichloroethane	ug/L	0.5	ND	11/12/92
Chloroform	ug/L	0.5	ND	11/12/92
1,1,1-Trichloroethane (TCA)	ug/L	0.5	2.8	11/12/92
Carbon Tetrachloride	ug/L	0.5	ND	11/12/92
1,2-Dichloroethane (EDC)	ug/L	0.5	ND	11/12/92
Trichloroethene (TCE)	ug/L	0.5	ND	11/12/92
1,2-Dichloropropane	ug/L	0.5	ND	11/12/92
Bromodichloromethane	ug/L	0.5	ND	11/12/92
2-Chloroethylvinyl ether	ug/L	0.5	ND	11/12/92
cis-1,3-Dichloropropene	ug/L	0.5	ND	11/12/92

REPORT OF LABORATORY ANALYSIS

November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

PACE Sample Number:			70 0245745	
Date Collected:			11/04/92	
Date Received:			11/06/92	
Client Sample ID:			MW-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
trans-1,3-Dichloropropene	ug/L	0.5	ND	11/12/92
1,1,2-Trichloroethane	ug/L	0.5	ND	11/12/92
Tetrachloroethene	ug/L	0.5	ND	11/12/92
Dibromochloromethane	ug/L	0.5	ND	11/12/92
Chlorobenzene	ug/L	0.5	ND	11/12/92
Bromoform	ug/L	0.5	ND	11/12/92
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	11/12/92
1,3-Dichlorobenzene	ug/L	0.5	ND	11/12/92
1,4-Dichlorobenzene	ug/L	0.5	ND	11/12/92
1,2-Dichlorobenzene	ug/L	0.5	ND	11/12/92
Bromochloromethane (Surrogate Recovery)			106%	11/12/92
1,4-Dichlorobutane (Surrogate Recovery)			100%	11/12/92
EXTRACTABLE FUELS EPA 3510/8015				
Extractable Fuels, as Diesel	mg/L	0.050	ND	11/11/92
Date Extracted			11/10/92	
OIL AND GREASE, SILICA GEL (LUFT)				
Oil and Grease, Gravimetric (SM5520)	mg/L	5.0	ND	11/16/92
Date Extracted			11/16/92	

REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle
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November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

PACE Sample Number:			70 0245753	
Date Collected:			11/04/92	
Date Received:			11/06/92	
Client Sample ID:			MW-2	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/10/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	11/10/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/10/92
Benzene	ug/L	0.5	ND	11/10/92
Toluene	ug/L	0.5	ND	11/10/92
Ethylbenzene	ug/L	0.5	ND	11/10/92
Xylenes, Total	ug/L	0.5	ND	11/10/92

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REPORT OF LABORATORY ANALYSIS

November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

PACE Sample Number:			70 0245761	
Date Collected:			11/04/92	
Date Received:			11/06/92	
Client Sample ID:			MW-3	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/11/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	760	11/11/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/11/92
Benzene	ug/L	0.5	3.7	11/11/92
Toluene	ug/L	0.5	15	11/11/92
Ethylbenzene	ug/L	0.5	1.9	11/11/92
Xylenes, Total	ug/L	0.5	57	11/11/92

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REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle
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November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

PACE Sample Number:			70 0245770	
Date Collected:			11/04/92	
Date Received:			11/06/92	
Client Sample ID:			MW-4	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/11/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	900	11/11/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/11/92
Benzene	ug/L	0.5	150	11/11/92
Toluene	ug/L	0.5	4.1	11/11/92
Ethylbenzene	ug/L	0.5	0.8	11/11/92
Xylenes, Total	ug/L	0.5	53	11/11/92

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REPORT OF LABORATORY ANALYSIS

November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

PACE Sample Number:			70 0245788	
Date Collected:			11/04/92	
Date Received:			11/06/92	
Client Sample ID:			QC-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/11/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	11/11/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/11/92
Benzene	ug/L	0.5	ND	11/11/92
Toluene	ug/L	0.5	ND	11/11/92
Ethylbenzene	ug/L	0.5	ND	11/11/92
Xylenes, Total	ug/L	0.5	ND	11/11/92

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REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle
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November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

PACE Sample Number:			70 0245796	
Date Collected:			11/04/92	
Date Received:			11/06/92	
Client Sample ID:			QC-2	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/10/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	11/10/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/10/92
Benzene	ug/L	0.5	ND	11/10/92
Toluene	ug/L	0.5	ND	11/10/92
Ethylbenzene	ug/L	0.5	ND	11/10/92
Xylenes, Total	ug/L	0.5	ND	11/10/92

These data have been reviewed and are approved for release.

Darrell Cain

Darrell C. Cain
Regional Director

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Novato, CA 94949
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FAX: 415-883-2673

Mr. Brady Nagle
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FOOTNOTES
for pages 1 through 7

November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

MDL Method Detection Limit
ND Not detected at or above the MDL.

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Client Reference: BP Station # 11107

EXTRACTABLE FUELS EPA 3510/8015
Batch: 70 16884
Samples: 70 0245745

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Extractable Fuels, as Diesel	mg/L	0.050	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Extractable Fuels, as Diesel	mg/L	0.050	1.00	71%	69%	2%

Mr. Brady Nagle
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QUALITY CONTROL DATA

November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

HALOGENATED VOLATILE COMPOUNDS EPA 8010
Batch: 70 16921
Samples: 70 0245745

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Dichlorodifluoromethane	ug/L	2.0	ND
Chloromethane	ug/L	2.0	ND
Vinyl Chloride	ug/L	2.0	ND
Bromomethane	ug/L	2.0	ND
Chloroethane	ug/L	2.0	ND
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND
1,1-Dichloroethene	ug/L	0.5	ND
Methylene Chloride	ug/L	2.0	ND
trans-1,2-Dichloroethene	ug/L	0.5	ND
cis-1,2-Dichloroethene	ug/L	0.5	ND
1,1-Dichloroethane	ug/L	0.5	ND
Chloroform	ug/L	0.5	ND
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND
Carbon Tetrachloride	ug/L	0.5	ND
1,2-Dichloroethane (EDC)	ug/L	0.5	ND
Trichloroethene (TCE)	ug/L	0.5	ND
1,2-Dichloropropane	ug/L	0.5	ND
Bromodichloromethane	ug/L	0.5	ND
2-Chloroethylvinyl ether	ug/L	0.5	ND
cis-1,3-Dichloropropene	ug/L	0.5	ND
trans-1,3-Dichloropropene	ug/L	0.5	ND
1,1,2-Trichloroethane	ug/L	0.5	ND
Tetrachloroethene	ug/L	0.5	ND
Dibromochloromethane	ug/L	0.5	ND
Chlorobenzene	ug/L	0.5	ND
Bromoform	ug/L	0.5	ND
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND
1,3-Dichlorobenzene	ug/L	0.5	ND
1,4-Dichlorobenzene	ug/L	0.5	ND
1,2-Dichlorobenzene	ug/L	0.5	ND
Bromochloromethane (Surrogate Recovery)			96%
1,4-Dichlorobutane (Surrogate Recovery)			91%

REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle
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QUALITY CONTROL DATA

November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

HALOGENATED VOLATILE COMPOUNDS EPA 8010
Batch: 70 16921
Samples: 70 0245745

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
1,1-Dichloroethane	ug/L	0.5	10.00	96%	95%	1%
Trichloroethene (TCE)	ug/L	0.5	10.00	100%	102%	1%
trans-1,3-Dichloropropene	ug/L	0.5	3.8	101%	102%	0%
Tetrachloroethene	ug/L	0.5	10.00	103%	106%	2%

Client Reference: BP Station # 11107

OIL AND GREASE, SILICA GEL (LUFT)
Batch: 70 16949
Samples: 70 0245745

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Oil and Grease, Gravimetric (SM5520)	mg/L	5.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Oil and Grease, Gravimetric (SM5520)	mg/L	5.0	20.0	85%	80%	6%

Mr. Brady Nagle
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QUALITY CONTROL DATA

November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

PURGEABLE FUELS AND AROMATICS
Batch: 70 16838
Samples: 70 0245745, 70 0245753, 70 0245796

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	388	102%	103%	0%
Benzene	ug/L	0.5	40.0	96%	97%	1%
Toluene	ug/L	0.5	40.0	96%	97%	1%
Ethylbenzene	ug/L	0.5	40.0	104%	104%	0%
Xylenes, Total	ug/L	0.5	80.0	99%	100%	1%

Mr. Brady Nagle
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QUALITY CONTROL DATA

November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

PURGEABLE FUELS AND AROMATICS
Batch: 70 16880
Samples: 70 0245770, 70 0245788

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	388	115%	103%	11%
Benzene	ug/L	0.5	40.0	89%	88%	1%
Toluene	ug/L	0.5	40.0	96%	94%	2%
Ethylbenzene	ug/L	0.5	40.0	105%	103%	1%
Xylenes, Total	ug/L	0.5	80.0	109%	103%	5%

Client Reference: BP Station # 11107

TPH GASOLINE/BTEX
Batch: 70 16879
Samples: 70 0245761

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	292	98%	96%	2%
Benzene	ug/L	0.5	40.0	110%	102%	7%
Toluene	ug/L	0.5	40.0	108%	100%	7%
Ethylbenzene	ug/L	0.5	40.0	110%	102%	7%
Xylenes, Total	ug/L	0.5	80.0	107%	99%	7%

Mr. Brady Nagle
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FOOTNOTES
for pages 9 through 15

November 19, 1992
PACE Project Number: 421106512

Client Reference: BP Station # 11107

MDL	Method Detection Limit
ND	Not detected at or above the MDL.
RPD	Relative Percent Difference

11 Digital Drive
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B.P. OIL MARKETING COMPANY

421106.5I2

33305 First Way South, Federal Way, WA 98003

CHAIN OF CUSTODY

☐ Novato, CA, 11 Digital Drive, 94949
Phone: (415) 883-6100 Fax: (415) 883-2673

Consultant's Name: ALISTO ENGINEERING GROUP — Page 1 of 1

Address: 10000 BURNETT AVE, CONCORD

Project Contact: BRADY NAGLE — Consultant Project #: 10-060 — Phone #: 5107984070 Fax #: 7984099

Sampled by (print): DAN BIRCH — Sampler's Signature: DJB

Shipment Method: — B.P. Site Location #: BP11107 — B.P. Site Location: SAN LORENZO

TAT: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Standard (10 day)

Sample Condition as Received
Temperature ° C: _____
Cooler #: _____
Inbound Seal Yes No
Outbound Seal Yes No

Sample Description	Collection Date/Time	Matrix Soil/Water TIME	Prsv	# of Cont	PACE Sample #	TPH/GAS/BTEX EPA 8015/8020	TPH/Diesel EPA 8015	Oil & Grease SM 5520	HVOC 8010	COMMENTS
MW-1	11/4/92	2050	HCl None	8	24574.5	X	X	X	X	LOCA LABELED W/SITE #11107
MW-2	"	2020	HCl	3	75.3	X				
MW-3	"	1925	"	"	76.1	X				
MW-4	"	1901	"	"	77.0	X				
QC-1	"	2055	"	"	78.8	X				
QC-2	"	2059	"	"	79.6	X				
10/2, 6/5										

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time
DJB BTS	11/5/92	1645	Tommy Oglesby	11-5-92	16:45
Tommy Oglesby	11.6.92	9.42	DJB	11/6/92	9:42
DJB	11/6/92	1554	Federal Express	11/6	1400
[illegible]	11/6	1730	[illegible]	11/6/92	1730

Additional Comments: