



ENGINEERING-SCIENCE, INC.
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TRANSMITTAL

Date: 1 August 1991
 ES Project No. NC222.13

STID 4352

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To: Alameda County Environmental Service Agency
80 Swan Way, suite 200
Oakland, CA 94621

Attn: Dennis Byrne
 Re: 1650-65th Street Site, Oakland CA

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1	7/3/91	May 1991 (Seventh Quarterly) Groundwater Monitoring Report, 1650 65th Street, Emeryville, CA

Remarks _____

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- File
 - Author
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 - _____

Signed: *Clyde R. Wong*
 Clyde R. Wong, Project Manager

3 July 1991
Ref: NC222.13

91 AUG -2 PM 2:27

Alameda County Environmental Health Services
Hazardous Materials Division
80 Swan Way, Suite 200
Oakland, CA 94621

Attention: Mr. Dennis Byrne

Subject: May 1991 (Seventh Consecutive Quarterly) Groundwater Monitoring Report,
1650 65th Street Site, Emeryville, California

Dear Mr. Byrne:

INTRODUCTION

This letter report presents the hydrologic and hydrochemical results of the May 1991 groundwater sampling event and a summary of the groundwater remediation conducted at the 1650 65th Street Site in Emeryville, California. The purpose of groundwater sampling is to collect data to evaluate seasonal variations in water levels, water quality and possible inputs from off-site sources. ES has been monitoring groundwater conditions at the site since November 1989. The November 1990 event marked the completion of one year of quarterly sampling. The present sampling event is the seventh consecutive event with the others occurring in November 1989, February 1990, May 1990, August 1990, November 1990 and March 1991.

The monitoring wellfield at the site consists of six (6) monitoring wells (MW-2, MW-3, MW-4, MW-5, MW-6, MW-7) and one (1) extraction well (EW-1). Figure 1 shows the locations of all seven wells at the site. Extraction Well EW-1 and monitoring Well MW-2 are located in the excavation backfill of the former on-site underground fuel storage tank. Well MW-3 is located near the western property line; Wells MW-4 and MW-6 are located near the southern property line, and Wells MW-5 and MW-7 are located along the northern property line. Three underground fuel storage tanks were removed from the neighboring property to the north in 1989.

Groundwater extraction and treatment operation at the site began on 17 December 1990. The groundwater extraction and treatment system consists of pumping water from extraction well EW-1 and routing it through three activated carbon canisters in series. The treated water is discharged to a sanitary sewer in accordance with the conditions of East Bay Municipal Utility District (EBMUD) effluent discharge Permit No. 502-02911. The system initially operated at a flow rate of 5 gpm; however, the pumping rate later decreased to approximately 2 gpm and the current pumping rate is less than 1 gpm. The

Alameda County E.H.S.

3 July 1991

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initial pumping rate was initially higher because the water was released mainly from the storage within the backfilled excavation. Based on the pumping rate, the natural recharge rate of the formation is estimated to be less than 2 gpm.

SAMPLING PROTOCOLS

Groundwater samples were collected from the monitoring wells on 28 May 1991 following the Regional Water Quality Control Board (RWQCB) groundwater sampling guidelines. Before sampling, the static groundwater levels in all the wells were recorded using an electronic water level indicator to a precision of 0.01 feet.

The next step entailed the collection of groundwater samples. Each well was initially checked for the presence of floating free product. This was accomplished by collecting water from the top 6 inches using a Teflon bailer and inspecting it for floating free product, any odor, and/or oily sheen. A strong hydrocarbon odor was observed in Well MW-2.

In order to sample for dissolved product, a minimum of three submerged well casing volumes were purged from each well prior to sampling. Field measurements of temperature, hydrogen ion activity (pH) and electrical conductivity (EC) were recorded three times: prior to purging, after two well volumes had been removed from each well, and after three well volumes had been removed from each well. Each time, the above parameters were compared with previously recorded values to document stabilization. The purpose of recording temperature, pH, and EC readings was to ensure that a water sample representative of formation water was collected. Temperature, EC, and pH values in each of the wells, except MW-2, stabilized within the first three readings (initial, two casing volumes, and three casing volumes) thus water samples were subsequently collected. Four casing volumes were purged from Well MW-2 before collection of groundwater samples.

Groundwater purging and sampling was done using a clean Teflon bailer. Samples for volatile hydrocarbons analysis (gasoline and BTXE) were collected in 40 ml glass containers specifically designed to prevent the loss of volatile components. Containers were preserved with hydrochloric acid per standard protocol for the method. Samples for extractable hydrocarbons (diesel) were collected in 1000 ml glass amber bottles. All samples were labelled and chain-of-custody records were completed prior to placement of these containers in an iced cooler. After collection of water samples from individual wells, the sampling equipment was decontaminated by washing with a mild detergent/water solution followed by rinsing with deionized water. Appendix A contains the groundwater sampling notes, water levels recorded in each well and chain-of-custody records.

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GROUNDWATER ELEVATIONS

Table 1 lists the historical groundwater levels for the last six quarterly monitoring events. Water levels measured in the field were calculated with reference to USGS datum. Groundwater elevations recorded in the site wells were used to construct the water table map presented as Figure 2.

TABLE 1
HISTORICAL GROUNDWATER ELEVATIONS
(Feet Above Mean Sea Level)

Well ID	Quarterly Sampling Events					
	21 February 90	25 May 90	29 August 90	29 November 90	01 March 91	28 May 91
MW-2	4.03	3.92	4.03	3.76	2.92	3.58
MW-3	3.27	3.20	2.95	2.65	2.92	3.40
MW-4	3.61	3.66	3.74	3.50	3.59	3.67
MW-5	5.90	5.23	5.06	4.64	4.71	5.43
MW-6	NI	NS	NS	NS	3.44	3.68
MW-7	NI	NS	NS	NS	5.39	5.83
EW-1	NI	NS	NS	NS	NS	NS

Notes: All elevations w.r.t. USGS datum
NI = Well Not Installed
NS = Well Elevations Not Surveyed

Water levels in all the wells increased since the last monitoring event in March 1991. Based on the water levels measured on 28 May 1991, the groundwater flow direction at the site was determined to be toward the southwest, which is consistent with historical groundwater flow direction. All the wells except MW-7 recharged quickly enough to be purged non-stop manually by 2-inch diameter bailer. Groundwater recharge in Well MW-7 was relatively slower.

ANALYTICAL RESULTS

Groundwater samples collected from all wells except MW-4 were analyzed using EPA Method 8020 for BTXE and DHS-LUFT Method (Modified 8015) for both gasoline and diesel. The water sample from MW-4 was analyzed only for diesel and BTXE but not

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gasoline. This sample was not analyzed for gasoline because gasoline has historically been absent in the samples collected from this well. The analytical procedures followed are referenced along with the analytical results in Appendix B.

Table 2 summarizes the historical analytical results of groundwater samples collected from the site wells for the last six events. The relevant state and federal drinking water standards are also listed for comparison.

Only one well (MW-2) contained gasoline above the detection limit. It contained 31,000 $\mu\text{g/L}$ of gasoline. None of the wells sampled contained diesel. Benzene was detected in Wells MW-2 (8,400 $\mu\text{g/L}$), MW-3 (2.6 $\mu\text{g/L}$), MW-4 (2.4 $\mu\text{g/L}$), MW-5 (110 $\mu\text{g/L}$), and MW-7 (120 $\mu\text{g/L}$). Toluene was detected in well MW-2 (4,700 $\mu\text{g/L}$) and MW-7 (2.7 $\mu\text{g/L}$) only. Xylenes and ethylbenzene were detected only in well MW-2 at concentrations of 6,300 $\mu\text{g/L}$ and 1,700 $\mu\text{g/L}$ respectively. None of the wells were analyzed for purgeable halocarbons and lead.

Five of the site wells (MW-2, MW-3, MW-4, MW-5, MW-7) contained benzene above the drinking water maximum contaminant levels (MCL). Only one well (MW-2) contained toluene, xylenes, and ethylbenzenes above the drinking water MCLs.

A comparison of May 1991 hydrochemical data with March 1991 data show that gasoline concentration in MW-2 dropped from 72,000 $\mu\text{g/L}$ to 31,000 $\mu\text{g/L}$. Total BTXE concentration in MW-2 was slightly higher than that detected in March 1991. Total BTXE concentration in MW-3 dropped from 87.3 $\mu\text{g/L}$ detected in March to 2.6 $\mu\text{g/L}$ in May 1991. Total BTXE in MW-4 and MW-6 remained almost the same. Upgradient well MW-5 showed a slight increase in total BTXE concentrations (68.3 to 110 $\mu\text{g/L}$). Total BTXE concentration in MW-7 increased from 103.6 $\mu\text{g/L}$ to 122.7 $\mu\text{g/L}$.

SUMMARY

The groundwater elevations have increased slightly since the March 1991 monitoring event. The groundwater flow direction is toward the southwest, essentially unchanged.

Total BTXE and TPH concentrations in MW-2 (the wells closest to the former underground fuel storage tank) were lower than the historical averages, indicating good overall cleanup trend. Diesel was not detected in any of the wells. Total BTXE concentrations in downgradient well MW-4, and transgradient well MW-3 were lower than those detected in March 1991. Total BTXE concentration in downgradient well MW-6 remained undetected for the second consecutive monitoring event. The two upgradient wells (MW-5 and MW-7) showed slight increases in total BTXE concentration.

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Engineering-Science appreciates the opportunity to provide you with technical services. Please call if you have any questions.

Very truly yours,



Clyde R. Wong, P.E.
Project Manager

David Bordin RG for RSM

Richard S. Makdisi, R.G.
Project Director

RSM/AS/dk
Attachments

cc: Mr. Thomas Gram, P.O. Partners

TABLE 2
HISTORICAL GROUNDWATER SAMPLING ANALYTICAL RESULTS
1650 - 65TH STREET PROPERTY, EMERYVILLE

Well ID	Sample Date	Total Petroleum Hydrocarbons (ug/L)		Aromatic Hydrocarbons (ug/L)					Purgeable Halocarbons (ug/L)	Lead (mg/L)
		Gasoline	Diesel	Benzene	Toluene	Xylenes (total)	Ethyl-Benzene	Total BTXE		
MW-2	Nov 89	100,000	NA	8,400	7,400	13,000	2,400	31,200	15*	0.05
	Feb 90	54,000	NA	7,800	5,600	8,400	1,600	23,400	32*	0.021
	May 90	40,000	NA	7,800	7,500	7,600	1,600	24,500	76*	0.025
	Aug 90	49,000	4,600	9,000	8,000	8,900	ND	25,900	40*	0.0059
	Nov 90	73,000	3,500	6,900	5,900	7,400	1,400	21,600	NA	NA
	Mar 91	72,000	1,800	5,500	6,600	7,700	1,000	20,800	NA	NA
	May 91	31,000	ND	8,400	4,700	6,300	1,700	21,100	NA	NA
MW-3	Nov 89	130	NA	2.2	ND	3.0	ND	5.2	ND	ND
	Feb 90	ND	NA	2.5	ND	ND	ND	2.5	NA	0.011
	May 90	ND	ND	2	ND	ND	ND	2.0	ND	NA
	Aug 90	ND	800	4.4	2.9	5.4	ND	12.7	NA	NA
	Nov 90	900	800	3.4	ND	ND	ND	3.4	NA	NA
	Mar 91	ND	ND	25	25	32	5.3	87.3	NA	NA
	May 91	ND	ND	2.6	ND	ND	ND	2.6	NA	NA
MW-4	Nov 89	200	NA	2.3	ND	ND	ND	2.3	ND	ND
	Feb 90	ND	NA	ND	ND	ND	ND	ND	NA	0.006
	May 90	ND	ND	1	ND	ND	ND	1	ND	NA
	Aug 90	ND	800	8.9	7.1	9.4	ND	25.4	NA	NA
	Nov 90	ND	700	2.7	ND	ND	ND	2.7	NA	NA
	Mar 91	NA	ND	3	ND	ND	ND	3	NA	NA
	May 91	NA	ND	2.4	ND	ND	ND	2.4	NA	NA
MW-5	Nov 89	ND	NA	74	ND	4.2	ND	78.2	ND	ND
	Feb 90	ND	NA	200	ND	ND	ND	200.0	NA	0.012
	May 90	ND	ND	110	ND	ND	ND	110.0	ND	NA
	Aug 90	ND	700	66	2.2	3.8	2.2	72.0	NA	NA
	Nov 90	600	900	69	ND	ND	ND	69	NA	NA
	Mar 91	ND	1,100	66	2.3	ND	ND	68.3	NA	NA
	May 91	ND	ND	110	ND	ND	ND	110	NA	NA

TABLE 2 (Continued)
 HISTORICAL GROUNDWATER SAMPLING ANALYTICAL RESULTS
 1650 - 65TH STREET PROPERTY, EMERYVILLE

Well ID	Sample Date	Total Petroleum Hydrocarbons (ug/L)		Aromatic Hydrocarbons (ug/L)					Purgeable Halocarbons (ug/L)	Lead (mg/L)
		Gasoline	Diesel	Benzene	Toluene	Xylenes (total)	Ethyl-Benzene	Total BTXE		
MW-6	Nov 89	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Feb 90	NI	NI	NI	NI	NI	NI	NI	NI	NI
	May 90	ND	ND	ND	ND	ND	ND	ND	ND	ND**
	Aug 90	NA	NA	NA	NA	NA	NA	NA	NA	ND**
	Nov 90	1,200	1,400	1.2	ND	ND	ND	1.2	NA	NA
	Mar 91	ND	ND	ND	ND	ND	ND	ND	NA	NA
	May 91	ND	ND	ND	ND	ND	ND	ND	NA	NA
MW-7	Nov 89	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Feb 90	NI	NI	NI	NI	NI	NI	NI	NI	NI
	May 90	NA	600	240	ND	ND	ND	240.0	ND	ND**
	Aug 90	ND	ND	81	1.8	1.6	ND	84.4	NA	ND**
	Nov 90	ND	800	54	ND	ND	ND	54	NA	NA
	Mar 91	ND	ND	100	3.6	ND	ND	103.6	NA	NA
	May 91	ND	ND	120	2.7	ND	ND	122.7	NA	NA
EW-1	Nov 89	NI	NI	NI	NI	NI	NI	NI	NI	NI
	Feb 90	NI	NI	NI	NI	NI	NI	NI	NI	NI
	May 90	20,000	ND	7,500	4,500	6,300	1,000	19,300	68	ND**
	Aug 90	NA	3,500	6,000	4,200	4,600	ND	14,800	16	ND**
	Nov 90	47,000	3,100	6,000	3,400	4,700	1,000	15,100	NA	NA
	Feb 91	NA	NA	1,200	280	ND	360	1,840	NA	NA
Drinking Water Standards			1 [^]	2,000 ⁻	1,750 [^]	680 [^]		0.5 [^]	5.0 [^]	

Notes:

* = 1,2 - Dichloroethane concentration (only 1,2 - Dichloroethane detected)

[^] = California Maximum Contaminant Level (MCL), California Code of Regulations, Title 22, Section 64435, Current as of 03/31/90

⁻ = Proposed Maximum Contaminant Level, Region 9 EPA Drinking Water Standards

and Health Advisory Tables Drinking Water Branch, June 1989.

ND = Not Detected; NA = Not Analysed; NI = Not Installed.

** = Organic Lead

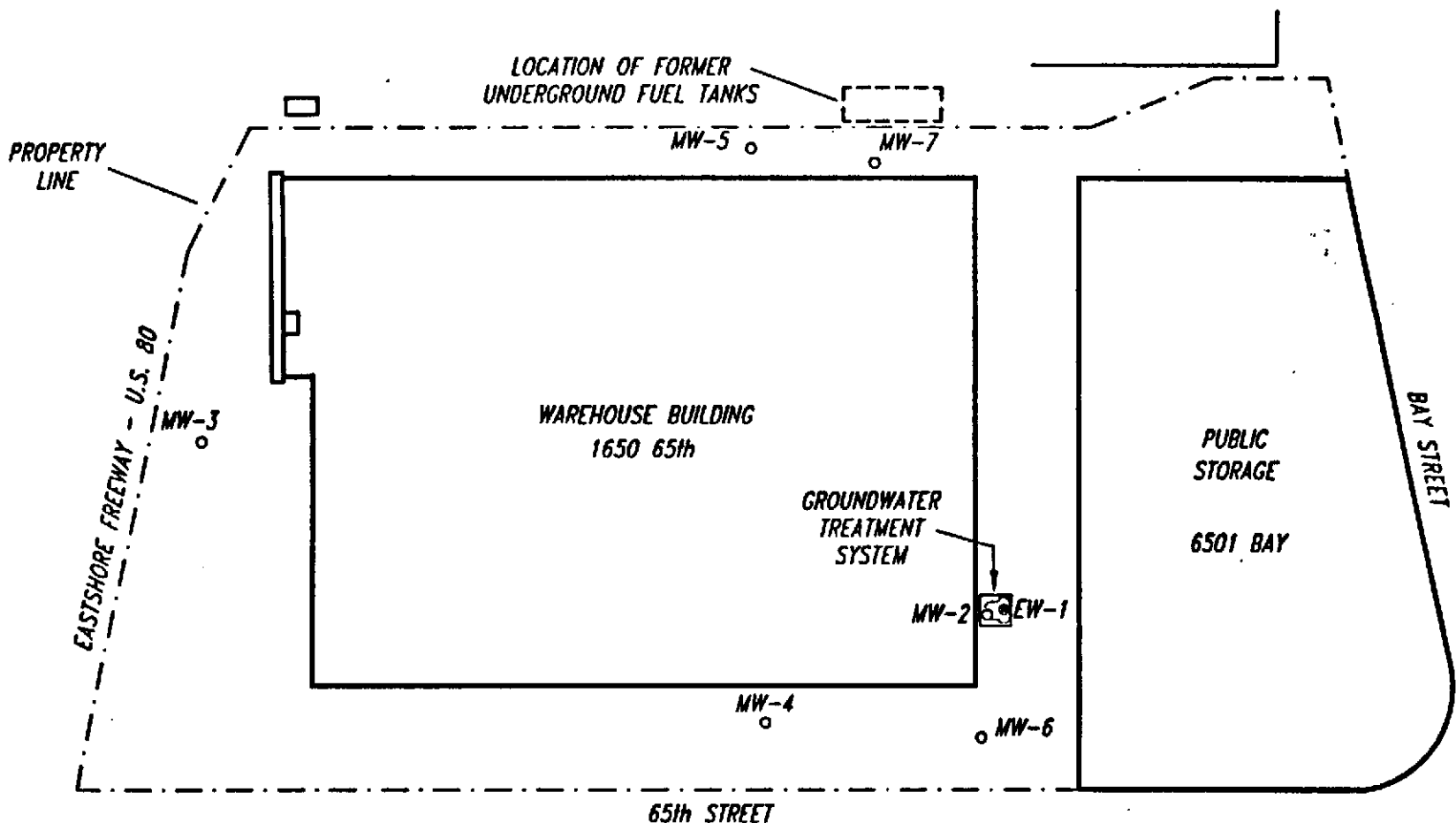
EW-1 (grab) was collected from the extraction pump.

REFERENCES

- Engineering-Science, Inc., 1987a, Underground Fuel Storage Tank Site Investigation near the Southeast Corner of the Warehouse Building, 1650 65th Street Property, Emeryville, California.
- Engineering-Science, Inc., 1987b, Soil Remediation Plan for the Southeastern Corner of the 1650 65th Street Property, Emeryville, California.
- Engineering-Science, Inc., 1988, Implementation of Soil Remedial Action Plan Report for United States Postal Service at 1650 65th Street, Emeryville, California.
- Engineering-Science, Inc., 1989a, October 1989 Quarterly Groundwater Monitoring Results for the 1650 65th Street Property in Emeryville, California.
- Engineering-Science, Inc., 1989b, November 1989 Groundwater Contamination Investigation, 1650 65th Street, Emeryville, California.
- Engineering-Science, Inc., 1990a, February 1990 Second Quarterly Groundwater Monitoring Report 1650 65th Street, Emeryville, California.
- Engineering-Science, Inc., 1990b, June 1990 Evaluation of Remedial Alternatives and Remedial Action Plan for the 1650 65th Street Property, Emeryville, California.
- Engineering-Science, Inc., 1990c, June 1990 Third Quarterly Groundwater Monitoring Report 1650 65th Street, Emeryville, California.
- Engineering-Science, Inc., 1990d, October 1990 Fourth Quarterly Groundwater Monitoring Report 1650 65th Street, Emeryville, California
- Engineering-Science, Inc., 1991a, March 1991 First Quarterly Groundwater Treatment System Self Monitoring Report, 1650 65th Street Site, Emeryville, California

SITE PLAN

1650 65th Street Property
Emeryville, California



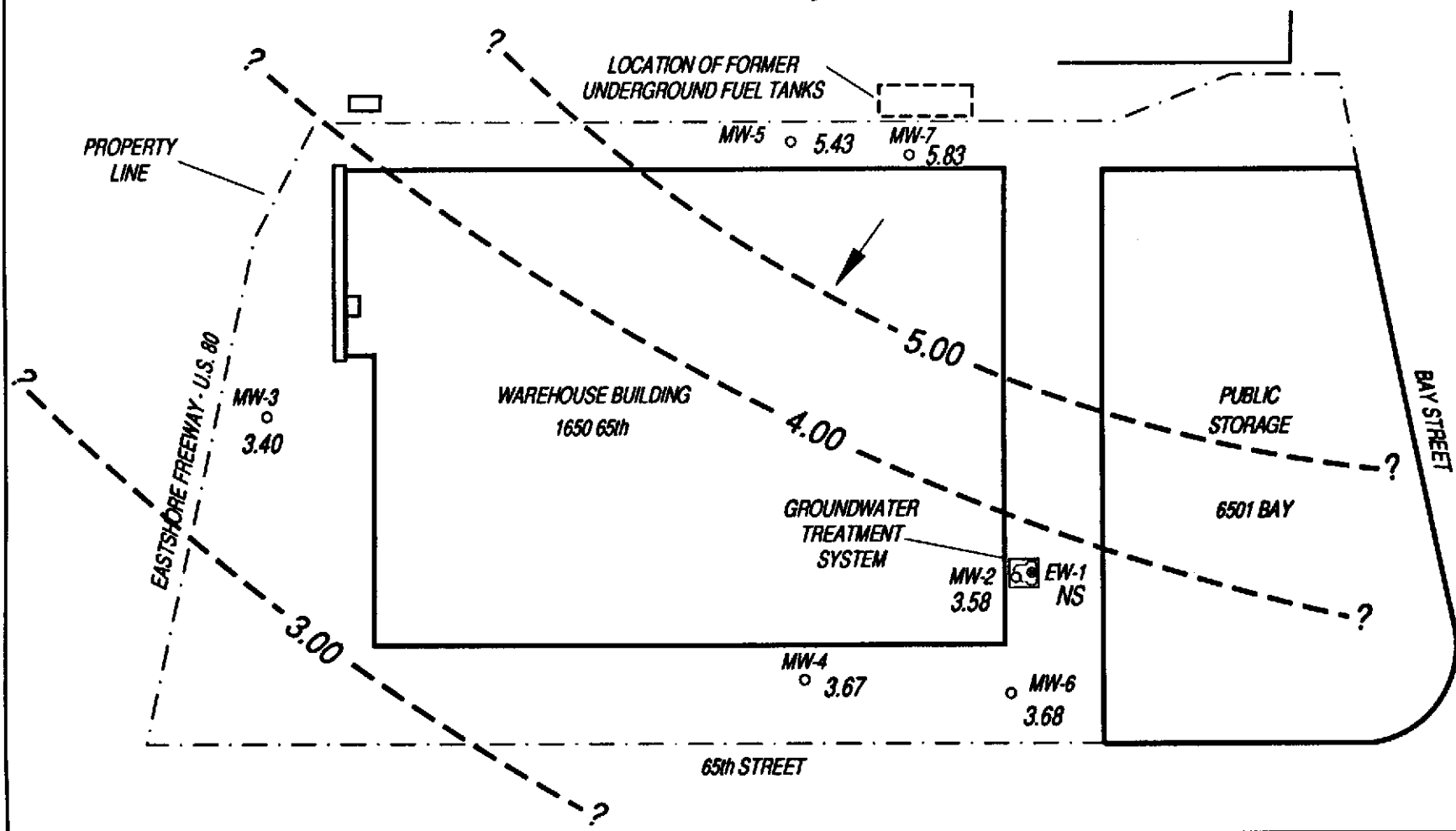
- LEGEND:**
- GROUNDWATER EXTRACTION WELL
 - MONITORING WELL



0 100
SCALE IN FEET

GROUNDWATER ELEVATION MAP

1650 65th Street Site, Emeryville, California
28 May 1991



- | | |
|---|---|
| <p>LEGEND:</p> <ul style="list-style-type: none"> ● GROUNDWATER EXTRACTION WELL ○ MONITORING WELL NS NOT SURVEYED | <p>— 5.00 — GROUNDWATER ELEVATION CONTOUR</p> <p>○ 3.50 WATER LEVEL ELEVATION IN FEET ABOVE SEA LEVEL</p> <p>↘ GROUNDWATER FLOW DIRECTION</p> |
|---|---|



ENGINEERING-SCIENCE

FIGURE 2

GROUNDWATER SAMPLING FIELD NOTES
Engineering-Science, Inc.

PROJECT/LOCATION: P.O. Partners, Emeryville
PROJECT NUMBER: NC222.13

PERSONNEL: A. Peel & A. Singh
DATE: 05/28/91

WELL ID	SAMPLE DATE, TIME AND SAMPLER	WATER LEVEL BEFORE*, WELL DIAMETER AND DEPTH (FEET)	WATER LEVEL AFTER* (FEET)	GALLONS PER CASING VOLUME	WELL PURGING METHOD**	PUMP ON/OFF	TEMP. °C	SPECIFIC CONDUCT. (UMHOS/CM)	pH	TOTAL WATER PURGED (GALS.)	SAMPLE COLL. METHOD	ANALYSIS & PRESERVATIVE NO. & TYPE OF CONTAINERS	COMMENTS
MW-4	05/28/91 1210 ACP	8.57 4" 15.88	9.51	4.75	B	NA	17.9 18.8 18.9	8200 8200 8000	8.67 8.84 8.84	17.0	B	(b), (c)	Cloudy, turbid; sulphurous odor.
MW-6	05/28/91 1200 AS	8.35 4" 18.50	14.77	6.6	B	NA	17.4 17.9 18.2	3900 10000 10500	6.85 6.99 6.97	20.0	B	(a), (b) (c)	Cloudy, turbid; sulphurous odor.
MW-3	05/28/91 1300 AS	9.03 4" 18.25	14.15	6.0	B	NA	18.9 20.3 20.0	4400 4800 4800	8.47 8.29 8.25	18.0	B	(a), (b) (c)	Cloudy, turbid; sulphurous odor.
MW-7	05/28/91 1510 AS	7.07 4" 18.70	16.29	7.56	B	NA	19.5 17.6 17.2	1900 1900 1900	7.89 8.15 8.10	23	B	(a), (b) (c)	Slow recharge, turbid.
MW-5	05/28/91 1520 AP	7.39 4" 17.96	7.50	6.9	B	NA	19.5 18.1 17.6 17.6	2800 2500 2650 2650	7.16 7.54 7.59 7.59	28	B	(a), (b) (c)	ellow/brown color slight odor.; turbid.

NOTES:

- * Water level from top of casing in feet.
** WW - Well Wizard; G - Grundfos Pump; B - Bailer
(a) TPHG - Total Petroleum Hydrocarbons as Gasoline - (3 40ml VOA vials).
(b) TPHD - Total Petroleum Hydrocarbons as Diesel (1 amber liter).

- (c) EPA 602 - Purgable Aromatics (3 40ml VOA vials, HCl preserved).
(d) Well sampled at 80% recharge after purging it dry.
NA Not applicable
NR Not recorded

POPmay28.wk1

GROUNDWATER SAMPLING FIELD NOTES
Engineering-Science, Inc.

PROJECT/LOCATION: P.O. Partners, EmeryvillePERSONNEL: A. Singh & A. PeelPROJECT NUMBER: NC222.13DATE: 05/28/91

WELL ID	SAMPLE DATE, TIME AND SAMPLER	WATER LEVEL BEFORE*, WELL DIAMETER AND DEPTH (FEET)	WATER LEVEL AFTER* (FEET)	GALLONS PER CASING VOLUME	WELL PURGING METHOD**	PUMP ON/OFF	TEMP. °C	SPECIFIC CONDUCT. (UMHOS/CM)	pH	TOTAL WATER PURGED (GALS.)	SAMPLE COLL. METHOD	ANALYSIS & PRESERVATIVE NO. & TYPE OF CONTAINERS	COMMENTS
MW-2	05/28/91 1600 AS	12.21 2" 27.00	NR	2.4	B	NA	18.5 18.2 18.2 18.4	14000 8000 5100 4500	7.19 7.137 7.50 7.61	7.2	B	(a), (b) (c)	strong odor, turbid.
Rinsate Blank	05/28/91 1610 AP											(c)	
Trip Blank	05/28/91 1615 AP											(c)	

NOTES:

* *Water level from top of casing in feet.*

(c)

*EPA 602 - Purgable Aromatics (3 40ml VOA vials, HCl preserved).*** *WW - Well Wizard; G - Grundfos Pump; B - Bailer*

(d)

Well sampled at 80% recharge after purging it dry.(a) *TPHG - Total Petroleum Hydrocarbons as Gasoline -
(3 40ml VOA vials).*

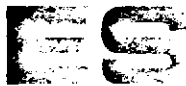
NA

Not applicable(b) *TPHD - Total Petroleum Hydrocarbons as Diesel (1 amber liter).*

NR

Not recorded

P2Pmay28.wk1



Report Date: 6/7/91

Work Order No.: 2939

Client: Clyde Wong
ES Berkeley/P.O. Partners
600 Bancroft Way
Berkeley, CA. 94610

Date of Sample Receipt: 5/28/91

Your water samples identified as:

MW-6
MW-3
MW-7
MW-5
MW-2

were analyzed for TPH gasoline plus BTEX, and TPH diesel.

In addition, your water sample identified as:

MW-4

was analyzed for BTEX by EPA Method 8020 and TPH diesel.

Finally, your water samples identified as:

RINSATE BLANK
TRIP BLANK

were analyzed for BTEX by EPA Method 8020.

The analytical reports for the samples listed above are attached.

Report Date:

Work Order No.:2939

Client: Clyde Wong
ES Berkeley/P.O. Partners
600 Bancroft Way
Berkeley, CA. 94610

Date of Sample Receipt: 5/28/91

Your water samples identified as:

MW-6
MW-3
MW-7
MW-5
MW-2

were analyzed for TPH gasoline plus BTEX, and TPH diesel.

In addition, your water sample identified as:

MW-4

was analyzed for BTEX by EPA Method 8020 and TPH diesel.

Finally, your water samples identified as:

RINSATE BLANK
TRIP BLANK

were analyzed for BTEX by EPA Method 8020.

The analytical reports for the samples listed above are attached.

GC ANALYTICAL REPORT
Analytical Method
BTEX Aromatic Compounds By 8020

Work Order NO.: 2939

% Moisture: NA

Client ID: MW-6

Matrix: WATER

Laboratory ID: 2939-01B

Level: NA

Unit: ug/L

Dilution Factor: 1

Date Analyzed: 6-04-91

Date Confirmed: NA

Compound	Result	Reporting Limit
Benzene	ND	1.0
Ethyl Benzene	ND	2.0
Toluene	ND	2.0
Xylenes (total)	ND	4.0

ND-Not Detected
NA-Not Applicable
D-Dilution Factor

ANALYST: J.C.

GROUP LEADER: SF

GC ANALYTICAL REPORT
Analytical Method
BTEX Aromatic Compounds By 8020

Work Order NO.: 2939

% Moisture: NA

Client ID: MW-4

Matrix: WATER

Laboratory ID: 2939-02B

Level: NA

Unit: ug/L


Dilution Factor: 1

Date Analyzed: 6-05-91
Date Confirmed: NA

Compound	Result	Reporting Limit
Benzene	2.4	1.0
Ethyl Benzene	ND	2.0
Toluene	ND	2.0
Xylenes (total)	ND	4.0

ND-Not Detected
NA-Not Applicable
D-Dilution Factor

ANALYST: J.C.

GROUP LEADER: 

GC ANALYTICAL REPORT
Analytical Method
BTEX Aromatic Compounds By 8020

Work Order NO.: 2939

% Moisture: NA

Client ID: MW-3

Matrix: WATER

Laboratory ID: 2939-03C

Level: NA

Unit: ug/L

Dilution Factor: 1

Date Analyzed: 6-05-91
Date Confirmed: NA

Compound	Result	Reporting Limit
Benzene	2.6	1.0
Ethyl Benzene	ND	2.0
Toluene	ND	2.0
Xylenes (total)	ND	4.0

ND-Not Detected
NA-Not Applicable
D-Dilution Factor

ANALYST:

J.C.

GROUP LEADER:

SF

GC ANALYTICAL REPORT
Analytical Method
BTEX Aromatic Compounds By 8020

Work Order NO.: 2939

% Moisture: NA

Client ID: MW-7

Matrix: WATER

Laboratory ID: 2939-04C

Level: NA

Unit: ug/L


Dilution Factor: 1

Date Analyzed: 6-05-91
Date Confirmed: NA

Compound	Result	Reporting Limit
Benzene	120 D-10	1.0
Ethyl Benzene	ND	2.0
Toluene	2.7	2.0
Xylenes (total)	ND	4.0

ND-Not Detected
NA-Not Applicable
D-Dilution Factor

ANALYST: S.C.

GROUP LEADER: 

GC ANALYTICAL REPORT
Analytical Method
BTEX Aromatic Compounds By 8020

Work Order NO.: 2939

% Moisture: NA

Client ID: MW-5

Matrix: WATER

Laboratory ID: 2939-05C

Level: NA

Unit: ug/L

Dilution Factor: 1

Date Analyzed: 6-05-91
Date Confirmed: NA

=====

Compound	Result	Reporting Limit
Benzene	110 D-10	1.0
Ethyl Benzene	ND	2.0
Toluene	ND	2.0
Xylenes (total)	ND	4.0

ND-Not Detected
NA-Not Applicable
D-Dilution Factor

ANALYST: *S.C.*

GROUP LEADER:



GC ANALYTICAL REPORT
Analytical Method
BTEX Aromatic Compounds By 8020

Work Order NO.: 2939

% Moisture: NA

Client ID: MW-2

Matrix: WATER

Laboratory ID: 2939-06C

Level: NA

Unit: ug/L

Dilution Factor: 200

Date Analyzed: 6-05-91
Date Confirmed: NA

Compound	Result	Reporting Limit
Benzene	8400	200.0
Ethyl Benzene	1700	400.0
Toluene	4700	400.0
Xylenes (total)	6300	800.0

ND-Not Detected
NA-Not Applicable
D-Dilution Factor

ANALYST: J.C.

GROUP LEADER:



GC ANALYTICAL REPORT
Analytical Method
BTEX Aromatic Compounds By 8020

Work Order NO.: 2939

% Moisture: NA

Client ID: RINSATE BLANK

Matrix: WATER

Laboratory ID: 2939-07A

Level: NA

Unit: ug/L


Dilution Factor: 1

Date Analyzed: 6-04-91
Date Confirmed: NA

Compound	Result	Reporting Limit
Benzene	ND	1.0
Ethyl Benzene	ND	2.0
Toluene	ND	2.0
Xylenes (total)	ND	4.0

ND-Not Detected
NA-Not Applicable
D-Dilution Factor

ANALYST: S.C.

GROUP LEADER: 

GC ANALYTICAL REPORT
Analytical Method
BTEX Aromatic Compounds By 8020

Work Order NO.: 2939

% Moisture: NA

Client ID: TRIP BLANK

Matrix: WATER

Laboratory ID: 2939-08A

Level: NA

Unit: ug/L

Dilution Factor: 1

Date Analyzed: 6-04-91
Date Confirmed: NA

=====

Compound	Result	Reporting Limit
Benzene	ND	1.0
Ethyl Benzene	ND	2.0
Toluene	ND	2.0
Xylenes (total)	ND	4.0

ND-Not Detected
NA-Not Applicable
D-Dilution Factor

ANALYST: *J.C.*

GROUP LEADER: *SF*

GC ANALYTICAL REPORT
Analytical Method
Modified EPA 8015

Work Order NO.: 2939
Laboratory ID: 2939-01
Client ID: MW-6

% Moisture: NA
Matrix: WATER
Level: NA
Units: mg/L

GASOLINE:

Dilution Factor: 1.0
Date Analyzed: 06-04-91

Compound	Result	Reporting Limit
GASOLINE	ND	0.5

ND-Not Detected
NA-Not Applicable

ANALYST: *Am F*

GROUP LEADER: *[Signature]*

ES-ENGINEERING SCIENCE, INC.

600 Bancroft Way
Berkeley, CA 94710

GC ANALYTICAL REPORT
Analytical Method
Modified EPA 8015

Work Order NO.: 2939
Laboratory ID: 2939-03
Client ID: MW-3

% Moisture: NA
Matrix: WATER
Level: NA
Units: mg/L

GASOLINE:

Dilution Factor: 1.0
Date Analyzed: 06-04-91

Compound	Result	Reporting Limit
GASOLINE	ND	0.5

ND-Not Detected
NA-Not Applicable

ANALYST:

Am A

GROUP LEADER:

DF

GC ANALYTICAL REPORT
Analytical Method
Modified EPA 8015

Work Order NO.: 2939
Laboratory ID: 2939-04
Client ID: MW-7

% Moisture: NA
Matrix: WATER
Level: NA
Units: mg/L

GASOLINE:

Dilution Factor: 1.0
Date Analyzed: 06-04-91

Compound	Result	Reporting Limit
GASOLINE	ND	0.5

ND-Not Detected
NA-Not Applicable

ANALYST:



GROUP LEADER:



GC ANALYTICAL REPORT
Analytical Method
Modified EPA 8015

Work Order NO.: 2939
Laboratory ID: 2939-05
Client ID: MW-5

% Moisture: NA
Matrix: WATER
Level: NA
Units: mg/L

GASOLINE:

Dilution Factor: 1.0
Date Analyzed: 06-04-91

Compound	Result	Reporting Limit
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GASOLINE	ND	0.5
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ND-Not Detected
NA-Not Applicable

ANALYST: *Am F*

GROUP LEADER: *ST*

GC ANALYTICAL REPORT
Analytical Method
Modified EPA 8015

Work Order NO.: 2939
Laboratory ID: 2939-02
Client ID: MW-4

% Moisture: NA
Matrix: WATER
Level: NA
Units: mg/L

DIESEL:
Date Extracted: 05-30-91
Dilution Factor: 1.0
Date Analyzed: 06-04-91

Compound	Result	Reporting Limit
DIESEL	ND	0.5

ND-Not Detected
NA-Not Applicable

ANALYST:



GROUP LEADER:



GC ANALYTICAL REPORT
Analytical Method
Modified EPA 8015

Work Order NO.: 2939
Laboratory ID: 2939-03
Client ID: MW-3

% Moisture: NA
Matrix: WATER
Level: NA
Units: mg/L

DIESEL:
Date Extracted: 05-30-91
Dilution Factor: 1.0
Date Analyzed: 06-04-91

Compound	Result	Reporting Limit
DIESEL	ND	0.5

ND-Not Detected
NA-Not Applicable

ANALYST:

AA

GROUP LEADER:

OF

GC ANALYTICAL REPORT
Analytical Method
Modified EPA 8015

Work Order NO.: 2939
Laboratory ID: 2939-04
Client ID: MW-7

% Moisture: NA
Matrix: WATER
Level: NA
Units: mg/L

DIESEL:
Date Extracted: 05-30-91
Dilution Factor: 1.0
Date Analyzed: 06-04-91

Compound	Result	Reporting Limit
DIESEL	ND	0.5

ND-Not Detected
NA-Not Applicable

ANALYST: *Asi F*

GROUP LEADER: *[Signature]*

GC ANALYTICAL REPORT
Analytical Method
Modified EPA 8015

Work Order NO.: 2939
Laboratory ID: 2939-05
Client ID: MW-5

% Moisture: NA
Matrix: WATER
Level: NA
Units: mg/L

DIESEL:
Date Extracted: 05-30-91
Dilution Factor: 1.0
Date Analyzed: 06-04-91

Compound	Result	Reporting Limit
DIESEL	ND	0.5

ND-Not Detected
NA-Not Applicable

ANALYST: *Am F*

GROUP LEADER: *[Signature]*

GC ANALYTICAL REPORT
Analytical Method
Modified EPA 8015

Work Order NO.: 2939
Laboratory ID: 2939-06
Client ID: MW-2

% Moisture: NA
Matrix: WATER
Level: NA
Units: mg/L

DIESEL:
Date Extracted: 05-30-91
Dilution Factor: 1.0
Date Analyzed: 06-04-91

Compound	Result	Reporting Limit
DIESEL	ND	0.5

ND-Not Detected
NA-Not Applicable

ANALYST: *Am F*

GROUP LEADER: *ST*

ENGINEERING - SCIENCE, INC.
CHAIN OF CUSTODY RECORD

LAB:

PAGE

CLIENT: ENGINEERING-SCIENCE, INC. BERKELEY			PROJECT MANAGER: CLYDE WONG		PROJ. NO.: NC222-13	NO. OF CONTAINERS	ANALYSES REQUIRED						REMARKS			
PROJECT NAME / LOCATION: P.O. Partners / Emeryville							TPH (gasoline)	TPH (Diesel)	BTXE					PRESERVED	TO BE COMPOSITED BY LAB	TURNAROUND TIME
SAMPLER(S): (SIGNATURE) Ajay Singh Alan Lal																
SAMPLE ID	DATE	TIME	MATRIX	SAMPLE LOCATION												
MW-6	5/28/9	1200	Water	Well MW-6		5	✓	✓	✓					2 wks	Only BTXE samples	
MW-4	"	1210	"	Well MW-4		3		✓	✓					3	AS preserved.	
MW-3	"	1300	"	Well MW-3		5	✓	✓	✓					3		
MW-7	"	1510	"	Well MW-7		5	✓	✓	✓					3		
MW-5	"	1520	"	Well MW-5		5	✓	✓	✓					3		
MW-2	"	1600	"	Well MW-2		5	✓	✓	✓					3		
R-Blank	"	1610	"	Roovate Blank		1 AS			✓					3		
Trip B	"	1615	"	Trip Blank		1 AS			✓					3		

RELINQUISHED BY: (SIGNATURE) Ajay Singh	DATE/TIME 5/28/1625	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED BY: (SIGNATURE)
RELINQUISHED BY: (SIGNATURE)	DATE/TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE) Clyde Wong	DATE/TIME 5/28/1625	REMARKS	