

Vonder Haar Hydrogeology

1609 Jaynes
Berkeley, CA 94703
(415) 527-7652

September 16, 1988

Ms. Kay Huffman
Chevron USA
P.O. Box 5004
San Ramon, California 95483

Re: Former Chevron SS #9-4612
San Leandro St. at 37th
Oakland, California
VH Job #88-114

Dear Ms. Huffman:

This letter report presents the results of the work performed by Vonder Haar Hydrogeology (VH) at the former Chevron service station #9-4612 located at 3614 San Leandro Street in Oakland, California (Attachment A, Figure 1). One 30 ft deep monitoring well, VH-1, was installed, and the soil and water from this well were analyzed. Ground water from monitoring well VH-1 contained benzene at a concentration of 3.3 parts per million (ppm) which is above the Department of Health Services (DHS) recommended Drinking Water Action Level (DWAL) of 0.0007 ppm, and toluene at 0.2 ppm which is above the DHS DWAL of 0.1 ppm. Monitoring well VH-1 ground water also contained xylenes, ethylbenzene, 1,2-dichloroethane, and total petroleum hydrocarbons below the DHS DWALs. Lead in the groundwater was below the Maximum Contaminant Level set by Title 22 of the State of California environmental health code.

The scope of work for this investigation included the following:

1. Review the previous geotechnical report prepared for the site.
2. Install and sample a monitoring well at the location agreed on with Alameda County Department of Environmental Health staff.

3. Analyze the ground water and soil boring samples for:
 - a) total fuel hydrocarbons and aromatic hydrocarbons including benzene, toluene, total xylenes and ethylbenzene (BTXE) by EPA method 524.2/8240, cryogenically focused gas chromatography/mass spectrometry (GC/MS),
 - b) lead by EPA method 7420/7421, and
 - c) chloride in the water using EPA method SM 407.
4. Prepare a technical letter report.

These tasks are described below.

SITE SETTING AND BACKGROUND

The site is located in the Coast Range physiographic province, and the San Francisco Bay sub-province. This location is approximately 1.5 miles from San Francisco Bay and about 0.4 miles from a developed tidal channel that empties into the Bay. The former Chevron station and surrounding area are apparently underlain by fill placed on tidal channels and mudflats. Land-use adjacent to the property is a blend of commercial and residential. Immediately north of the site, but separated from the site by railroad tracks are the Fruitvale BART station and parking lot. The site is flat and is now a dirt lot covered with grass and low bushes. The service station was demolished several years ago and the underground storage tanks were removed, on February 2, 1976 (M. Lindquist, 1988, personal communication).

On 10 February 1988 Rogers/Pacific drilled three geotechnical borings at the site (Figure 1 of Attachment A) during a preliminary soil investigation for a proposed warehouse. Ground water was encountered in the borings at approximately 10 to 15 ft below grade. "A strong gasoline odor" was detected in all three borings (Rogers/Pacific, 1988). This report of gasoline odor prompted the present investigation. ✕

MONITORING WELL INSTALLATION AND SAMPLING

The monitoring well, VH-1, was installed on August 9, 1988 by Datum Drilling of Long Beach, California under the supervision of Stephen Vonder Haar, principal hydrogeologist. The well was drilled to a depth of 31 feet using

a Mobile B-56 hollow stem auger. Soil samples were collected every 5 feet for lithologic and hydrogeologic description and chemical analyses. Details of the gravelly and sandy clay, and clayey sand encountered, and well construction details can be found in Attachment B. Samples were collected with a 2 inch diameter split barrel sampler in clean brass tubes. After removal from the sampler, the tubes were trimmed, capped with aluminum foil and plastic end caps, hermetically sealed with duct tape, labeled and refrigerated for delivery to Central Coast Analytical Services (CCAS) for chemical analysis. Ground water was first encountered in the well during drilling at a depth of 22.5 ft from the ground surface. No hydrocarbon or other industrial chemical type odors and no signs of free product were detected by the on-site personnel during drilling. The well was developed and purged on August 10, 1988 by bailing approximately 72 gallons of water and temporarily storing the water on-site in 55 gallon metal drums, pending analytic results.

Ground water samples were collected from the monitoring well on 10 August, 1988 using a new, clean teflon bailer. On the day of sampling, the ground water level in VH-1 had recovered to a static level of 13 ft below the ground level.

CHEMICAL ANALYSIS

Ground water samples were collected in volatile organic vials (VOAs) for analysis. The soil and ground water samples were sent to CCAS of Goleta, California under chain of custody (Attachment C). The water samples were analyzed for TFHC and BTXE with detection limits of 0.1 ppm for TFHC and 0.001 ppm BTXE. Analytic results for water and soil are tabulated in Table 1 and analytic reports are included as Attachment C.

Hydrocarbons were detected in the ground water sample from monitoring well VH-1. The ground water sample contained 11 ppm TFHC, and 4.56 ppm of combined BTXE, of which 3.3 ppm benzene was the largest component.

Total fuel He

CONCLUSIONS

The ground water sample from monitoring well VH-1 contained concentrations of benzene and toluene above the State Department of Health Services (DHS) recommended Drinking Water Action Levels. Ethylbenzene, xylenes, 1,2-dichloroethane, total fuel hydrocarbons, and lead were also detected in the ground water but at concentrations below DHS and State Title

22 recommended action levels. The chlorine content of the ground water from the monitoring well was relatively low, 43 milligrams per liter, compared to seawater. Sediment (soil) samples from the well contained benzene at concentrations of 0.042 ppm or less, and lead at 6 and 7 ppm.

To the best of our knowledge the ground water flow in this area is toward the west-southwest toward San Francisco Bay. A detailed analysis of the ground water gradient was not part of the scope of work for this project. Preliminary inquiries (M. Lindquist, personal communication) suggest that there are few, if any, wells in the vicinity.

We appreciate the opportunity to provide hydrogeologic consulting to Chevron and trust that this report meets your needs. If you have any questions, please call.

Sincerely,
Vonder Haar Hydrogeology



Stephen P. Vonder Haar, Ph D., R.G.
Principal Hydrogeologist

Attachments: A - Site Location Map and Geologic Crosssection
 B - Boring Log and Well Construction Details
 C - Analytic Chemical Report

cc: M. A. Lindquist

SPV/nlb

Vh88114a.wp

REFERENCES

Lindquist, M., 1988, August, Telecommunication re. tank removal documented in Fire Department records; and wells in the vicinity.

Rogers/Pacific, 1988, April 8, Preliminary Soil Investigation Lots 18 and 19 San Leandro Street, Oakland, California; 10 pp. plus attachments.

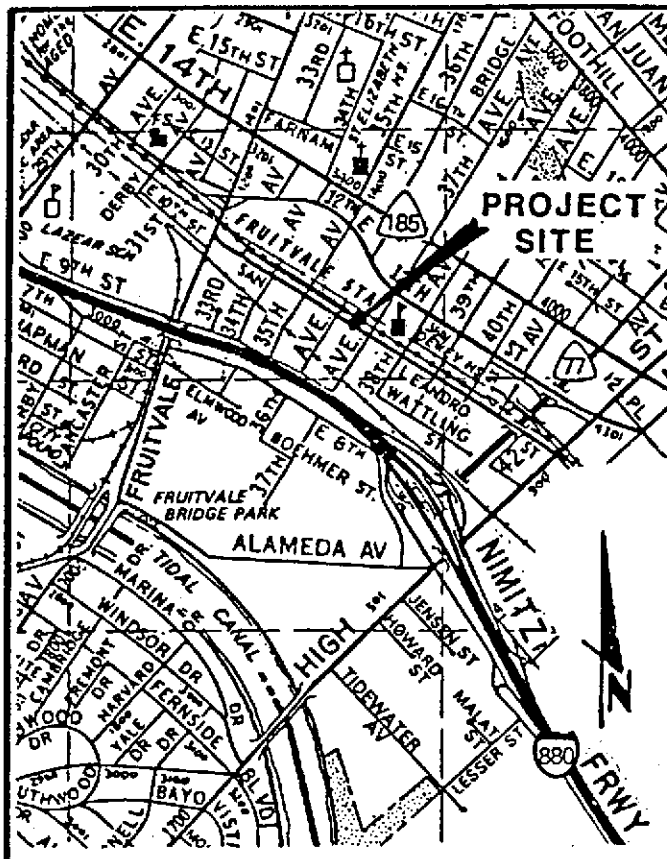
TABLE 1. Analytic Results for Ground Water, Chevron S.S. #9-4612 Oakland, California

Sample ID	Sample Type	Analytic Lab	Analytic Method	Sample Date	TFHC	----- ppm -----				Total Lead	Chloride
						B	T	X	E		
<i>No Shallow borings</i> VH-1.	water	CCAS	524.2/8240	8/10/88	11	3.3	0.2	0.54	0.52	0.043	43(b)
VH-1-20.5	soil	CCAS	524.2/8240	8/10/88	<0.5	0.042	<0.005	<0.005	<0.005	6	NA
VH-1-25.5	soil	CCAS	524.2/8240	8/10/88	<0.5	0.036	<0.005	<0.005	<0.005	6 and 7	NA
DHS ACTION LEVELS		--	--	--	--	0.0007	0.1	0.62	0.68	0.05 for water (c)	250 (c)

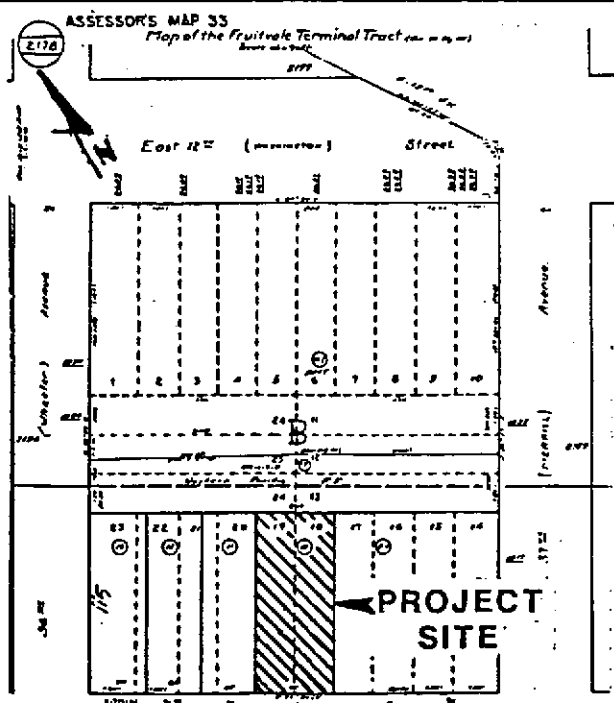
- Notes: a = by EPA method 7420/7421
 b = by EPA method SM407
 c = Title 22 State of California Environmental Health Code, Maximum Contaminant Level
 NA = not analyzed
 DHS = Department of Health Services, State of California
 TFHC = Total Fuel Hydrocarbons
 B = Benzene
 T = Toluene
 X = Xylenes
 E = Ethylbenzene
 CCAS = Central Coast Analytic Services

ATTACHMENT A

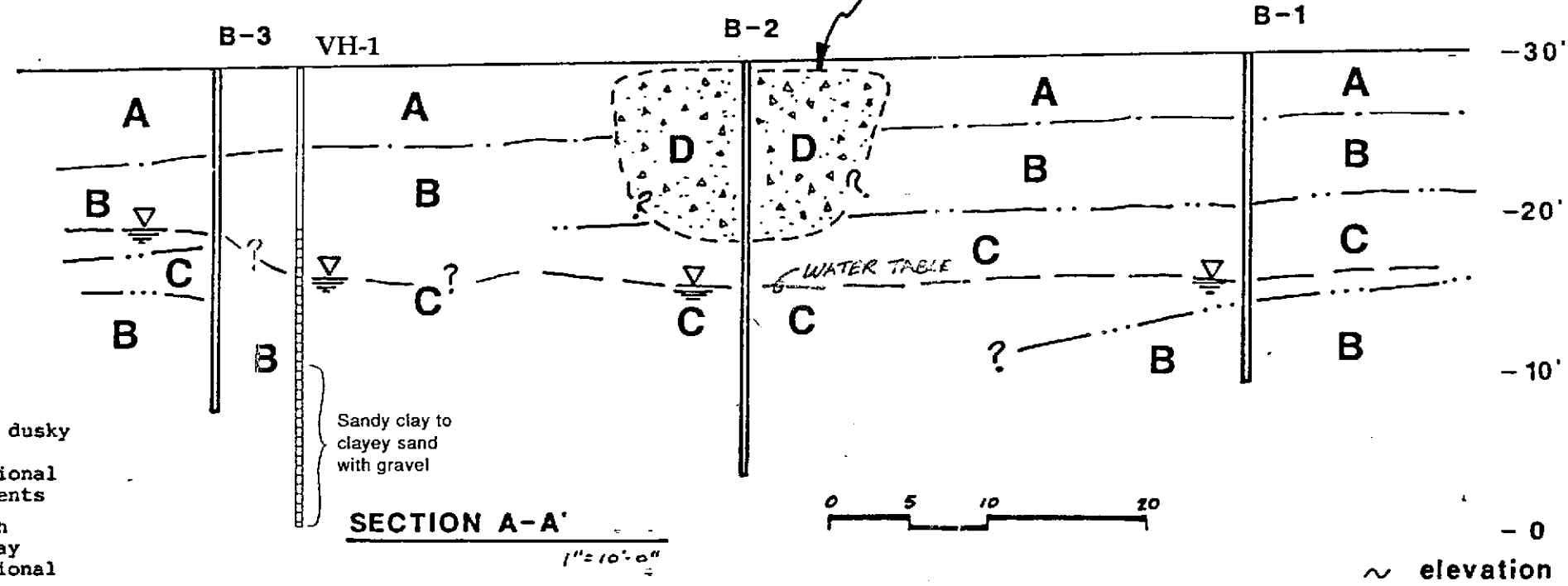
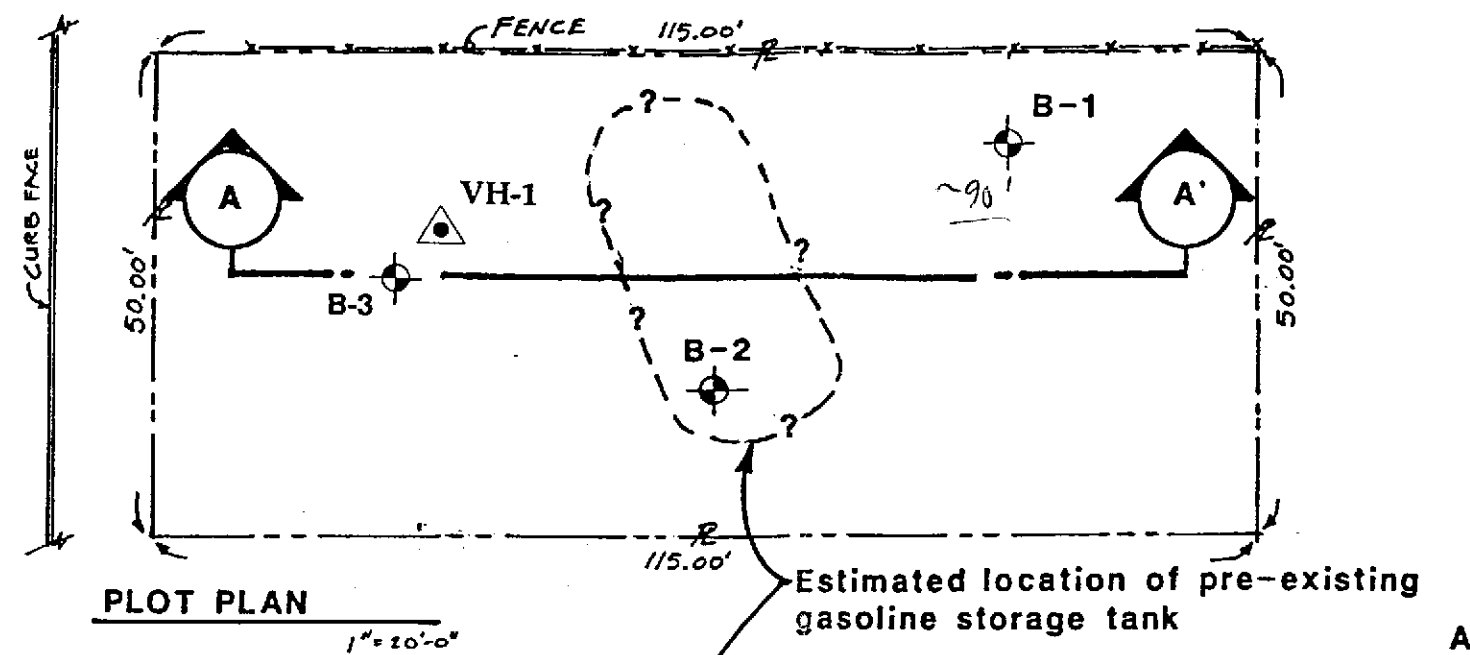
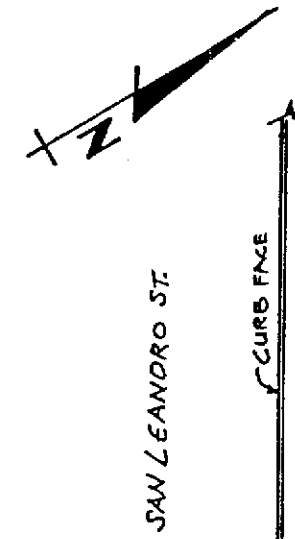
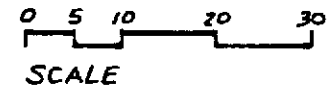
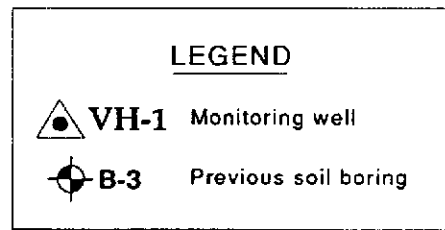
Site Location Map and Geologic Crosssection



VICINITY MAP



LOT LOCATION



- SOIL LEGEND**
- A** CLAY, brownish black to dusky yellowish brown, highly plastic clay with occasional roots and charred fragments
 - B** CLAY, moderate yellowish brown to light olive gray silty sandy clay, occasional charred fragments
 - C** CLAY & CONGLOMERATE, dark to moderate yellowish brown clay with abundant clasts and conglomerate with clay. Clasts range from very coarse grain to 2" dia. and composed of sandstone, quartzite, greenstone, and chert.
 - D** SAND AND GRAVEL BACKFILL

Addition of monitoring well VH-1 by Vonder Haar Hydrogeology 8-18-88

<p>ROGERS/PACIFIC PROFESSIONAL ENGINEERING CONSULTANTS</p>	<p>PLOT PLAN AND CROSS-SECTION McILRAITH WAREHOUSE FOUNDATION INVESTIGATION</p> <p>Lot 18 & 19, San Leandro Street, Oakland, Calif.</p>		
	<p>SCALE: as shown DATE: Mar. 1988</p>	<p>JOB NUMBER GF0362 462</p>	<p>DRAWN BY PB</p>

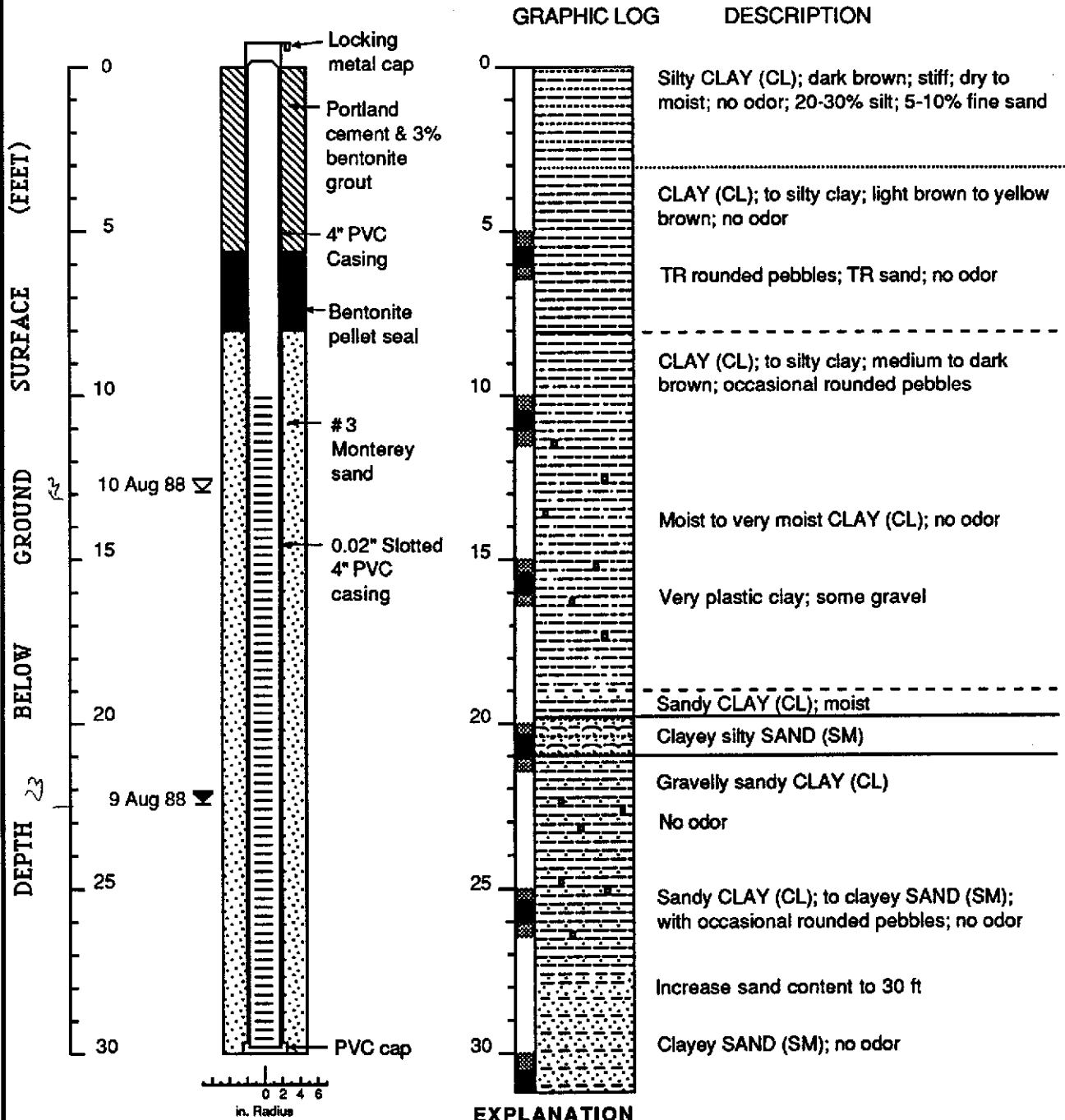
ATTACHMENT B

Boring Log and Well Construction Details

Confined aquifer

Vonder Haar Hydrogeology

WELL VH-1



- ▼ Water level during drilling (date)
- ◻ Water Level (date)
- Contact (dashed where approx.)
- - - - Gradational Contact
- ▨ Location of recovered drive sample
- Location of drive sample collected for chemical analysis

Logged by: Stephen Vonder Haar
 Drilling Company: Datum Drilling, Long Beach, CA
 Driller: Anthony Randy
 Drilling Method: Hollow stem auger
 Dates Drilled: 8-9-88
 Type of sampler: Split Barrel (2.0" ID)

ATTACHMENT C

Analytic Chemical Reports

Central
Coast
Analytical
Services

Central Coast
Analytical Services, Inc.
6483-D Calle Real
Goleta, California 93117
(805) 964-7838

Lab Number: GB-2312
Collected: 08/10/88
Received: 08/11/88
Tested: 08/12/88
Collected by: S.Vonder Haar
Fuel Fingerprint Analysis - EPA Method 524.2/8240

Vonder Haar Hydrogeology
1609 Jaynes
Berkeley, CA 94703

SAMPLE DESCRIPTION:
Proj. # 88-114, Lindquist
VH-1C water

Compound Analyzed	Detection Limit in ppm	Concentration in ppm
Benzene	0.001	3.3
Toluene	0.001	0.20
Ethylbenzene	0.001	0.52
Xylenes	0.001	0.54
1,2-Dichloroethane (EDC)	0.001	0.003
Ethylene Dibromide (EDB)	0.001	not found

TOTAL PURGEABLE PETROLEUM HYDROCARBONS (GASOLINE)	0.1	11.

BTX as a Percent of Fuel		37.

Percent Surrogate Recovery		120.

Respectfully submitted,
CENTRAL COAST ANALYTICAL SERVICES
Mary Havlicek (mc)
Mary Havlicek, Ph.D.
President

gb2312f.wr1
MH/jpm/mc
msdg1/080688

Central
Coast
Analytical
Services

Central Coast
Analytical Services, Inc.
6483-D Calle Real
Goleta, California 93117
(805) 964-7838

Lab Number: As Listed
Collected: 08/10/88
Received: 08/11/88
Tested: 08/12/88
Collected by: S.Vonder Haar

Vonder Haar Hydrogeology
1609 Jaynes
Berkeley, CA 94703

SAMPLE DESCRIPTION:
Proj. #88-114, Lindquist
Soil Samples as Listed

DIGESTED BY EPA METHOD 3005

REPORT

LAB NUMBER SAMPLE DESCRIPTION LEVEL FOUND - mg/l

TOTAL LEAD
mg/l

EPA METHOD NUMBER-----
DETECTION LIMIT-----
DATE TESTED/ANALYST-----

7421
0.005
08/12/88/NW

GB-2316

VH-1G, water

0.043

Respectfully submitted,
CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek (mc)
Mary Havlicek, Ph.D.
President

gb2316pb.wr1
nw/ro/mc/mh

Central
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Analytical
Services

Central Coast
Analytical Services
6483-D Calle Real
Goleta, California 93117
(805) 964-7838

Lab Number: GB-2312
Collected: 08/10/88
Received: 08/11/88
Tested: 08/15/88
Collected by: S.Vonder Haar

Vonder Haar Hydrogeology
1609 Jaynes
Berkeley, CA 94703

Sample Description:

Project # 88-114, Lindquist
VH-1C water

REPORT

CONSTITUENT	EPA METHOD/DATE/ANALYST	DETECTION LIMIT	LEVEL FOUND -mg/l
CHLORIDE	SM 407 08/15/88 GP	1.	43.

08/26/88
gb2312c1.wr1
MH/mc

Respectfully submitted,
CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek (mc)
Mary Havlicek, Ph.D., President

Central
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Services

Central Coast
Analytical Services, Inc.
6483-D Calle Real
Goleta, California 93117
(805) 964-7838

Lab Number: GB-2305
Collected: 08/09/88
Received: 08/11/88
Tested: 08/12/88
Collected by: S.Vonder Haar

Fuel Fingerprint Analysis - EPA Method 524.2/8240

Vonder Haar Hydrogeology
1609 Jaynes
Berkeley, CA 94703

SAMPLE DESCRIPTION:
Proj. # 88-114, Lindquist
VH-1 @ 20.5' soil

Compound Analyzed	Detection Limit in ppm	Concentration in ppm
Benzene	0.005	0.042
Toluene	0.005	not found
Ethylbenzene	0.005	not found
Xylenes	0.005	not found
1,2-Dichloroethane (EDC)	0.005	not found
Ethylene Dibromide (EDB)	0.005	not found
TOTAL PURGEABLE PETROLEUM HYDROCARBONS (GASOLINE)	0.5	<0.5
BTX as a Percent of Fuel		not applicable
Percent Surrogate Recovery		97.

Respectfully submitted,
CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek (mc)
Mary Havlicek, Ph.D.
President

gb2305f.wr1
MH/jpm/mc
msdg1/080688

Central
Coast
Analytical
Services

Central Coast
Analytical Services, Inc.
6483-D Calle Real
Goleta, California 93117
(805) 964-7838

Lab Number: GB-2307
Collected: 08/09/88
Received: 08/11/88
Tested: 08/12/88
Collected by: S.Vonder Haar
Fuel Fingerprint Analysis - EPA Method 524.2/8240

Vonder Haar Hydrogeology
1609 Jaynes
Berkeley, CA 94703

SAMPLE DESCRIPTION:
Proj. # 88-114, Lindquist
VH-1 @ 25.5' soil

Compound Analyzed	Detection Limit in ppm	Concentration in ppm
Benzene	0.005	0.036
Toluene	0.005	not found
Ethylbenzene	0.005	not found
Xylenes	0.005	not found
1,2-Dichloroethane (EDC)	0.005	not found
Ethylene Dibromide (EDB)	0.005	not found

TOTAL PURGEABLE PETROLEUM HYDROCARBONS (GASOLINE)	0.5	<0.5

BTX as a Percent of Fuel		not applicable
Percent Surrogate Recovery		102.

Respectfully submitted,
CENTRAL COAST ANALYTICAL SERVICES
Mary Havlicek (mc)
Mary Havlicek, Ph.D.
President

gb2307f.wr1
MH/jpm/mc
msdg1/080688

Central
Coast
Analytical
Services

Central Coast
Analytical Services, Inc.
6483-D Calle Real
Goleta, California 93117
(805) 964-7838

Lab Number: B081288
Collected:
Received:
Tested: 08/12/88
Collected by: JPM
Fuel Fingerprint Analysis - EPA Method 524.2/8240

CCAS

SAMPLE DESCRIPTION:
INSTRUMENT BLANK

Compound Analyzed	Detection Limit in ppm	Concentration in ppm
Benzene	0.001	not found
Toluene	0.001	not found
Ethylbenzene	0.001	not found
Xylenes	0.001	not found
1,2-Dichloroethane (EDC)	0.001	not found
Ethylene Dibromide (EDB)	0.001	not found
TOTAL PURGEABLE PETROLEUM HYDROCARBONS (GASOLINE)	0.1	<0.1
BTX as a Percent of Fuel		not applicable
Percent Surrogate Recovery		95.

Respectfully submitted,
CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek (mc)
Mary Havlicek, Ph.D.
President

b081288f.wr1
MH/jpm/mc
msdg1/080688

Central
Coast
Analytical
Services

Central Coast
Analytical Services, Inc.
6483-D Calle Real
Goleta, California 93117
(805) 964-7838

Lab Number: As Listed
Collected: 08/09/88
Received: 08/11/88
Tested: 08/12/88
Collected by: S.Vonder Haar

Vonder Haar Hydrogeology
1609 Jaynes
Berkeley, CA 94703

SAMPLE DESCRIPTION:
Proj. #88-114, Lindquist
Soil Samples as Listed

DIGESTED BY EPA METHOD 3050

REPORT

LAB NUMBER	SAMPLE DESCRIPTION	LEVEL FOUND - mg/kg
EPA METHOD NUMBER-----		TOTAL LEAD mg/kg
DETECTION LIMIT-----		7420
DATE TESTED/ANALYST-----		1.
		08/12/88/NW
GB-2305	VH-1 @ 20.5'	6.
GB-2307	VH-1 @ 25.5'	6.
GB-2307duplicate	VH-1 @ 25.5'	7.

Respectfully submitted,
CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek (mc)
Mary Havlicek, Ph.D.
President

FORM 101-R HY 761 06,
 1609 JAYNES
 BERKELEY CA 94703

(415) 527-7652

CHAIN-OF-CUSTODY RECORD AND ANALYTIC INSTRUCTIONS

Shuttle Inventory Number: _____

Shipping Seal No. _____

IA Personnel: Be sure to include copy of this form in the field sampling files

Project ID: PR-114

Sampled by: Stephen Vonderhaar Laboratory Name: CCAS

NOTES TO LAB:

- 1) Specify analytic method and detection limit in report.
- 2) Notify us if there are any anomalous peaks on GC or other scans.
- 3) Duplicates listed in parentheses.
- 4) ANY QUESTIONS/CLARIFICATIONS: CALL US.

EB

Sample ID	Sampling Date	Sample/Container Type	Analyze/ Hold	Turn-around	Analyze For:	Analytic Method/ Detection Limit	Comments
2298	VH-1 5'	8/9/88 S Tube	Hold				
2299	" 5 1/2'	" "	Hold				
2300	" 10'	" "	Hold				
2301	" 10 1/2'	" "	Hold				
2302	" 15'	" "	Hold				
2303	" 15 1/2'	" "	Hold				
2304	" 20'	" "	Hold				
2305	" 20 1/2'	" "	A	RUSH 20 30 min	FUEL FINGERPRINT & BTXES and TOTAL LEAD	524.2/8240 and AA	and acid chromatograph
2306	" 25'	" "	Hold				
2307	" 25 1/2'	" "	A	RUSH 20 30 min	FUEL FINGERPRINT & BTXES and TOTAL LEAD	524.2/8240 and AA	and acid chromatograph
2308	" 30'	" "	Hold				
2309	" 30 1/2'	" "	Hold				

x Stephen Vonderhaar Aug 9, 1988 x

Released by (Signature), Date

Released by (Signature), Date

x Stephen Vonderhaar x

Shipping Carrier, Method, Date

Received by Lab Personnel, Date, Telephone

Seal Intact? Number

1. Sample Type Code: L = Water, S = Soil, D = Other (specify)

2. Container Type Code: V = Vol Bottle, P = Plastic Bottle, G = Glass Bottle, T = Brass Tube, O = Other (specify)

3. Analyze/Hold: A = Analyze, HOLD (specify hrs) = DO NOT ANALYZE UNLESS NECESSARY or REQUESTED

5. T = Normal Turnaround, 1 = 1-Hour Turnaround, 2 = 24-Hour Turnaround

J. M. HANCOCK