MICHELLE E. BOSCOE, RHSP, REA
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PACIFIC GAS & ELECTRIC COMPANY
4525 HOLLIS STREET
EMERYVILLE, CA 94608

~~SHD~~ BJS
LOP 365
SMC 65

MS. SUSAN HUGO
SENIOR HAZARDOUS MATERIALS SPECIALIST
ALAMEDA COUNTY HEALTH AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH
80 SWAN WAY, ROOM 200
OAKLAND, CA 94621

MAY 13, 1994

DEAR MS. HUGO:

ENCLOSED IS A COPY OF THE REPORT ON THE GROUNDWATER INVESTIGATION OF THE EMERYVILLE ABOVE-GROUND STORAGE TANK SITE PERFORMED BY OUR TECHNICAL AND ECOLOGICAL SERVICES DEPARTMENT, IN CONJUNCTION WITH AN OUTSIDE CONSULTING FIRM, ENVIRONMENTAL SCIENCE AND ENGINEERING. THE REPORT, DATED MAY 12, 1994, IS ENTITLED, "EMERYVILLE MATERIALS FACILITY, ABOVEGROUND TANK GROUNDWATER INVESTIGATION, EMERYVILLE, CALIFORNIA." INCLUDED ALSO WITH THE REPORT IS A PG&E INTERNAL COVER MEMORANDUM WHICH PROVIDES A SUMMARY OF THE SAMPLING RESULTS, AND RECOMMENDED SUBSEQUENT COURSES OF ACTION.

PLEASE REVIEW THE REPORT AND ADVISE ON OUR NEXT COURSE OF ACTION.

SINCERELY

MICHELLE E. BOSCOE

CC: MEL BYRD
MIKE SMITH
JOHN HOLT
PHIL WEISS
FILE

ALCO HAZMAT
94 MAY 16 PM 2:53

Memorandum

Date: May 11, 1994 **File #:** 402.331

To: CENTRAL REPAIR AND RECOVERY SERVICES

From: TECHNICAL AND ECOLOGICAL SERVICES

Subject: Soil and Groundwater Investigation at the Emeryville Materials Facility
Former Aboveground Transformer Oil Storage Tank Area

MEL BYRD:

Enclosed are four copies of the report "Emeryville Materials Facility, Aboveground Tank Groundwater Investigation, Emeryville, California." The report presents a description of soil and groundwater sampling in the vicinity of the former aboveground tanks and the results of the study. The work was performed at your request in March 1994.

The area in the vicinity of the former aboveground tanks is underlain by silt and clay with small lenses of gravel. Groundwater in the vicinity exists under confining conditions within a gravel aquifer ranging in thickness from 15 to 18 feet, at a depth of 18 to 20 feet below grade. Groundwater generally flows north with a gradient of 0.04 ft/ft. In the vicinity of the tank farm the groundwater flows west with a gradient of 0.02 ft/ft.

Soils within the site boundaries contain PCBs at concentrations to 0.4 mg/kg, total extractable petroleum hydrocarbons at concentrations up to 2,100 mg/kg, and volatile organic compounds as benzene (10 µg/kg), toluene (29 µg/kg), ethylbenzene (3 µg/kg), and xylenes (25 µg/kg). Neither PCBs nor petroleum hydrocarbons were found above detection limits in soil samples from either of the two off-site soil borings located along 53rd Street.

Groundwater did not contain any PCBs above detection limits. Petroleum hydrocarbons in groundwater are confined to on-site wells. No petroleum hydrocarbons were present above the detection limits in the two off-site wells. Total extractable petroleum hydrocarbons are present in well ESE1 (340 µg/l) and ESE2 (250 µg/l). Well ESE2 also contained benzene (0.8 µg/l), toluene (1.5 µg/l) and xylenes (2.7 µg/l).

Although petroleum hydrocarbons are present in the groundwater in the on-site wells, concentrations do not exceed either primary or secondary maximum contaminant levels (MCL) set forth by the state of California (benzene [primary MCL 1.0 µg/l], toluene [secondary MCL 40 µg/l], xylenes [secondary MCL 20 µg/l]). It does not appear that contamination of groundwater will be a major concern, however, the wells should be monitored on a quarterly basis for a period of one year due to the presence of total extractable hydrocarbons in the groundwater samples collected from ESE1 and ESE2.

As determined from this investigation and from the results of the previous study, soils in the vicinity of the former aboveground tank farm are affected by petroleum hydrocarbons. To date, the horizontal extent of these compounds in the soil has not been determined. Further investigation will be necessary to determine the lateral extent of these compounds in the soil to the south and east of the former aboveground tank farm.

Should you have any questions please call me at 251-5808 or Darrell Klingman at 251-5883.

FREDERICK F. FLINT
Registered Geologist

FFF(251-5808):cap
cca05/11/94 03:11 PM(0155bltr.doc/cp48)

pc: BSBenson
MEBoscoe
DAGilbert/DSKlingman

Attachment

TES

Emeryville Materials Facility
Aboveground Tank Groundwater
Investigation
Emeryville, California

Prepared by

Land and Water Quality Unit

Prepared for

Central Repair and Recovery Services
Pacific Gas and Electric Company

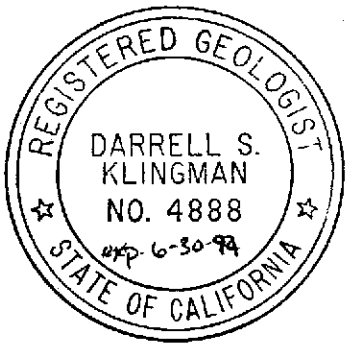
May 12, 1994

Report 402.331-94.10

Pacific Gas and Electric Company
Technical and Ecological Services
3400 Crow Canyon Road, San Ramon, California 94583

Prepared by:

Approved by:



Frederick F. Flint
Contract Registered Geologist

Darrell S. Klingman
Registered Geologist

David A. Gilbert
Senior Engineer

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FIGURES

TABLES

Section 1

INTRODUCTION AND PURPOSE

This report presents the results of a soil and groundwater investigation performed in the vicinity of four former aboveground transformer oil storage tanks at PG&E's Emeryville Materials Facility in Alameda County. The purpose of the investigation was to assess the possible presence of materials associated with transformer oil storage in the subsurface soils and groundwater in the vicinity of the tanks at the facility. All work completed during this investigation was performed according to PG&E's "Work Plan for the Groundwater Investigation of Emeryville Materials Facility, Emeryville, California", dated January 11, 1994.

The scope of work for this study included advancing and sampling four soil borings, completing the soil borings as groundwater monitoring wells, performing chemical analyses of soil and water samples, reviewing available geologic literature, and preparing this report.

SITE DESCRIPTION

Location and Land Use

The Emeryville Materials Facility is located at 4525 Hollis Street in the city of Emeryville (Figure 1), between Hollis and Holden streets and extends from an area south of 45th Street to the railroad right-of-way property located north of 53rd Street (Figure 2). The property occupies approximately 16.5 acres and is used as materials storage and supply yard for PG&E. Land use in the near vicinity is industrial.

The site was constructed on artificial fill about three to four feet above the natural ground surface at an elevation of approximately 28 feet above mean sea level (USGS 1980). The nearest drainage is Temescal Creek, an intermittent creek which flows west through the property toward San Francisco Bay. In the vicinity of the site, Temescal Creek flows through an underground culvert. San Francisco Bay is located approximately one-half mile west of the site (Figure 3).

Geologic Setting

The facility is located in a lowland area along the eastern shore of San Francisco Bay. The Bay is a flooded river valley in a northwest trending structural trough formed in Franciscan bedrock. Tectonic forces in place during the Pleistocene epoch (approximately 2 million years ago) created the San Francisco Bay depression as the Oakland/Berkeley hills were undergoing uplift. Erosion and deposition of material from the Oakland/Berkeley hills created coalescing alluvial fan deposits along the east shore of the bay.

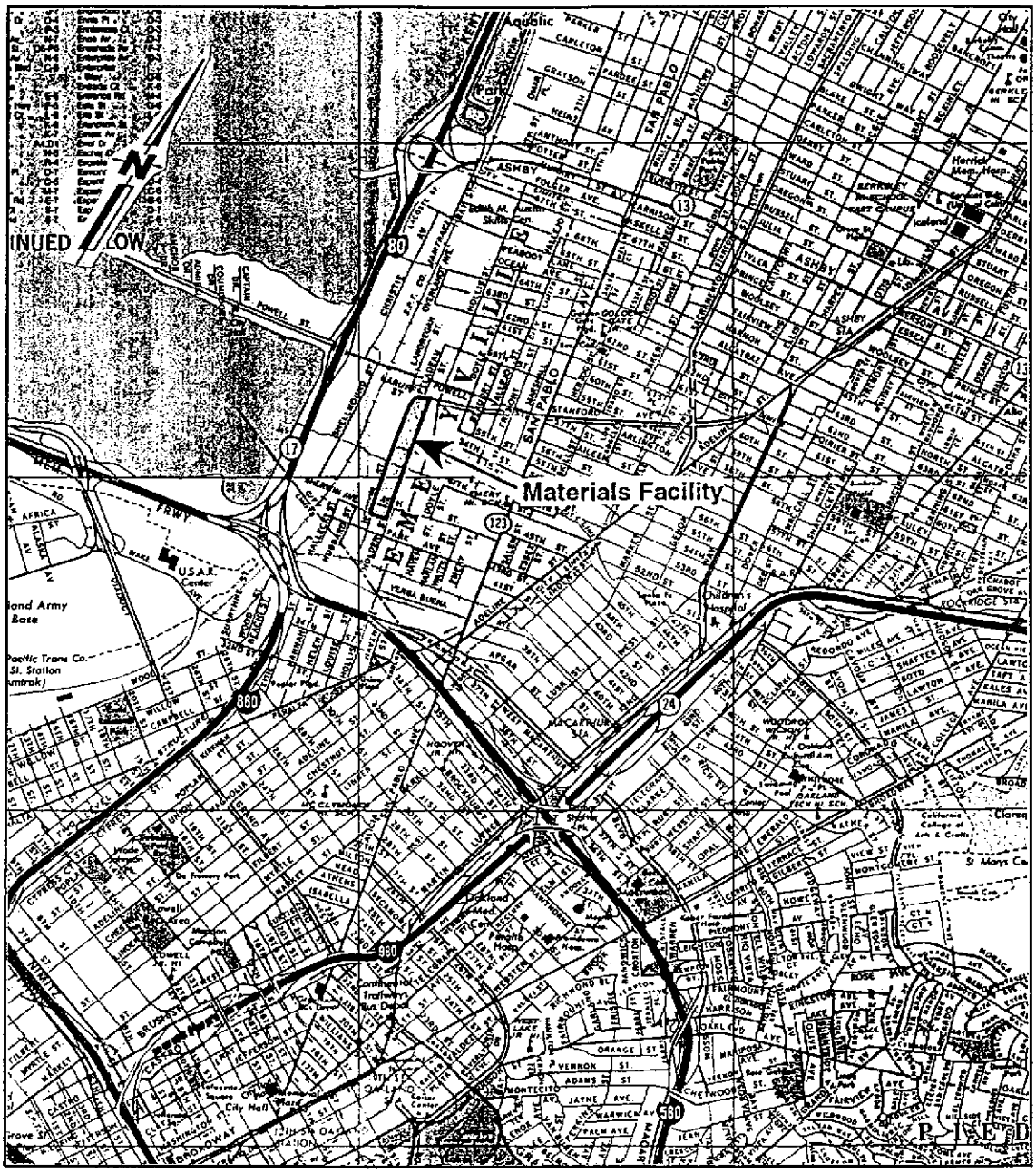


Figure 1. Location map of Emeryville Materials Facility.

930974/S9

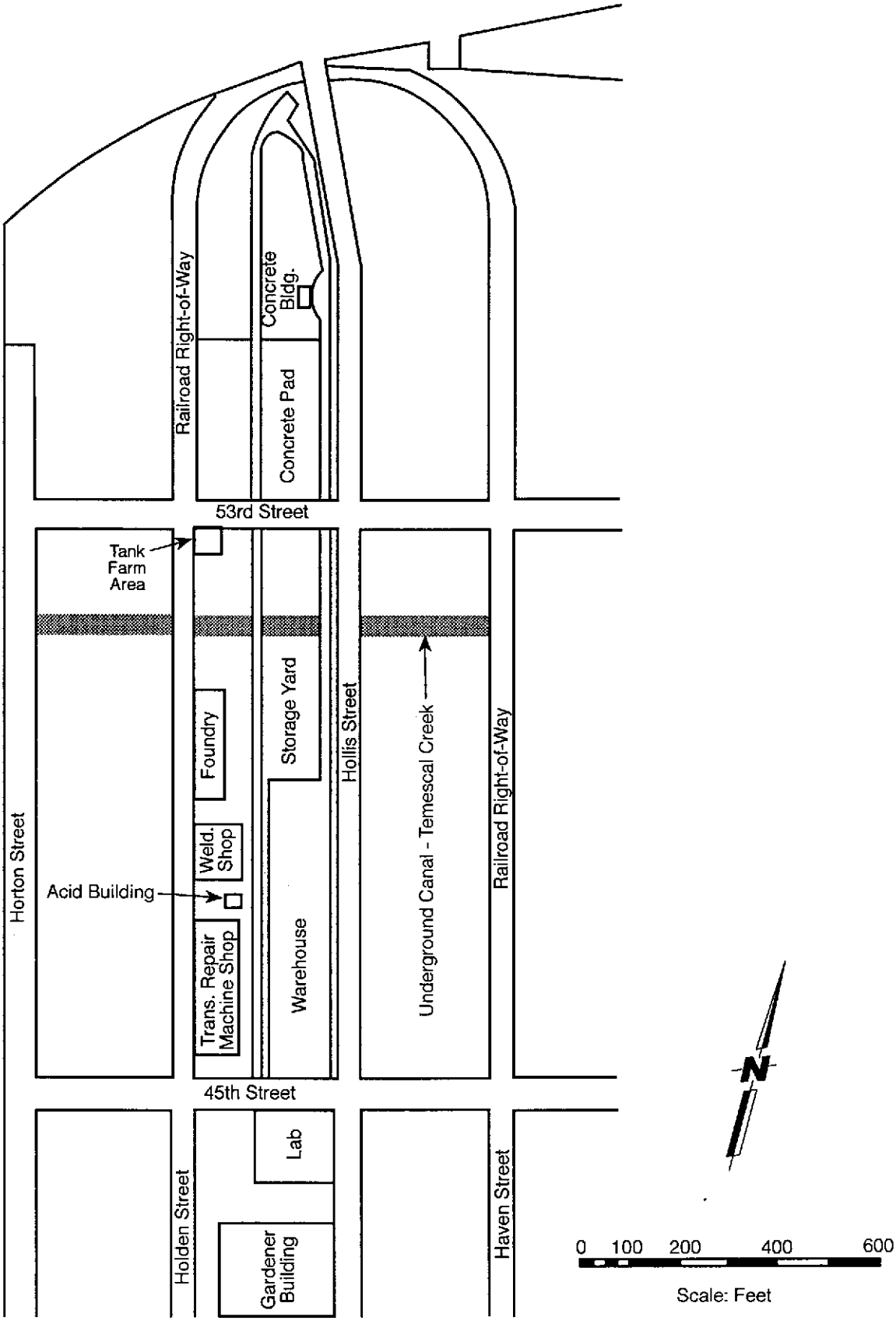


Figure 2. Site map of Emeryville Materials Facility.

930974/S9

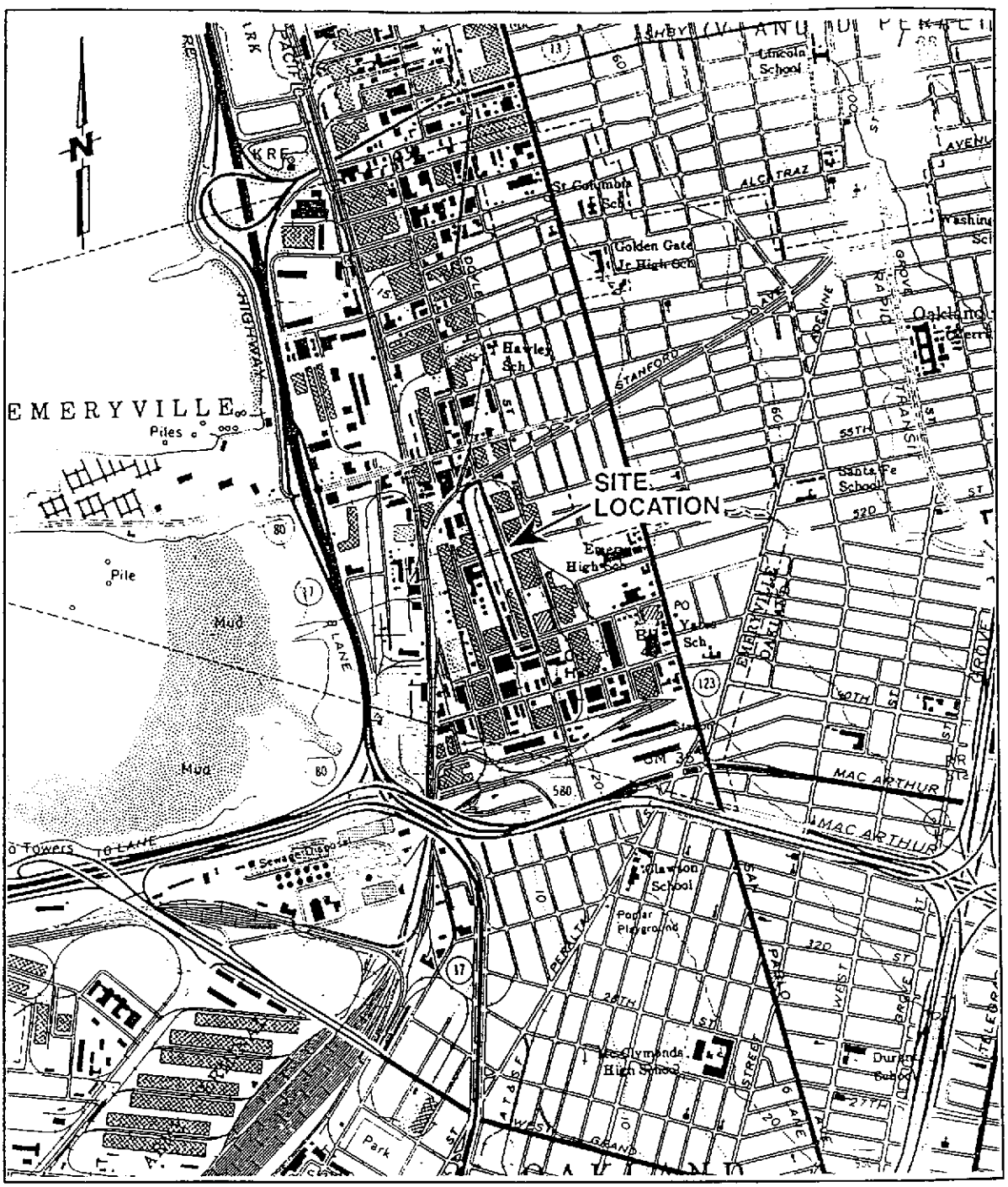


Figure 3. Topographic map of Emeryville Materials Facility.

930974/S9

Alluvial deposits along the East Bay margin include:

- Pleistocene alluvial fan deposits consisting of silty and sandy clay with gravely lenses which grade laterally into margin sediments.
- Upper Pleistocene Merrit sand consisting of fine grained lenticular sands and silty sands that occur irregularly and vary in thickness from a few inches to 65 feet.
- Late Pleistocene to Holocene alluvial deposits consisting of interbedded clayey gravels, sand and silty clays, and sand-silt-clay mixtures that grade laterally into Merrit sand.
- Holocene stream deposits.

Generally, Pleistocene alluvial fan material is termed Alameda formation and the Late Pleistocene sands and alluvium are termed the Temescal formation (Radbruch 1957). Classification of these alluvial units into stratigraphic formations are subject to interpretation.

Previous investigations indicate that the facility is underlain by approximately 3–4 feet of fill. This fill is underlain by Pleistocene alluvial fan deposits consisting of thick sequences of silty and sandy clay with thinly interbedded and discontinuous gravel lenses.

Shallow groundwater occurs at an elevation of about 6 to 8 feet above sea level, 12.5 to 14.5 feet below ground surface. General groundwater flow direction is anticipated to be westerly toward the bay shoreline.

BACKGROUND

The Emeryville Materials Facility was constructed in the early 1920's and has served as a warehouse, repair shop and storage yard. Transformers, capacitors, oil circuit breakers and other miscellaneous equipment used in the electrical transmission and distribution system are brought to the facility for repair and storage.

A tank farm used to store transformer oil was located along the western edge of the property adjacent to 53rd Street. This corner of the property contains a lowered concrete pad (40' x 40') which supported four aboveground storage tanks and a pump which was used for oil transfer. Three of the tanks had a capacity of 10,000 gallons each while the fourth had a capacity of 11,000 gallons. The tanks, pump, and concrete pad have been removed.

A preliminary investigation was performed in October 1993 to determine if polychlorinated biphenyls (PCBs) and total extractable petroleum hydrocarbons (TEPH) are present in subsurface soils within the former aboveground tank containment area. PCBs were detected at concentrations up to 385 mg/kg at a depth of 3.0–4.5 feet, and TEPH were detected at concentrations up to 16,000 mg/kg at a depth of 7.5 to 9.0 feet. Groundwater was not encountered in any of the soil borings to a depth of 9 feet. A nearby

groundwater well was sampled and analyzed for PCBs, TEPH and BTEX; none of these compounds were detected. Results of the preliminary investigation are presented in TES report No. 402.331-93.41, entitled, "Investigation of Subsurface Soils at Emeryville Materials Facility, Emeryville, California."

Section 2

METHODS

DRILLING AND MONITORING WELL INSTALLATION

Four monitoring wells were installed on March 21–22, 1994 at the locations proposed in the work plan (Figure 4). The well construction and drilling procedures used were consistent with those recommended by the State Water Resources Control Board (SWRCB 1988) and Alameda County. Field work was conducted by a field geologist from ESE Inc., who logged the soil borings. Drilling and well installation was conducted by Gregg Drilling and Testing, Inc. Two different drill rigs were used due to access limitations. Wells ESE1 and ESE2 were drilled with a Simco 2400 while wells ESE3 and ESE4 were drilled using a Mobile Drill B-53. All boreholes were advanced using continuous flight hollow-stem augers; three borings were advanced to 31.5 ft, and the fourth boring was advanced to 35 ft.

The details of well construction are presented in the drilling logs and well completion diagrams (Appendix A). As shown in the well completion diagrams, all four wells were completed with 2-inch diameter schedule 40 PVC pipe to a depth of approximately 31.5 to 35 ft, with 15 feet of 0.010-inch slotted screen and 18-20 feet of blank casing. The annular space around the well casing was filled with #2/12 Lapis Luster sand up to a level about 1 ft above the top of the screen. The sand pack was sealed with 1 ft of hydrated bentonite followed by a neat Portland cement grout to the surface to prevent direct infiltration of surface water into the well. Top of casing elevations were surveyed for each well relative to a survey mark on top of the wall along 53rd Street measured at 28.10 feet above mean sea level.

SOIL SAMPLING

During drilling, soil samples were collected from each borehole using a 2-inch I.D. California split-spoon sampler lined with three 6-inch long brass tubes. The samples were collected at 5-ft intervals, beginning at 5.0 ft below the surface and continuing to the bottom of the borehole. Between each sampling interval, the sampler and the brass tubes were thoroughly cleaned with trisodium phosphate solution and rinsed with deionized water. Boring ESE1 was sampled continuously from 10 ft to 19 ft in anticipation of encountering the water table. The bottom core from each sampling interval was immediately sealed with Telflon sheets, capped, labeled, and placed on ice. The samples from the upper and middle brass tube were used for soil classification and field screening with a Photovac Tip 1 photoionization detector to determine the presence of aromatic hydrocarbons. The soil samples were analyzed for total extractable petroleum hydrocarbons (TEPH) (EPA method 3540/8015), polychlorinated biphenyls (PCBs) (EPA method 3540/8080) and volatile organics (BTEX) (EPA method 8020). Selected samples from each borehole, including one from the bottom of each boring, were selected for chemical analysis and sent with a chain-of-custody form to Sherwood Labs in Hilmar (a state of California-certified analytical laboratory).

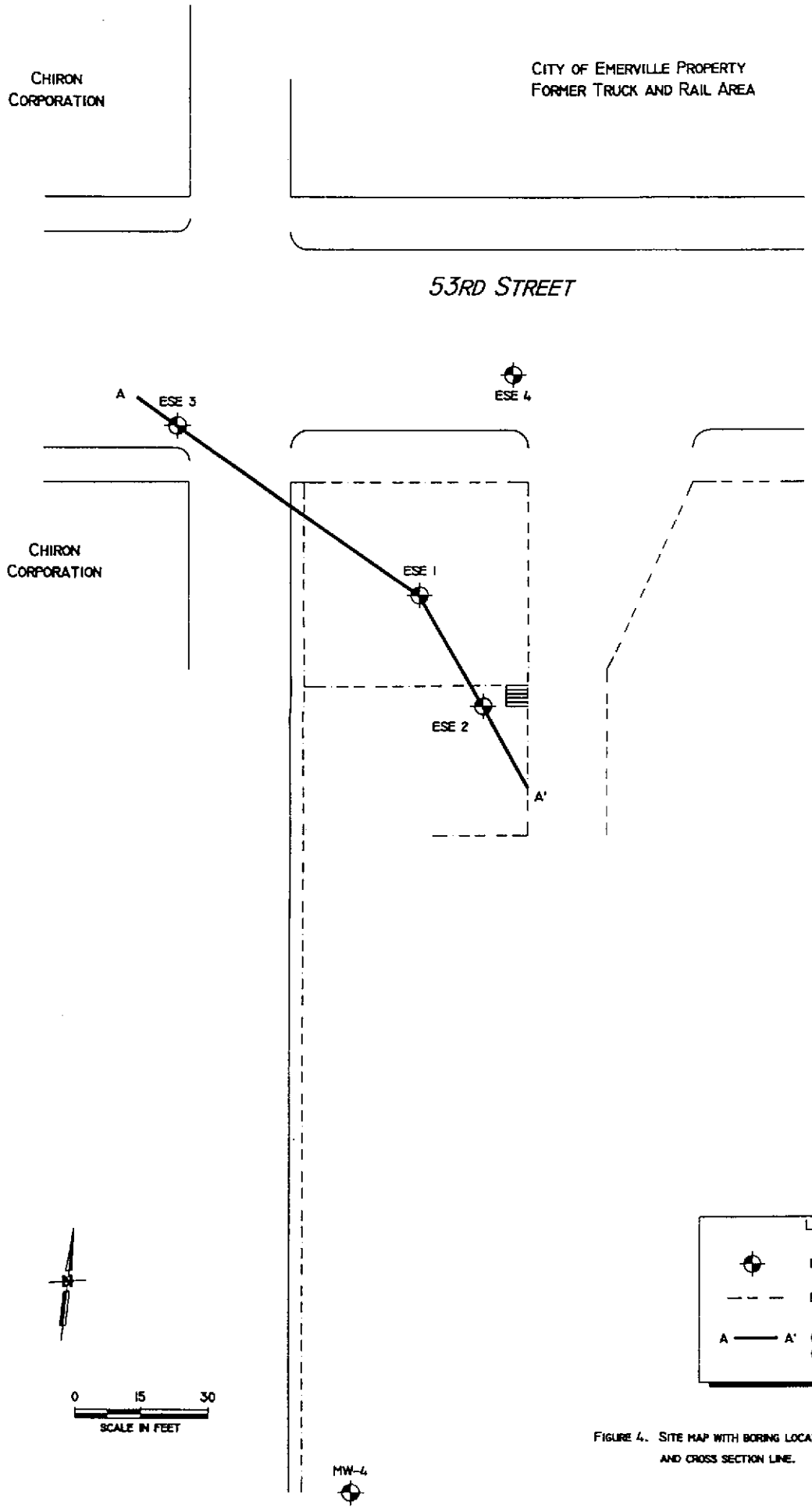


FIGURE 4. SITE MAP WITH BORING LOCATIONS AND CROSS SECTION LINE.

WELL GAUGING

The four wells were gauged on March 28, 1994 to determine the hydraulic gradient and direction of groundwater flow. The wells were sounded to determine the depth to water from the top of the casing using a Solinst water level probe, accurate to 0.01 ft.

WATER SAMPLING

On March 24 1994, the wells were developed by using a surge block, hand pump, and bailer. Each well was surged and then bailed in an effort to remove sand and silt from the well. Field data sheets are included in Appendix B.

The wells were purged, using clean Teflon bailers, by removing at least three well volumes (8–10 gal) of water. Before purging, each well was checked for the presence of free product. After purging, samples of groundwater were collected using a clean Teflon bailer and transferred to 40-ml and 1 liter bottles for chemical analyses (i.e., TEPH EPA method 3540/8015, PCBs by EPA method 608 and BTEX EPA method 602). The water samples were carefully decanted into the sample bottles to ensure that no air bubbles were present. Each bottle was closed with a Teflon-lined cap, labeled, placed on ice, and sent to Sherwood Labs under chain-of-custody.

Section 3

RESULTS

HYDROGEOLOGY OF THE SITE

The boring logs indicate that the site is underlain predominantly by silt and clay with small lenses of gravel to a depth of 18–20 feet below grade. Beneath the silt and clay is a gravel ranging from 18 to 15 feet in thickness. Beneath the gravel is a blue clay of unknown thickness (Figure 5). Groundwater occurs under confining conditions in the gravel at depths from 10 –11.8 ft below the surface, or approximately 17.5–12.5 ft above mean sea level (Table 1). The groundwater potentiometric surface slopes predominantly to the north with a gradient of 0.04 ft/ft. In the vicinity of the tank farm the flow direction is west with a gradient of 0.02 ft/ft (Figure 6).

SOIL AND GROUNDWATER ANALYSES

The soil samples collected during drilling were analyzed for TEPH, PCBs and volatile organics (BTEX) by Sherwood Labs. Borings ESE1 and ESE2 contained TEPH as dielectric oil and volatile organics, while borings ESE3 and ESE4 contained no compound above the method detection limits. The sample collected at 5 feet from ESE1 contained TEPH (270 mg/kg), benzene (6 ug/kg), toluene (29 ug/kg) and xylenes (21 ug/kg). The sample collected at 10 feet from boring ESE1 contained TEPH (1,800 mg/kg), benzene (10 ug/kg), toluene (29 ug/kg), ethylbenzene (3 ug/kg), and xylenes (25 ug/kg). The sample collected at 5 feet from boring ESE2 contained TEPH (8 mg/kg). The sample collected at 9 feet from ESE2 contained TEPH (2,100 mg/kg), benzene (9 ug/kg), toluene (28 ug/kg), ethylbenzene (3 ug/kg), and xylenes (21 ug/kg). The sample collected at 15 feet from boring ESE2 contained TEPH (1,900 mg/kg). No PCBs were detected in any of the soil samples. The formal laboratory reports are presented in Appendix C and the results are summarized in Table 2.

Groundwater samples collected from each well were analyzed for TEPH and PCBs and BTEX (Table 3). A field blank was also analyzed for petroleum hydrocarbon. Groundwater in well ESE1 contained the highest concentrations of TEPH characterized as dielectric oil (340 µg/l). The groundwater sample from well ESE2 contained TEPH as dielectric oil (250 µg/l), benzene (0.8 µg/l), toluene (1.5 µg/l), and xylenes (2.7 µg/l). No PCBs were detected in any of the groundwater samples and wells ESE3 and ESE4 contained no petroleum hydrocarbons above the method detection limit.

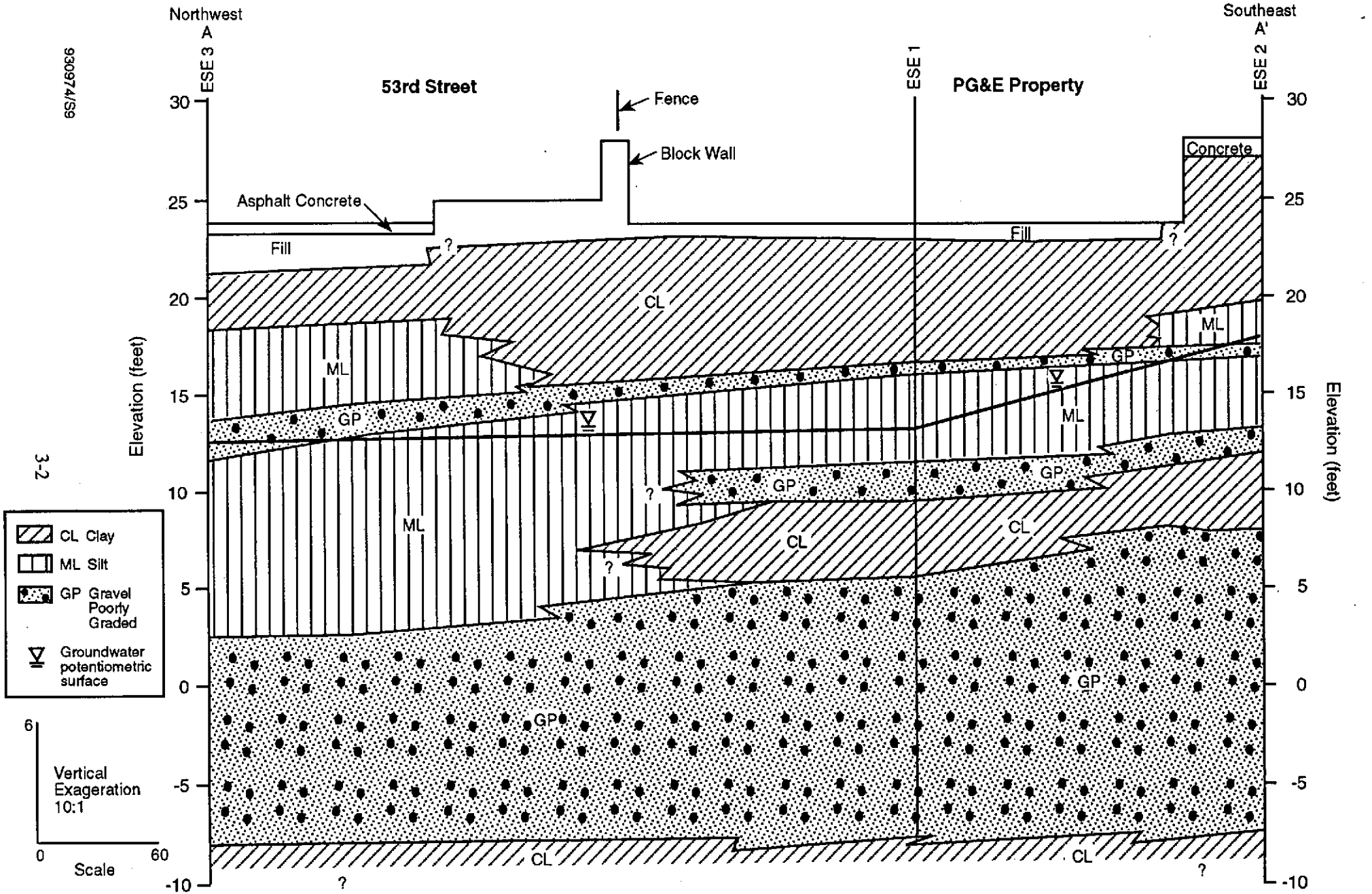


Figure 5. Cross section of subsurface in vicinity of above ground storage tanks at Emeryville Materials Facility.

Table 1

Summary of Groundwater Gradient Data
PG&E's Emeryville Maintenance Facility

Date Measured	Elevations of the Tops of Casings (feet) (feet above Mean Sea Level relative to Site Benchmark)					
	BM	ESE 1	ESE 2	ESE 3	ESE 4	MW4
	28.10	23.66	27.80	23.91	24.33	28.14
		Depth to Groundwater (feet) Below the Top of Casings				
		ESE 1	ESE 2	ESE 3	ESE 4	MW4
4/7/94		10.22	14.37	11.29	10.85	10.71
		Groundwater Elevation (feet above Mean Sea Level relative to Site Benchmark)				
		ESE 1	ESE 2	ESE 3	ESE 4	MW4
4/7/94		13.44	13.43	12.62	13.48	17.43

	Groundwater Flow	
	Direction	Magnitude
4/7/94	N-W	0.02-0.04

Notes:
All depths are in feet.
BM = Benchmark 28.10 feet, surveyed point on wall along 53rd Street.

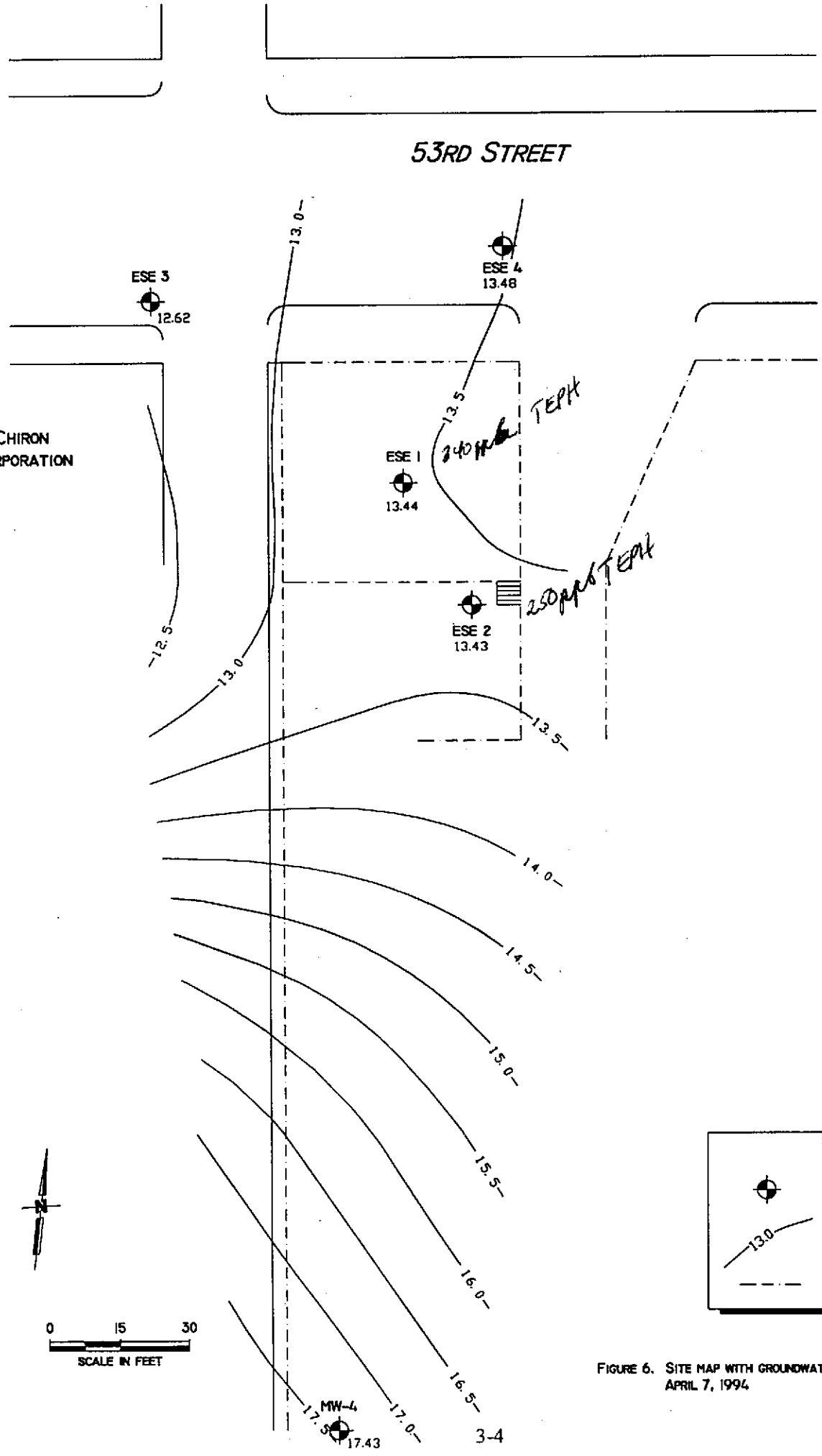


FIGURE 6. SITE MAP WITH GROUNDWATER CONTOURS
APRIL 7, 1994

Table 2

Emeryville Materials Facility
Soil Analytical Data

Sample	PCB* mg/kg	TEPH mg/kg	B ug/kg	T ug/kg	E ug/kg	X ug/kg
ESE 1-5'	<1	270	6	29	<3.0	21
ESE 1-10'	<1	1800*	10	29	3	25
ESE 1-16'	<1	<5	<3.0	<3.0	<3.0	<3.0
ESE 1-19'	<1	<5	<3.0	<3.0	<3.0	<3.0
ESE 2-5'	<1	8	<3.0	<3.0	<3.0	<3.0
ESE 2-9'	<1	2100	9	28	3	21
ESE 2-10'	<1	<5	<3.0	<3.0	<3.0	<3.0
ESE 2-15'	<1	1900	<3.0	<3.0	<3.0	<3.0
ESE 3-5'	<1	<5	<3.0	<3.0	<3.0	<3.0
ESE 3-10'	<1	<5	<3.0	<3.0	<3.0	<3.0
ESE 3-13'	<1	<5	<3.0	<3.0	<3.0	<3.0
ESE 3-19'	<1	<5	<3.0	<3.0	<3.0	<3.0
ESE 4-5'	<1	<5	<3.0	<3.0	<3.0	<3.0
ESE 4-10'	<1	<5	<3.0	<3.0	<3.0	<3.0
ESE 4-15'	<1	<5	<3.0	<3.0	<3.0	<3.0
ESE 4-20'	<1	<5	<3.0	<3.0	<3.0	<3.0

NA = Not Analyzed
< = Quantity is less than the value indicated
PCB = Polychlorinated Biphenyls
TEPH = Total Extractable Petroleum Hydrocarbons
* = All PCBs characterized as Aroclor 1260

Table 3

Emeryville Materials Facility
Groundwater Analytical Data

Sample	PCB ug/l	TEPH ug/l	B ug/l	T ug/l	E ug/l	X ug/l
ESE 1	<1	340	<0.3	<0.3	<0.3	<0.3
ESE 2	<1	250	0.8	1.5	<0.3	2.7
ESE 3	<1	<50	<0.3	<0.3	<0.3	<0.3
ESE 4	<1	<50	<0.3	<0.3	<0.3	<0.3
Trip BL	<1	<50	<0.3	<0.3	<0.3	<0.3

NA = Not Analyzed
< = Quantity is less than the value indicated
PCB = Polychlorinated Biphenyls
TEPH = Total Extractable Petroleum Hydrocarbons (quantified as dielectric oil)

Section 4

CONCLUSIONS

The following conclusions are drawn from the investigation of PG&E's Emeryville Materials Facility:

- The site is underlain by silt and clay with small lenses of gravel to a depth of 18-20 feet. Gravel underlies the silt and clay ranging in thickness from 15 to 18 feet.
- Groundwater beneath the site exists under confining conditions at depths from 10 to 11.8 feet below the surface.
- Groundwater beneath the site generally flows north with a gradient of 0.04 ft/ft. In the vicinity of the tank farm it flows west with a gradient of 0.02 ft/ft.
- PCBs were not reported in soil or groundwater.
- TEPH as dielectric oil are present in soil from boring ESE1 and ESE2 at concentrations up to 2,100 mg/kg (ESE2, 9 feet). TEPH as dielectric oil is also present in groundwater in wells ESE1 and ESE2 up to a concentration of 340 µg/l (ESE1).
- Volatile organic compounds as BTEX are present in borings ESE1 and ESE2. Highest concentrations were found in ESE1 from a depth of 10 feet containing benzene (10 µg/kg), toluene (29 µg/kg), ethylbenzene (3 µg/kg), and xylenes (25 µg/kg). Groundwater from well ESE2 contained benzene (0.8 µg/l), toluene (1.5 µg/l) and xylenes (2.7 µg/l).

Section 5

REFERENCES

Radbruch, Dorothy H., 1957, Areal and Engineering Geology of the Oakland West Quadrangle, California, United States Geological Survey Miscellaneous Geologic Investigation Map I–239, USGS, Washington D.C.

United States Geological Survey. 1980 7.5 minute Quadrangle. Oakland West, California.

Ecology & Environment, 1984, Site Investigation of the Pacific Gas & Electric Company Materials Distribution Center in Emeryville, California, San Francisco.

MONITORING WELL LOG

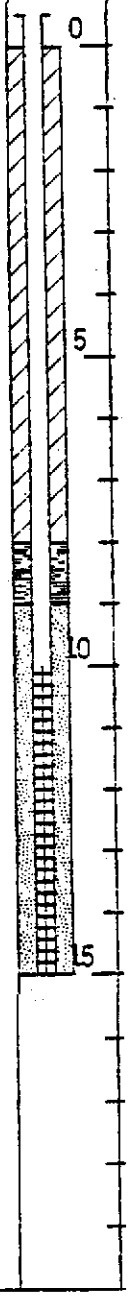
BORING NUMBER MW-4 REF. POINT 18.01 feet above MSL DATE 8/5/83

WELL TYPE Monitoring LOCATION Emeryville Mat. Dist. Center NAME Glenn Smart

DRILL METHOD Hollow Stem Auger/B-80 Rig Block 11-NW corner PAGE 1 OF 1

WATER LEVEL encountered _____ while drilling _____ final _____

DEPTH IN FEET	LITH COL	SAMPLE	LITHOLOGIC DESCRIPTION	OBSERVATIONS
0				3 ppm background HNU
			1-1.5' black gravelly clay fill	
			1.5-2.5' yellowish brown sandy clay	augered to 5'
5			5-5.3' black gravelly clay	
			5.3-5.5' brown coarse sand	
			5.5-6.5' dark brown silty sand	augered to 10'
10			10-10.5' dark brown silty clayey gravel	
			10.5-11.5' grayish brown silty clay with some pebbles and oxidized zones	augered to 15'
15			15-16.3' yellowish brown fine sandy clay with trace of pebbles	



WELL DESIGN

Environmental Science & Engineering, Inc.

A GILCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

ESE1

Page 1 of 1

WELL COMPLETION

Completion Depth: 31.5 Feet

	Size/Type	From	To
Casing:	2" Diam. Blank PVC	0 Feet	18.0 Feet
Screen:	2" Diam. Slotted (0.020") PVC	18.0 Feet	31.5 Feet
Filter:	#2/12 Sand	17 Feet	31.5 Feet
Seal:	Bentonite Pellets	16 Feet	17.0 Feet
	Grout	0.5 Feet	16.0 Feet

Well Cap or Box: 7-inch steel Morrison, (1/2-inch bolts)

Project Name: PG&E - Emeryville Project No: 6-94-5225

Location: PG&E Materials Facility
4525 Hollis Street
Emeryville, California

Driller: Gregg Drilling, Inc.
Method: Simco 2400 Hollow-Stem Auger
Hole Diameter: 10 Inches Total Depth: 32.0 Feet
Ref. Elevations:
Logged By: Bart Miller

Dates:
Start: 3-21-94
Finish: 3-21-94

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
0	FILL, gravel to depth of approx. 6 inches.						START 9:19
	FORMATIONAL SEDIMENTS					0	
	SILTY CLAY, black, slightly moist, moderate plasticity, petroleum hydrocarbon odor.	CL					
	As above, greenish at 3.5-4.0 feet.						
5						4.0	SAMPLE 9:36
	SANDY GRAVEL, green, petroleum hydrocarbon odor, possible buried fill(?).	GP					
	SANDY SILT, mottled greyish-brown, slightly moist, low plasticity, no odor.	ML					
10						3.5	SAMPLE 9:47
						0.2	SAMPLE 9:51
	GRAVEL, silty sand matrix, mottled reddish-brown and grey, slightly moist, no odor.	GP				0.2	SAMPLE 9:56
	SILTY CLAY, mottled grey-brown, slightly moist, moderate plasticity, no odor.	CL				0.2	SAMPLE 10:03
15						0.4	SAMPLE 10:08
						0.5	SAMPLE 10:14
	SANDY GRAVEL, brown with reddish brown zones, wet, friable, coarse sand, no odor.	GP					Water saturation
20							
25							
30	CLAY, blue-grey, dry, moderate plasticity, no odor.	CL					
35							

REGISTERED GEOLOGIST
MICHAEL E. QUILLIN
#5315
STATE OF CALIFORNIA

Environmental Science & Engineering, Inc.
A CH2M HILL Company

BORING LOG AND WELL COMPLETION SUMMARY

ESE2

Page 1 of 1

WELL COMPLETION

Completion Depth: 35 Feet

	Size/Type	From	To
Casing:	2" Diam. Blank PVC	1.0 Feet	20.0 Feet
Screen:	2" Diam. Slotted (0.020") PVC	20.0 Feet	35.0 Feet
Filter:	#2/12 Sand	19.0 Feet	35.0 Feet
Seal:	Bentonite Pellets	17.0 Feet	19.0 Feet
	Grout	1.0 Feet	17.0 Feet

Well Cap or Box: 7-inch steel Morrison, (1/2-inch bolts)

Project Name: PG&E - Emeryville Project No: 6-94-5225

Location: PG&E Materials Facility
4525 Hollis Street
Emeryville, California

Driller: Gregg Drilling, Inc.
Method: Simco 2400 Hollow-Stem Auger
Hole Diameter: 10 Inches Total Depth: 35.0 Feet
Ref. Elevations:
Logged By: Bart Miller

Dates:
Start: 3-21-94
Finish: 3-22-94

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
							START 16:25
0	CONCRETE						
	FORMATIONAL SEDIMENTS						
	SILTY CLAY, black, dry, moderate plasticity, no odor.	CL					
5						0	SAMPLE 16:32
	SANDY SILT, grey, wet, low plasticity, petroleum hydrocarbon odor, sheen on sampling tool.	ML					Small perched zone with water and product
10						0.4	SAMPLE 16:40
	GRAVEL, sand matrix, mottled reddish-brown and grey, dry, no odor.	GP					
		ML					
15	GRAVEL, silty sand matrix, brown and grey, wet, petroleum hydrocarbon odor, sheen on sampling tool.	GP				0	SAMPLE 16:52
	SILTY CLAY, mottled grey brown, slightly moist, moderate plasticity, no odor.	CL					
20	SANDY GRAVEL, brown with reddish zones, wet, friable, minor petroleum hydrocarbon odor.	GP				0	SAMPLE 17:06
							Water saturation
25							
30							
35	CLAY, blue-grey, dry, moderate plasticity, no odor.	CL					

REGISTERED GEOLOGIST
MICHAEL E. QUILLIN
#5315
STATE OF CALIFORNIA

Environmental Science & Engineering, Inc.
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BORING LOG AND WELL COMPLETION SUMMARY

ESE3

Page 1 of 1

WELL COMPLETION

Completion Depth: 31.5 Feet

	Size/Type	From	To
Casing:	2" Diam. Blank PVC	1.0 Feet	18.0 Feet
Screen:	2" Diam. Slotted (0.020") PVC	18.0 Feet	31.5 Feet
Filter:	#2/12 Sand	17.0 Feet	31.5 Feet
Seal:	Bentonite Pellets	16.0 Feet	17.0 Feet
	Grout	1.0 Feet	16.0 Feet

Well Cap or Box: 7-inch steel Morrison, (1/2-inch bolts)

Project Name: PG&E - Emeryville Project No: 6-94-5225

Location: PG&E Materials Facility
4525 Hollis Street
Emeryville, California

Driller: Gregg Drilling, Inc.
Method: Mobile B-53 Hollow-Stem Auger
Hole Diameter: 10 inches Total Depth: 31.5 Feet
Ref. Elevations:
Logged By: Bart Miller

Dates:
Start: 3-22-94
Finish: 3-22-94

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology / Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
						START 8:25
0	ASPHALT					
	FILL, coarse gravel with minor sand matrix, dry, no odor.					
	FORMATIONAL SEDIMENTS					
	SILTY CLAY, brown, dry, moderate plasticity, no odor.	CL				
5			5		0	SAMPLE 8:48
	SANDY SILT, reddish-brown, dry, low plasticity, no odor.	ML	10 12			
10	GRAVEL, sand matrix, mottled reddish-brown, slightly moist, no odor.	GP	8 9 17		0.4	SAMPLE 8:56
	SANDY SILT, reddish-brown with grey, slightly moist, low plasticity, no odor.	ML	11 12 14		0.5	SAMPLE 9:05
15						
	As above.		7 8 12		0.7	SAMPLE 9:21
20			5 8 9		0.9	SAMPLE 9:29
	SANDY GRAVEL, brown with reddish-brown zones, wet, friable, coarse sand, no odor.	GP				Water saturation
25						
30			11 14			
	CLAY, blue-grey, dry, moderate plasticity, no odor.	CL	17			
35						

REGISTERED GEOLOGIST
MICHAEL E. QUILLIN
#5315
STATE OF CALIFORNIA

Environmental Science & Engineering, Inc.
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BORING LOG AND WELL COMPLETION SUMMARY

ESE4

Page 1 of 1

WELL COMPLETION

Completion Depth: 31.5 Feet

	Size/Type	From	To
Casing:	2" Diam. Blank PVC	1.0 Feet	18.0 Feet
Screen:	2" Diam. Slotted (0.020") PVC	18.0 Feet	31.5 Feet
Filter:	#2/12 Sand	17.0 Feet	31.5 Feet
Seal:	Bentonite Pellets	16.0 Feet	17.0 Feet
	Grout	1.0 Feet	16.0 Feet

Well Cap or Box: 7-inch steel Morrison, (1/2-inch bolts)

Project Name: PG&E - Emeryville Project No: 6-94-5225

Location: PG&E Materials Facility
4525 Hollis Street
Emeryville, California

Driller: Gregg Drilling, Inc.
Method: Mobile B-53 Hollow-Stem Auger
Hole Diameter: 10 Inches Total Depth: 31.5 Feet
Ref. Elevations:
Logged By: Bart Miller

Dates:
Start: 3-22-94
Finish: 3-22-94

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
0	ASPHALT CONCRETE FILL, coarse gravel with minor sand matrix, dry, no odor.						START 12:38
	FORMATIONAL SEDIMENTS SILTY CLAY, black and brown, dry, moderate plasticity, no odor.	CL					
5	SANDY GRAVEL, mottled reddish-brown, dry, no odor.	GP	9 7 13			4.1	SAMPLE 12:48
	SANDY SILT, mottled greyish-brown, slightly moist, no odor.	ML					
10	GRAVEL, silty sand matrix, mottled reddish-brown with grey, slightly moist, no odor.	GP	18 19 29			1.9	SAMPLE 12:59
	SILTY CLAY, mottled grey and brown, dry, moderate plasticity, no odor.	CL					
15			4 6 7			1.0	SAMPLE 13:07
20	SANDY GRAVEL, brown with reddish-brown zones, wet, friable, coarse sand, no odor.	GP	21 23 27			1.5	SAMPLE 13:15 Water saturation
25							
30	CLAY, blue-grey, dry, moderate plasticity, no odor.	CL	13				
35							

REGISTERED GEOLOGIST
MICHAEL E. QUILLIN
#5315
STATE OF CALIFORNIA

Environmental Science & Engineering, Inc.
A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: PG&E - EMERYVILLE
PROJECT NO.: 6-94-5225
DATE: 3-28-94

SAMPLE LOCATION I.D.: ESE-1
SAMPLER: CHRIS VALCHEFF
PROJECT MANAGER: MIKE OVILLA

CASING DIAMETER

2" X
4" ____
Other ____

SAMPLE TYPE

Ground Water X
Surface Water ____
Treat. Influent ____
Treat. Effluent ____
Other ____

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: - (ft.)
DEPTH TO WATER: 10.06 (ft.)
DEPTH OF WELL: 30.98 (ft.)

PRODUCT THICKNESS: - (ft.)
WATER COLUMN: 20.92 (ft.)
WELL CASING VOLUME: 3.41 (gal)

MINIMUM PURGE VOLUME (3 or 4 WCV): 10.24 (gal)
ACTUAL VOLUME PURGED: 10.50 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (X1000 Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
1050	0	8.77	0.75	66.9	-	BROWN/SILTY
1120	4.00	8.90	0.62	72.8	-	"
1150	8.00	8.58	0.57	69.1	-	"
1206	10.00	8.48	0.60	73.1	-	"

INSTRUMENT CALIBRATION

pH/COND./TEMP.:	TYPE	H4OAC	UNIT#	93086	DATE:	3-28-94	TIME: 1030	BY: CHV
TURBIDITY:	TYPE	____	UNIT#	____	DATE:	____	TIME: ____	BY: ____

PURGE METHOD

___Displacement Pump
___Bailer (Teflon/PVC/SS)
X Other DISPOSABLE BAILER
___Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS)
X Bailer (Disposable)
___Dedicated
___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	ESE-1	13:30	3-28-94		
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS: ____

SAMPLER: [signature] PROJECT MANAGER ____

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SAMPLE COLLECTION LOG

PROJECT NAME: PG&E - Emeryville
PROJECT NO.: 6-94-5225
DATE: 3-28-94

SAMPLE LOCATION I.D.: ESE-2
SAMPLER: CHRIS VALCHEFF
PROJECT MANAGER: MIKE GUILLEN

CASING DIAMETER

2" X
4" ____
Other ____

SAMPLE TYPE

Ground Water X
Surface Water ____
Treat. Influent ____
Treat. Effluent ____
Other ____

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
(2.0)	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: SHEEN (ft.) PRODUCT THICKNESS: SHEEN (ft.) MINIMUM PURGE VOLUME
DEPTH TO WATER: 10.13 (ft.) WATER COLUMN: 24.10 (ft.) (3) or 4 WCV): 11.80 (gal)
DEPTH OF WELL: 34.23 (ft.) WELL CASING VOLUME: 3.93 (gal) ACTUAL VOLUME PURGED: 13 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. X1000 (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
~~1030~~	~~0~~	~~8.77~~	~~0.75~~	~~66.4~~	—	SHEEN/SLIGHT
13:29	0	8.02	0.73	66.7	—	
13:30	2	7.86	0.60	67.0		
13:31	4	7.71	0.60	67.2		
13:33	8	7.67	0.58	67.5		

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE HYDAC UNIT# 9308B DATE: 3-28-94 TIME: 1030 BY: CHV
TURBIDITY: TYPE ____ UNIT# ____ DATE: ____ TIME: ____ BY: ____

PURGE METHOD

___Displacement Pump ___Other
___Bailer (Teflon/PVC/SS) X Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS) ___Dedicated
X Bailer (Disposable) ___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	ESE-2	1400	3-28-94		
DUPLICATE	DUP	1400	3-28-94		
SPLIT					
FIELD BLANK					

COMMENTS: INTERFACE PROBE REGISTERED PRODUCT BUT <0.01 FT. THICK

SAMPLER: [signature] PROJECT MANAGER

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SAMPLE COLLECTION LOG

PROJECT NAME: PG&E - GREENVILLE
PROJECT NO.: 6-94-5225
DATE: 3-28-94

SAMPLE LOCATION I.D.: ESE-3
SAMPLER: CHRIS VALCHEFF
PROJECT MANAGER: MIKE GAILLIN

CASING DIAMETER

2" X
4"
Other

SAMPLE TYPE

Ground Water X
Surface Water
Treat. Influent
Treat. Effluent
Other

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: — (ft.)
DEPTH TO WATER: 11.23 (ft.)
DEPTH OF WELL: 30.85 (ft.)

PRODUCT THICKNESS: — (ft.)
WATER COLUMN: 19.62 (ft.)
WELL CASING VOLUME: 3.20 (gal)

MINIMUM PURGE VOLUME (3 or 4 WCV): 9.6 (gal)
ACTUAL VOLUME PURGED: 15.0 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
12:18	0	8.52	0.66	69.3	—	
12:20	3	8.15	0.60	68.3		
12:21	6	8.08	0.60	68.2		
12:24	10	7.97	0.61	68.7		

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE HYDAC UNIT# 93086 DATE: 3-28-94 TIME: 1030 BY: CHV
TURBIDITY: TYPE ____ UNIT# ____ DATE: ____ TIME: ____ BY: ____

PURGE METHOD

___Displacement Pump ___Other
___Bailer (Teflon/PVC/SS) X Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS) ___Dedicated
X Bailer (Disposable) ___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	ESE-3	1230	3-28-94		
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS:

SAMPLER: _____ PROJECT MANAGER _____

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SAMPLE COLLECTION LOG

PROJECT NAME: PG&E Guernsville
PROJECT NO.: 6-94-5225
DATE: 3-28-94

SAMPLE LOCATION I.D.: ESE-4
SAMPLER: CHRIS VALCHEFF
PROJECT MANAGER: MIKE QUINN

CASING DIAMETER

2" +
4"
Other

SAMPLE TYPE

Ground Water X
Surface Water
Treat. Influent
Treat. Effluent
Other

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: — (ft.)
DEPTH TO WATER: 10.63 (ft.)
DEPTH OF WELL: 31.41 (ft.)

PRODUCT THICKNESS: — (ft.)
WATER COLUMN: 20.78 (ft.)
WELL CASING VOLUME: 3.39 (gal)

MINIMUM PURGE VOLUME
(3 or 4 WCV): 10.17 (gal)
ACTUAL VOLUME PURGED: (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
12:50	Ø	8.29	~~Ø.62~~	70.3	—	
12:52	4	8.00	Ø.57	68.Ø	—	
12:53	6	7.94	Ø.56	67.1	—	
12:54	8	7.83	Ø.55	66.5	—	
12:55	1Ø	7.77	Ø.61	66.3	—	

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE H4DAC UNIT# 9308B DATE: 3-28-94 TIME: 1030 BY: CHV
TURBIDITY: TYPE ____ UNIT# ____ DATE: ____ TIME: ____ BY: ____

PURGE METHOD

___Displacement Pump ___Other
___Bailer (Teflon/PVC/SS) X Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS) ___Dedicated
X Bailer (Disposable) ___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	ESE-4	1300	3-28-94		
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS:

SAMPLER: CHV PROJECT MANAGER

4090 Nelson Avenue, Suite J Concord, CA 94520 Phone (510) 685-4053 Fax (510) 685-5323

Appendix C

ANALYTICAL DATA SHEETS AND CHAIN-OF-CUSTODY FORMS

Sherwood Labs
CORPORATION

8071 NORTH LANDER AVENUE
P.O. BOX 937
HILMAR, CALIFORNIA 95324

03/28/94 DHS Certification #: 1400

ANALYSIS REPORT: BTEX/Total Petroleum Hydrocarbons as Gasoline

CLIENT: Pacific Gas & Electric
3400 Crow Canyon Road
San Ramon, CA 94583
Attn: Fred Flint

Job Number: 6-94-5225
Sampled By: Bart Miller

Date Sampled: 03/22/94
Date Received: 03/23/94
Date Started: 03/23/94
Date Completed: 03/27/94

Lab Report #: H4032325

RESULTS:

	BTEX EPA 8020 ug/Kg			
	Benzene,	Toluene,	Ethyl Benzene,	Total Xylene
PH4033620 ESE 1-5'	6	29	ND<3.0	21
PH4033621 ESE 1-10'	10	29	3	25
PH4033622 ESE 1-16'	ND<3.0	ND<3.0	ND<3.0	ND<3.0
PH4033623 ESE 1-19'	ND<3.0	ND<3.0	ND<3.0	ND<3.0
PH4033624 ESE 2-5'	ND<3.0	ND<3.0	ND<3.0	ND<3.0
PH4033625 ESE 2-9'	9	28	3	21
PH4033626 ESE 2-10'	ND<3.0	ND<3.0	ND<3.0	ND<3.0
PH4033627 ESE 2-15'	ND<3.0	ND<3.0	ND<3.0	ND<3.0

Paul Freehauf
Laboratory Director

Sherwood Labs
CORPORATION

8071 NORTH LANDER AVENUE
P.O. BOX 937
HILMAR, CALIFORNIA 95324

03/28/94 DHS Certification #: 1400

ANALYSIS REPORT: BTEX/Total Petroleum Hydrocarbons as Gasoline

CLIENT: Pacific Gas & Electric
3400 Crow Canyon Road
San Ramon, CA 94583
Attn: Fred Flint

Job Number: 6-94-5225
Sampled By: Bart Miller

Date Sampled: 03/22/94
Date Received: 03/23/94
Date Started: 03/23/94
Date Completed: 03/27/94

Lab Report #: H4032325

RESULTS:

	BTEX EPA 8020 ug/Kg			
	Benzene,	Toluene,	Ethyl Benzene,	Total Xylene
PH4033628 ESE 3-5'	ND<3.0	ND<3.0	ND<3.0	ND<3.0
PH4033629 ESE 3-10'	ND<3.0	ND<3.0	ND<3.0	ND<3.0
PH4033630 ESE 3-13'	ND<3.0	ND<3.0	ND<3.0	ND<3.0
PH4033631 ESE 3-19'	ND<3.0	ND<3.0	ND<3.0	ND<3.0
PH4033632 ESE 4-5'	ND<3.0	ND<3.0	ND<3.0	ND<3.0
PH4033633 ESE 4-10'	ND<3.0	ND<3.0	ND<3.0	ND<3.0
PH4033634 ESE 4-15'	ND<3.0	ND<3.0	ND<3.0	ND<3.0
PH4033635 ESE 4-20'	ND<3.0	ND<3.0	ND<3.0	ND<3.0

Paul Freehauf
Laboratory Director

Sherwood Labs
CORPORATION

8071 NORTH LANDER AVENUE
P.O. BOX 937
HILMAR, CALIFORNIA 95324

003/28/94 DHS Certification #: 1400

ANALYSIS REPORT: Total Recoverable Petro. Hydrocarbons

CLIENT: Pacific Gas & Electric
3400 Crow Canyon Road
San Ramon, CA 94583
Attn: Bart Miller

Project Name: P G & E/Emeryville
Emeryville, CA

Date Received: 03/23/94
Date Started: 03/23/94
Date Completed 02/27/94

Sampled By: Bart Miller

Date Taken : 03/22/94

Lab Report #: H4032325

RESULTS: TRPH-Diesel, Kerosene, Dielectric and Motor Oils
EPA 3540/8015(M)
mg/Kg

PH4033628 ESE 3-5'	ND<5 All Analytes
PH4033629 ESE 3-10'	ND<5 All Analytes
PH4033630 ESE 3-13'	ND<5 All Analytes
PH4033631 ESE 3-19'	ND<5 All Analytes
PH4033632 ESE 4-5'	ND<5 All Analytes
PH4033633 ESE 4-10'	ND<5 All Analytes
PH4033634 ESE 4-15'	ND<5 All Analytes
PH4033635 ESE 4-20'	ND<5 All Analytes

Paul Freehauf
Laboratory Director

Sherwood Labs
CORPORATION

8071 NORTH LANDER AVENUE
P.O. BOX 937
HILMAR, CALIFORNIA 95324

03/28/94 DHS Certification #: 1400

ANALYSIS REPORT: Total Recoverable Petro. Hydrocarbons

CLIENT: Pacific Gas & Electric
3400 Crow Canyon Road
San Ramon, CA 94583
Attn: Bart Miller

Project Name: P G & E/Emeryville
Emeryville, CA

Date Received: 03/23/94
Date Started: 03/23/94
Date Completed 02/27/94

Sampled By: Bart Miller

Date Taken : 03/22/94

Lab Report #: H4032325

RESULTS: TRPH-Diesel, Kerosene, Dielectric and Motor Oils
EPA 3540/8015(M)
mg/Kg

PH4033620 ESE 1-5'	270 Dielectric Oil
PH4033621 ESE 1-10'	1800 Dielectric Oil
PH4033622 ESE 1-16'	ND<5.0
PH4033623 ESE 1-19'	ND<5.0
PH4033624 ESE 2-5'	8 Dielectric Oil
PH4033625 ESE 2-9'	2100 Dielectric Oil
PH4033626 ESE 2-10'	ND<5.0
PH4033627 ESE 2-15'	1900 Dieletric Oil

Paul Freehauf
Laboratory Director

SHERWOOD LABS, INC TEST REPORT #6 03/28/94

S0446
PACIFIC GAS & ELEC-SAN RAMON
3400 CROW CANYON ROAD
SAN RAMON, CA 94583
ATTN: FRED FLINT

SHERWOOD LABS, INC
8071 N. LANDER AVENUE
HILMAR, CA 95324-
PAUL FREEHAUF, CHEMIST
DATE RCVD: 03/23/94

Lab Report #: H4032324 Lot# 6-94-5225 PO Number: ZS-2746-202

Below is a listing of the samples received on 03/23/94 together with the laboratory results on their respective PCB content. Please contact the lab at 209-667-5258 if you have any questions regarding these sample results.

SWL NUM	SERIAL NO.	COMPANY ID.	AROCLOR	RESULTS	TYPE
PH4033612		ESE 3-5'		ND	SOIL
PH4033613		ESE 3-10'		ND	SOIL
PH4033614		ESE 3-13'		ND	SOIL
PH4033615		ESE 3-19'		ND	SOIL
PH4033616		ESE 4-5'		ND	SOIL
PH4033617		ESE 4-10'		ND	SOIL
PH4033618		ESE 4-15'		ND	SOIL
PH4033619		ESE 4-20'		ND	SOIL

The following table shows the methods and detection limits used, all tests use EPA Method 600/4-81-045.

TEST	EXTRACTION METHOD	LOWER DET. LIMIT	DIMENSIONS	TEST EQUIPMENT
OIL	NA	<1	PARTS PER MILLION	GC
SOIL	8080/3540	<1	MICROGRAMS/GRAM	SOXHLET/GC
WIPE	8080/3540	<1	MICROGRAMS/100 SQ CM	SOXHLET/GC

Paul Freehauf

SHERWOOD LABS, INC TEST REPORT #6 05/10/94

S0446
PACIFIC GAS & ELEC-SAN RAMON
3400 CROW CANYON ROAD
SAN RAMON, CA 94583
ATTN: FRED FLINT

SHERWOOD LABS, INC
8071 N. LANDER AVENUE
HILMAR, CA 95324-
PAUL FREEHAUF, CHEMIST
DATE RCVD: 03/23/94

Lab Report #: H4032323 Lot# 6-94-5225 PO Number: ZS-2746-202

Below is a listing of the samples received on 03/23/94 together with the laboratory results on their respective PCB content. Please contact the lab at 209-667-5258 if you have any questions regarding these sample results.

SWL NUM	SERIAL NO.	COMPANY ID.	AROCLOR	RESULTS	TYPE
PH4033604		ESE 1-5'	1260	ND	SOIL
PH4033605		ESE 1-10'	1260	ND	SOIL
PH4033606		ESE 1-16'		ND	SOIL
PH4033607		ESE 1-19'		ND	SOIL
PH4033608		ESE 2-5'		ND	SOIL
PH4033609		ESE 2-9'		ND	SOIL
PH4033610		ESE 2-10'		ND	SOIL
PH4033611		ESE 2-15'	1260	ND	SOIL

The following table shows the methods and detection limits used, all tests use EPA Method 600/4-81-045.

TEST	EXTRACTION METHOD	LOWER DET. LIMIT	DIMENSIONS	TEST EQUIPMENT
OIL	NA	<1	PARTS PER MILLION	GC
SOIL	8080/3540	<1	MICROGRAMS/GRAM	SOXHLET/GC
WIPE	8080/3540	<1	MICROGRAMS/100 SQ CM	SOXHLET/GC

Pat Freehauf

CHAIN OF CUSTODY RECORD

Environmental Science & Engineering, Inc.
A CILCORP Company
4090 Nelson Avenue
Suite J
Concord, CA 94520
Phone (510) 685-4053
Fax (510) 685-5323

DATE March 22, 1994 PAGE 1 OF 1

PROJECT NAME PG:E / EMERYVILLE

ADDRESS EMERYVILLE MATERIALS FACILITY
EMERYVILLE, CALIFORNIA

PROJECT NO. 6-94-5225

SAMPLED BY [signature] BART MILLER

LAB NAME SHERWOOD LABS

ANALYSES TO BE PERFORMED

SAMPLE #	DATE	TIME	LOCATION	TEPH EPA 3510/8015	PCBs EPA 8080	BTEX EPA 601								MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
ESE3-5'	3/22/94	8:48	53rd St.	✓	✓									SOIL	1	
ESE3-10'	"	8:56	"	✓	✓									"	1	
ESE3-13'	"	9:05	"	✓	✓									"	1	
ESE3-19'	"	9:21	"	✓	✓	✓								"	1	
ESE4-5'	"	12:48	"	✓	✓									"	1	
ESE4-10'	"	12:59	"	✓	✓									"	1	
ESE4-15'	"	13:07	"	✓	✓									"	1	
ESE4-20'	"	13:15	"	✓	✓	✓								"	1	

TOTAL NUMBER OF CONTAINERS: 8

RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1. [signature]	William R Berry Jr	3-22-94	13:45
2. [signature]	Joe V. [illegible] Jr.	3-23-94	9:00A
3.			
4.			
5.			

REPORT RESULTS TO:
FRED FLINT
PG:E
3400 CROW CANYON RD.
SAN RAMON, CA
(510) 866-5808

SPECIAL SHIPMENT REQUIREMENTS
COLD TRANSPORT

SAMPLE RECEIPT	
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):
5-day TAT. Call Fred Flint (Project Manager) at 510-866-5808 with questions.

CHAIN OF CUSTODY RECORD

DATE MARCH 21 1994 PAGE 1 OF 1

PROJECT NAME PG:E EMERYVILLE

ADDRESS EMERYVILLE MATERIALS FACILITY
EMERYVILLE, CALIFORNIA

PROJECT NO. 6-94-5225

SAMPLED BY BART MILLER

LAB NAME SHERWOOD LABS

ESE Environmental Science & Engineering, Inc.
A CILCORP Company
4090 Nelson Avenue
Suite J
Concord, CA 94520
Phone (510) 685-4053
Fax (510) 685-5323

SAMPLE #	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: TEPH EPA 3510/8015	PCBs EPA 8080	BTEX EPA 601	MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
ESE1-5'	3/21/94	9:36	FORMER AST LOCATION	✓	✓		SOIL	1	
ESE1-10'	"	9:47	"	✓	✓		"	1	
ESE1-12'	"	9:51	"				"	1	HOLD
ESE1-14'	"	9:56	"				"	1	HOLD
ESE1-16'	"	10:03	"	✓	✓		"	1	
ESE1-17'	"	10:08	"				"	1	HOLD
ESE1-19'	"	10:14	"	✓	✓	✓	"	1	
ESE2-5'	"	16:32	FORMER AST DOCK AREA	✓	✓		"	1	
ESE2-9'	"	16:40	"	✓	✓		"	1	
ESE2-10'	"	16:43	"	✓	✓		"	1	
ESE2-15'	"	16:52	"	✓	✓	✓	"	1	

RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1.	R H Eden	3/22/94	7:12 AM
2. R H Eden	Joe V. Prato-Jr	3/22/94	12:35
3.			
4.			
5.			

TOTAL NUMBER OF CONTAINERS: 11

REPORT RESULTS TO:
FRED FLINT
PG:E
3400 CROW CANYON RD.
SAN RAMON, CA
(510) 866-5808

SPECIAL SHIPMENT REQUIREMENTS
COLD TRANSPORT

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):
5-day T.A.T. Call Fred Flint (Project Manager) at 510-866-5808 with questions.

SHERWOOD LABS, INC TEST REPORT #7 04/13/94

S0446
PACIFIC GAS & ELEC-SAN RAMON
3400 CROW CANYON ROAD
SAN RAMON, CA 94583
ATTN: FRED FLINT

SHERWOOD LABS, INC
8071 N. LANDER AVENUE
HILMAR, CA 95324-
PAUL FREEHAUF, CHEMIST
DATE RCVD: 03/31/94

Lab Report #: H4033107 Lot# PO Number: ZS-2746-202

Below is a listing of the samples received on 03/31/94 together with the laboratory results on their respective PCB content. Please contact the lab at 209-667-5258 if you have any questions regarding these sample results.

SAMPLE #	SERIAL NUMBER	AROCLOR	RESULTS	SWL NUM
ESE 1			ND	PH4034921
DESCRIPTION:	WATER MDL <1 PPB EPA METHOD 608			WATER
ESE 2			ND	PH4034922
DESCRIPTION:	WATER MDL <1 PPB EPA METHOD 608			WATER
ESE 3			ND	PH4034923
DESCRIPTION:	WATER MDL <1 PPB EPA METHOD 608			WATER
ESE 4			ND	PH4034924
DESCRIPTION:	WATER MDL <1 PPB EPA METHOD 608			WATER

The following table shows the methods and detection limits used, all tests use EPA Method 600/4-81-045.

Pat Freehauf

TEST	EXTRACTION METHOD	LOWER DET. LIMIT	DIMENSIONS	TEST EQUIPMENT
OIL	NA	<1	PARTS PER MILLION	GC
SOIL	8080/3540	<1	MICROGRAMS/GRAM	SOXHLET/GC
WIPE	8080/3540	<1	MICROGRAMS/100 SQ CM	SOXHLET/GC

Sherwood Labs CORPORATION
8071 NORTH LANDER AVENUE
P.O. BOX 937
HILMAR, CALIFORNIA 95324

4/07/94 DHS Certification #: 1400

ANALYSIS REPORT: BTEX/Total Recoverable Petroleum Hydrocarbons

CLIENT: Pacific Gas & Electric-San Ramon PO #: ZS-2746-202
3400 Crow Canyon RD
San Ramon, CA 94583

Project Name: PG&E Emeryville
4525 Hollis Street
Emeryville, CA

Date Sampled: 3/28/94
Date Received: 3/29/94
Date Started: 3/30/94
Date Completed: 3/31/94

Project #: 6-94-5225

Sampled By: Chris Valcheff

Lab Report #: H4033105

REGULTS	BTEX EPA 602 ug/L				TRPH EPA 3510/8015(M) ug/L
	Benzene,	Toluene,	Ethyl Benzene,	Total Xylene	TRPH
PH4034916 ESE 1	ND<0.3	ND<0.3	ND<0.3	ND<0.3	340 Dielectric Oil
PH4034917 ESE 2	0.8	1.5	ND<0.3	2.7	250 Dielectric Oil
PH4034918 ESE 3	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<50
PH4034919 ESE 4	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<50
PH4034920 Trip BL	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<50

Paul Freehauf
Laboratory Director

H4883105-H4883107

CHAIN OF CUSTODY RECORD

DATE March 28, 1994 PAGE 1 OF 1

PROJECT NAME Rose-Emeryville

ADDRESS 4525 Hollis Street
Emeryville, CA

PROJECT NO. 6-94-5225

SAMPLED BY Chris Valliere

LAB NAME

Environmental Science & Engineering, Inc.
4080 Nelson Avenue Suite J
Concord, CA 94520
Phone (510) 685-4055
Fax (510) 685-6523

SAMPLE #	DATE	TIME	LOCATION	BTEX	PCB's	TPH-418.1	MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
				ANALYSES TO BE PERFORMED			MATRIX		
ESE-1	3-28-94	1330	Emeryville	X	X	X	H2O	4	2 VOAs, 2 LTRs
ESE-2	"	1400	"	X	X	X	"	4	"
ESE-3	"	1230	"	X	X	X	"	4	"
ESE-4	"	1300	"	X	X	X	"	4	"
DUP	"	1400	"				"	4	" HCl
TRIP	"		"	X			"	2	VOA

510-891-5808

RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1.		3/28/94	1400
2.		3/28/94	1330
3.			
4.			
5.			

21 TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO: MIKE QUILLIN

SPECIAL SHIPMENT REQUIREMENTS: COLD TRANSPORT

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS

REC'D GOOD CONDTN/COLD

CONFORMS TO RECORD

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):