Industrial Compliance
9838 Old Placerville Road Suite 100 Sacramento, CA 95827-3559
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3-29-95

FOURTH QUARTER 1994
GROUND WATER MONITORING REPORT

Southern Pacific Transportation Company
5th Avenue and 7th Street
Oakland, California

IC Project No. 05100269

Prepared For:

Southern Pacific Transportation Company
One Market Plaza
San Francisco, CA 94105

March 29, 1995

Industrial Compliance
9838 Old Placerville Road Suite 100 Sacramento, CA 95827-3559
916/369-8971 FAX 916/369-8370

March 29, 1995

IC Project No. 05100269

Ms. Jennifer Eberle
Alameda County Health Care Services Agency
Department of Environmental Health
Division of Hazardous Materials
1131 Harbor Bay Parkway
Alameda, California 94502

VIA REGULAR MAIL

Re: Fourth Quarter 1994 Ground Water Monitoring Report
Southern Pacific Transportation Company
5th Avenue and 7th Street Property – Oakland, California

Dear Ms. Eberle:

Industrial Compliance (IC), on behalf of Southern Pacific Transportation Company (SPTCo), has prepared the attached Fourth Quarter 1994 Ground Water Monitoring Report for the SPTCo property located in the East Oakland Yard at 5th Avenue and 7th Street, Oakland, California.

If you should have any questions regarding this report, please contact either of the undersigned at your earliest convenience at (510) 238-9540 or (916) 369-8971.

Sincerely,

INDUSTRIAL COMPLIANCE

James B. Ackerman
Project Geologist

Richard L. Bateman, R.G.
Principal Hydrogeologist

JBA/RLB/ekw

Attachment

cc: Mr. Mike Grant, Southern Pacific Transportation Company (with attachment)
Mr. Darrell J. Maxey, Oakland Program Office, Southern Pacific Transportation Company (with attachment)
Ms. Gina Kathuria, California Regional Water Quality Control Board, San Francisco Region (with attachment)

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FOURTH QUARTER 1994
GROUND WATER MONITORING REPORT

Southern Pacific Transportation Company
5th Avenue and 7th Street
Oakland, California

Prepared By:

James B. Ackerman
Project Geologist

Reviewed By:

Richard L. Bateman
Principal Hydrogeologist

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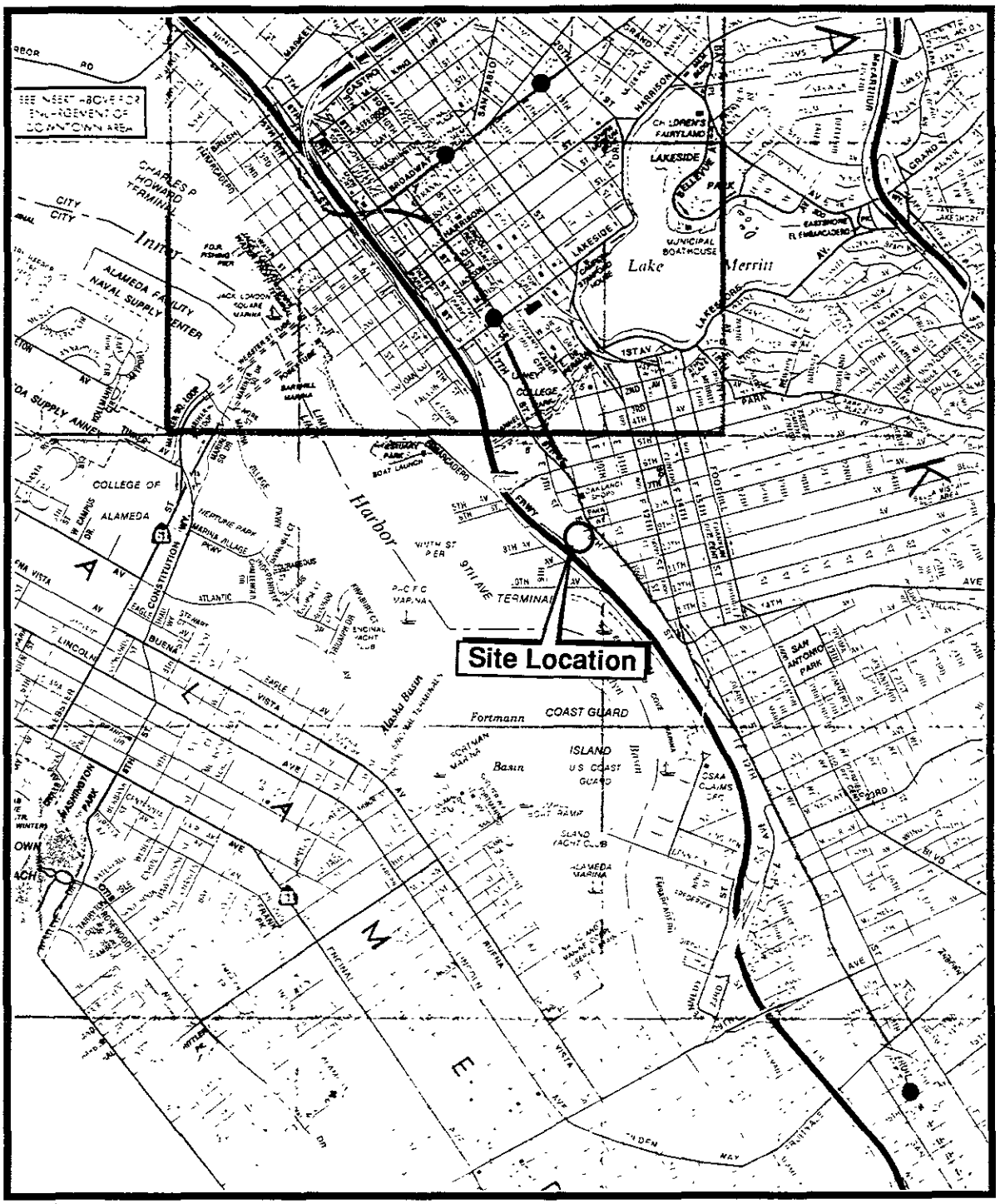
1.0 INTRODUCTION

Industrial Compliance (IC) on behalf of Southern Pacific Transportation Company (SPTCo), is conducting quarterly ground water monitoring at the SPTCo property located on a portion of the East Oakland Yard at 5th Avenue and 7th Street in Oakland, California (Figure 1). The site was formerly the location of four underground fuel storage tanks (Figure 2). Fourth quarter monitoring and sampling activities were performed on November 9 and 10, 1994. This report presents the results of that monitoring event.



Reference
Map of Oakland, Berkeley, Alameda
American Automobile Association

Industrial Compliance A Subsidiary of SP Environmental Systems Inc	SITE LOCATION MAP SOUTHERN PACIFIC TRANSPORTATION COMPANY 5TH AVENUE AND 7TH STREET PROPERTY OAKLAND, CALIFORNIA	Figure 1
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Drawn By Patti Decker / Checked By James Ackerman		

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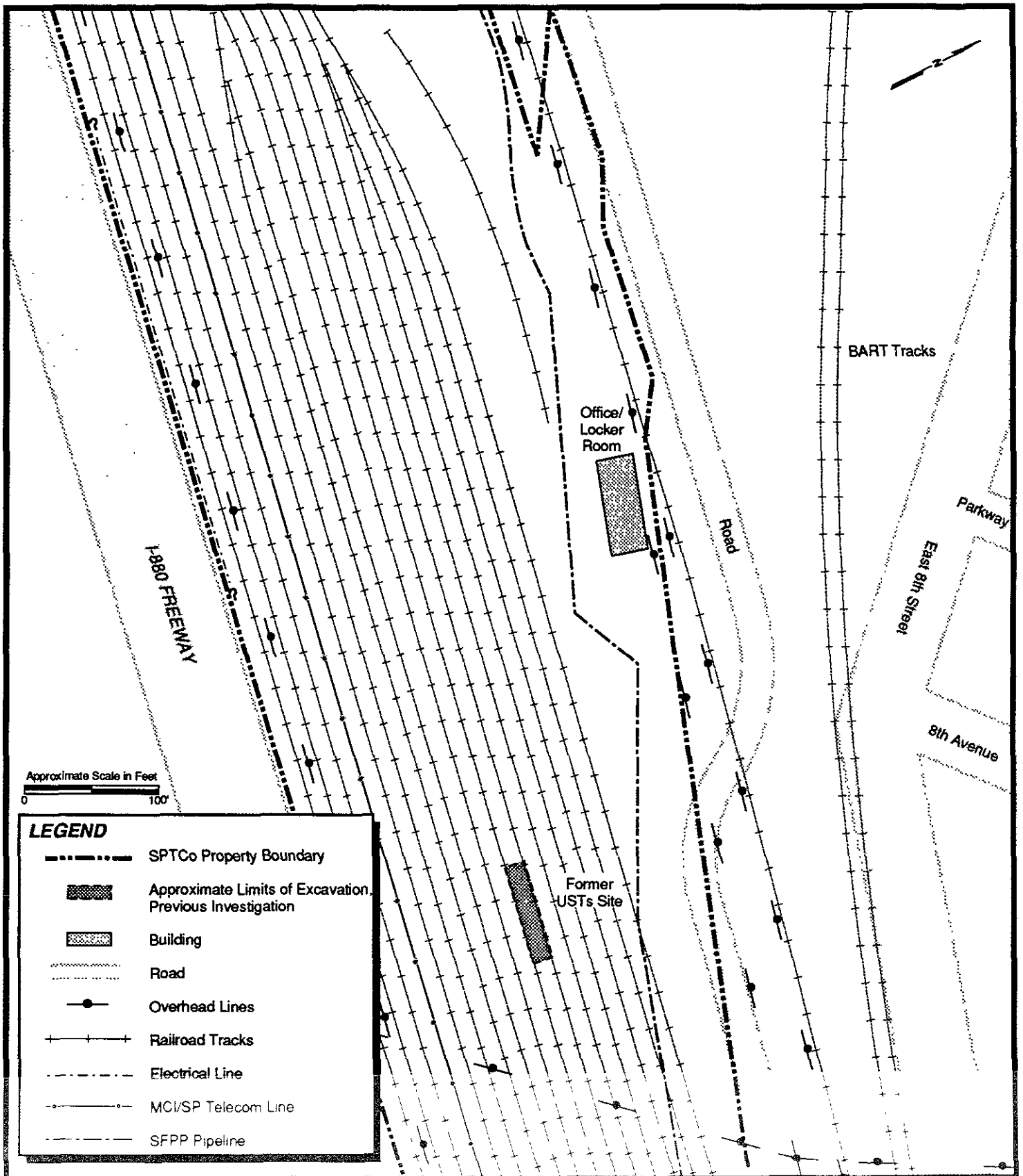

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SITE LAYOUT MAP
SOUTHERN PACIFIC TRANSPORTATION COMPANY
5TH AVENUE AND 7TH STREET PROPERTY
OAKLAND, CALIFORNIA

Figure 2

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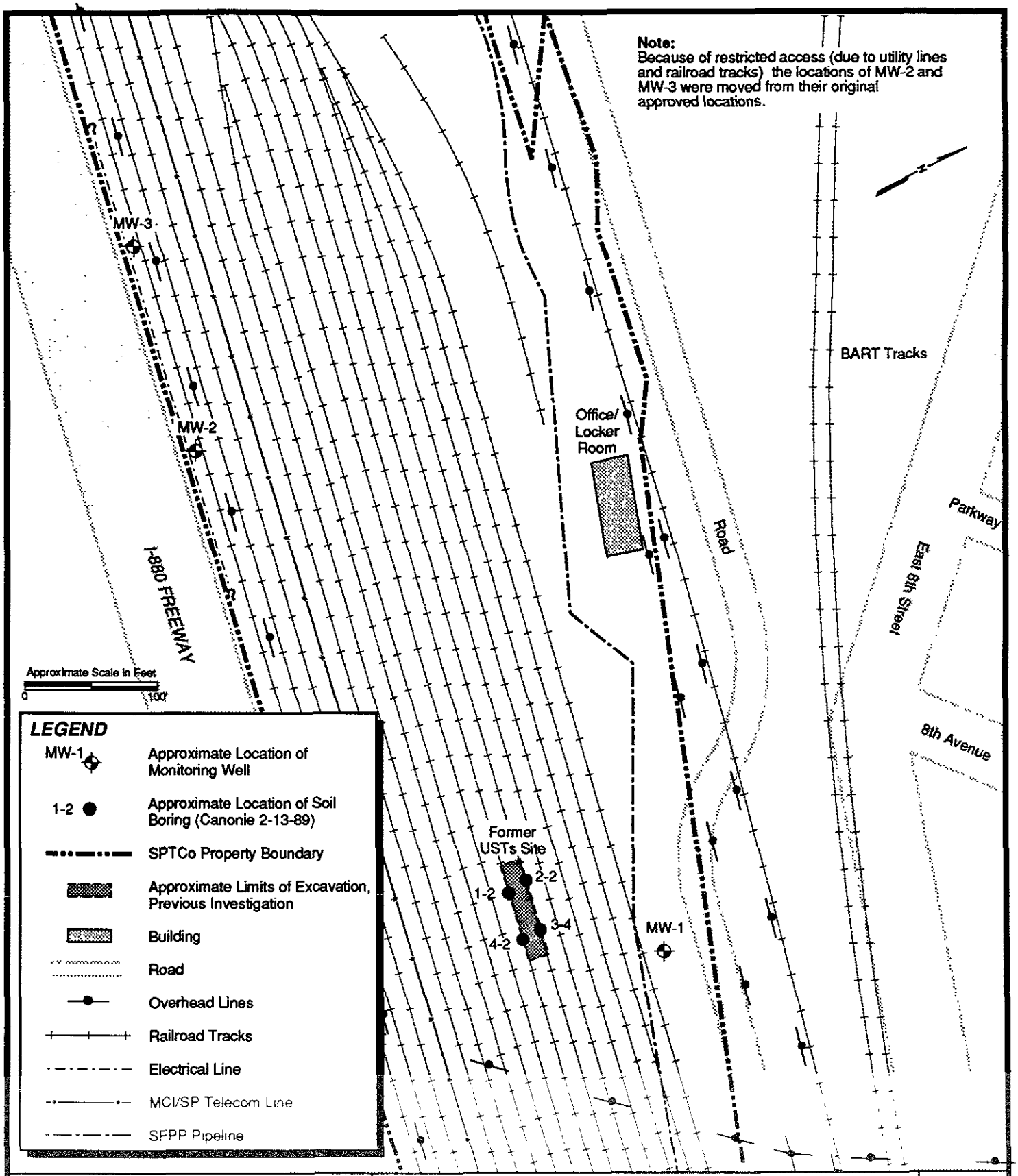
2.0 BACKGROUND

In February, 1989, Canonie Environmental Services Corporation (Canonie) prepared to remove four underground storage tanks (USTs) from the site: two 7,000-gallon diesel USTs (which Canonie referred to as Tanks A and B) and two 7,000-gallon Bunker "C" oil USTs (which Canonie referred to as Tanks C and D). Prior to removal of the USTs, Canonie collected four subsurface soil samples from borings adjacent to the perimeter of the USTs (Figure 3). This preliminary collection of samples was required by Alameda County Health Care Services Agency - Department of Environmental Health, Division of Hazardous Materials (Alameda County) to verify that Canonie's tank removal activities would not further impact the site. Laboratory analyses performed on these soil samples indicated a maximum concentration of total extractable petroleum hydrocarbons (TEPH) of 16,000 parts per million (ppm). The results of these sampling activities were summarized in a Canonie letter report dated February 15, 1989 (letter report entitled: *Soil Sampling Report and Records of Correspondence with Regulatory Agencies, Southern Pacific Transportation Company Railyard, Fifth Avenue and Seventh Street, Oakland, California*).

On February 20, 1989, Canonie began the excavation and removal of the four USTs. Soil was removed from the excavation to a depth of approximately 12 feet below ground surface (bgs). According to the Canonie report, no water entered the excavation in the three days that it remained open. According to the Canonie report, soil in the excavation did not appear impacted (by visual observation). Canonie reported approximately 500 cubic yards (cy) of soil was generated from the UST excavation and was stockpiled on plastic sheeting onsite.

Prior to backfilling the excavation, a total of 12 soil samples were collected from the excavation. Six soil samples were taken from the bottom of the excavation at a depth of 12 feet bgs and six soil samples were taken from 2 feet below the bottom of the excavation (or at 14 feet bgs). Laboratory analyses performed on the soil samples collected at 12 feet bgs



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LOCATION OF SOIL BORINGS AND MONITORING WELLS INSTALLED DURING PREVIOUS SITE INVESTIGATIONS SOUTHERN PACIFIC TRANSPORTATION COMPANY 5TH AVENUE AND 7TH STREET PROPERTY OAKLAND, CALIFORNIA

Figure 3
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identified maximum concentrations of 12 ppm of TEPH and 43 ppm of total recoverable petroleum hydrocarbons (TRPH). The six samples at 12 feet bgs were composited into two samples and analyzed for polychlorinated biphenyls (PCBs). Laboratory analysis did not detect PCBs at or above the method practical quantitation limit. The excavation was backfilled with clean imported fill material. The procedures and results of this work were presented in a Canonie report dated April 3, 1989 (report entitled: *Completion Report, Underground Storage Tank Removal, Southern Pacific Transportation Company Facility, Oakland, California*).

At the request of Alameda County, IC conducted a preliminary site assessment at the site in April, 1994. A total of three soil borings were drilled at the site, which were then converted to monitoring wells (MW-1, MW-2, and MW-3) (Figure 3). Because of restricted access (due to utility lines and railroad tracks), the locations for two of the monitoring wells (MW-2 and MW-3) were moved in a westerly direction from their previously approved location. After a period of approximately nine days these wells were developed, and subsequently sampled six days thereafter. The procedures and results of this work were presented in an IC report dated September 2, 1994 (report entitled: *Soil and Ground Water Investigation Report, Southern Pacific Transportation Company, 5th Avenue and 7th Street, Oakland, California*).

In August of 1994, IC initiated quarterly ground water monitoring and sampling activities with the monitoring wells installed during the April 1994 field activities. The results of the fourth quarter, 1994 sampling event are presented in this report.

3.0 FIELD INVESTIGATION

This section discusses the procedures and protocol used for the collection of monitoring well water level data and ground water samples for laboratory analyses.

3.1 Monitoring Well Water Level Data

On November 9, 1994, prior to purging, the depth to ground water was measured in all wells (MW-1, MW-2, and MW-3). All measurements were taken from the top of casing (which had been surveyed by a licensed surveyor relative to mean sea level [MSL]) using a water level indicator with an accuracy to 0.01 feet. Ground water elevations this quarter ranged from 5.14 to 6.12 feet above MSL. Ground water elevation data are summarized in Table 1. Ground water elevation data were used to construct a ground water elevation contour map (Figure 4). Ground water flow is in a southerly direction. The calculated local hydraulic gradient is 0.013 feet per foot.

3.2 Monitoring Well Purging

After measurement of the ground water level in each well, the saturated well volume was calculated by subtracting the depth to ground water from the total depth of the well and multiplying the resultant length by the number of gallons per foot of casing. Prior to sample collection, each well was purged to ensure that the water sample obtained from the well was representative of the formation water. Each well was purged by hand-bailing a minimum of three times the saturated casing volume in the well, or until the well was bailed dry (which was the case for well MW-3). Purging equipment was cleaned with Alconox and rinsed with deionized (DI) water prior to each use. Ground water characterization data, consisting of electrical conductivity, temperature and pH, were measured from the initial water removed and at least three times during purging. The ground water in each well was assumed to be

TABLE 1
GROUND WATER ELEVATION DATA
NOVEMBER, 1994

Monitoring Well[a]	Date Measured	Time Measured	Reference Elevation[b] (feet MSL)	Depth to Ground Water[c] (feet TOC)	Ground Water Elevation[d] (feet MSL)
MW-1	11/09/94	0755	8.20	2.08	6.12
MW-2	11/09/94	0815	6.36	1.22	5.14
MW-3	11/09/94	0810	6.84	1.10	5.74

a See Figure 3 for approximate location of monitoring wells.

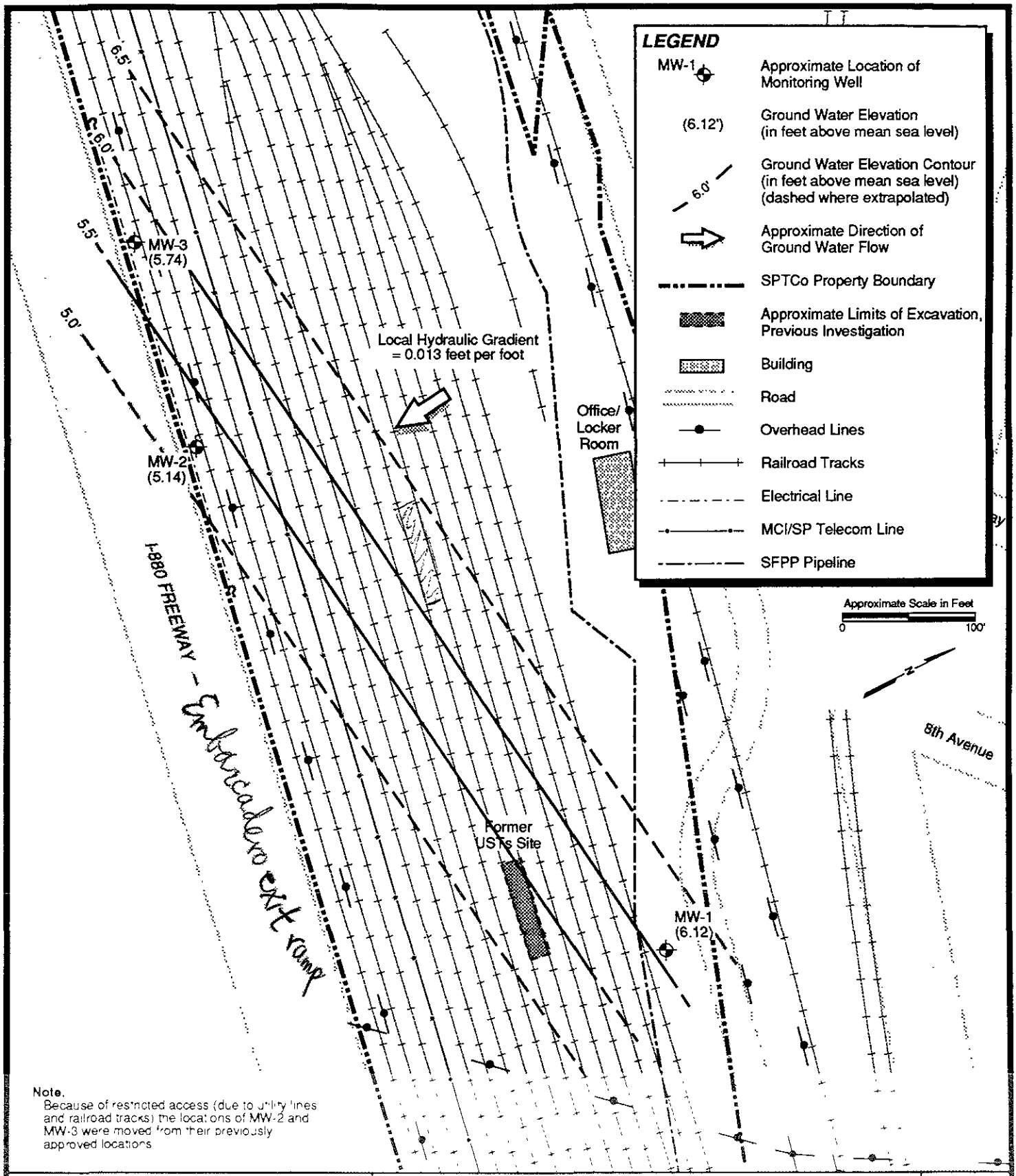
b Reference casing elevation is a point marked on the top of the well casing, which has been measured by a licensed surveyor.

c Depth to ground water measured from top of casing (TOC).

d Ground water elevation calculated by subtracting the depth to ground water from the reference casing elevation.

MSL Mean sea level

TOC Top of casing



Note.
Because of restricted access (due to utility lines and railroad tracks) the locations of MW-2 and MW-3 were moved from their previously approved locations

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CONTOUR MAP OF GROUND WATER ELEVATION NOVEMBER, 1994 SOUTHERN PACIFIC TRANSPORTATION COMPANY 5TH AVENUE AND 7TH STREET PROPERTY OAKLAND, CALIFORNIA

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Drawn By	Patti Decker	Checked By	Richard Bateman

Figure 4
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Scale as shown

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representative of the formation when a minimum of three well volumes had been removed and consecutive parameter readings were within 10 percent (unless dewatering occurred). After purging was complete, each well was allowed to recover to at least 90 percent of the original water level. Due to the slow recharge rate, well MW-3 was bailed dry and subsequently sampled before recovering to 90 percent of the pre-purge water level. Monitoring well ground water purge characterization parameters are summarized in Table 2. Monitoring well purge characterization and sample log field data sheets are included in Appendix A.

3.3 Monitoring Well Sampling

Ground water samples were collected using new, disposable polyethylene bailers. The water samples from the bailers were transferred to laboratory-supplied containers of appropriate volumes and with required preservatives for the intended analyses. Volatile organic analysis (VOA) sample containers were filled to capacity, sealed with Teflon-lined lids, and checked for air bubbles. If air bubbles were detected, the vial was re-opened, additional sample water added, and the vial resealed.

After sample collection was completed, each sample was labeled with a unique sample number, the site name, date of collection, time of collection, initials of collector, and any other pertinent information. The samples were then placed in a chilled ice chest for transport to Chromalab Inc. Environmental Services (Chromalab). A chain-of-custody document was completed concurrent with sample collection and accompanied the samples upon transport to the laboratory. Chain-of-custody documents are included in Appendix B.

TABLE 2
GROUND WATER PURGE CHARACTERIZATION DATA
NOVEMBER, 1994

Monitoring Well[a]	Date Measured	Purge Volume (gallons)	Electrical Conductivity (μmhos)/cm	Temperature (°F)	Field pH (units)
MW-1	11/09/94	1	780	61.8	6.35
		9	720	59.1	6.25
		14	700	58.2	6.23
		23	730	61.1	6.32
MW-2	11/10/94	1	1090	57.3	7.28
		9	520	61.6	7.32
		18	540	60.1	7.24
		27	610	60.2	7.16
MW-3	11/10/94	1	700	60.7	7.27
		9	2070	61.6	6.68
		17	5250	63.3	6.76
		20	6830	62.7	7.03
		22	2760	63.5	7.06

a See Figure 3 for approximate location of monitoring wells.

μmhos/cm Micromhos per centimeters

°F Degrees Fahrenheit

Note: Purge characterization data sheets included in Appendix A.

All ground water samples were analyzed for the following constituents:

Constituent	Analytical Method
Total petroleum hydrocarbons as diesel (TPH-D)	EPA Method 8015 Modified
Total petroleum hydrocarbons as motor oil (TPH-MO)	EPA Method 8015 Modified
Benzene, toluene, ethylbenzene, and xylenes (BTEX)	EPA Method 8020
Sodium chloride	Calculation[1]
Total dissolved solids (TDS)	EPA Method 160.1

3.4 Quality Assurance/Quality Control

To evaluate the integrity of the ground water sampling/analysis process, a duplicate ground water sample was collected from MW-1 using the procedures previously described in Section 3.3. The duplicate ground water sample was analyzed for TPH-D, TPH-MO, BTEX, sodium chloride and TDS.

To assess the potential for cross-contamination of the ground water samples during transport to the laboratory, one trip blank was prepared on site prior to sample collection with DI water and accompanied the ground water samples during shipment to the laboratory. The trip blank was submitted to the laboratory for BTEX analysis only.

In addition, one equipment blank was collected by pouring DI water through the sampling equipment into the appropriate sample bottles. The equipment blank was analyzed for TPH-D, TPH-MO, and BTEX.

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1 Sodium chloride concentration obtained by calculation after analyzing for sodium and chloride separately.

4.0 ANALYTICAL RESULTS

Fourth quarter 1994 ground water samples were analyzed by Chromalab for the suite of constituents listed in Section 3.3. Analytical results are summarized in Table 3. Figure 5 is a chemical distribution map. Analytical laboratory reports are included as Appendix C. The following is a summary of the fourth quarter, 1994 analytical results:

* TPH-D, TPH-MO, and BTEX were not detected in any of the wells sampled at or above their respective reporting limits.

* Sodium chloride concentrations ranged from 25 milligrams per liter (mg/L) in MW-1 to 140 mg/L in MW-3 (average concentration for all three wells = 67 mg/L).

* TDS ranged from 370 mg/L in MW-2 to 620 mg/L in MW-3 (average concentration for all three wells = 487 mg/L).

The analytical results for the duplicate ground water sample collected from MW-1 were consistent with those of the original ground water sample.

None of the analyzed constituents were detected at or above their respective reporting limits in either the trip blank or the equipment blank.

All laboratory procedures (holding times, methods used, method blanks, documentation, etc.) and subsequent results were monitored throughout the analytical process according to standard quality assurance/quality control (QA/QC) procedures. In addition, all laboratory reports were evaluated as part of QA/QC procedures for ground water monitoring. The analytical data included in this fourth quarter, 1994 report are considered quantitatively valid.

TABLE 3
GROUND WATER ANALYTICAL RESULTS
NOVEMBER, 1994

Sample Location	Date Sampled	Total Petroleum[a] Hydrocarbons (µg/L)		Volatile Organic Compounds[b] (µg/L)				Sodium Chloride[c] (mg/L)	Total Dissolved Solids[d] (mg/L)
		Diesel	Motor Oil	Benzene	Toluene	Ethylbenzene	Xylenes		
MW 1	11/09/94	<50	<500	<0.5	<0.5	<0.5	<0.5	25	470
MW 2	11/10/94	<50	<500	<0.5	<0.5	<0.5	<0.5	35	370
MW 3	11/10/94	<50	<500	<0.5	<0.5	<0.5	<0.5	140	620
MW 1 Duplicate	11/09/94	<50	<500	<0.5	<0.5	<0.5	<0.5	25	480
Equipment Blank	11/09/94	<50	<500	<0.5	<0.5	<0.5	<0.5	NA	NA
Trip Blank	11/09/94	NA	NA	<0.5	<0.5	<0.5	<0.5	NA	NA
Cal DHS MCLs[e]		NE	NE	1	100[f]	680	1,750	NE	500

a Analyzed by EPA Method 8015 Modified.

b BTEX analyzed by EPA Method 8020.

c Sodium chloride concentrations determined by calculation, after analyzing for sodium and chloride separately.

d Total dissolved solids analyzed by EPA Method 160.1.

e California Department of Health Services (DHS) Maximum Contaminant Levels (MCLs) for drinking water (California RWQCB, May, 1993, Compilation of Water Quality Goals)

f California DHS action level for drinking water (California RWQCB, May, 1993, Compilation of Water Quality Goals).

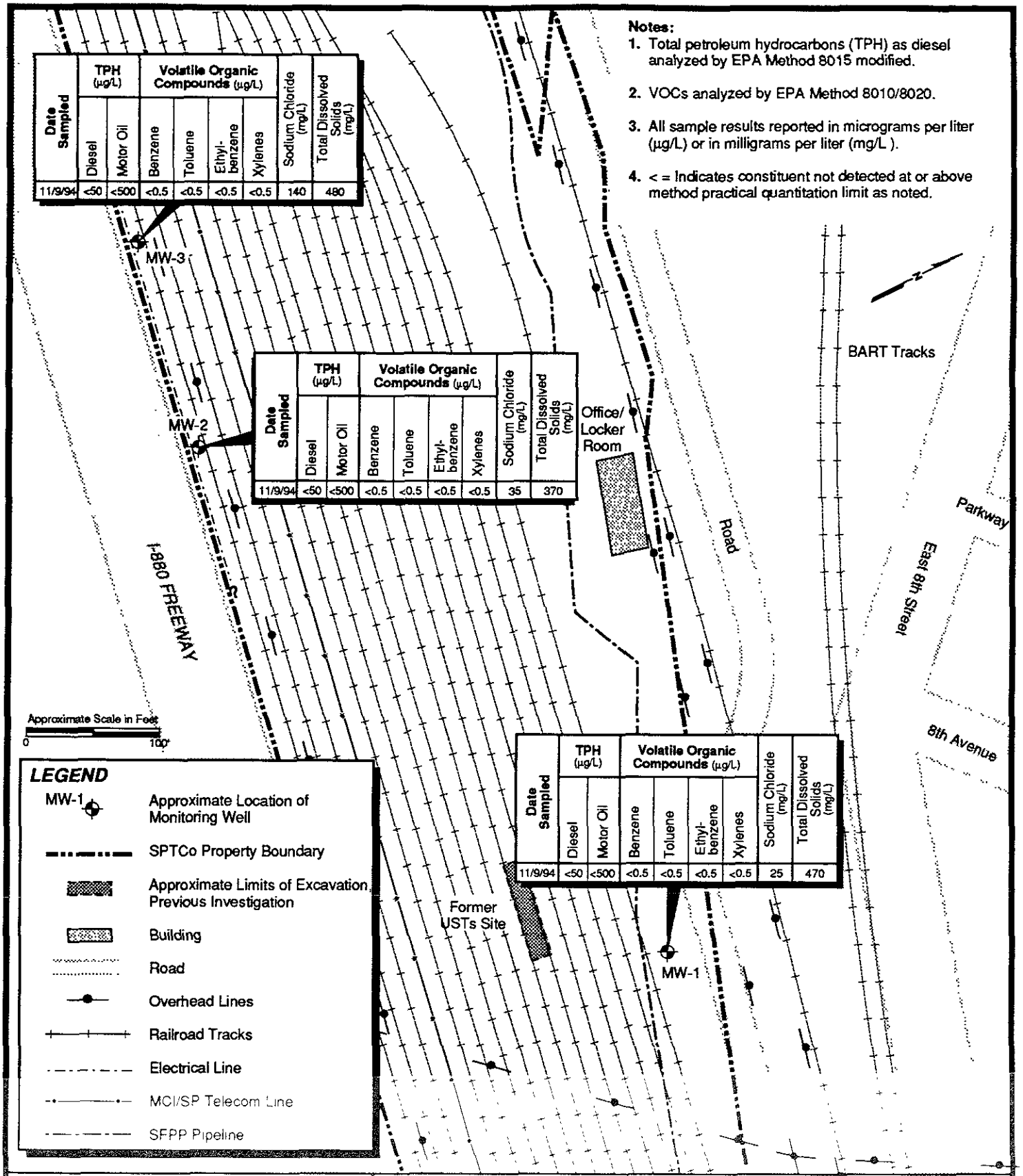
NA Not analyzed.

NE No MCL established.

mg/L Milligrams per liter

µg/L Micrograms per liter

< Indicates the constituent was not detected at a concentration at or above the reporting limit as listed.



Date Sampled	TPH (µg/L)		Volatile Organic Compounds (µg/L)				Sodium Chloride (mg/L)	Total Dissolved Solids (mg/L)
	Diesel	Motor Oil	Benzene	Toluene	Ethyl-benzene	Xylenes		
11/9/94	<50	<500	<0.5	<0.5	<0.5	<0.5	140	480

Date Sampled	TPH (µg/L)		Volatile Organic Compounds (µg/L)				Sodium Chloride (mg/L)	Total Dissolved Solids (mg/L)
	Diesel	Motor Oil	Benzene	Toluene	Ethyl-benzene	Xylenes		
11/9/94	<50	<500	<0.5	<0.5	<0.5	<0.5	35	370

Date Sampled	TPH (µg/L)		Volatile Organic Compounds (µg/L)				Sodium Chloride (mg/L)	Total Dissolved Solids (mg/L)
	Diesel	Motor Oil	Benzene	Toluene	Ethyl-benzene	Xylenes		
11/9/94	<50	<500	<0.5	<0.5	<0.5	<0.5	25	470

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CHEMICAL DISTRIBUTION MAP FOR CONSTITUENTS IN GROUND WATER SAMPLES NOVEMBER, 1994 SOUTHERN PACIFIC TRANSPORTATION COMPANY 5TH AVENUE AND 7TH STREET PROPERTY OAKLAND, CALIFORNIA

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Drawn By	Patti Decker
Checked By	Richard Bateman
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5.0 DISCUSSION

No petroleum hydrocarbons or related volatile organic compounds were detected in ground water samples collected during the fourth quarter, 1994 ground water monitoring event at the SPTCo Fifth Avenue and Seventh Street property. This result is generally consistent with analytical results from all previous monitoring events (Table 4). TPH-MO was detected in MW-2 at a concentration of 750 mg/L during the third quarter 1994 monitoring event. None of the constituents analyzed this or any preceding quarter has exceeded established California Department of Health Services (DHS) maximum contaminant levels (MCLs) or action levels (ALs) for drinking water.

Ground water elevation contour maps for all previous monitoring events are included in Appendix D. Table 5 lists all ground water elevation data collected to date. A comparison of ground water elevation data collected during the fourth quarter, 1994 sampling event with ground water elevations measured during third the quarter 1994, indicates a slight increase in ground water elevations in wells MW-2 and MW-3, and a substantial increase in ground water elevation in MW-1. Ground water elevations measured during the fourth quarter (November 9, 1994) show an average increase of 4.11 feet over third quarter water levels (August 16, 1994). The local hydraulic gradient for the fourth quarter, 1994 was calculated to be 0.013 feet per foot which is slightly lower than the gradient calculated for August, 1994 of 0.017 feet per foot. The ground water flow direction has changed from a northeasterly direction in August of 1994 to a southerly direction this quarter (November 1994). The observed increase in ground water elevation is most likely due to seasonal variation. The change in flow direction may be due to seasonal variation or tidal influence. Figure 6 shows hydrographs of ground water elevations for all monitoring wells.

TABLE 4
GROUND WATER ANALYTICAL RESULTS
HISTORIC SUMMARY

Sample Location	Date Sampled	Total Petroleum Hydrocarbons (µg/L)		Volatile Organic Compounds[b] (µg/L)				Sodium Chloride[c] (mg/L)	Total Dissolved Solids[d] (mg/L)
		Diesel[a]	Motor Oil[b]	Benzene	Toluene	Ethylbenzene	Xylenes		
MW 1	04/28/94	<50	<200	<0.5	<0.5	<0.5	<0.5	61	530
	08/16/94	<120	<750	<0.3	<0.3	<0.5	<0.5	86	600
	11/09/94	<50	<500	<0.5	<0.5	<0.5	<0.5	25	470
MW 2	04/28/94	<50	<200	<0.5	<0.5	<0.5	<0.5	77	460
	08/16/94	<120	750	<0.3	<0.3	<0.5	<0.5	170	690
	11/10/94	<50	<500	<0.5	<0.5	<0.5	<0.5	35	370
MW 3	04/28/94	<50	<200	<0.5	<0.5	<0.5	<0.5	300	680
	08/16/94	<120	<750	<0.3	<0.3	<0.5	<0.5	1200	3700
	11/10/94	<50	<500	<0.5	<0.5	<0.5	<0.5	140	620
Cal DHS MCLs[e]		NE	NE	1	100[f]	680	1,750	NE	500[g]

a Analyzed by EPA Method 8015 Modified (April 1994 samples analyzed by EPA Method 8260)

b Analyzed by EPA Method 8015 Modified (April 1994 samples analyzed by EPA Method 8270)

c Sodium chloride concentrations determined by calculation, after analyzing for sodium and chloride separately.

d Total dissolved solids analyzed by EPA Method 160.1.

e California Department of Health Services (DHS) Maximum Contaminant Levels (MCLs) for drinking water (California RWQCB, May, 1993, Compilation of Water Quality Goals).

f California DHS action level for drinking water (California RWQCB, May, 1993, Compilation of Water Quality Goals).

g California DHS Standard Secondary (Recommended) Drinking Water.

NA Not analyzed.

NE No MCL established.

mg/L Milligrams per liter

µg/L Micrograms per liter

< Indicates the constituent was not detected at a concentration at or above the method practical quantitation limit or method detection limit as listed.

TABLE 5
GROUND WATER ELEVATION DATA
HISTORIC SUMMARY

Monitoring Well[a]	Date Measured	Time Measured	Reference Elevation[b] (feet MSL)	Depth to Ground Water[c] (feet TOC)	Ground Water Elevation[d] (feet MSL)
MW-1	04/28/94	0900	8.20	4.68	3.52
	08/16/94	0815		10.50	-2.30
	11/09/94	0755		2.08	6.12
MW-2	04/28/94	0913	6.36	2.01	4.35
	08/16/94	0845		3.16	3.20
	11/09/94	0815		1.22	5.14
MW-3	04/28/94	0920	6.84	2.99	3.85
	08/16/94	0910		3.06	3.78
	11/09/94	0810		1.10	5.74

a See Figure 3 for approximate location of monitoring wells.

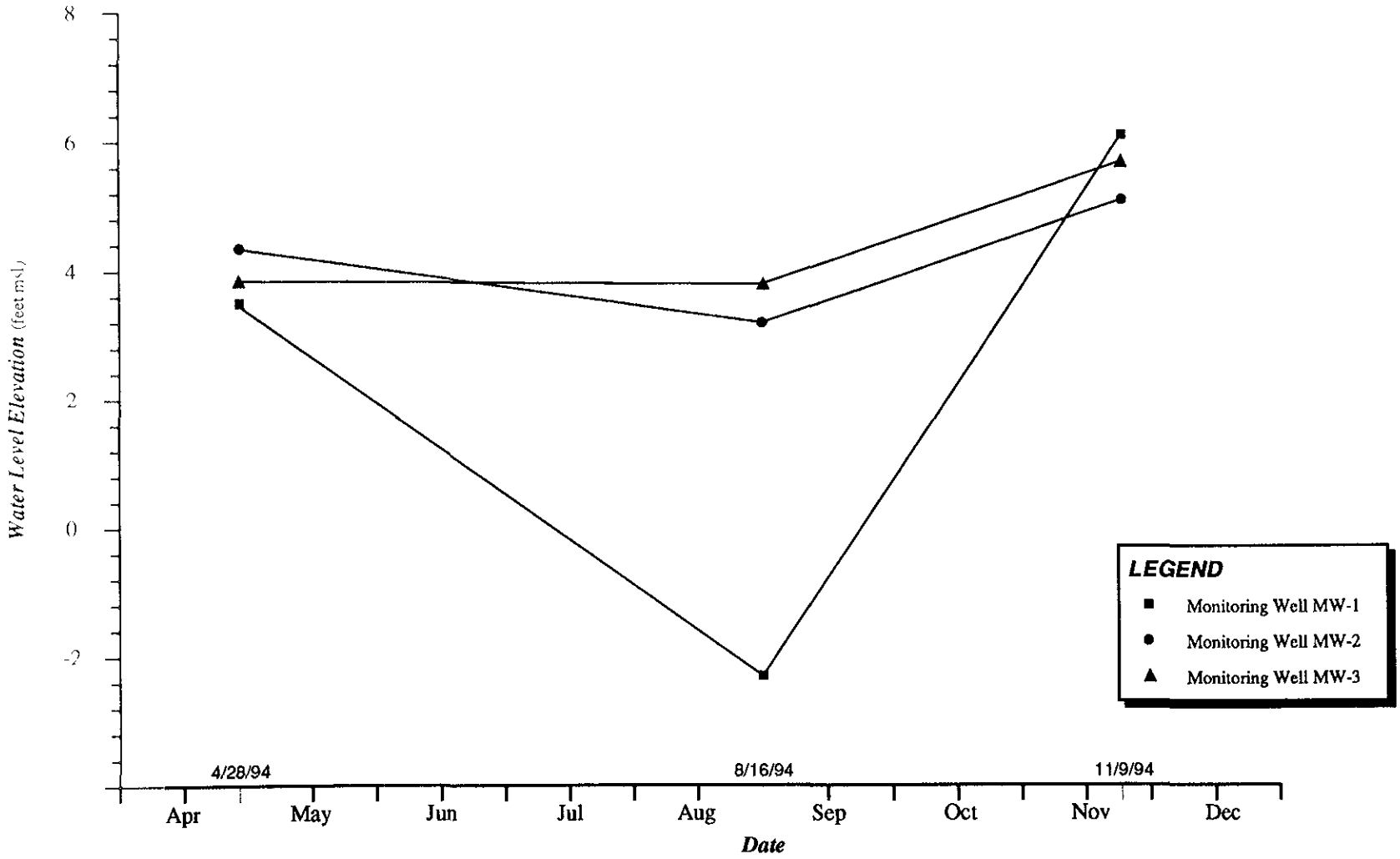
b Reference casing elevation is a point marked on the top of the well casing, which has been measured by a licensed surveyor.

c Depth to ground water measured from top of casing (TOC).

d Ground water elevation calculated by subtracting the depth to ground water from the reference casing elevation.

MSL Mean sea level

TOC Top of casing



Industrial Compliance A Subsidiary of SP Environmental Systems, Inc.		**HYDROGRAPHS OF GROUND WATER ELEVATION SOUTHERN PACIFIC TRANSPORTATION COMPANY 5TH AVENUE AND 7TH STREET PROPERTY OAKLAND, CALIFORNIA**	Figure: 6
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Drawn By: Patti Decker	Checked By: Richard Bateman		Scale: as shown

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6.0 GLOSSARY OF ACRONYMS

ALs	Action levels
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylenes
cy	Cubic yards
DHS	California Department of Health Services
DI	Deionized
DI	Deionized
IC	Industrial Compliance
MCLs	Maximum contaminant levels
mg/L	Milligrams per liter
MSL	Mean sea level
PCBs	Polychlorinated biphenyls
ppm	Parts per million
QA/QC	Quality Assurance/Quality Control
SPTCo	Southern Pacific Transportation Company
TDS	Total dissolved solids
TEPH	Total extractable petroleum hydrocarbons
TPH-D	Total petroleum hydrocarbons as diesel
TPH-MO	Total petroleum hydrocarbons as motor oil
TRPH	Total recoverable petroleum hydrocarbons
UST	Underground storage tank
VOA	Volatile organic analysis

APPENDIX A

PURGE CHARACTERIZATION FIELD DATA SHEETS

Industrial Compliance
A Subsidiary of SP Environmental Systems, Inc.

PURGE CHARACTERIZATION AND SAMPLE LOG

Project Number: 05100269 Project Name: Inst Oakland Yard Date: 11-10-94

Well Number: MW-3 Sampler: James Ackerman / Mike Endecott Weather: Sunny Partially Cloudy

Military Time	0915	0925	0940	1000	1030	1300	
Gallons Purged	1	9	17	20	22		Depth to bottom (DB): 13.60
Purge Rate						S	Depth to water (DW): 1.29
pH	7.27	6.68	6.76	7.03	7.06	A	Height of water column (H) = DB - DW: 12.31
Conductivity	.70x1000	2.07x1000	5.25x1000	6.83x1000	2.76x1000	M	One casing volume (CV) = H x multiplier: 8.00
Temperature (C)	60.7	61.6	63.3	62.7	63.5	P	Three casing volumes (3CV): 24.0
Salinity (0/00)						L	Multipliers = 2" well = 0.16 gallons/foot
Turbidity	Cloudy	—	—	—	—	E	4" well = 0.65 gallons/foot
Color					well dry		6" well = 1.47 gallons/foot
Water Level Casing							8" well = 2.61 gallons/foot
Calibration	pH						S.C.:

Sample #	Quantity	Volume	Type	Preserv.	Analysis	Lab	Sample Equip.	Purge Equip.	Field Comments
MW-3	2	40ml	VOA	HCL	BTEX	Chroma Lab	Disp. Bailer	Teflon Bailer	
↓	1	1l+	Amber	None	TPH-D	↓	↓	↓	
	1	1l+	Amber	None	TPH-MO				
↓	1	1l+	Poly	None	TDS/NACL	↓	↓	↓	
Cleaning:									
Comments:	While purging MDE noticed "rotten egg" odor (H_2S?), well slow to recharge								

Sampler's Signature: James Ackerman

GROUND WATER ELEVATION MEASUREMENT LOG

Sheet 1 of 1

Project Name: OAKLAND YARD EAST Project No. 05100269 Task/Phase:

Date: 11-09-94 Equipment: Weather: CLOUDY

Well Number	Reference Elevation (feet-MSL)	Time (military)	Depth to Water (feet)	Depth to Product (feet)	Total Depth (feet)	PT (feet)	PT x 0.8 (feet)	Adjusted DTW[1] (feet)	Ground Water Elevation[2] (feet-MSL)
MW-1	8.20	0755	2.08	—	13.68			2.08	6.12
MW-2	6.36	0815	1.22	—	13.64			1.22	5.14
MW-3	6.84	0810	1.10	—	13.60			1.10	5.74
Comments:									

1 Adjusted depth to water = DTW - (PT x 0.8)

2 Ground water elevation = Reference elevation - Adjusted DTW

MSL Mean sea level

DTW Depth to water (to 0.01 foot)

PT Product thickness (0.01 foot)

Signature James A. Sherman

Industrial Compliance

A Subsidiary of SP Environmental Systems, Inc.

PURGE CHARACTERIZATION AND SAMPLE LOG

Project Number: 05100269 Project Name: EAST OAKLAND Date: 11-9-94

Well Number: MW-1 Sampler: JAMES ACKERMAN / MIKE ENDICOTT Weather: CLOUDY

Military Time	800	810	815	835	845		
Gallons Purged	1	9	14	23	——		Depth to bottom (DB): 13.68
Purge Rate	——	——	——	——			Depth to water (DW): 2.02
pH	6.35	6.25	6.23	6.32	S		Height of water column (H) = DB - DW: 11.60
Conductivity	.^1000 .38	K1000 .22	K1000 .20	K1000 .23	A		One casing volume (CV) = H x multiplier: 7.54
Temperature (C)	61.8	58.1	58.2	61.1	M		Three casing volumes (3CV): 22.62
Salinity (0/00)	——	——	——	——	P		Multipliers = 2" well = 0.16 gallons/foot
Turbidity	CLEAR	CLEAR	CLEAR	CLEAR	L		4" well = 0.65 gallons/foot
Color	CLEAR	CLEAR	CLEAR	CLEAR	E		6" well = 1.47 gallons/foot
Water Level Casing							8" well = 2.61 gallons/foot
Calibration	pH						S.C.:

Sample #	Quantity	Volume	Type	Preserv.	Analysis	Lab	Sample Equip.	Purge Equip.	Field Comments
MW-1	2	40ML	VOA	HCL	8020	CHROM	TEF BAILER	DISP BAILER	
MW-1	1	1 LT	AMBER	——	TPH/MOTOR 8015	CHROM	TEF BAILER	DISP BAILER	
MW-1	1	1 LT	POLY	——	TDS/NACL	CHROM	TEF BAILER	DISP BAILER	
MW-1	1	1 LT	AMBER	——	TPH/DIESEL 8015	CHROM	TEF BAILER	DISP BAILER	
MW-1D	2	40ML	VOA	HCL	8020	CHROM	TEF BAILER	DISP BAILER	
MW-1D	1	1 LT	AMBER	——	TPH/MOTOR 8015	CHROM	TEF BAILER	DISP BAILER	
MW-1D	1	1 LT	POLY	——	TDS/NACL	CHROM	TEF BAILER	DISP BAILER	
MW-1D	1	1 LT	AMBER	——	TPH/DIESEL 8015	CHROM	TEF BAILER	DISP BAILER	

Cleaning: WASHED WITH ALCONOX / RINSED OUT WITH WATER

Comments:

Sampler's Signature: Mike Endicott

Industrial Compliance
A Subsidiary of SP Environmental Systems, Inc.

PURGE CHARACTERIZATION AND SAMPLE LOG

Project Number: 5100269 Project Name: EAST OAKLAND YARD Date: 11-10-94

Well Number: MW-2 Sampler: JAMES ACKERMAN / MIKE ENDECOTT Weather: SUNNY / PARTALLY CLOUDY

Military Time	0810	0815	0830	0845	0900		
Gallons Purged	1	9	18	27			Depth to bottom (DB): 13.64
Purge Rate					S		Depth to water (DW): .08
pH	7.28	7.32	7.24	7.16	A		Height of water column (H) = DB - DW: 13.56
Conductivity	1.09 x 1000	52 x 1000	.54 x 1000	.61 x 1000	M		One casing volume (CV) = H x multiplier: 8.8
Temperature (C)	57.3	61.6	60.1	60.2	P		Three casing volumes (3CV): 26.4
Salinity (0/00)					L		Multipliers = 2" well = 0.16 gallons/foot
Turbidity	CLEAR				E		4" well = 0.65 gallons/foot
Color							6" well = 1.47 gallons/foot
Water Level Casing							8" well = 2.61 gallons/foot
Calibration	pH:						S.C.:

Sample #	Quantity	Volume	Type	Preserv.	Analysis	Lab	Sample Equip.	Purge Equip.	Field Comments
MW-2	2	~~VOA 40ml~~	VOA	HCl	BTEX	CHROMA	DIS. BAILER	TEFLON BAILER	
	1	1lt	AMBER	NONE	TPH-DIESEL	KAB	↓	↓	
	1	1lt	AMBER	NONE	TPH-MO				
↓	1	1lt	POLY	NONE	TDS/NACL	↓	↓	↓	

Cleaning:

Comments:

Sampler's Signature: James Ackerman

APPENDIX B

CHAIN-OF-CUSTODY DOCUMENT

CHAIN-OF-CUSTODY RECORD

19284

129/69480 – 69485

No. 20428

INDUSTRIAL COMPLIANCE • 9838 OLD PLACERVILLE ROAD, SUITE 100 • SACRAMENTO, CA 95827-3559 • Phone 916-369-8971 • FAX 916-369-8370

PROJECT NAME: EAST OAKLAND YARD
PROJECT LOCATION: OAKLAND, CA
PROJ. NO: 05100269
PROJECT CONTACT: JAMES ACKERMAN
PROJECT TELEPHONE NO.: (510) 238-9540
CLIENT'S REPRESENTATIVE:
PROJECT MANAGER/SUPERVISOR: CARL TAYLOR

SUBM #: 9411129
CLIENT: INDCOMP
DUE: 11/17/94
REF #:19284

ITEM NO	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE LOCATION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS) BTEX 8020	TPH-DIESEL 8015M	TPH-MOTOR OIL 8015M	TDS/NACL	REMARKS
1	TRIP	11-9	0830			TRIP BLANK (WATER)	2	X				
2	MW-1		0845			SAMPLE, MONITORING WELL MW-1 (WATER)	5	X	X	X	X	
3	MW-1DUP		0845			DUPLICATE SAMPLE, MONITORING WELL MW-1 (WATER)	5	X	X	X	X	
4	EQUIP		1300			EQUIPMENT BLANK (BAILER) (WATER)	4	X	X	X		
5	MW-2	11-10	0900			SAMPLE, MONITORING WELL MW-2 (WATER)	5	X	X	X	X	
6	MW-3		1300			SAMPLE, MONITORING WELL MW-3 (WATER)	5	X	X	X	X	
7												
8												
9												
10												

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	6	James Ackerman	[signature]	11-11-94	1623
2					
3					
4					

REMARKS: 5 DAY TURNAROUND

SAMPLER'S NAME: JAMES ACKERMAN
SAMPLER'S SIGNATURE: James Ackerman

LAB COPY

APPENDIX C

ANALYTICAL LABORATORY REPORTS, GROUND WATER SAMPLES

CHROMALAB, INC.
Environmental Services (SDB)

November 17, 1994 *Submission #:* 9411129

INDUSTRIAL COMPLIANCE-OAKLAND

Atten: Carl Taylor

Project: EAST OAKLAND YARD *Project#:* 05100269
Received: November 10, 1994

re: 6 samples for BTEX analysis.

Matrix: WATER
Sampled: November 9, 1994 *Run#:* 4568 *Analyzed:* November 15, 1994
Method: EPA 8020

Spl #	CLIENT SMPL ID	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
69482	MW-1-DUP	N.D.	N.D.	N.D.	N.D.
69483	EQUIP	N.D.	N.D.	N.D.	N.D.

Matrix: WATER
Sampled: November 10, 1994 *Run#:* 4568 *Analyzed:* November 15, 1994
Method: EPA 8020

Spl #	CLIENT SMPL ID	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
69484	MW-2	N.D.	N.D.	N.D.	N.D.
69485	MW-3	N.D.	N.D.	N.D.	N.D.

Matrix: WATER
Sampled: November 9, 1994 *Run#:* 4580 *Analyzed:* November 17, 1994
Method: EPA 8020

Spl #	CLIENT SMPL ID	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
69480	TRIP	N.D.	N.D.	N.D.	N.D.
69481	MW-1	N.D.	N.D.	N.D.	N.D.
Reporting Limits		0.5	0.5	0.5	0.5
Blank Result		N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)		103	101	101	110

Jack Kelly
Chemist

Ali Kharrazi
Organic Manager

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

November 17, 1994 *Submission #:* 9411129

INDUSTRIAL COMPLIANCE-OAKLAND

Atten: Carl Taylor

Project: EAST OAKLAND YARD *Project#:* 05100269
Received: November 10, 1994

re: Five samples for TEPH analysis

Matrix: WATER *Extracted:* November 14, 1994
Sampled: See Below *Analyzed:* November 15, 1994
Method: 3510/8015

Sample #	Client Sample ID	Kerosene (µg/L)	Diesel (µg/L)	Motor Oil (mg/L)	Date Sampled
69481	MW-1	N.D.	N.D.	N.D.	11/9/94
69482	MW-1 DUP	N.D.	N.D.	N.D.	11/9/94
69483	EQUIP	N.D.	N.D.	N.D.	11/9/94
69484	MW-2	N.D.	N.D.	N.D.	11/10/94
69485	MW-3	N.D.	N.D.	N.D.	11/10/94
Blank		N.D.	N.D.	N.D.	
Spike Recovery		----	102%	----	
Dup Spike Recovery		----	114%		----
Reporting Limit		50	50	0.5 = 500ppb	

ChromaLab, Inc.

Sirirat Chullakorn
Analytical Chemist

Ali Kharrazi
Organic Manager

cc

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

GeoAnalytical Laboratories, Inc.

1031 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # F315-06

ChromaLab
1220 Quarry Lane
Pleasanton CA 94566 - 4756

Date: 11/23/94
Date Received: 11/11/94
Date Started: 11/11/94
Date Completed: 11/18/94

Project Name: INDCOMP

Project # 9411129

Sample ID	Lab ID	Detection Limit	Method	Analyte	Results	Units mg/L
MW-1	F35581	1	300	Chloride	15	
MW-1-Dup	F35582	1	300	Chloride	15	
MW-2	F35583	1	300	Chloride	21	
MW-3	F35584	1	300	Chloride	85	
MW-1	F35581	1	6010	Sodium	42	
MW-1-Dup	F35582	1	6010	Sodium	42	

Ramiro Salgado
Chemist

Certification # E757

Donna Allsup
Laboratory Director

GeoAnalytical Laboratories, Inc.

1031 Kansas Avenue
Modesto, CA 95351

Phone (209) 572-0900
FAX (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # F315-06
ChromaLab
1220 Quarry Lane
Pleasanton CA 94566 - 4756

Date: 11/23/94
Date Received: 11/11/94
Date Started: 11/11/94
Date Completed: 11/18/94

Project Name: INDCOMP

Project # 9411129

Sample ID	Lab ID	Detection Limit	Method	Analyte	Results	Units mg/L
MW-2	F35583	1	6010	Sodium	39	
MW-3	F35584	1	6010	Sodium	98	
MW-1	F35581	10	160.1	Total Dissolved Solids	470	
MW-1-Dup	F35582	10	160.1	Total Dissolved Solids	480	
MW-2	F35583	10	160.1	Total Dissolved Solids	370	
MW-3	F35584	10	160.1	Total Dissolved Solids	620	

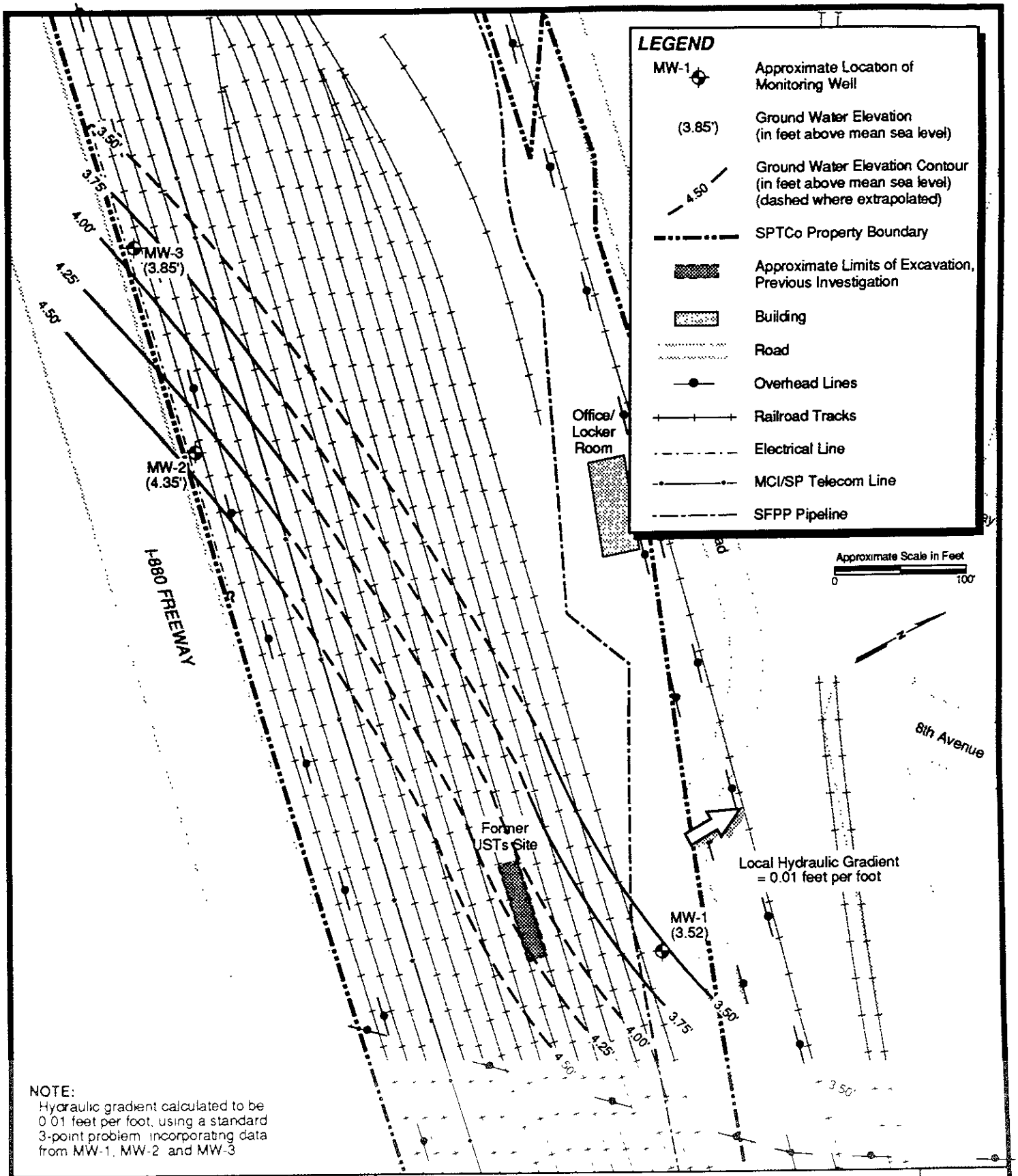
Ramiro Salgado
Chemist

Certification # E757

Donna Allsup
Laboratory Director

APPENDIX D

GROUND WATER ELEVATION CONTOUR MAPS
PREVIOUS MONITORING EVENTS



NOTE:
Hydraulic gradient calculated to be 0.01 feet per foot, using a standard 3-point problem incorporating data from MW-1, MW-2 and MW-3

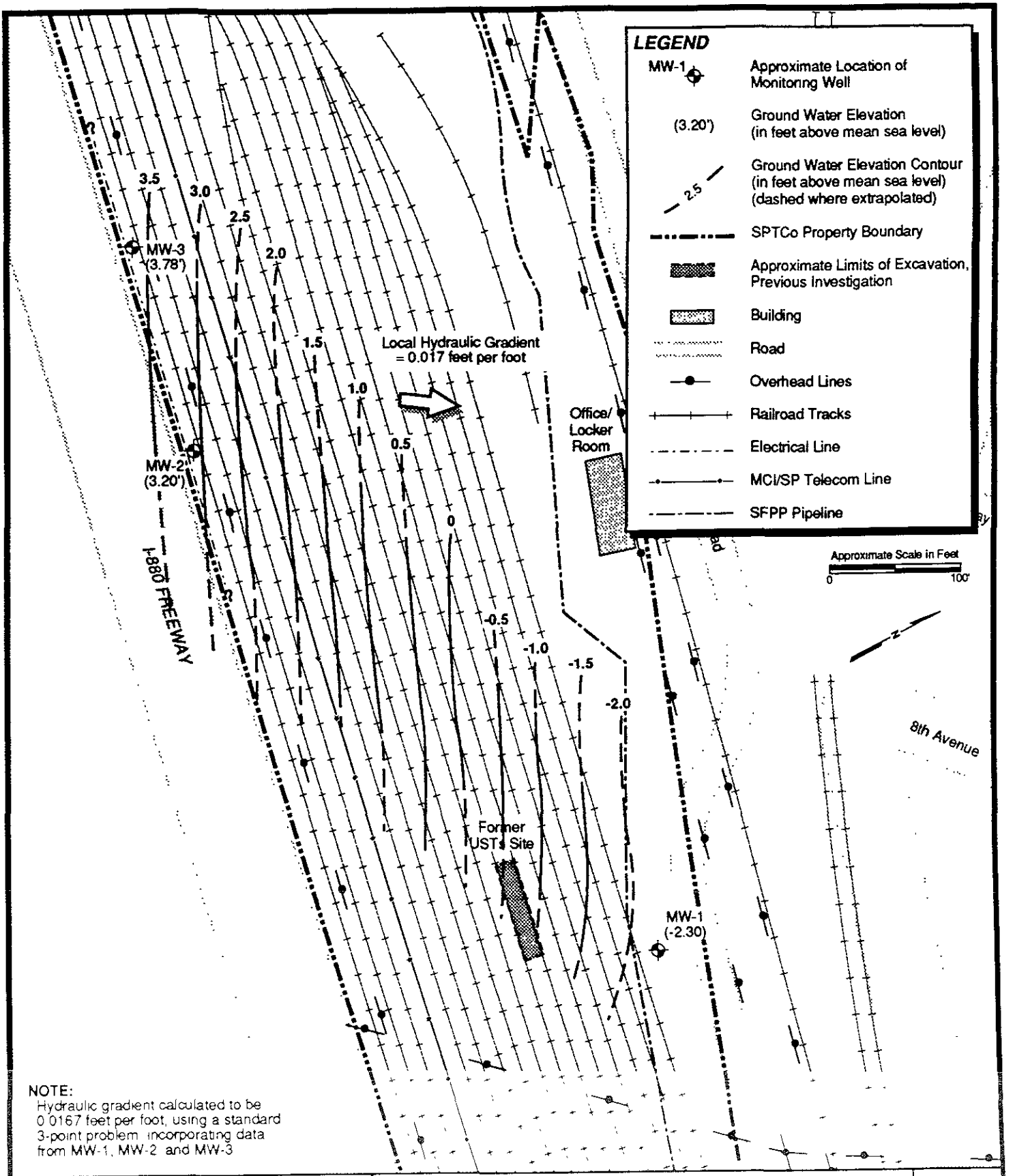
Industrial Compliance
A Subsidiary of SP Environmental Systems Inc

CONTOUR MAP OF GROUND WATER ELEVATIONS WITH HYDRAULIC GRADIENT, APRIL, 1994 SOUTHERN PACIFIC TRANSPORTATION COMPANY 5TH AVENUE AND 7TH STREET PROPERTY OAKLAND, CALIFORNIA

Project No	05100269	Date	08/01/94
Drawn By	Patti Decker	Checked By	James G Jensen

Figure 8
Page No
Scale as shown

Oak 259/S-0894/F 08 #200



NOTE:
Hydraulic gradient calculated to be 0 0167 feet per foot, using a standard 3-point problem incorporating data from MW-1, MW-2 and MW-3

Industrial Compliance
A Subsidiary of SP Environmental Systems Inc

CONTOUR MAP OF GROUND WATER ELEVATIONS
AUGUST, 1994
SOUTHERN PACIFIC TRANSPORTATION COMPANY
5TH AVENUE AND 7TH STREET PROPERTY
OAKLAND, CALIFORNIA

Project No	05100269	Date	12/01/94
Drawn By	Patti Decker	Checked By	James Ackerman

Figure 4
Page No
Scale as shown

Oak 269/Q394GWF 04 #300