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Environmental Services

ENVIRONMENTAL
PROTECTION

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June 18, 1996

Amy Leech
Alameda County Health Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Re: Recommendation for Groundwater Monitoring and Site Closure
Caltrans Hayward Maintenance Station
21195 Center Street
Hayward, CA
SES Project #MR-904-06

Dear Ms. Leech:

On behalf of the Office of the State Architect, Sierra Environmental Services (SES) is pleased to provide this letter which reviews the project's status and outlines recommendations for future work at the above-referenced site.

SITE BACKGROUND

In January 1989, two underground storage tanks (USTs) (one 1,000-gallon gasoline and one 260-gallon diesel) were removed from the Hayward Maintenance Station (Site). Three soil samples were collected by Tetra Tech Inc. (TTI) field staff, beneath the USTs. The detected concentrations ranged from 3.7 parts per million (ppm) in TPH-G in samples collected beneath the gasoline UST to 54 ppm in TPH-Diesel sample collected beneath the diesel UST.[1]

In January 1990, Geo/Resource Consultants Inc. (GRC) performed a Preliminary Site Assessment (PSA) at the Site. The PSA consisted of six soil borings around the former tanks and dispenser island. Soil samples were collected at depths ranging from five to 36 feet below ground surface (BGS). Petroleum hydrocarbon-impacted soil was reported at depths ranging from five feet to 20 feet BGS.

[1] Tetra Tech Inc., 1992, Remediation of Soil Contamination and Dry Well Installation, Consultant Site Remediation Report prepared for Office of the State Architect, November 1, 1992, 22 pages, 7 figures and 5 appendices.

A Phase II site investigation was conducted in February 1991 by TTI, to delineate the extent of petroleum hydrocarbons soil. Eight additional soil borings were drilled in the affected area; and near the former tank and dispenser island. TTI concluded that the extent of petroleum hydrocarbon-impacted soil had been delineated.[2]

TOPOGRAPHY AND GEOLOGY

The Hayward Maintenance Station lies within the East Bay Plain, Castro Valley Ground Water Sub-Basin, as reported by the Alameda County Flood Control and Water Conservation District. Site elevation is approximately 224 feet above mean sea level. Depth to ground water in the vicinity has been reported to historically vary from 28 to 35 feet bgs. The ground water flow direction is southwesterly. The nearest surface water body, San Lorenzo Creek is located east approximately 0.25 miles from the site. The confluence of Crow Creek and San Lorenzo Creek, is due east of the site.[3]

The Site and hills to the north and east of the site are underlain by the Chico formation. This is largely composed of biotitic arkosic sandstone and clay shale, with minor amount of arenaceous shale, siltstone and conglomerate.

There are three faults near this Site. The East and West Chabot faults are located within 1.25 miles of this site. Both East and West Chabot faults are concealed. The active Hayward fault is located 1.9 miles west of the Site, and experienced its last movement during Quanternary time (Mid 19th century).

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2 Tetra Tech Inc., 1992, Remediation of Soil Contamination and Dry Well Installation, Consultant's Site Remediation Report, prepared for the Office of the State Architect, November 1, 1992, 22 pages 7 figures and 5 appendices.

3 Robinson, G.D., 1956, Geology of the Hayward Quadrangle, California, Geologic Quadrangle Maps of the Unite States, United States Geological Survey Quad Map GQ- 88.

The soils underlying the Site are low dipping beds of poorly consolidated gravels that contain fragments of Miocene rocks in addition to dark-colored chert and greenstone derived from the Franciscan and possibly older rocks. The gravel occurs in thin patches on hilltops and in vaguely defined benches and is deeply eroded.[4]

SOIL EXCAVATION AND DISPOSAL

Excavation began September 14, 1992 and ended on September 16, 1992. The excavation work was centered in the vicinity of the former dispenser island. TTI supervised the work.[5] TTI observed that petroleum hydrocarbons appeared to have migrated vertically through shallow silt deposits and then pooled and spread laterally in underlying sand layers. The excavation proceeded until all visible petroleum hydrocarbon-impacted soil was removed. The excavation was terminated at a depth of approximately 31 feet BGS.

The excavated petroleum hydrocarbon-impacted soil was stockpiled on-site and covered with polyethylene sheeting pending characterization and disposal. Approximately 391 tons of petroleum hydrocarbon-impacted soil were excavated from the underground tank and dispenser island area. The stockpiled soil was transported from the Site on September 18 and 21, 1992, to the Reed and Graham (R&G) disposal facility for treatment and disposal. The TTI report did not state who transported the soil to the Reed and Graham disposal facility.

manifests?

4 Robinson, G.D., 1956, Geology of the Hayward Quadrangle, California, Geologic Quadrangle Maps of the United States, United States Geological Survey

5 Tetra Tech Inc., 1992, Remediation of Soil Contamination and Dry Well Installation prepared for Office of the Stae Architect, November 1, 1992, 22 pages, 7 figures and 5 appendices.

WELL INSTALLATION

Three monitoring wells (VW-1, VW-2 and VW-3) were installed on September 28, 1992 by TTI Inc.[6] The three monitoring wells extended to a total depth of 35 feet BGS. Each well had 20 feet of screened casing, and 15 feet of blank casing.

For a period of one week following construction, the monitoring wells were checked for the presence of accumulated ground water. Since ground water was not immediately detected, the wells were not developed and ground water samples were not collected.

On October 28, 1994 SES initiated a ground water monitoring program at the site During the first sampling event, VW-1, VW-2, and VW-3 contained very little ground water. The height of ground water in the casings ranged from 1.75 to 5.81 feet. SES has collected ground water samples from all three monitoring wells since October, 1994. Ground water sampling has continued on a quarterly basis from June 7, 1995 through March 12, 1996.

CONCLUSIONS

Based upon the analytical results of the TTI investigation, it appears that the majority of the affected soil in the vicinity of the former gasolene and diesel USTs have been removed. Relatively low concentrations of TPH-G and TPH(D) ($\leq$ 54 parts per million (ppm) and $\leq$ 3.74 ppm, respectively). Most of the soil samples did not have detectable levels of TPH-G nor TPH(D). Concentrations of TPH-G and TPH(D) were below the Alameda County Department of Environmental Health guidelines of 100 ppm. All of TTI's soil samples were below the detection limit for benzene and toluene. Ethylbenzene was detected in one soil sample at 0.58 ppm. While xylenes were detected at $\leq$ 0.226 ppb.

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[6] Tetra Tech Inc., 1992, Remediation of Soil Contamination and Dry Well Installation prepared for Office of the State Architect, November 1, 1992, 22 pages, 7 figures, 5 appedix.

Based on the data collected during this and previous work at the site, SES concludes the following:

- Analytic results for ground water during SES quarterly monitoring program for total purgeable petroleum hydrocarbo as gasoline have been below the reporting limits of 50 parts per billion (ppb). Analytic results of ground water for TPH(D) have been below the reporting limits of 50 parts per billion, with the exception of one sample being detected at 1.4 ppb.

- Benzene, toluene, ethylbenzene and xylenes have only been detected in the last quarterly monitoring event at or below the 1.9 ppb, 3.1 ppb, 1.3 ppb and 6.9 ppb, respectively.

- The concentrations of TPH-G, TPH-D and ethylbenzene and xylene that remain in soil in the vicinity of the former UST area do not appear to pose a significant or actionable threat to ground water.

SES therefore recommends that the Alameda County Department of Environmental Health consider the site for case closure. Please call if you have any questions or require additional information.

Sincerely,
Sierra Environmental Services

David M. Beardsley
Senior Environmental Technician

REGISTERED GEOLOGIST
WAYNE S. AKIYAMA
No. 6009
STATE OF CALIFORNIA

Wayne S. Akiyama R.G. R.E.A.
Senior Hydrogeologist #6009

VM 370-1455

DMB/WSA/db

Attachment: Appendix A - Figures
Appendix B - Tables

cc: Mike Hilliard - Caltrans - Oakland
Mike Golden - Division of the State Architect - Sacramento

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APPENDIX A
FIGURES

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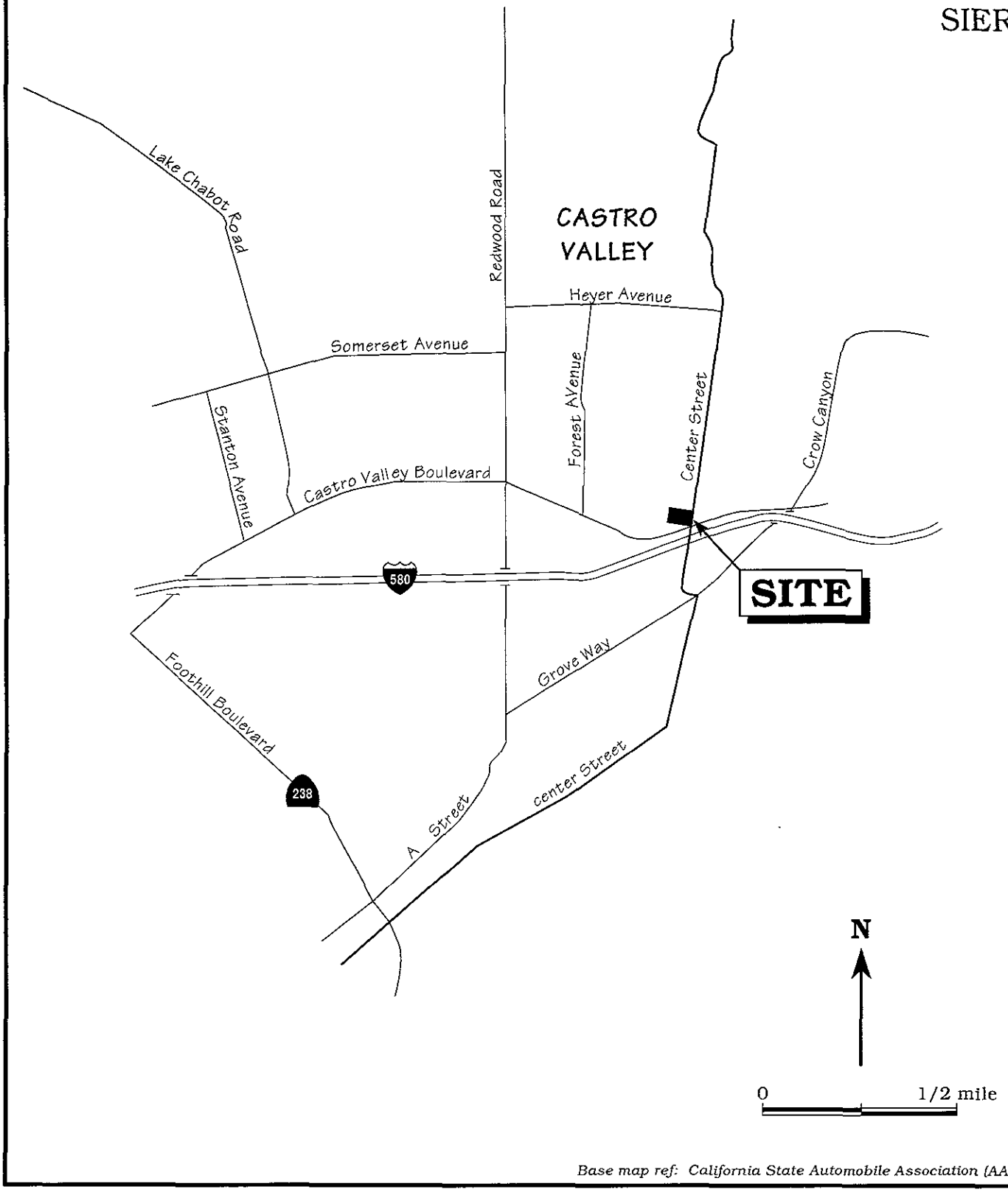

Base map ref: California State Automobile Association (AAA)

Figure 1. Site Location Map – Caltrans Maintenance Facility, 21175 Center Street, Castro Valley, California

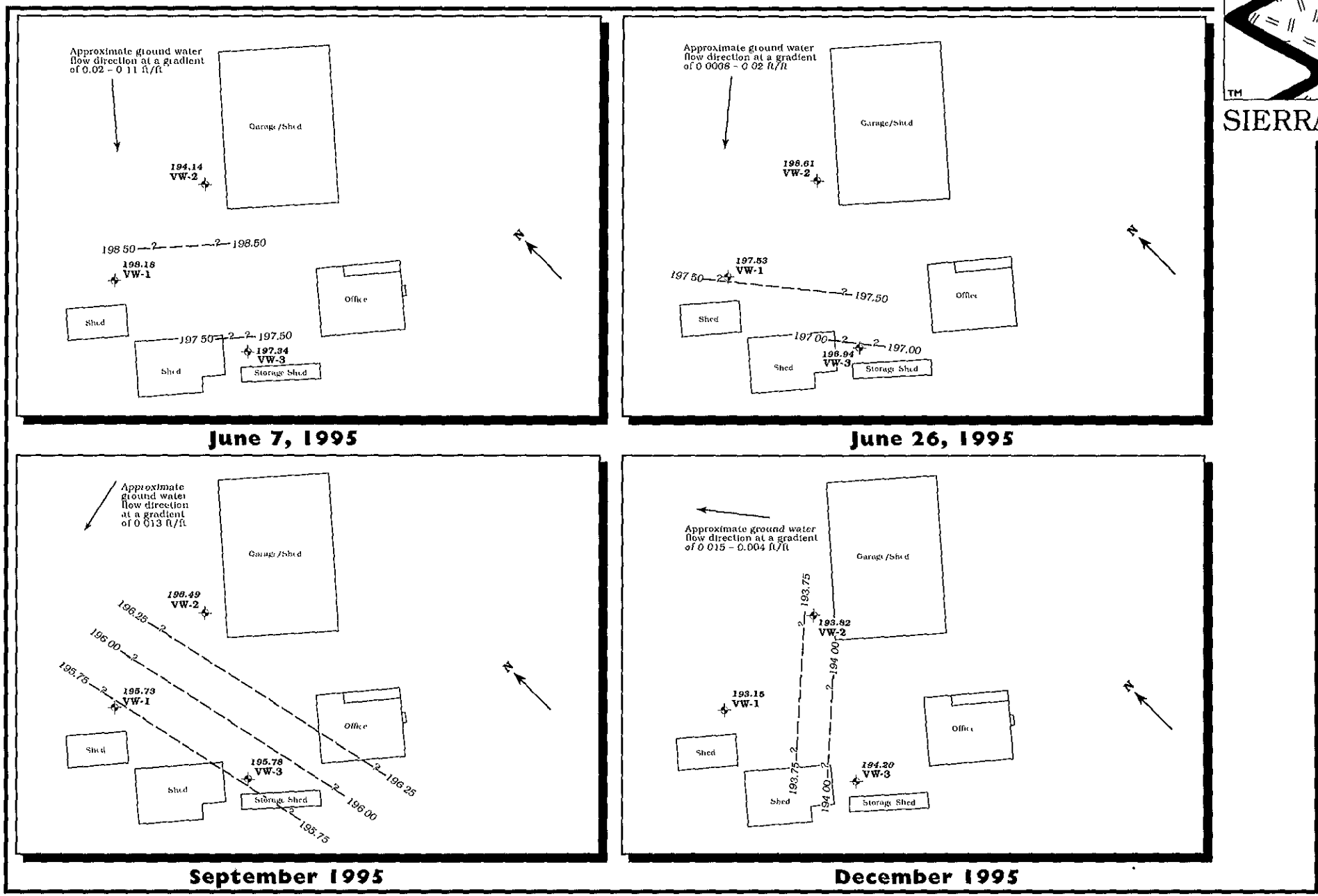

Figure 2. Ground Water Elevation Contour Maps - June 7, 1995, June 26, 1995, September 15, 1995 and December 18, 1995 - Caltrans Maintenance Facility, 21175 Center Street, Castro Valley, California

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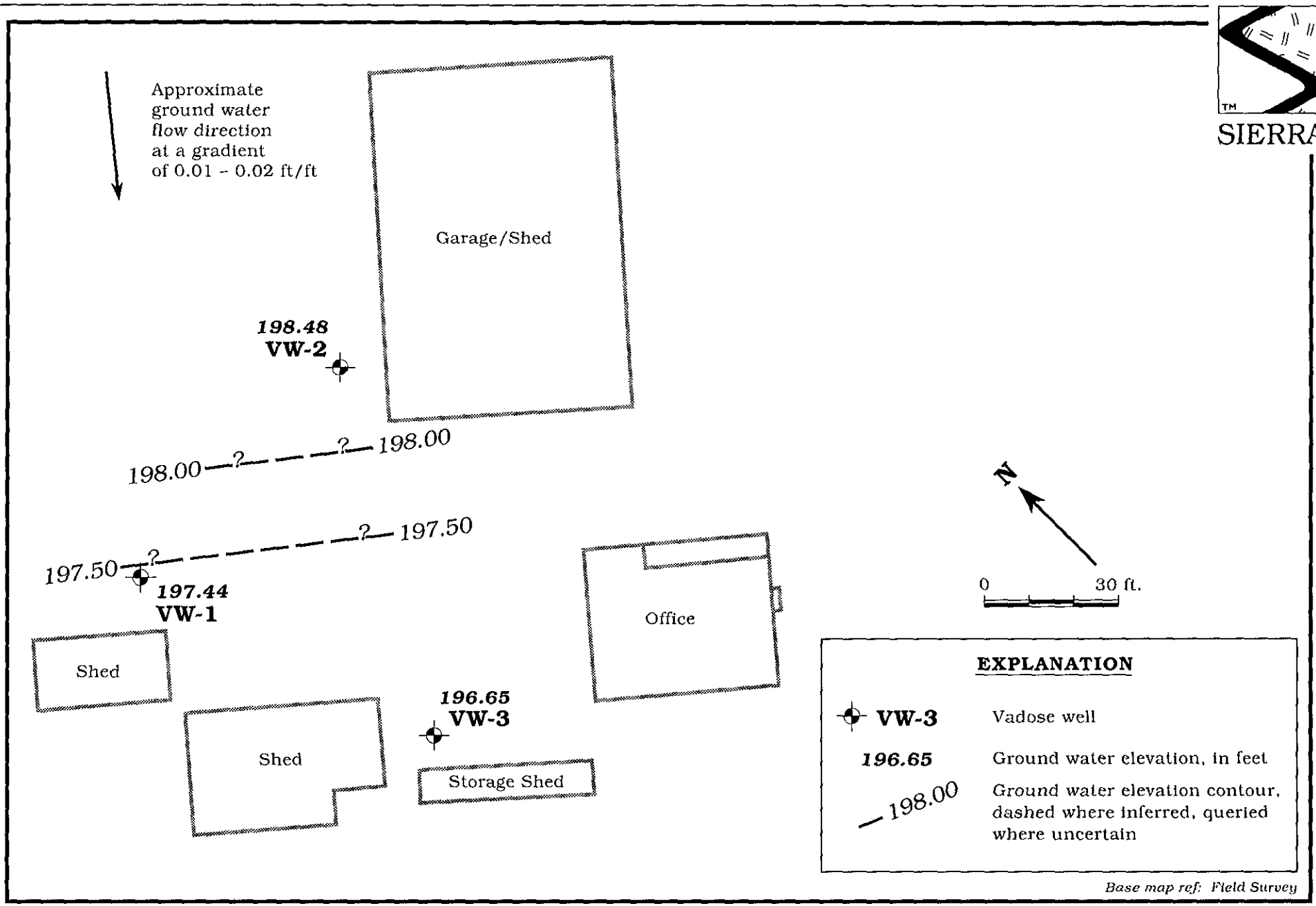

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Figure 3. Monitoring Well Location and Ground Water Elevation Contour Map - March 12, 1996 - Caltrans Maintenance Facility, 21175 Center Street, Castro Valley, California

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APPENDIX B
TABLE

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Table 1. Water Level Data and Well Construction Details - Caltrans Maintenance Station, 21195 Center Street, Castro Valley, California

Well ID	Date Measured	DTW (ft)	TOC (ft)	GWE (msl)	Product Thickness* (ft)	Screen Interval	Sand Pack Interval	Bentonite/Grout Interval
						<----------feet below grade---------->		
VW-1	10/28/94	32.25		[1]	0			
	6/7/95	26.07			0	20.35[3]	22	3
	→ 6/28/95	26.72			0			
			224.25[2]					
	9/15/95	28.52		195.73				
	12/18/95	31.10		193.15	0			
	3/12/96	**26.81**		**197.44**	**0**			
VW-2	10/28/94	31.64			0			
	6/7/95	25.78-			0	20.35	22	3
	6/28/95	26.31			0			
			224.92[1]					
	9/15/95	28.43		196.49				
	12/18/95	31.10		193.82	0			
	3/12/96	**26.44**		**198.48**	**0**			
VW-3	10/28/95	28.74			0			
	6/7/95	26.76			0	20.35	22	3
	6/28/95	27.16			0			
			224.10[1]					
	9/15/95	28.32		195.78				
	12/18/95	29.90		194.20	0			
	3/12/96	**27.45**		**196.65**	**0**			
UNKNOWN	2/28/95	27.20			0			
			224.57[1]					

EXPLANATION:

DTW = Depth to water
TOC = Top of casing elevation
GWE = Ground water elevation
msl = Measurements referenced relative to mean sea level
--- = Not available

NOTES (continued):

[1] Monitoring wells were not survey yet.

[2] All top of casing elevations were surveyed by Ron Miller, Professional Engineer #15816 on July 28, 1995.

[3] All well completion data obtained from Tetra Tech, Inc., 1992, Hayward Maintence Station, Remediation of Soil Contamination and Dry Well Installation, 11-1-92.

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Table 2. Analytic Results for Ground Water - Caltrans Maintenance Station, 21195 Center Street, Castro Valley, California

Well ID	Date Sampled	Analytic Method	TPPH(G)	TPH(D)	B	T	E	X
			<----------ppb---------->					
VW-1	10/28/94	8015/8020	<50	<500	<0.5	<0.5	<0.5	<0.5
	6/7/95	8015/8020	<50	<50	<0.5	<0.5	<0.5	<0.5
	9/18/95	8015/8020	<50	<50	<0.5	<0.5	<0.5	<0.5
	12/18/95	8015/8020	<50	<50	<0.5	<0.5	<0.5	<0.5
	3/12/96	**8015/8020**	**<50**	**<50**	**1.9**	**3.1**	**1.3**	**6.9**
VW-2	10/28/94	8015/8020	<50	<500	<0.5	<0.5	<0.5	<0.5
	6/7/95	8015/8020	<50	---*	<0.5	<0.5	<0.5	<0.5
	6/28/95	8015/8020	---	1.4**	---	---	---	---
	9/18/95	8015/8020	<50	<50	<0.5	<0.5	<0.5	<0.5
	12/18/95	8015/8020	<50	<50	<0.5	<0.5	<0.5	<0.5
	3/12/96	**8015/8020**	**<50**	**<50**	**<0.5**	**0.9**	**<0.5**	**2.6**
VW-3	10/28/94	8015/8020	<50	<500	<0.5	<0.5	<0.5	<0.5
	6/7/95	8015/8020	<50	<50	<0.5	<0.5	<0.5	<0.5
	9/18/95	8015/8020	<50	<50	<0.5	<0.5	<0.5	<0.5
	12/18/95	8015/8020	<50	<50	<0.5	<0.5	<0.5	<0.5
	3/12/96	**8015/8020**	**<50**	**<50**	**0.53**	**1.3**	**0.76**	**4.0**
TB	6/7/95	8015/8020	<50	---	<0.5	<0.5	<0.5	<0.5
	9/18/95	8015/8020	<50	---	<0.5	<0.5	<0.5	<0.5
	12/18/95	8015/8020	<50	---	<0.5	<0.5	<0.5	<0.5
	3/12/96	**8015/8020**	**<50**	**---**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
BB								
	9/18/95	8015/8020	<50	---	<0.5	<0.5	<0.5	<0.5
	12/18/95	8015/8020	<50	---	<0.5	<0.5	<0.5	<0.5
	3/12/96	**8015/8020**	**---**	**---**	**---**	**---**	**---**	**---**

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Table 2. Analytic Results for Ground Water - Caltrans Maintenance Station, 21195 Center Street, Castro Valley, California. (continued)

EXPLANATION:

TPPH(G) = Total Purgeable Petroleum Hydrocarbons as Gasoline
TPH(D) = Total Petroleum Hydrocarbons as Diesel
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
ppb = Parts per billion
--- = Not analyzed/not applicable

ANALYTIC METHODS:

8015 = EPA Method 8015/5030 for TPPH(G)
8015 = Modified EPA Method 8015 for TPH(D)
8020 = EPA Method 8020 for BTEX

ANALYTIC LABORATORY:

Samples prior to September 19, 1995 were analyzed by Applied P & CH Laboratory of Chino, California.
Samples analyzed after September 19, 1995were analyzed by Chromalab Environmental Services of Pleasanton, California.

NOTE:

* Sample Bottle was broken upon receipt.
** Motor oil with a small amount of diesel.