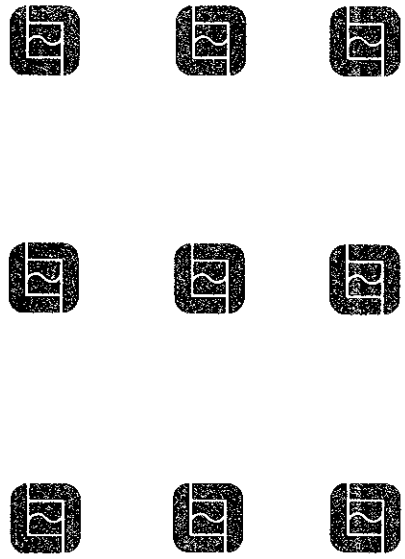

Combined Well Replacement and Quarterly Monitoring Report for July 1 through September 30, 1994 Yerba Buena/East Baybridge Center Emeryville and Oakland, California

October 27, 1994
1649.02

Prepared for
Catellus Development Corporation
201 Mission Street
San Francisco, California 94105

LEVINE·FRICKE

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

October 27, 1994 LF 1649.02

Ms. Susan Hugo
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Second Floor
Oakland, California 94502

Subject: Combined Well Replacement and Quarterly Monitoring Report for July 1 through September 30, 1994, Yerba Buena/East Baybridge Center, Emeryville and Oakland, California

Dear Ms. Hugo:

In July 1993 ground-water monitoring wells at the Yerba Buena/East Baybridge Center site in Emeryville and Oakland, California, were destroyed in conjunction with site development activities. Specifically, all ground-water monitoring wells east of Hollis Street (LF-1 through LF-8, LF-16 through LF-21, LF-24 through LF-29, and deeper wells LF-4D, LF-4Z, LF-5D, and LF-19D) and off-site well LF-30 were abandoned.

Destruction of the wells was proposed in Levine•Fricke's "Work Plan for Site Characterization and Remediation Activities to be Conducted in Conjunction with Proposed Site Development," submitted to the Alameda County Health Care Services Agency (ACHA) on April 28, 1993. Details regarding well abandonment were presented in Levine•Fricke's October 29, 1993 reports:

- "Quarterly Monitoring Report for July 1 through September 30, 1993, Area A and the South-Central Portion of Area B, Yerba Buena/East Baybridge Center, Emeryville and Oakland, California"

- "Quarterly Monitoring Report for July 1 through September 30, 1993, Former Ransome Property, Yerba Buena/East Baybridge Project Site, Emeryville, California."

In July 1994, 17 replacement wells were installed at locations illustrated on Figure 2 of the enclosed report. In addition, two ground-water extraction wells EX-3 and EX-4 (see Figure 2) were installed on January 2, 1994. The locations of the monitoring wells were proposed in the April 28, 1993 work plan, which was approved by the ACHA in an August 4, 1993 letter from you to Jenifer Beatty of Levine•Fricke.

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Other offices in Irvine, CA; Sacramento/Roseville, CA; Tallahassee, FL; Honolulu, HI

The enclosed combined replacement well and quarterly monitoring report is submitted to document:

- the field methods used in July 1994 to install the replacement wells (Appendix A)
- well construction details and the lithology at each location (Appendix B)
- results of the first quarterly monitoring event following installation of the replacement wells

Well replacement and monitoring were conducted in accordance with the April 28 work plan.

If you have any questions or comments concerning this report, please call me.

Sincerely,

Ron Goloubow
Senior Project Geologist

Enclosure

cc: Kimberly Brandt, Catellus Development
Sumadhu Arigala, Regional Water Quality Control Board

1649/1649094.QMR/NAS

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CERTIFICATION

All hydrogeologic and geologic information, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by a Levine·Fricke California Registered Geologist.

Andrew L. Wright
Principal Geologist
California Registered Geologist (4592)

10/27/94
Date

October 27, 1994 LF 1649.02

COMBINED WELL REPLACEMENT AND QUARTERLY GROUND-WATER MONITORING REPORT FOR JULY 1 THROUGH SEPTEMBER 30, 1994 YERBA BUENA/EAST BAYBRIDGE CENTER PROJECT SITE EMERYVILLE AND OAKLAND, CALIFORNIA

1.0 INTRODUCTION

In July 1993 ground-water monitoring wells at the Yerba Buena/East Baybridge Center site ("the Site"; Figure 1) in Emeryville and Oakland, California, were destroyed in conjunction with site development activities. Specifically all ground-water monitoring wells east of Hollis Street (LF-1 through LF-8, LF-16 through LF-21, LF-24 through LF-29, and deeper wells LF-4D, LF-4Z, LF-5D, and LF-19D) and off-site well LF-30 were abandoned.

Destruction of the wells was proposed in Levine·Fricke's "Work Plan for Site Characterization and Remediation Activities to be Conducted in Conjunction with Proposed Site Development," submitted to the Alameda County Health Care Services Agency (ACHA) on April 28, 1993. That work plan was approved by the ACHA in an August 4, 1993 letter from Ms. Susan Hugo of the ACHA to Ms. Jenifer Beatty of Levine·Fricke.

Details regarding well abandonment were presented in Levine·Fricke's October 29, 1993 report:

- "Quarterly Monitoring Report for July 1 through September 30, 1993, Area A and the South-Central Portion of Area B, Yerba Buena/East Baybridge Center, Emeryville and Oakland, California"
- "Quarterly Monitoring Report for July 1 through September 30, 1993, Former Ransome Property, Yerba Buena/East Baybridge Project Site, Emeryville, California"

This combined replacement well and quarterly monitoring report documents:

- the field methods used in July 1994 to install 17 replacement wells (Appendix A)
- well construction details and the lithology at each well location (Appendix B)

- results of the first quarterly monitoring event following installation of the replacement wells (Section 4.0)

Well replacement and monitoring were conducted in accordance with the April 28 work plan.

2.0 BACKGROUND

The site layout is presented in Figure 2. The Site covers approximately 51 acres and is currently under development. From the early 1900s to approximately 1990, the Site was used by a variety of industrial and commercial businesses. These businesses included warehouse storage of predominantly dry goods and limited quantities of hazardous materials (oxides and acids [a complete record of materials stored at the Site is not available]); metal foundries; truck maintenance and repair; an auto storage and wrecking yard; a construction yard; and several passenger and freight rail lines.

Environmental investigations at the Site were initiated in September 1989 by Levine·Fricke on behalf of Catellus and have continued over the past five years. Results of the Phase I and Phase II Investigation indicated volatile organic compounds (VOCs) were present in shallow ground water beneath the Site. Based on the presence of these VOCs, a ground-water monitoring program was implemented for the Site in January 1992 to monitor VOC concentration in ground water.

To reduce the potential for off-site migration of shallow VOC-affected ground water, a ground-water extraction and treatment system was installed at the Site. A report of the operation of that extraction and treatment system was presented in Levine·Fricke's October 31, 1994 "Quarterly Self-Monitoring Report, Ground-Water Extraction and Treatment System, Catellus Development Corporation, East Baybridge Center, 3838 Hollis Street, Emeryville, California," which was submitted to the East Bay Municipal Utilities District.

In addition, in October 1992, a monitoring program was implemented for the former Ransome Property, located southeast of the intersection of Hollis and 40th streets. Wells located at the property were monitored for petroleum hydrocarbons to assess whether petroleum-affected soil identified and subsequently removed from the area had affected shallow ground water quality. Results indicated that petroleum hydrocarbon-affected soil has not affected shallow ground water.

All ground-water monitoring wells east of Hollis Street were destroyed in July 1993 in connection with site development and as approved by the ACHA in its August 4, 1993 letter. Following completion of site grading activities, 17 replacement wells were installed in July 1994, as described in Section 3.0 and Appendix A, so that the ground-water monitoring program for the Site could continue. The monitoring program includes the collection of quarterly water-level measurements from all wells located at the Site and collection of ground-water samples from selected wells at the Site on a periodic basis as described in the April 28, 1994 work plan. Samples will be collected quarterly to monitor VOCs in shallow ground water. Additionally, samples will be collected semiannually for analysis of total petroleum hydrocarbons as diesel (TPHd) and TPH as oil (TPHo) to monitor diesel-affected soil contained at the Site during development activities. The first round of sampling and analysis of the replacement wells was conducted in September 1994 and is described in Section 4.0.

3.0 WELL REPLACEMENT

In accordance with Levine·Fricke's April 28, 1993 work plan, 17 replacement wells were installed in July 1994 at the locations illustrated on Figure 2. In addition, two ground-water extraction wells EX-3 and EX-4 (see Figure 2) were installed on January 2, 1994. The locations of the monitoring wells were proposed in the April 28, 1993 work plan. Field methods used to install those wells are described in Appendix A. Well logs describing the construction details and the lithology at each location are provided in Appendix B.

4.0 QUARTERLY MONITORING REPORT

The ground-water monitoring activities for this first quarterly monitoring event following installation of the replacement wells included:

- measuring water levels in all accessible on- and off-site wells on September 12, 1994
- collecting ground-water samples for chemical analysis from on-site monitoring wells MW-1, MW-3, MW-5, MW-6, MW-6D, MW-7, MW-7D, MW-7Z, MW-8, MW-9, MW-9D, MW-10, MW-22, MW-23, and extraction wells EX-3 and EX-4 between September 12 and 14, 1994

Replacement wells were surveyed to the nearest 0.01 foot by a state-licensed surveyor following installation. Depth to water was measured to the nearest 0.01 foot using an electric water-level sounding probe and recorded in the field. Before ground-water samples were collected, three to four well volumes of water were purged from each well in accordance with field procedures for quarterly ground-water sampling described in Appendix A. Water-quality sampling sheets are included in Appendix C. Results of these monitoring activities are discussed in Section 4.1 and 4.2.

4.1 Ground-Water Elevations and Flow Direction

Table 1 summarizes depth-to-water and ground-water elevation data collected at the Site on September 12, 1994. Depth to ground water measured in shallow wells (less than 25 feet deep) on September 12, 1994, ranged from 8.00 feet below ground surface (bgs) (MW-2) to 19.70 feet bgs (MW-9).

A ground-water elevation contour map for water levels measured on September 12, 1994, is presented in Figure 2. These data indicate that the direction of shallow ground-water flow beneath the Site is toward the west-southwest, towards the ground-water extraction wells and interceptor trench. The hydraulic gradient across the Site is 0.016 ft/ft, as measured between wells MW-2 and MW-9. This direction and gradient is consistent with the ground-water flow direction previously reported at the Site in past monitoring periods. The influence of pumping from the shallow extraction wells and trench on the ground-water flow pattern is illustrated in Figure 2 by depressions in the ground-water surface and by the deflection of contour lines in the vicinity of the extraction wells and trench.

4.2 Ground-Water Quality

Analytical results for ground-water samples collected in September 1994 are summarized in Table 2. Laboratory data sheets and chain-of-custody forms are presented in Appendix D. For comparative purposes the analytical results for samples collected from the wells that were abandoned are summarized in Tables 3 and 4. In general, the concentration of VOCs detected in samples collected during this monitoring period are within the same order of magnitude as samples previously collected from the abandoned wells.

Ground-water samples were submitted to American Environmental Network, Inc., a state-certified laboratory, under strict chain-of-custody procedures. All samples, with the exception

of well MW-1, were analyzed for VOCs using EPA Method 8010. To asses whether shallow ground water has been affected by petroleum-affected soil identified at the former Ransome Property and subsequently removed, the ground-water sample collected from well MW-1 was analyzed for TPHg, TPHd (carbon chain length C_{12} to C_{22}), and TPHo (carbon chain length C_{22} to C_{36}). Results of chemical analyses are discussed below.

For QA/QC purposes, a duplicate sample was collected from well MW-9 and analyzed for VOCs. Results of the duplicate sample were similar to results of the primary sample.

4.2.1 Shallow Monitoring Wells

Analytical results for ground-water samples collected from shallow monitoring wells in September 1994 were similar to results reported for the Site during previous monitoring events (see Table 3).

No VOCs were detected at concentrations above method detection limits in ground-water samples collected from one (MW-3) of the 9 shallow wells sampled. 1,1-DCE was detected at concentrations ranging from 0.002 parts per million (ppm) (well LF-23) to 0.280 ppm (MW-6) in samples collected from all wells except wells MW-3 and MW-8, which did not contain 1,1-DCE above method detection limits. Trichloroethene (TCE) and tetrachloroethene (PCE) were detected at low concentrations, ranging from 0.0005 ppm to 0.006 ppm, in the samples collected from wells MW-5, MW-6, LF-22, and LF-23 and at concentrations up to 0.04 ppm in extraction wells EX-3 and EX-4. TCE and PCE were not detected in the other samples collected during this monitoring period.

Samples collected from well MW-1 did not contain TPHg or TPHo. TPHd was present at a concentration of 0.300 ppm.

4.2.2 Deeper Monitoring Wells

Analytical results for samples collected from deeper monitoring wells are generally consistent with results reported previously for the Site. Monitoring wells MW-6D, MW-7D, and MW-9D, are screened in intermediate-depth sediments, from 30 to 45 feet bgs. Monitoring well LF-7Z is screened in deeper sediments, from 50 to 65 feet bgs.

No VOCs were detected in deep well MW-9D and deeper well MW-7Z. 1,1-DCE was detected in the ground-water samples collected from wells MW-6D and MW-7D at concentrations of 0.003 ppm at both wells. These concentrations are

significantly lower than those reported for the ground-water sample collected from shallow wells MW-6 and MW-7, located within 10 feet of wells MW-6D and MW-7D but screened in shallow sediments (9.5 to 19.5 feet bgs). No VOCs were detected in deeper well LF-7Z, located within 10 feet of well LF-7D, indicating that VOC-affected ground water in the vicinity of well LF-7D has not migrated to deeper sediments.

5.0 DISCUSSION OF RESULTS

Ground-water gradient and flow direction measured in September 1994 are consistent with the ground-water flow direction previously reported for the Site. Additionally, the direction of shallow ground-water flow beneath the Site is being influenced by the ground-water extraction wells and extraction trench at the Site.

Analytical results for ground-water samples collected in September 1994 are similar to results previously reported for the Site during 1992 and 1993. Results indicate that the plume of VOC-affected ground water likely extends from an area between wells MW-3 and MW-6 approximately 800 feet southwest (downgradient) of well MW-6 towards the extraction wells and trench, and is approximately 300 feet wide. Based on ground-water elevations in area wells, the extraction system is effectively capturing VOC-affected ground water and inhibiting off-site migration of affected ground water west of Hollis Street.

6.0 ACTIVITIES PROPOSED FOR OCTOBER THROUGH DECEMBER 1994

Ground-water monitoring activities planned for the fourth quarter (October through December) of 1994 include water level measurements and quarterly ground-water sampling. The sampling schedule is summarized in Table 4. It is anticipated a report summarizing these activities will be submitted to the ACHA by January 31, 1995.

REFERENCES

Levine•Fricke, Inc. 1993. Work Plan for Site Characterization and Remediation Activities to be Conducted in Conjunction with Proposed Site Development. April 28

Table 1
Water-Level Elevations
East Baybridge Yerba Buena Project Site
Oakland/Emeryville, California

Well ID	Date of Measurement	Top of Casing Elevation (1)	Depth to Water (2)	Water Level Elevation (1)
Shallow Wells (20 to 25 feet below grade)				
MW-1	12-Sep-94	27.47	14.88	12.59
MW-2	12-Sep-94	37.23	8.00	29.23
MW-3	12-Sep-94	32.05	9.88	22.17
MW-4	12-Sep-94	24.28	17.01	7.27
MW-5	12-Sep-94	22.19	17.15	5.04
MW-6	12-Sep-94	28.54	12.58	17.45
MW-7	12-Sep-94	26.29	11.60	14.69
MW-8	12-Sep-94	24.40	9.96	14.44
MW-9	12-Sep-94	24.17	19.70	4.47
LF-22	12-Sep-94	17.99	11.96	6.03
LF-23	12-Sep-94	17.99	12.24	5.75
Extraction Wells (20 to 30 feet below grade)				
EX-1	12-Sep-94	23.51	24.83	-1.32
EX-2	12-Sep-94	20.03	20.83	-0.80
EX-3	12-Sep-94	20.96	22.33	-1.37
EX-4	12-Sep-94	20.96	22.61	-1.65
Deeper Wells (40 to 45 feet below grade)				
MW-6D	12-Sep-94	28.48	11.09	17.39
MW-7D	12-Sep-94	26.27	11.32	14.95
MW-9D	12-Sep-94	24.17	18.38	5.79
Deep Well (65 feet below grade)				
MW-7Z	12-Sep-94	25.96	11.78	14.18

Notes:
1. Top of casing elevations and water-level elevations realtive to mean sea level.
2. Depth to water is in feet below top of casing.

TABLE 2
QUARTERLY SUMMARY OF GROUND-WATER QUALITY DATA
EAST BAYBRIDGE DEVELOPMENT
OAKLAND/EMERYVILLE, CALIFORNIA
(concentrations expressed in parts per million)

Well ID	Notes	Date	Lab	TPH(g)	TPH(d)	TPH(o)	TCE	1,1,1-TCA	PCE	1,1-DCE	1,1-DCA	1,2-DCA
Shallow Wells (20 to 25 feet below grade)												
MW-3		12-Sep-94	AEN	NA	NA	NA	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
MW-5		13-Sep-94	AEN	NA	NA	NA	<0.0005	0.001	0.0007	0.003	0.002	<0.0005
MW-6	(2)	13-Sep-94	AEN	NA	NA	NA	0.0005	0.041	<0.0005	0.280	0.005	0.001
MW-7		12-Sep-94	AEN	NA	NA	NA	<0.0005	0.017	<0.0005	0.160	0.003	0.0009
MW-8	(3)	13-Sep-94	AEN	NA	NA	NA	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005
MW-9		12-Sep-94	AEN	NA	NA	NA	<0.0005	0.017	<0.0005	0.120	0.0005	0.006
Duplicate		12-Sep-94	AEN	NA	NA	NA	<0.0005	0.015	<0.0005	0.120	0.0005	0.009
LF-22		12-Jul-91	ANA	NA	NA	NA	0.0007	0.012	0.0017	0.053	0.0063	0.0016
		07-Jan-92	ANA	NA	NA	NA	<0.0005	0.009	0.0037	0.041	0.0054	0.0011
		16-Apr-92	ANA	NA	NA	NA	<0.0005	0.0026	0.0018	0.015	0.0021	<0.0005
	(1)	23-Jul-92	ANA	NA	NA	NA	<0.0005	0.0034	0.0014	0.027	0.0052	<0.0005
		20-Oct-92	ANA	NA	NA	NA	0.00078	0.0013	0.00066	0.014	0.004	<0.0005
		25-May-93	ANA	NA	NA	NA	<0.0005	0.00084	0.00058	0.0061	0.0024	<0.0005
		13-Jul-93	ANA	NA	NA	NA	0.00069	0.00095	0.00088	0.0077	0.0033	<0.0005
	(4)	13-Sep-94	AEN	NA	NA	NA	0.004	<0.0005	0.008	0.003	0.001	0.0007
LF-23		12-Jul-91	ANA	NA	NA	NA	0.0039	0.0009	0.027	0.0012	0.011	0.0009
		07-Jan-92	ANA	NA	NA	NA	0.007	0.0023	0.056	0.0034	0.012	0.0013
		16-Apr-92	ANA	NA	NA	NA	0.0036	0.00068	0.020	0.0044	0.0044	0.0011
		23-Jul-92	ANA	NA	NA	NA	0.0038	0.0013	0.029	0.0061	0.0044	0.0014
		20-Oct-92	ANA	NA	NA	NA	0.0033	0.00054	0.023	0.0047	0.002	0.0015
		25-May-93	ANA	NA	NA	NA	0.0042	0.00065	0.016	0.0035	0.0017	0.0019
		13-Jul-93	ANA	NA	NA	NA	0.0081	0.0015	0.018	0.0074	0.0033	0.0051
		13-Sep-94	AEN	NA	NA	NA	<0.0005	<0.0005	0.0006	0.002	0.003	0.0007
Shallow Extraction Wells (20 to 30 feet below grade)												
EX-3	(5)	14-Sep-94	AEN	NA	NA	NA	0.004	0.014	0.042	0.100	0.005	0.001
EX-4		14-Sep-94	AEN	NA	NA	NA	<0.0005	0.025	0.010	0.220	0.006	0.001

TABLE 2
QUARTERLY SUMMARY OF GROUND-WATER QUALITY DATA
EAST BAYBRIDGE DEVELOPMENT
OAKLAND/EMERYVILLE, CALIFORNIA
(concentrations expressed in parts per million)

Well ID	Notes	Date	Lab	TPH(g)	TPH(d)	TPH(o)	TCE	1,1,1-TCA	PCE	1,1-DCE	1,1-DCA	1,2-DCA
Deeper Wells (40 to 45 feet below grade)												
MW-6D		13-Sep-94	AEN	NA	NA	NA	<0.0005	<0.0005	<0.0005	0.003	<0.0005	0.0005
MW-7D		13-Sep-94	AEN	NA	NA	NA	<0.0005	<0.0005	<0.0005	0.003	<0.0005	<0.0005
MW-9D		12-Sep-94	AEN	NA	NA	NA	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Deep Well (65 feet below grade)												
MW-7Z		13-Sep-94	AEN	NA	NA	NA	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Notes:

Data entered by REG Data checked by BCC
QA/QC REG

(1) denotes that 0.00081 ppm vinyl chloride was detected.
(2) denotes that 0.002 ppm chloroform was detected.
(3) denotes that 0.0008 ppm chloroform was detected.
(4) denotes that 0.002 ppm chloroform was detected.
(5) denotes that 0.0008 ppm cis-1,2-Dichloroethene was detected.

Key to abbreviations:

TCE	= Trichloroethene	1,1-DCE	= 1,1-Dichloroethene
PCE	= Tetrachloroethene	1,1-DCA	= 1,1-Dichloroethane
1,1,1-TCA	= 1,1,1-Trichloroethane	1,2-DCA	= 1,2-Dichloroethane

TPH(g) = Total petroleum hydrocarbons as gasoline
TPH(d) = Total petroleum hydrocarbons as diesel
TPH(o) = Total petroleum hydrocarbons as oil

AEN denotes American Environmental Network in Pleasant Hill, California
ANA denotes Inchcape Testing Anametrix Inc. in San Jose, California
NA denotes parameter not analyzed

TABLE 3
HISTORICAL GROUND-WATER QUALITY DATA
CHEMICAL COMPOUNDS DETECTED IN SHALLOW GROUND WATER
FEBRUARY 1990 THROUGH JULY 1993
AREA A AND VICINITY
YERBA BUENA PROJECT SITE
(concentrations in parts per million)

Sample Location	Date Sampled		1,1-DCE	1,1-DCA	1,2-DCE	TCE	1,1,1-TCA	PCE	Oil	Diesel
LF-3	06-Feb-90		ND	ND	ND	ND	ND	ND	NA	NA
	07-Jan-92		ND	ND	ND	ND	ND	ND	ND	ND
	23-Jul-92		ND	ND	ND	ND	ND	ND	NA	NA
	12-Jul-93		NA	NA	NA	NA	NA	NA	0.068	ND
LF-4	07-Feb-90		0.49	0.008	ND	ND	0.082	ND	NA	NA
	06-Jan-92		0.43	0.006	ND (1)	ND (1)	0.078	ND (1)	ND	ND
	duplicate		0.41	0.004	ND (1)	ND (1)	0.075	ND (1)	ND	ND
	15-Apr-92		0.25	ND	ND	ND	0.025	ND	NA	NA
	24-Jul-92		0.22	ND	ND	ND	0.024	ND	0.042	ND
	21-Oct-92		0.19	ND	ND	ND	0.02	ND	NA	NA
	24-May-93		0.16	ND	ND	ND	0.014	ND	NA	NA
	12-Jul-93		0.16	ND	ND	ND	0.021	ND	0.061	ND
LF-4D	25-Apr-90		0.43	0.007	ND	ND	0.087	ND	NA	NA
	06-Jan-92		0.39	0.006	ND (2)	ND (2)	0.074	ND (2)	NA	NA
	16-Apr-92		0.16	ND	ND	ND	0.020	ND	NA	NA
	23-Jul-92		0.15	ND	ND	ND	0.018	ND	NA	NA
	21-Oct-92		0.15	ND	ND	ND	0.013	ND	NA	NA
	24-May-93	(11)	0.18	0.0042	ND	ND	0.019	ND	NA	NA
	12-Jul-93		0.1	0.0034	ND	ND	0.015	ND	NA	NA
LF-4Z	21-Nov-90		ND	ND	ND	ND	ND	ND	NA	NA
	06-Jan-92		ND	ND	ND	ND	ND	ND	NA	NA
	16-Apr-92		ND	ND	ND	ND	ND	ND	NA	NA
	23-Jul-92		ND	ND	ND	ND	ND	ND	NA	NA
	21-Oct-92		ND	ND	ND	ND	ND	ND	NA	NA
	24-May-93		ND	ND	ND	ND	ND	ND	NA	NA
	12-Jul-93		ND	ND	ND	ND	ND	ND	NA	NA
LF-5	06-Feb-90		0.73	0.014	ND	ND	0.27	ND	ND	ND
	06-Jan-92		0.88	0.011	ND (3)	ND (3)	0.010	ND (3)	ND	ND
	16-Apr-92		0.44	ND	ND	ND	0.10	ND	NA	NA
	23-Jul-92		0.47	ND	ND	ND	0.08	ND	0.0058	ND
	21-Oct-92		0.39	ND	ND	ND	0.042	ND	NA	NA
	24-May-93	(10)	0.52	ND	ND	ND	0.095	ND	NA	NA
	12-Jul-93		0.34	ND	ND	ND	0.076	ND	0.085	ND
LF-5D	26-Apr-90		ND	ND	ND	ND	ND	ND	NA	NA
	29-Nov-90		ND	ND	ND	ND	ND	ND	NA	NA
	06-Jan-92		ND	ND	ND	ND	ND	ND	NA	NA
	16-Apr-92		ND	ND	ND	ND	ND	ND	NA	NA
	23-Jul-92		ND	ND	ND	ND	ND	ND	NA	NA
	21-Oct-92		ND	ND	ND	ND	ND	ND	NA	NA
	24-May-93		ND	ND	ND	ND	ND	ND	NA	NA
	12-Jul-93		ND	ND	ND	ND	ND	ND	NA	NA
LF-6	07-Feb-90		ND	0.018	ND	ND	ND	ND	ND	ND
	duplicate		ND	0.018	ND	ND	ND	ND	ND	NA
	29-Nov-90		ND	ND	ND	ND	ND	ND	NA	NA
	07-Jan-92		0.0048	0.011	0.0005	0.0026	0.0044	0.018	NA	NA
	15-Apr-92		0.004	0.0032	0.0025	0.0026	0.001	0.0065	NA	NA
	23-Jul-92	(8)	0.0082	0.0033	0.0094	0.0071	0.0014	0.0094	NA	NA
	20-Oct-92	(8)	0.0051	0.0026	0.016	0.0046	0.0015	0.0025	NA	NA
	24-May-93		0.0086	0.0018	0.0016	0.0021	0.0016	0.005	NA	NA
	13-Jul-93		0.017	0.0034	0.0034	0.0039	0.0027	0.0094	NA	NA
LF-17	25-Apr-90		0.009	0.001	ND	ND	0.003	ND	NA	NA
	duplicate		ND	ND	ND	ND	ND	ND	NA	NA
	07-Jan-92		0.490	0.012	ND (2)	ND (2)	0.092	ND (2)	NA	NA
	16-Apr-92		0.350	ND	ND	ND	0.047	ND	NA	NA

TABLE 3
HISTORICAL GROUND-WATER QUALITY DATA
CHEMICAL COMPOUNDS DETECTED IN SHALLOW GROUND WATER
FEBRUARY 1990 THROUGH JULY 1993
AREA A AND VICINITY
YERBA BUENA PROJECT SITE
(concentrations in parts per million)

Sample Location	Date Sampled		1,1-DCE	1,1-DCA	1,2-DCE	TCE	1,1,1-TCA	PCE	Oil	Diesel
	duplicate		0.360	ND	ND	ND	0.049	ND	NA	NA
	24-Jul-92		0.320	ND	ND	ND	0.035	ND	NA	NA
	duplicate		0.460	ND	ND	ND	0.053	ND	NA	NA
	21-Oct-92		0.380	ND	ND	ND	0.04	ND	NA	NA
	duplicate		0.320	ND	ND	ND	0.033	ND	NA	NA
	25-May-93	(12)	0.340	ND	ND	ND	0.033	ND	NA	NA
	duplicate	(13)	0.290	ND	ND	ND	0.027	ND	NA	NA
	12-Jul-93		0.300	0.0062	ND	ND	0.04	ND	NA	NA
	duplicate		0.300	0.0061	ND	ND	0.039	ND	NA	NA
LF-18	25-Apr-90		0.003	ND	ND	ND	ND	ND	NA	NA
	07-Jan-92		0.0013	ND	ND	ND	ND	ND	NA	NA
	16-Apr-92		0.0017	ND	ND	ND	ND	ND	NA	NA
	23-Jul-92		ND	ND	ND	ND	ND	ND	NA	NA
	21-Oct-92		ND	ND	ND	ND	ND	ND	NA	NA
	25-May-93		ND	ND	ND	ND	ND	ND	NA	NA
	13-Jul-93		ND	ND	ND	ND	ND	ND	NA	NA
LF-19	25-Apr-90		0.15	0.006	ND	ND	0.034	ND	NA	NA
	06-Jan-92		0.100	0.0087	ND	ND	0.018	ND	ND	0.120
	15-Apr-92		0.064	0.0028	ND	ND	0.008	ND	NA	NA
	24-Jul-92		0.032	0.0032	ND	ND	0.0039	ND	0.200	ND
	20-Oct-92	(7)	0.0052	0.003	ND	ND	0.0011	ND	NA	NA
	25-May-93		0.013	0.0011	ND	ND	0.0012	ND	NA	NA
	12-Jul-93		0.010	0.0013	ND	ND	0.0017	ND	0.190	ND
LF-19D	12-Jul-91		ND	ND	ND	ND	ND	ND	NA	NA
	06-Jan-92		ND	ND	ND	ND	ND	ND	ND	ND
	15-Apr-92		ND	ND	ND	ND	ND	ND	NA	NA
	23-Jul-92		ND	0.0007	ND	ND	ND	ND	NA	NA
	20-Oct-92		ND	ND	ND	ND	ND	ND	NA	NA
	25-May-93		ND	0.00067	ND	ND	ND	ND	NA	NA
	12-Jul-93		0.00089	0.0012	ND	ND	ND	ND	NA	NA
LF-20	26-Apr-90		ND	ND	ND	ND	ND	ND	NA	NA
	duplicate		ND	ND	ND	ND	ND	ND	NA	NA
	07-Jan-92		ND	ND	ND	ND	ND	ND	NA	NA
	16-Apr-92		ND	ND	ND	ND	ND	ND	NA	NA
	24-Jul-92		ND	ND	ND	ND	ND	ND	NA	NA
	21-Oct-92		ND	ND	ND	ND	ND	ND	NA	NA
	25-May-93		ND	ND	ND	ND	ND	ND	NA	NA
	13-Jul-93		ND	ND	ND	ND	ND	ND	NA	NA
LF-21	29-Nov-90		ND	ND	ND	ND	ND	ND	NA	NA
	07-Jan-92		ND	ND	ND	ND	ND	ND	NA	NA
	16-Apr-92		ND	ND	ND	ND	ND	ND	NA	NA
	24-Jul-92		ND	ND	ND	ND	ND	ND		
	21-Oct-92		ND	ND	ND	ND	ND	ND	NA	NA
	25-May-93		ND	ND	ND	ND	ND	ND	NA	NA
	13-Jul-93		ND	ND	ND	ND	ND	ND	NA	NA
LF-22	12-Jul-91		0.053	0.0063	0.0016	0.0007	0.012	0.0017	NA	NA
	07-Jan-92		0.041	0.0054	0.0011	ND	0.009	0.0037	NA	NA
	16-Apr-92		0.015	0.0021	ND	ND	0.0026	0.0018	NA	NA
	23-Jul-92	(6)	0.027	0.0052	ND	ND	0.0034	0.0014	NA	NA
	20-Oct-92		0.014	0.004	ND	0.00078	0.0013	0.00066	NA	NA
	25-May-93		0.0061	0.0024	ND	ND	0.00084	0.00058	NA	NA
	13-Jul-93		0.0077	0.0033	ND	0.00069	0.00095	0.00088	NA	NA
LF-23	12-Jul-91		0.0012	0.011	0.0009	0.0039	0.0009	0.027	NA	NA
	07-Jan-92		0.0034	0.012	0.0013	0.007	0.0023	0.056	NA	NA

TABLE 3
HISTORICAL GROUND-WATER QUALITY DATA
CHEMICAL COMPOUNDS DETECTED IN SHALLOW GROUND WATER
FEBRUARY 1990 THROUGH JULY 1993
AREA A AND VICINITY
YERBA BUENA PROJECT SITE
(concentrations in parts per million)

Sample Location	Date Sampled		1,1-DCE	1,1-DCA	1,2-DCE	TCE	1,1,1-TCA	PCE	Oil	Diesel
	16-Apr-92		0.0044	0.0044	0.0011	0.0036	0.00068	0.020	NA	NA
	23-Jul-92		0.0061	0.0044	0.0014	0.0038	0.0013	0.029	NA	NA
	20-Oct-92		0.0047	0.002	0.0015	0.0033	0.00054	0.023	NA	NA
	25-May-93		0.0035	0.0017	0.0019	0.0042	0.00065	0.016	NA	NA
	13-Jul-93		0.0074	0.0033	0.0051	0.0081	0.0015	0.018	NA	NA
LF-30	22-Oct-92		0.00079	0.0058	0.0015	0.00065	0.001	ND	NA	NA
	duplicate		0.00081	0.0053	0.0013	0.00051	0.00056	ND	NA	NA
	25-May-93		ND	0.0036	0.0021	0.0011	0.00051	ND	NA	NA
	13-Jul-93	(15)	0.00063	0.0035	0.0032	0.0012	ND	ND	NA	NA
Field Blanks:										
LF1-7503	05-Feb-90		ND	ND	ND	ND	ND	ND	NA	NA
LF-4FB	06-Jan-92		ND	ND	ND	ND	ND	ND	ND	ND
LF-17FB (4)	16-Apr-92		ND	ND	ND	ND	ND	ND	NA	NA
LF-17FB	24-Jul-92		ND	ND	ND	ND	ND	ND	NA	NA
LF-17-BB	20-Oct-92	(9)	ND	ND	ND	ND	ND	ND	NA	NA
LF-23-BB	25-May-93		ND	ND	ND	ND	ND	ND	NA	NA
LF-17-FB	12-Jul-93	(14)	ND	ND	ND	ND	ND	ND	NA	NA
Detection Limit:			0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.05	0.05

Data entered by SCH/28-Sep-93. Data proofed by JJB/27-Oct-93. QA/QC by RG.

NA - not analyzed
ND - not present at concentrations above method detect limits.

1,1-DCE - 1,1-Dichloroethene
1,1-DCA - 1,1-Dichloroethane
1,2-DCE - 1,2-Dichloroethene
TCE - Trichloroethene
1,1,1-TCA - 1,1,1-Trichloroethane
PCE - Tetrachloroethene

(1) Detection limit 0.003 ppm.
(2) Detection limit 0.002 ppm.
(3) Detection limit 0.005 ppm.
(4) 0.0011 ppm methylene chloride detected; methylene chloride is a common laboratory contaminant.
(5) 0.0015 ppm vinyl chloride detected.
(6) 0.00081 ppm vinyl chloride detected.
(7) 0.0012 ppm vinyl chloride detected.
(8) 0.0023 ppm vinyl chloride detected.
(9) 0.0016 ppm methylene chloride (a common laboratory contaminant) detected within normal laboratory background concentrations.
(10) 0.022 ppm methylene chloride (a common laboratory contaminant) detected within normal laboratory background concentrations.
(11) 0.0062 ppm methylene chloride (a common laboratory contaminant) detected within normal laboratory background concentrations.
(12) 0.014 ppm methylene chloride (a common laboratory contaminant) detected within normal laboratory background concentrations.
(13) 0.015 ppm methylene chloride (a common laboratory contaminant) detected within normal laboratory background concentrations.
(14) 0.0045 ppm chloroform detected. According to Anametrix, chloroform can be found in tap water and possibly in laboratory-supplied water used for field blanks.
(15) 0.0011 ppm vinyl chloride detected.

TABLE 4
HISTORICAL GROUND-WATER QUALITY DATA
CHEMICAL COMPOUNDS DETECTED IN SHALLOW GROUND WATER
FEBRUARY 1990 THROUGH JULY 1993
FORMER RANSOME PROPERTY
YERBA BUENA PROJECT SITE
(concentrations expressed in milligrams per liter [mg/l])

Well Number	Date	Lab	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Oil and Grease	Hydrocarbons	Diesel
LF-16	14-May-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	6.6	6.3	NA
	28-May-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	<0.5	<0.5	0.05
	22-Oct-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	<0.5	NA	0.05
	12-Feb-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	<0.05*
	26-May-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	0.054
	14-Jul-93	ANA	0.05	<0.0005	0.0017	<0.0005	<0.0005	NA	<5	<0.05
LF-24	14-May-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	<0.5	<0.5	NA
	28-May-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	<0.5	<0.5	0.98
	22-Oct-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	<0.5	NA	0.3
	12-Feb-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	0.076
	26-May-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	0.180
	14-Jul-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	<0.05
	Duplicate	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	NA	NA
LF-25	14-May-92	QUA	<0.05	0.0004	0.0004	<0.0003	<0.001	4	2	NA
	duplicate	QUA	<0.05	0.0004	0.0004	<0.0003	<0.001	5.6	3	NA
	28-May-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	2	1	0.2
	duplicate	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	NA	NA	NA
	22-Oct-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	0.6	NA	0.4
	11-Feb-93	ANA	0.054	0.0006	<0.0005	<0.0005	<0.0005	NA	<5	<0.05
	26-May-93	ANA	0.070	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	0.320
	Duplicate	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	0.230
	14-Jul-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	1.0
LF-26	14-May-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	<0.5	<0.5	NA
	28-May-92	QUA	<0.05	<0.0003	0.002	<0.0003	<0.001	<0.5	<0.5	0.1
	22-Oct-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	<0.5	NA	<0.05
	11-Feb-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	<0.05
	26-May-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	0.088
	14-Jul-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	<0.05
LF-27	14-May-92	QUA	<0.05	0.0004	0.002	<0.0003	0.002	<0.5	<0.5	NA
	28-May-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	<0.5	<0.5	0.1
	22-Oct-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	<0.5	NA	<0.05
	11-Feb-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	<0.05
	26-May-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	0.085
	14-Jul-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	<0.05
LF-28	14-May-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	<0.5	<0.5	NA
	28-May-92	QUA	<0.05	<0.0003	0.001	<0.0003	<0.001	<0.5	<0.5	0.3
	22-Oct-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	<0.5	NA	<0.05
	12-Feb-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	<0.05
	26-May-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	0.062
	14-Jul-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	<0.05
LF-29	22-Oct-92	QUA	0.09	0.001	<0.0003	0.0004	0.001	<0.5	NA	<0.05
	11-Feb-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	<5	<0.05
	26-May-93	ANA	<0.05	<0.0005	<0.0005	0.0039	<0.0005	NA	<5	0.170
	14-Jul-93	ANA	0.08	<0.0005	<0.0005	0.012	<0.0005	NA	<5	<0.05
LF-25-FB	14-May-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	NA	NA	NA
	28-May-92	QUA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	NA	NA	NA
	26-May-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	NA	NA
LF-25-BB	14-Jul-93	ANA	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA	NA	NA

Data entered by SCH/28-Sep-93. Data proofed by JJB. QA/QC by JG.

TABLE 4
HISTORICAL GROUND-WATER QUALITY DATA
CHEMICAL COMPOUNDS DETECTED IN SHALLOW GROUND WATER
FEBRUARY 1990 THROUGH JULY 1993
FORMER RANSOME PROPERTY
YERBA BUENA PROJECT SITE

Notes:

Milligrams per liter is equivalent to parts per million.
TPHg - Total petroleum hydrocarbons as gasoline.
Diesel - Extractable hydrocarbons as diesel
NA - not analyzed
FB - field blank

ANA - Anametrix, Inc., of San Jose, California.
QUA - Quanteq Laboratories of Pleasant Hill, California.

Oil and grease (analyzed using Standard Method 5520c) is all oil and grease compounds, including animal, vegetable, and petroleum hydrocarbon oil and grease compounds.

Hydrocarbons (analyzed using Standard Methods 5520 B+F and C+F) is only the petrolem hydrocarbon fraction of the oil and grease compounds.

* 0.33 ppm of an unknown compound was detected during analysis of sample LF-16 for TPHd. The laboratory confirmed that its detection most likely is the result of instrument contamination.

TABLE 5
CALENDER OF GROUND-WATER SAMPLING
OCTOBER THROUGH DECEMBER
EAST BAYBRIDGE DEVELOPMENT
EMERYVILLE/ OAKLAND, CALIFORNIA

QUARTERLY PERIOD	NUMBER OF WELLS	WELL DEPTH (feet)	WELL IDENTIFICATION	ANALYSES
OCTOBER through DECEMBER	10	20' TO 25'	MW-2	TPHg & BTEX
			MW-3, MW-4,	TPHd, TPHo, VOCs
			MW-5, MW-6, MW-7,	TPHd, TPHo, VOCs
			MW-8, MW-9, LF-22,	VOCs
			LF-23	VOCs
	1		MW1	TPHg, BTEX, TPHd, TPHo
	2		EX-3, EX-4	TPHd, TPHo, VOCs
	3	40' TO 45'	MW-6D, MW-7D, MW-9D	VOCs, TPHd, TPHo
	1	60'	MW-7Z	VOCs

NOTES:

This schedule is in accordance with the Levine-Fricke document entitled: "Work Plan for Site Characterization to be Condcucted in Conjunction with Proposed Site Development Yerba Buena/East Baybridge Project Site Emeryville and Oakland, California" dated April 28, 1993.

TPHg using Modified EPA Method 8015
TPHd/TPHo using EPA Method 8015
VOCs using EPA Method 8010
BTEX using EPA Method 8020

One duplicate sample, a trip blank, and bailer rinsate blank will be analysis for VOCs each monitoring period.

1649\4THQTSCHED

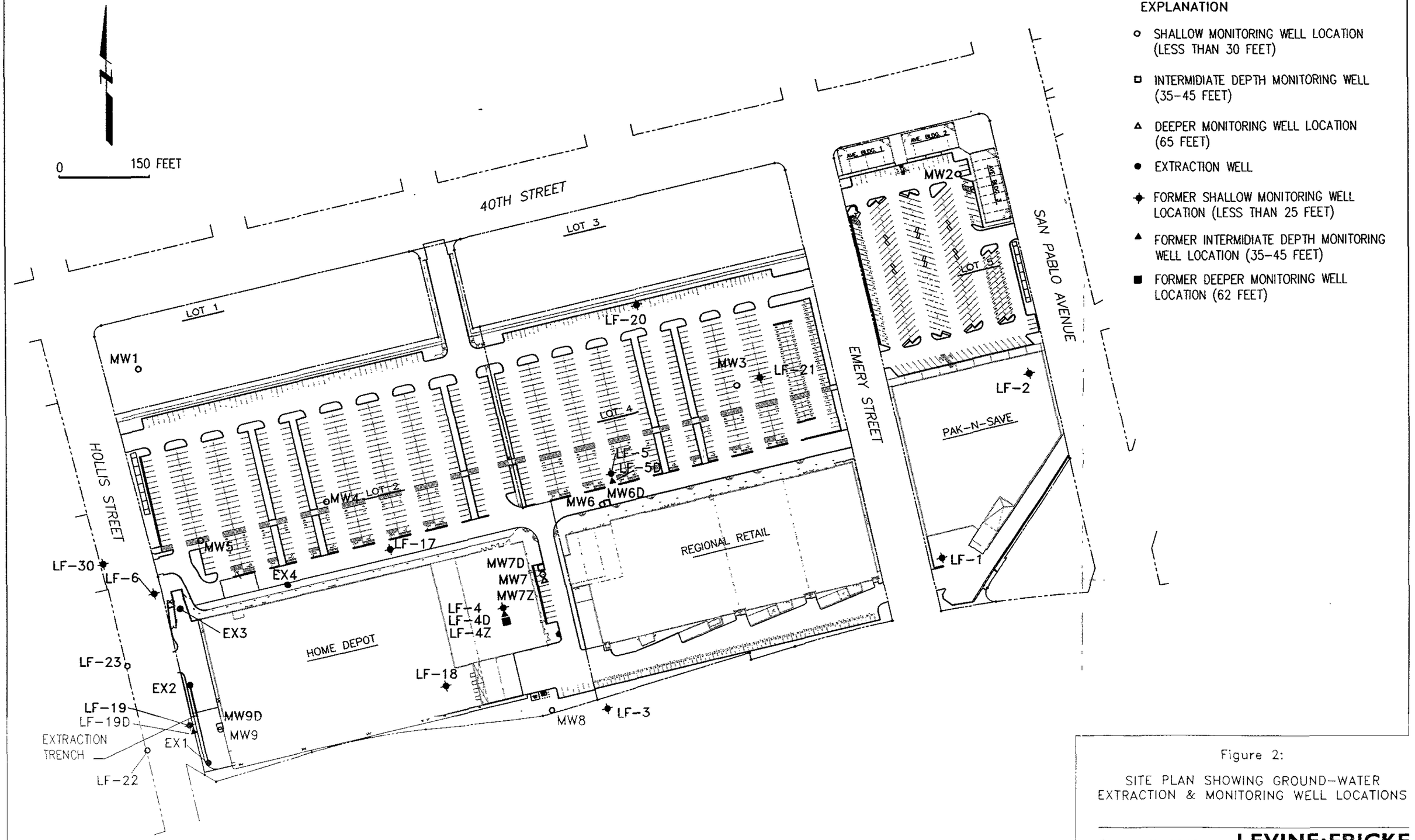
MAP SOURCE:
Alameda & Contra Costa Counties,
Thomas Bros. map, 1990 Edition

Figure 1 : SITE LOCATION MAP
YERBA BUENA PROJECT SITE

Project No. 1649

LEVINE • FRICKE
CONSULTING ENGINEERS AND HYDROGEOLOGISTS

1649ALS-5FEB91-rY2



EXPLANATION

- ○ SHALLOW MONITORING WELL LOCATION (LESS THAN 30 FEET)
- □ INTERMIDIATE DEPTH MONITORING WELL (35–45 FEET)
- △ DEEPER MONITORING WELL LOCATION (65 FEET)
- ● EXTRACTION WELL
- ✦ FORMER SHALLOW MONITORING WELL LOCATION (LESS THAN 25 FEET)
- ▲ FORMER INTERMIDIATE DEPTH MONITORING WELL LOCATION (35–45 FEET)
- ■ FORMER DEEPER MONITORING WELL LOCATION (62 FEET)

Figure 2:

SITE PLAN SHOWING GROUND–WATER EXTRACTION & MONITORING WELL LOCATIONS

Project No 1649

LEVINE·FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

S\ENGCAD\1649\SITEPL16.DWG GM

N

0 150 FEET

EXPLANATION

- ○ SHALLOW MONITORING WELL LOCATION (LESS THAN 30 FEET)
- □ INTERMIDIATE DEPTH MONITORING WELL (35–45 FEET)
- △ DEEPER MONITORING WELL LOCATION (65 FEET)
- ● EXTRACTION WELL
- 12.59 WATER LEVEL ELEVATION (FEET MSL)

40TH STREET

SAN PABLO AVENUE

HOLLIS STREET

EMERY STREET

LOT 1

LOT 2

LOT 3

LOT 4

MW1 12.59

MW2 29.23

MW3 22.17

MW4 27.27

MW5 5.04

MW6 MW6D 17.45

MW7D 14.69 MW7 MW7Z

MW8 14.44

MW9D MW9 4.47

EX1 −1.32

EX2 −0.80

EX3 −1.37

EX4 −1.65

LF−23 6.03

LF−22 5.75

EXTRACTION TRENCH

HOME DEPOT

REGIONAL RETAIL

PAK−N−SAVE

Figure 3:

SITE PLAN SHOWING GROUND−WATER ELEVATION IN SHALLOW WELLS SEPTEMBER 12, 1994

Project No 1649

LEVINE·FRICKE
ENGINEERS HYDROGEOLOGISTS, & APPLIED SCIENTISTS

S:\ENGCAD\1649\SITEPL13.DWG GM

APPENDIX A

FIELD PROCEDURES

FIELD PROCEDURES

MONITORING WELL REPLACEMENT

Before drilling the borings for installation of the 17 replacement wells, applications for drilling permits were completed and submitted to the Alameda County Flood Control District. The borings for the 14 shallow wells were drilled to approximately 18 to 30 feet below ground surface using a hollow auger drilling rig equipped with 8-inch-diameter augers. Borings for the 3 deeper ground-water monitoring wells were initially drilled using 6-inch-diameter hollow augers. Hollow augers were used to allow collection of soil samples. After the 6-inch-diameter boreholes were complete, the borings were reamed to the appropriate depth using 14-inch-diameter hollow stem augers. The 14-inch-diameter hollow augers were used to allow installation of 10-inch-diameter steel conductor casing. The annular space between the conductor casing and the borehole was sealed with cement grout containing approximately 5 percent bentonite. The grout was placed in the annular space using a tremie pipe set at the bottom of the conductor casing. Following installation of the conductor casing, the boring was advanced using 8-inch-diameter augers to approximately 40 feet bgs at well MW-7D, 45 feet bgs at wells MW-6D and MW-9D, and 65 feet bgs at well MW-7Z. Gregg Drilling of Pacheco, California, a California state-licensed subcontractor, was retained to provide drilling services.

Soil Sampling

Soil samples for lithologic description were collected from each of the borings on a continuous basis for lithologic description using a 5-foot-long core barrel. Lithologic logs of the borings were prepared by a qualified Levine·Fricke geologist, under the supervision of either a Registered Geologist or Certified Engineering Geologist. Appendix B contains the ground-water monitoring well logs that provide well construction details and a description of soil lithology for each well boring.

Well Installation

The shallow-zone and deeper-zone monitoring wells were completed using 2-inch-diameter flush-threaded well casing and screen. The shallow-zone wells were completed at depths ranging from 18 feet bgs to 30 feet bgs. The deeper wells were completed 40 and 65 feet below grade.

The casing and screen for each well was placed in the completed boreholes through the hollow-stem augers. A filter pack consisting of appropriately graded sand was poured into the annular space between the borehole and the slotted PVC well casing as the augers were gradually removed from the boreholes. Bentonite pellets were placed above the sand pack to isolate the perforated interval from material above and prevent the entrance of grout into the sand pack. A cement-bentonite grout was placed above the bentonite to the land surface to seal the remainder of the borehole interval from surface-water infiltration. With the exception of wells MW-1 and MW-8, all wells were completed below grade and subsequently protected with a traffic-rated well box. Wells MW-1 and MW-8 were completed above grade and subsequently protected with a steel casing (stove pipe), which extends 4 feet and 1 foot, respectively above ground surface. Extraction wells EX-3 and EX-4 were completed within utility vaults.

The top of the PVC well casing was surveyed at each well for horizontal and vertical placement by Nolte & Associates, a state-licensed land surveyor.

Well Development

The newly installed wells were developed by surging the well and purging ground water from the well to remove sediment from around the screened interval and enhance hydraulic communication with the surrounding formation. Each well was purged using a bailer and a centrifugal or submersible pump. Observations of the pH, temperature, specific conductance, quantity, and clarity of water withdrawn were recorded on water-quality data sheets during development. Copies of these data sheets are included in Appendix C. Each well was developed until approximately 10 well casing volumes were removed or until relatively sediment-free water was produced.

Waste Management

Soil cuttings from each well location were stockpiled on-site and covered with plastic. The soil was transported to Remco Environmental to be recycled for use as structural backfill. Purged ground water was pumped into the on-site ground-water treatment system.

QUARTERLY GROUND-WATER SAMPLING

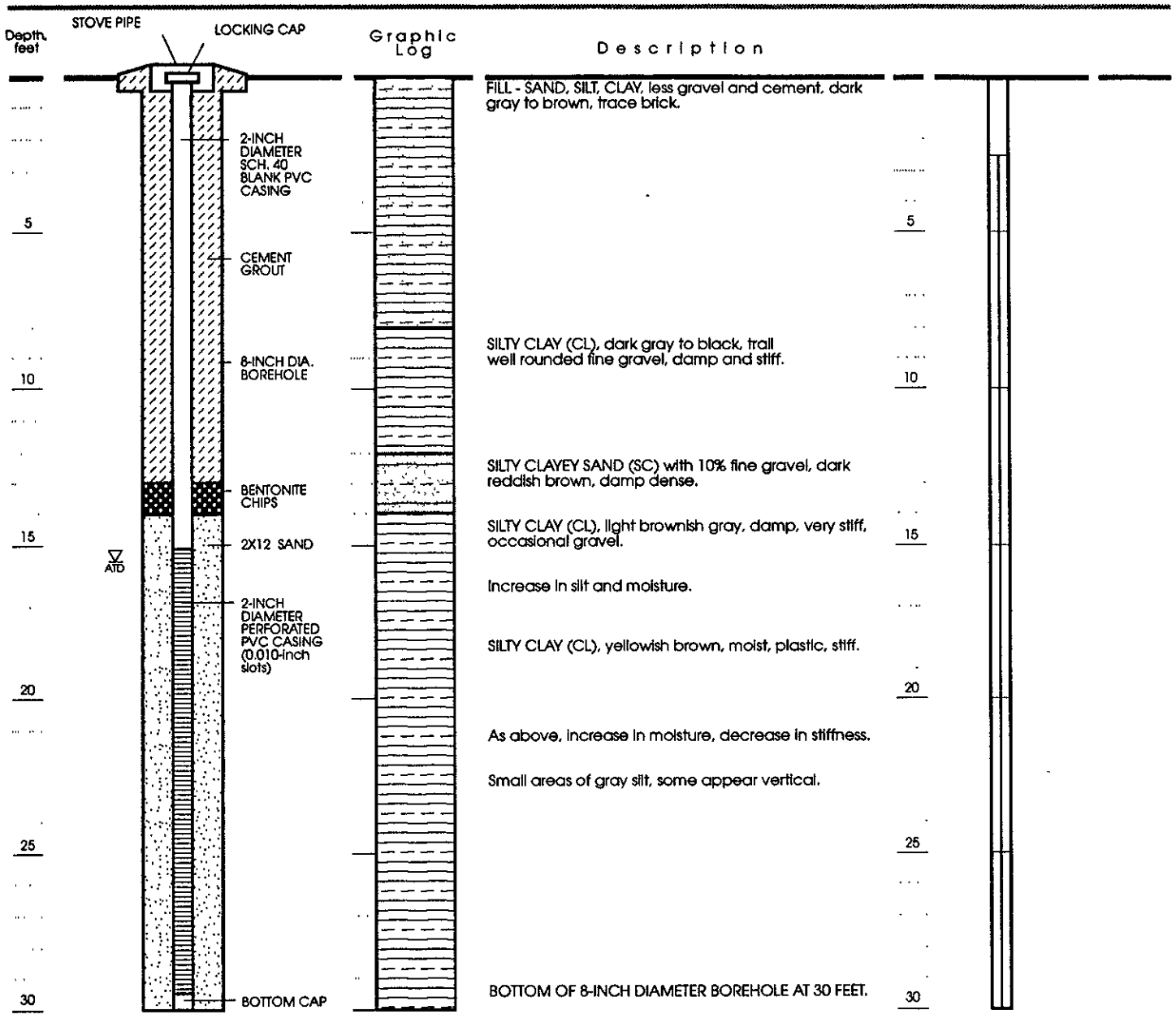
Before sample collection, depth to static water was measured in each well and the volume of water in the well casing was calculated. Three to five well casing volumes of ground-water were then purged from each well using a centrifugal pump or a bailer until indicator parameter readings (pH, specific conductance, and temperature) stabilized. Indicator parameters were measured using portable field instruments and measurements were recorded on water-quality sampling forms. Purging and sampling equipment was steam cleaned before use at each well. Purged ground water was pumped into the on-site treatment system.

After the well had been purged, ground-water samples were collected using a clean Teflon bailer. Samples were collected in containers appropriate for the laboratory analysis to be performed. Samples collected for VOC analyses were collected by pouring ground water directly from the bailer into laboratory-supplied, 40-milliliter volatile organic analysis (VOA) glass vials. Vials were gently filled to overflowing, capped, and then inverted to check for trapped air. If an air bubble was observed, the vial was discarded and a new vial filled. Samples were immediately capped and placed in an ice-chilled cooler for transportation to the analytical laboratory.

Ground-water samples were submitted to American Environmental Network, a state-certified laboratory, under strict chain-of-custody protocol. For quality assurance/quality control measures, a duplicate sample was collected from well MW-9 and analyzed for VOCs using EPA Method 8010. Laboratory certificates are presented in Appendix D.

APPENDIX B

WELL LOGS



Permit No.: 94411
Drilling method: Hollow Stem Auger
Date well drilled: July 12, 1994
Well elevation: 27.47
Drilling company: Gregg Drilling
LF Geologist: Ron Goloubow

EXPLANATION

Clay
Silt
Sand
Gravel
5-foot continuous core
ATD Water encountered in sediment at time of drilling

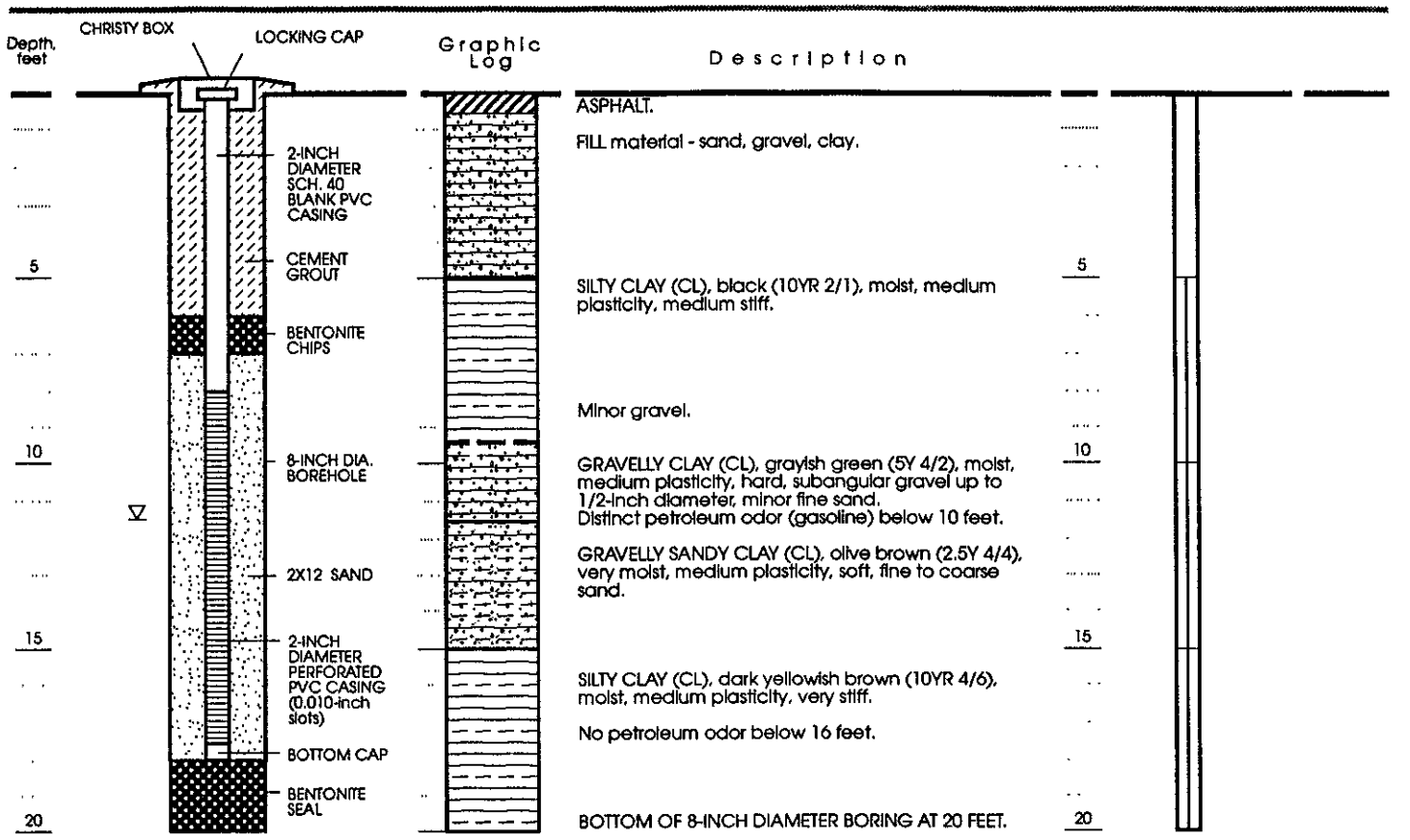
Approved by: RG 4592

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-1

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L017.REG:JSC/JSM 102094



Permit No.: 94411
Drilling method: Hollow Stem Auger
Date well drilled: July 11, 1994
Well elevation: 37.23
Drilling company: Gregg Drilling
LF Geologist: Larry Lapuyade

EXPLANATION

Clay
Silt
Sand
Gravel
5-foot continuous core
ATD Water encountered in sediment at time of drilling

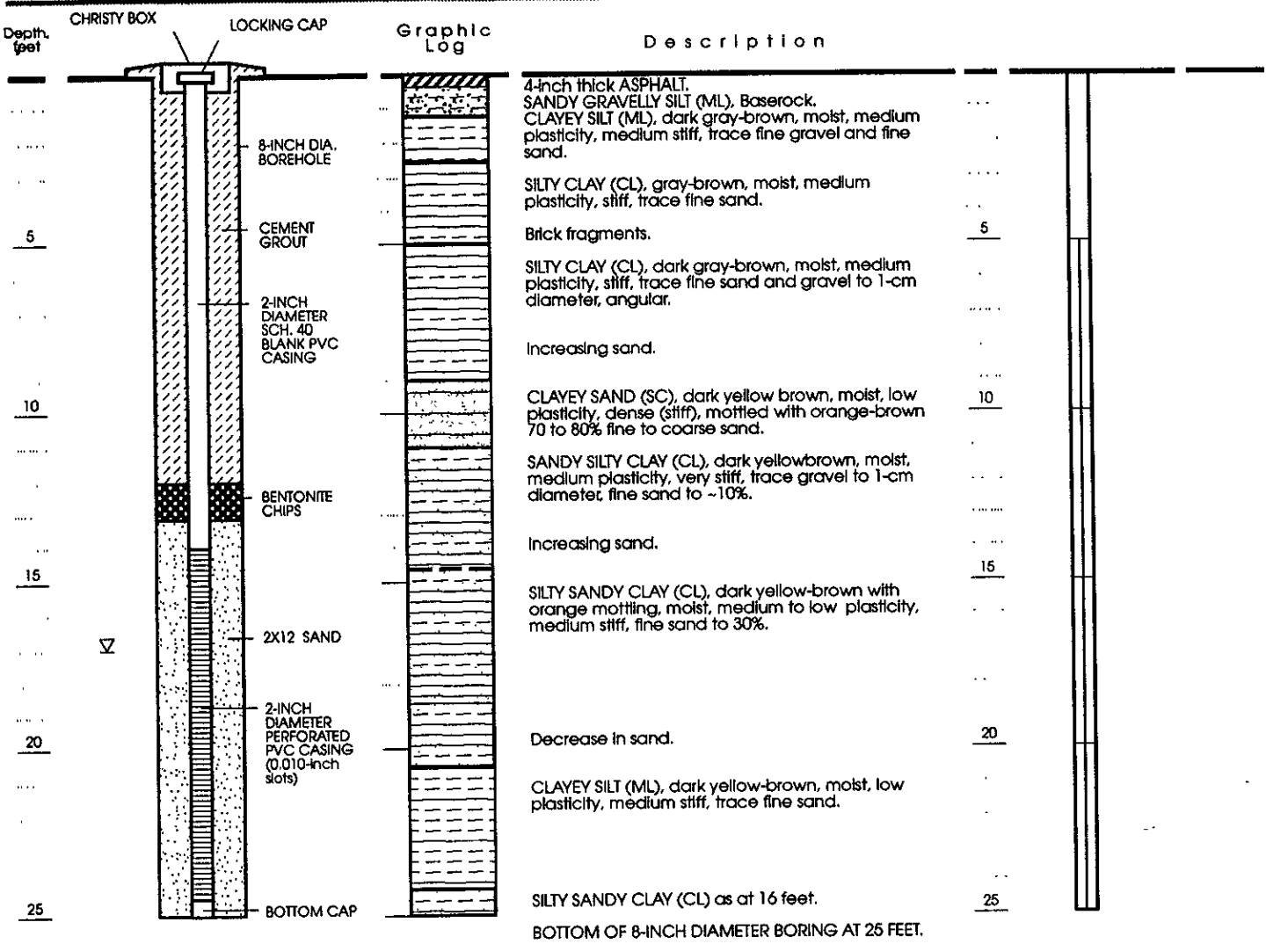
Approved by: RG 4592

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-2

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L018.LPL:JSC/JSM 102094



Permit No.: 94411
Drilling method: Hollow Stem Auger
Date well drilled: July 8, 1994
Well elevation: 32.05
Drilling company: Gregg Drilling
LF Geologist: Robin Barbers

EXPLANATION

Clay
Silt
Sand
Gravel
5-foot continuous core
ATD Water level in sediment at time of drilling

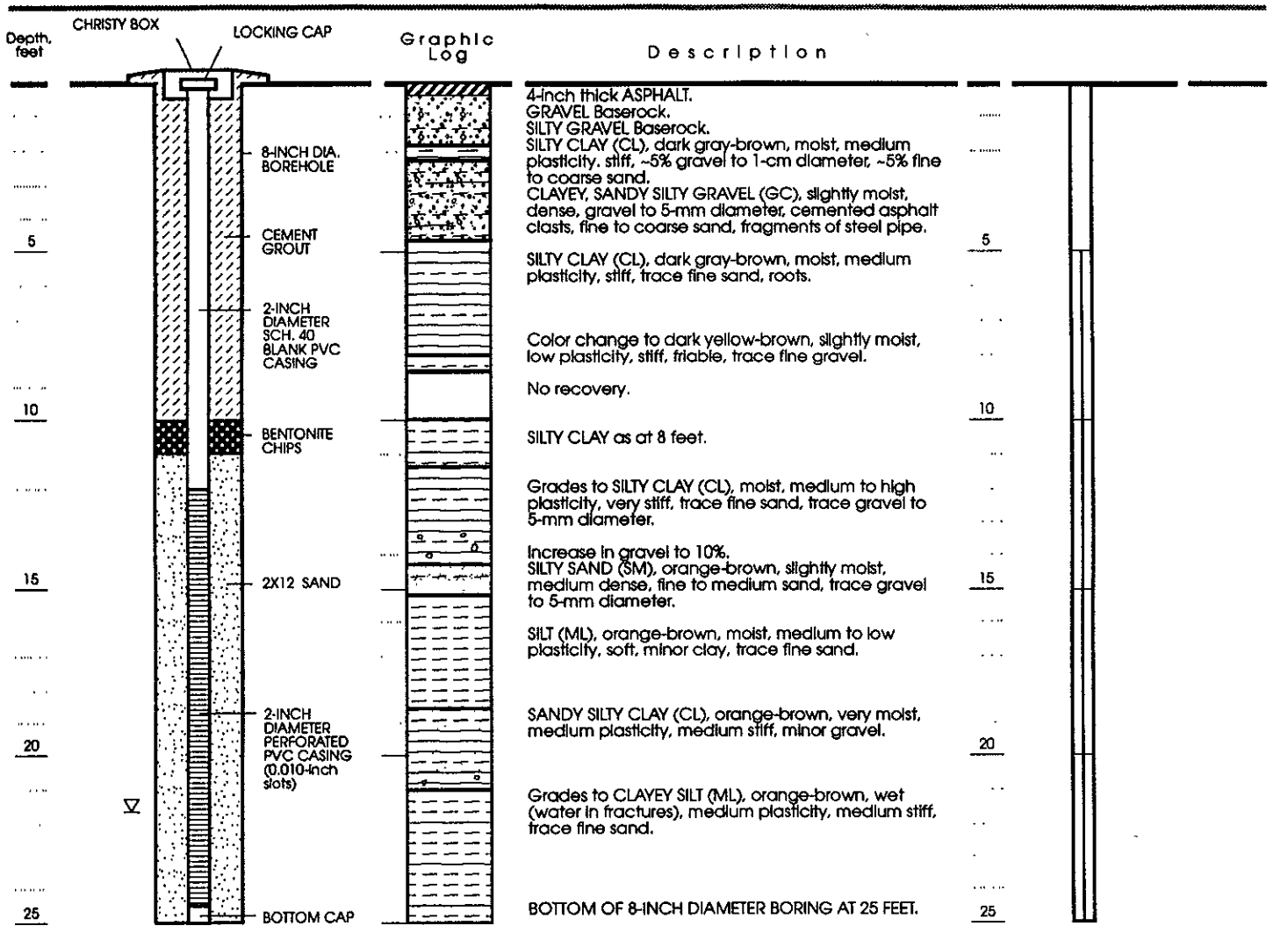
Approved by: RG 4592

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-3

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L019.REG:JSC/JSM 102094



Permit No.: 94411
Drilling method: Hollow Stem Auger
Date well drilled: July 8, 1994
Well elevation: 24.28
Drilling company: Gregg Drilling
LF Geologist: Robin Barbers

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- 5-foot continuous core
- ▽ Water encountered in sediment at time of drilling

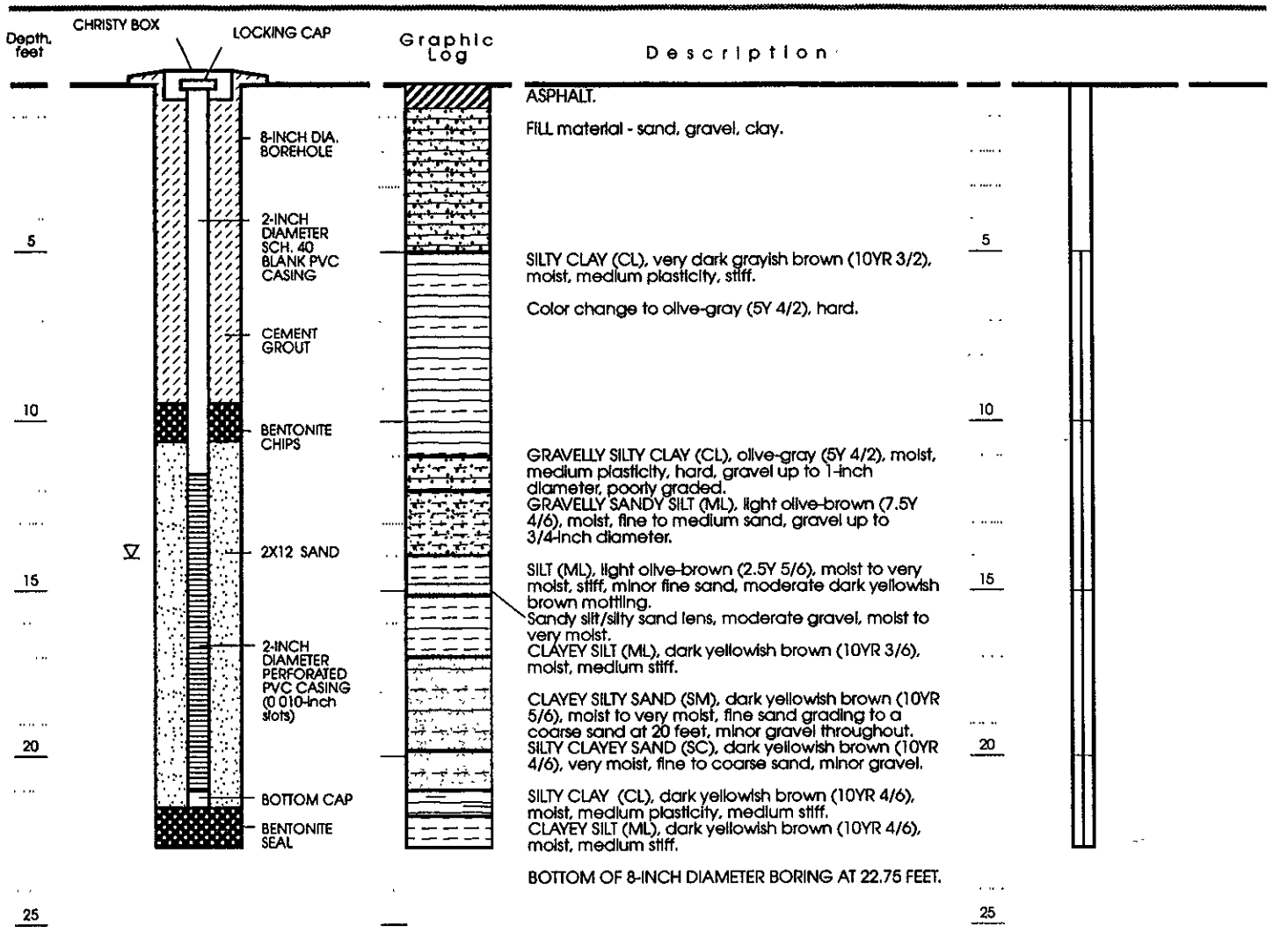
Approved by: RG #572

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-4

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L020.REG:JSC/JSM 102194



Permit No.: 94411
Drilling method: Hollow Stem Auger
Date well drilled: July 11, 1994
Well elevation: 22.19
Drilling company: Gregg Drilling
LF Geologist: Larry Lapuyade

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- 5-feet continuous core
- ▽ Water encountered in sediment at time of drilling

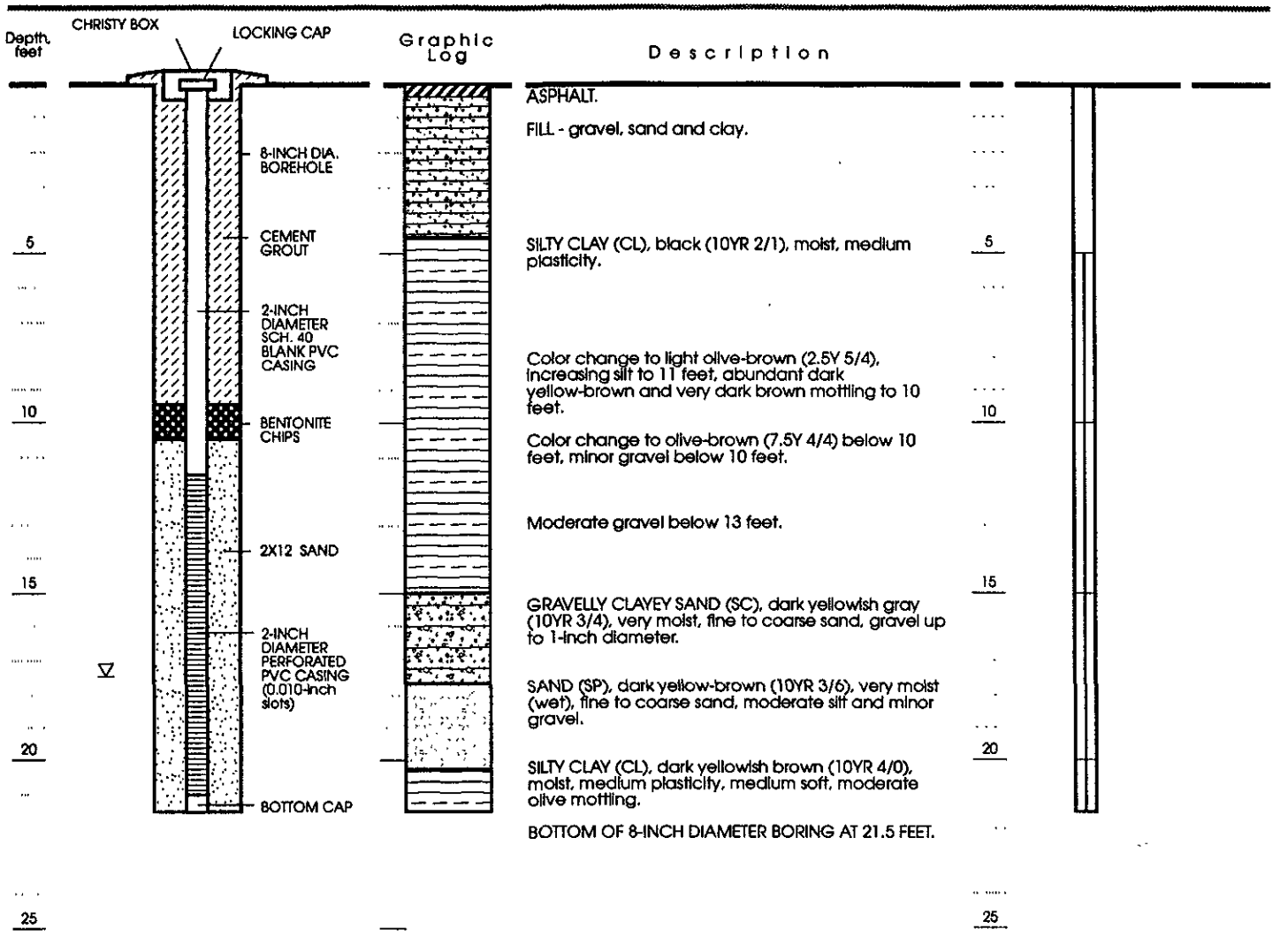
Approved by: RG 4592

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-5

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649I021.REG:JSC/JSM 102194



Permit No.: 94411
Drilling method: Hollow Stem Auger
Date well drilled: July 12, 1994
Well elevation: 28.54
Drilling company: Gregg Drilling
LF Geologist: Larry Lapuyade

EXPLANATION

Clay
Silt
Sand
Gravel
Modified California Sampler
▽ Water encountered in sediment at time of drilling

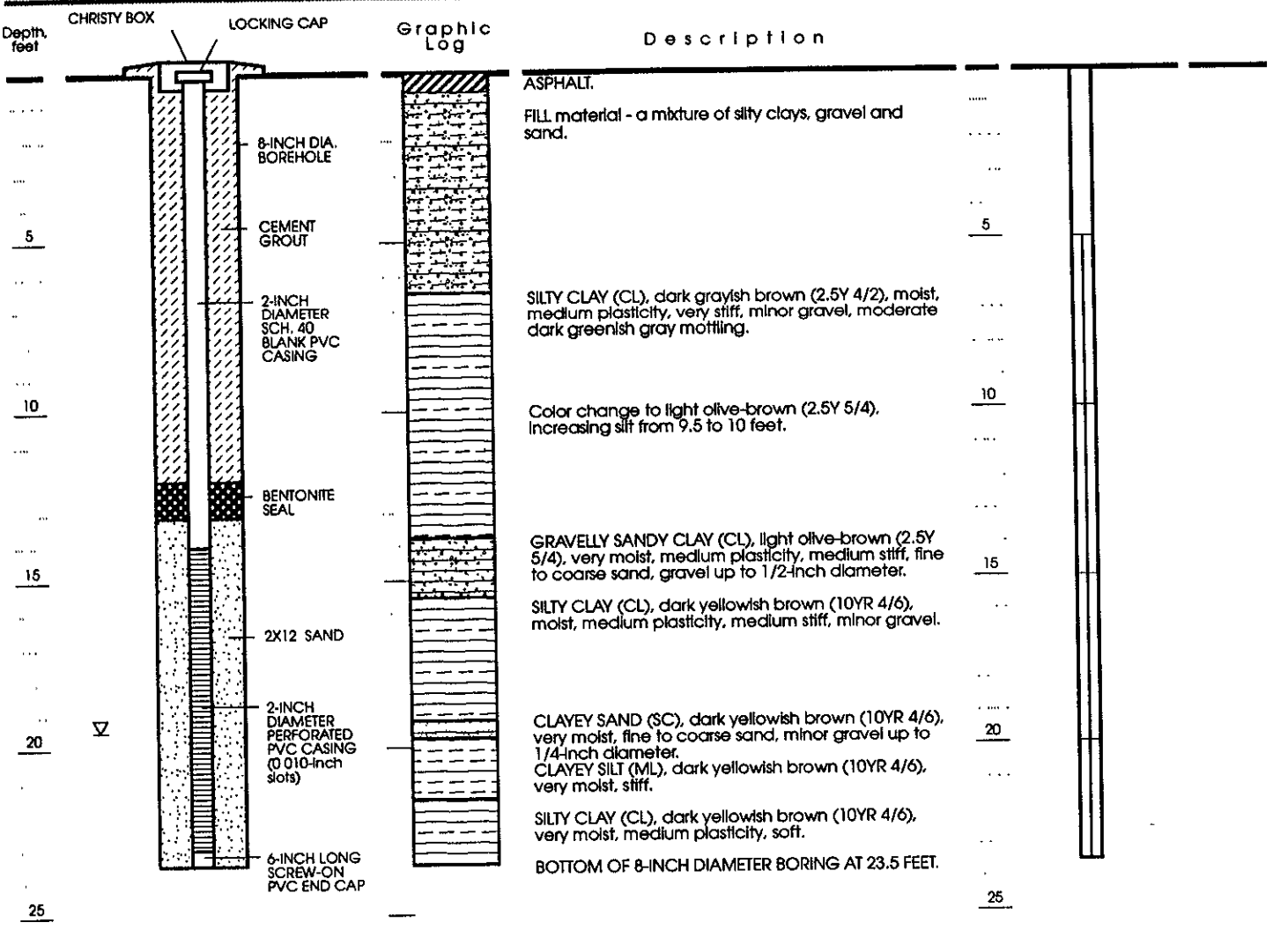
Approved by: RG 4592

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-6

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L022.REG:JSC 102094



Permit No.: 94411
Drilling method: Hollow Stem Auger
Date well drilled: July 7, 1994
Well elevation: 26.29
Drilling company: Gregg Drilling
LF Geologist: Larry Lapuyade

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- 5-feet continuous core
- ▽ Water encountered in sediment at time of drilling

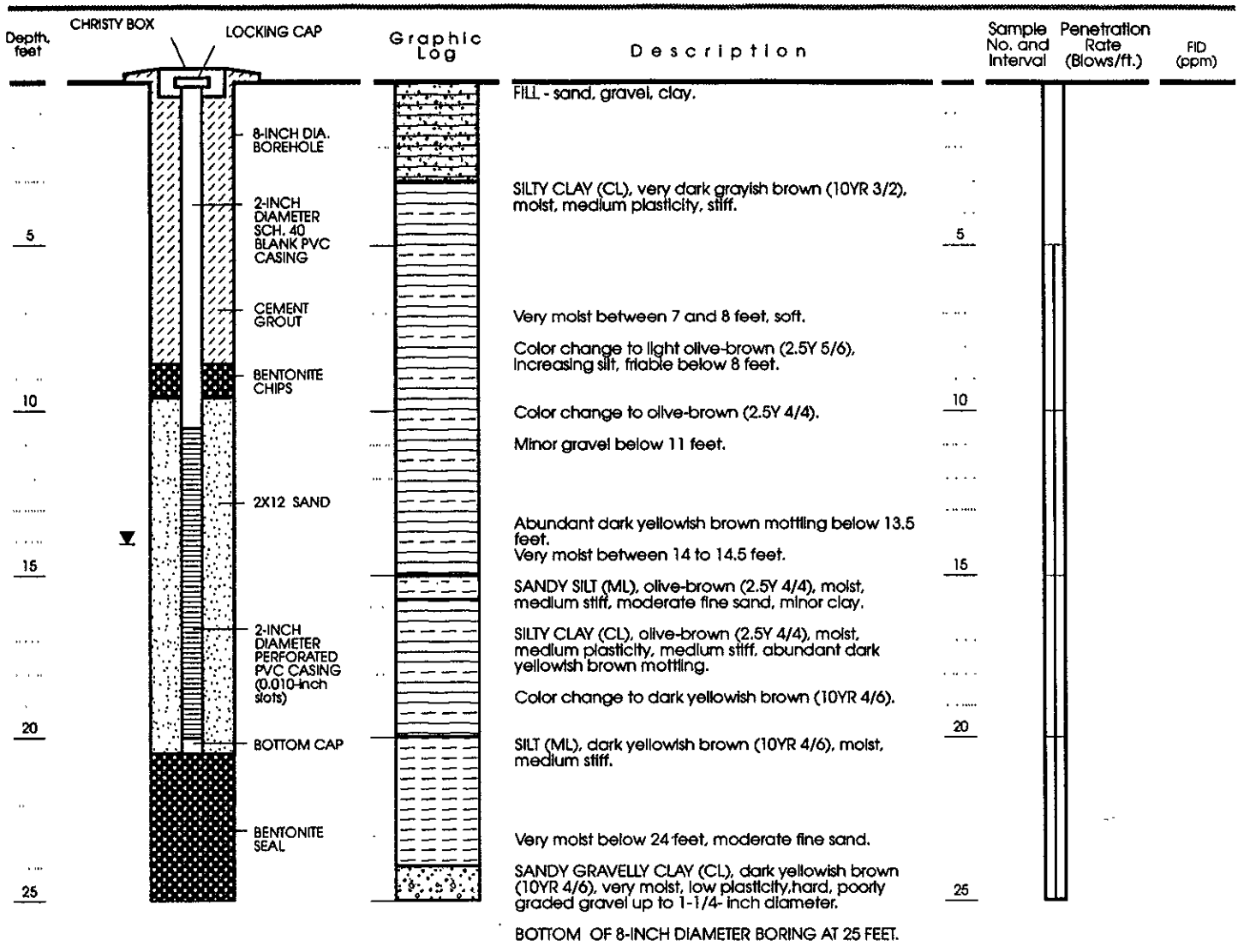
Approved by: RG 4592

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-7

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L029.REG:JSC/JSM 102094



Permit No.: 94411
Drilling method: Hollow Stem Auger
Date well drilled: July 12, 1994
Date water level measured:
Drilling company: Gregg Drilling
LF Geologist: Larry Lapuyade

EXPLANATION

Clay
Silt
Sand
Gravel
Modified California Sampler
Water encountered in sediment at time of drilling

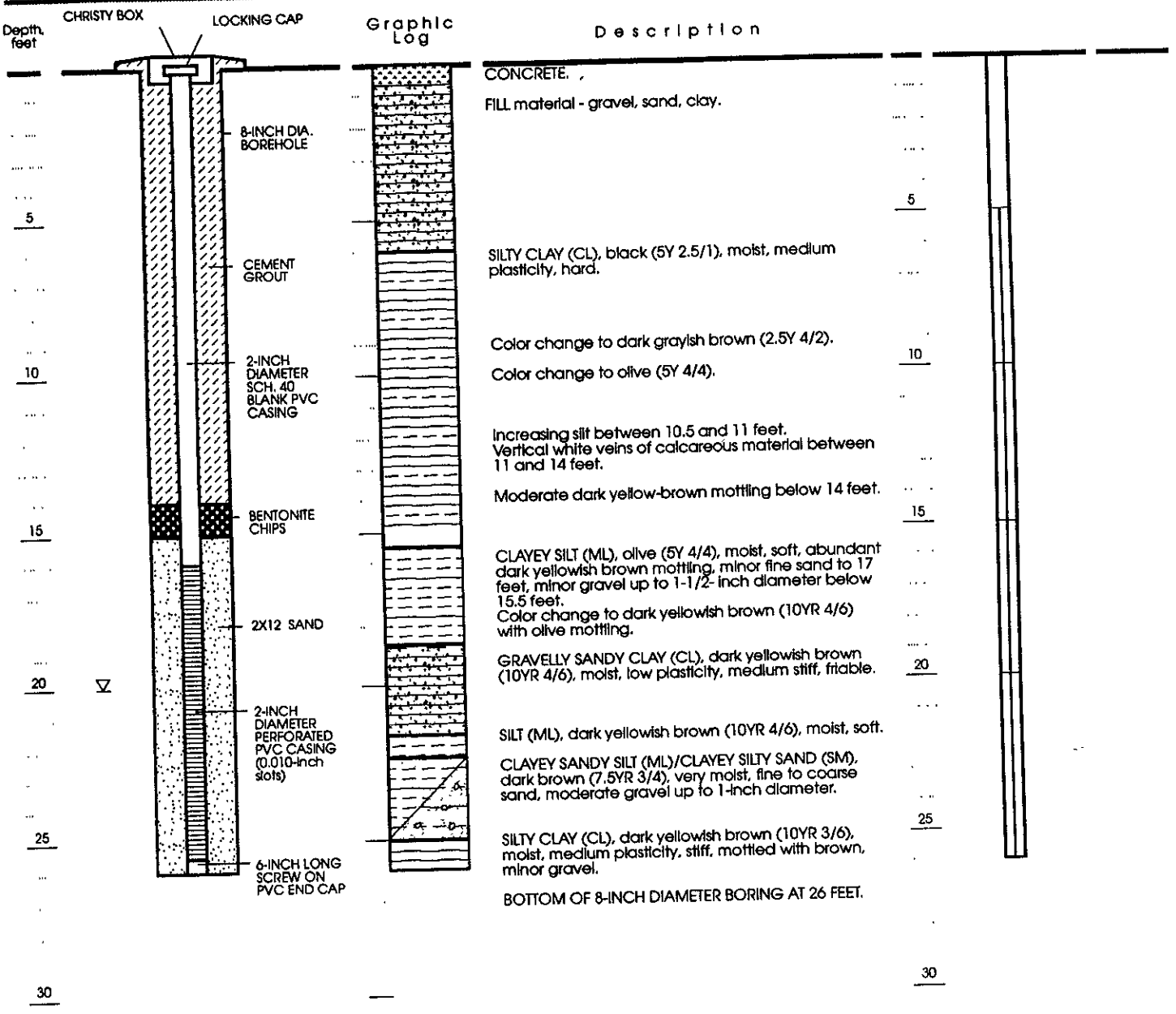
Approved by: RG 4592

Figure : WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-8

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L023.REG:JSC 090194



Permit No.: 94411
Drilling method: Hollow Stem Auger
Date well drilled: July 7, 1994
Well elevation: 24.17
Drilling company: Gregg Drilling
LF Geologist: Larry Lapuyade

EXPLANATION

Clay
Silt
Sand
Gravel
Modified California Sampler
▽ Water encountered in sediment at time of drilling

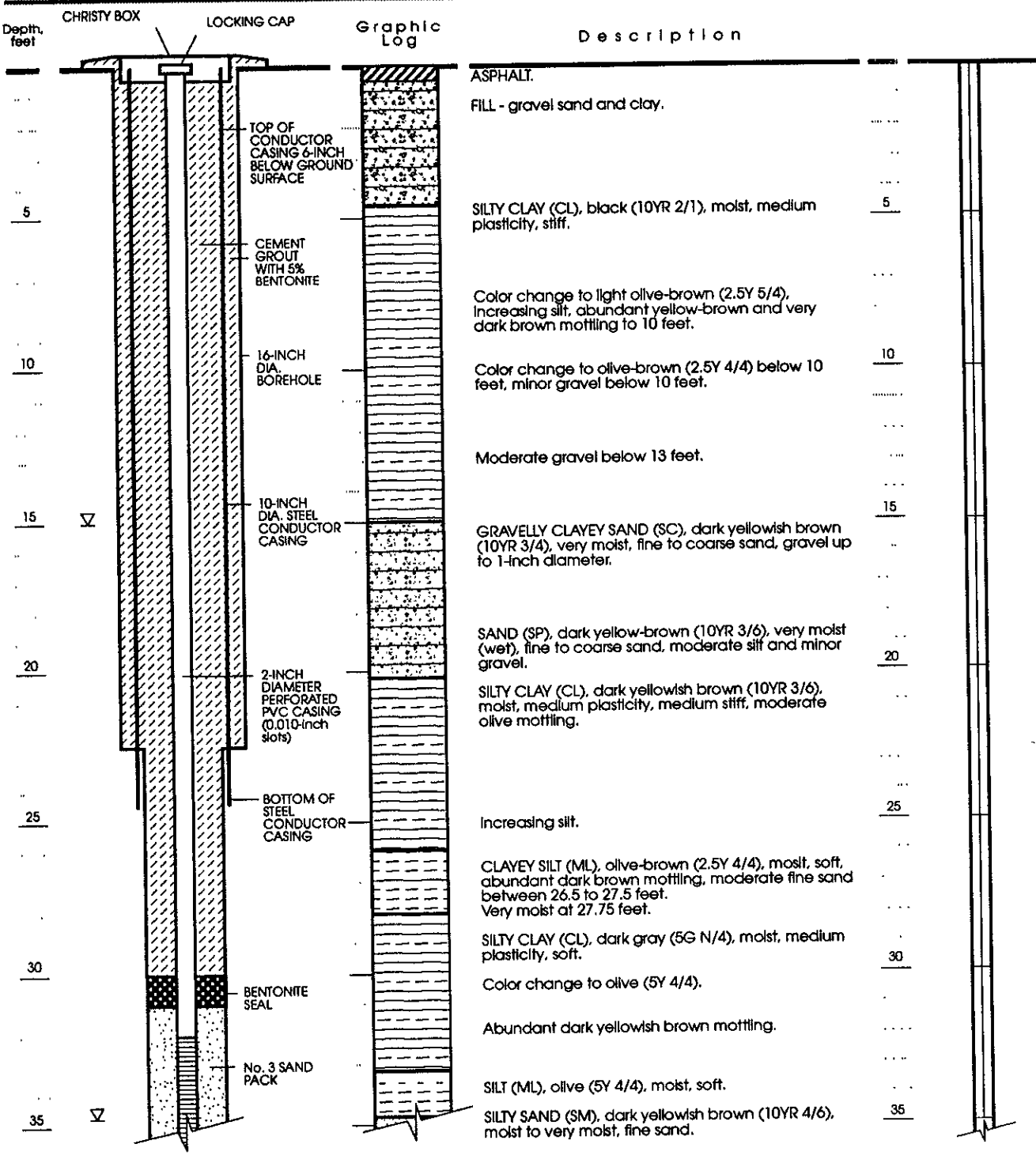
Approved by: RG 4592

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-9

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L024.REG:JSC/JSM 102094



Approved by:

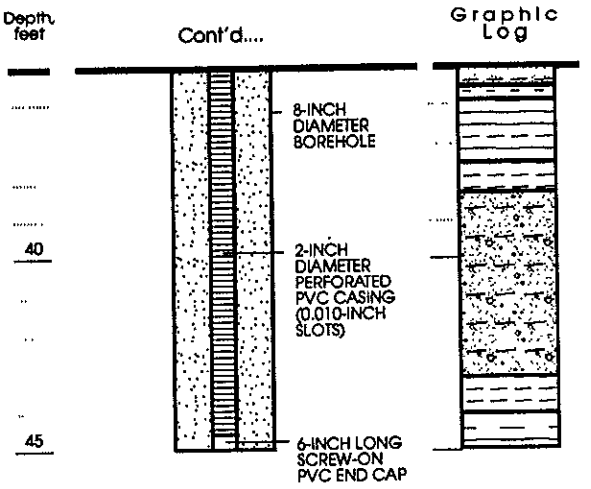
WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-6D (page 1 of 2)

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L027.LPL:JSC/JSM 102094

WELL CONSTRUCTION	LITHOLOGY	SAMPLE DATA



Description

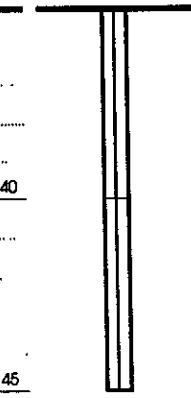
SILT (ML), dark yellowish brown (10YR 4/6), moist, stiff, abundant olive mottling.

SILTY CLAY (CL), dark yellowish brown (10YR 4/6), moist, medium plasticity, stiff.

GRAVELLY SILTY SAND (SM), dark yellowish brown (10YR 3/6), very moist, fine to coarse sand, abundant gravel up to 2-inch diameter.

SILTY CLAY (CL), dark gray (5Y 3/1), moist, medium plasticity, very stiff.

BOTTOM OF BORING AT 45 FEET.



Well Permit No.: 94411
Date well drilled: July 1994
Well elevation: 28.48
Drilling company: Gregg Drilling
Hammer weight: 140 lbs.
LF Geologist: Larry Lapuyade

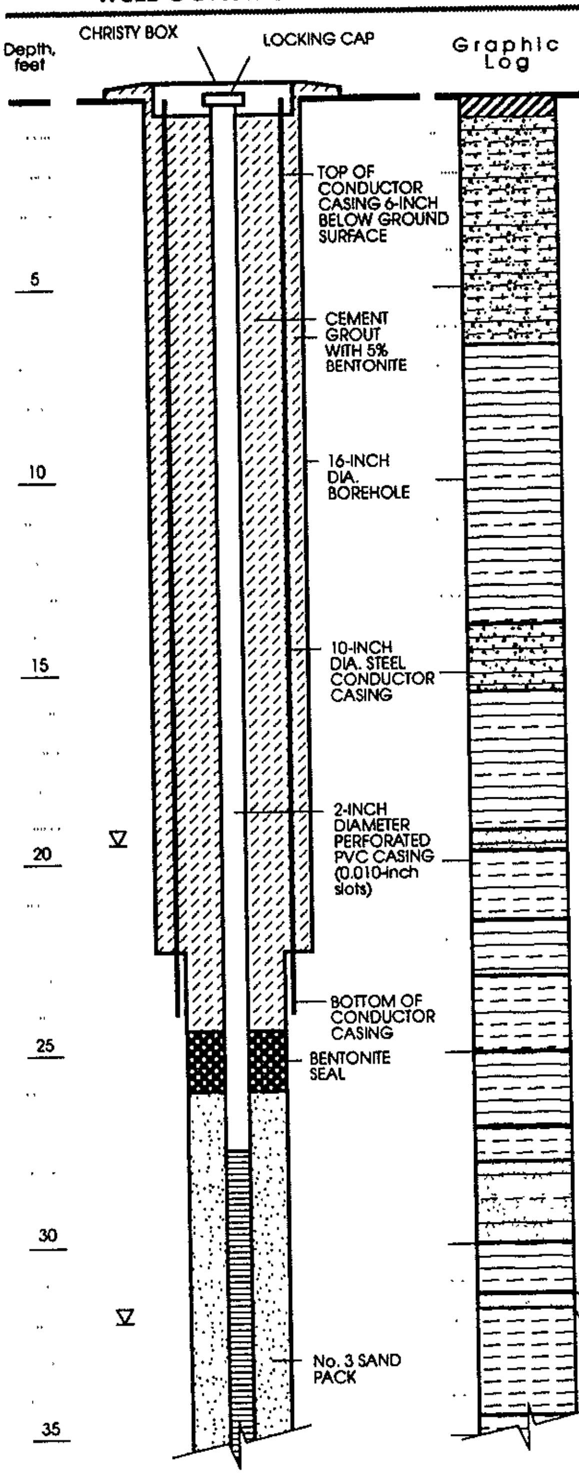
EXPLANATION

Clay
Silt
Sand
Gravel
5-feet continuous core
Water encountered in sediments at time of drilling (before and after installation of conductor casing)

Approved by: RG 4572

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-6D (page 2 of 2)

WELL CONSTRUCTION	LITHOLOGY	SAMPLE DATA



Description

ASPHALT.

FILL material - a mixture of silty clay, gravel and sand.

SILTY CLAY (CL), dark grayish brown (2.5Y 4/2), moist, medium plasticity, very stiff, minor gravel, moderate dark greenish gray mottling.

Color change to light olive-brown (2.5Y 5/4), increasing silt from 9.5 to 10 feet.

GRAVELLY SANDY CLAY (CL), light olive-brown (2.5Y 5/4), very moist, medium plasticity, medium stiff, fine to coarse sand, gravel up to 1/2-inch diameter.

SILTY CLAY (CL), dark yellowish brown (10YR 4/6), moist, medium plasticity, medium stiff, minor gravel.

CLAYEY SAND (SC), dark yellowish brown (10YR 4/6), very moist, fine to coarse sand, minor gravel up to 1/4-inch diameter.

CLAYEY SILT (ML), dark yellowish brown (10YR 4/6), very moist, stiff.

SILTY CLAY (CL), dark yellowish brown (10YR 4/6), very moist, medium plasticity, soft.

CLAYEY SILT (ML), dark yellowish brown (10YR 4/6), moist, friable 24 to 25 feet.

SILTY CLAY (CL), dark yellowish brown (10YR 4/6), moist, medium plasticity, soft.

CLAYEY SILT (ML), dark yellowish brown (10YR 4/6), moist.

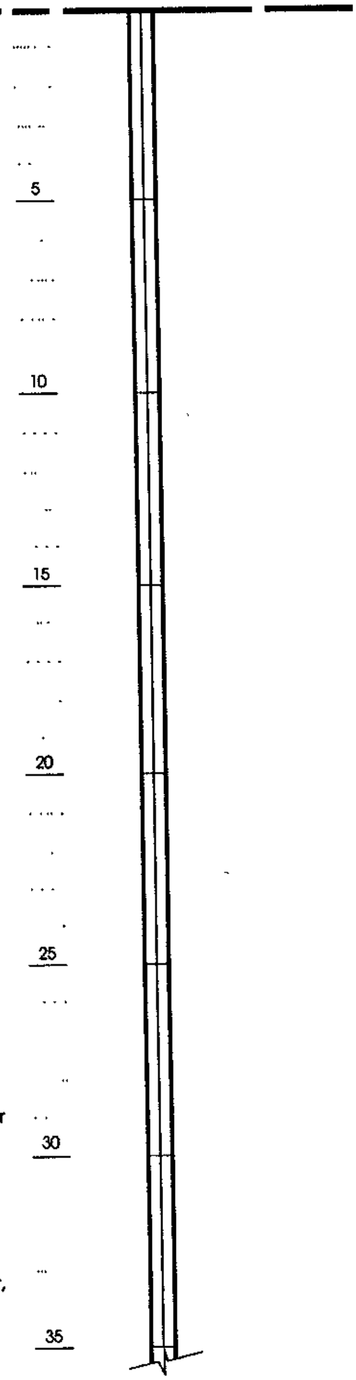
CLAYEY SILTY SAND (SM), dark yellowish brown (10YR 4/6), very moist, fine grading to a coarse sand, minor gravel.

SILTY CLAY (CL), light olive-brown (2.5Y 5/6), moist, medium plasticity, stiff, abundant dark yellowish brown mottling.

CLAYEY SILTY SAND (SM), dark yellowish brown (10YR 4/6), very moist, fine to coarse sand, minor gravel.

SILT (ML), dark yellowish brown (10YR 4/6), very moist, soft, abundant olive mottling.

CLAYEY SILT (ML), dark yellowish brown (10YR 4/6),



Approved by:

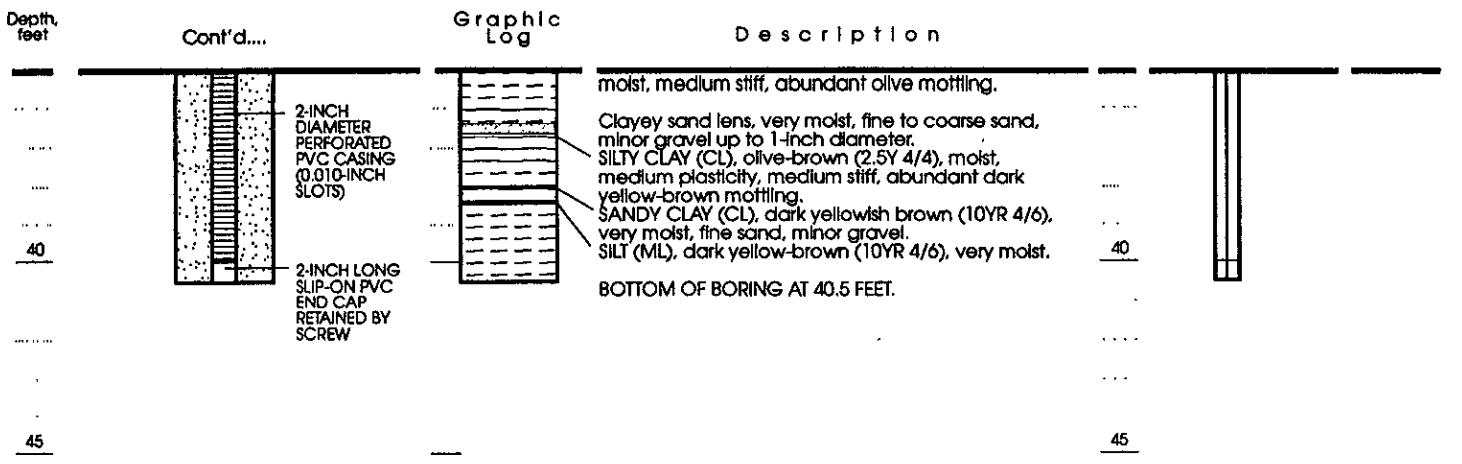
WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-7D (page 1 of 2)

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L030.LPL:JSM 102094

WELL CONSTRUCTION	LITHOLOGY	SAMPLE DATA



Well Permit No.: 94411
Date well drilled: July 5 & 7, 1994
Well elevation: 26.27
Drilling company: Gregg Drilling
Hammer weight: 140 lbs.
LF Geologist: Larry Lapuyade

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- 5-feet continuous core
- ▽ Water encountered in sediment at time of drilling

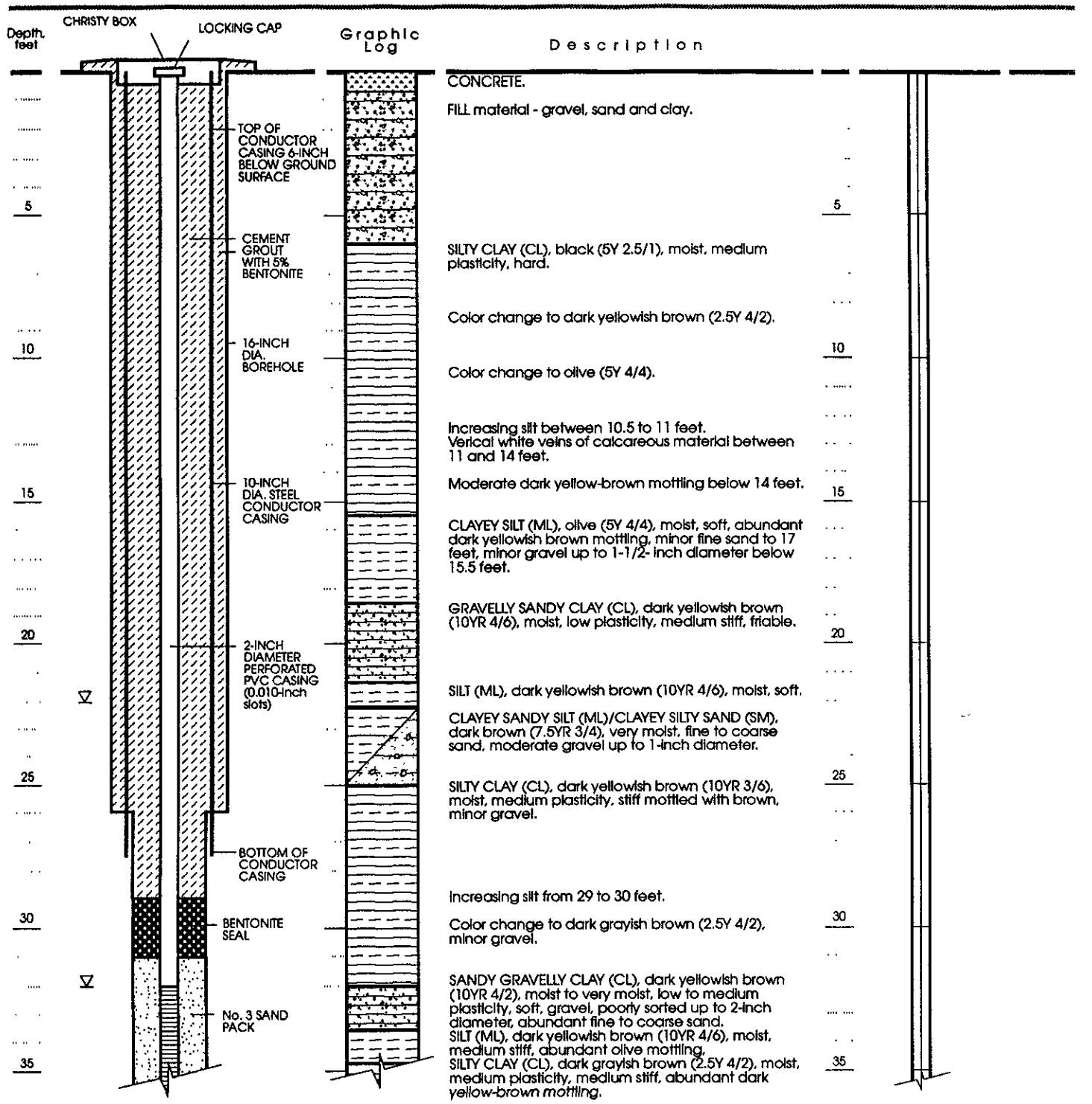
Approved by: RG 4592

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-7D (page 2 of 2)

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L031.LPL:JSC/JSM 102094



Approved by:

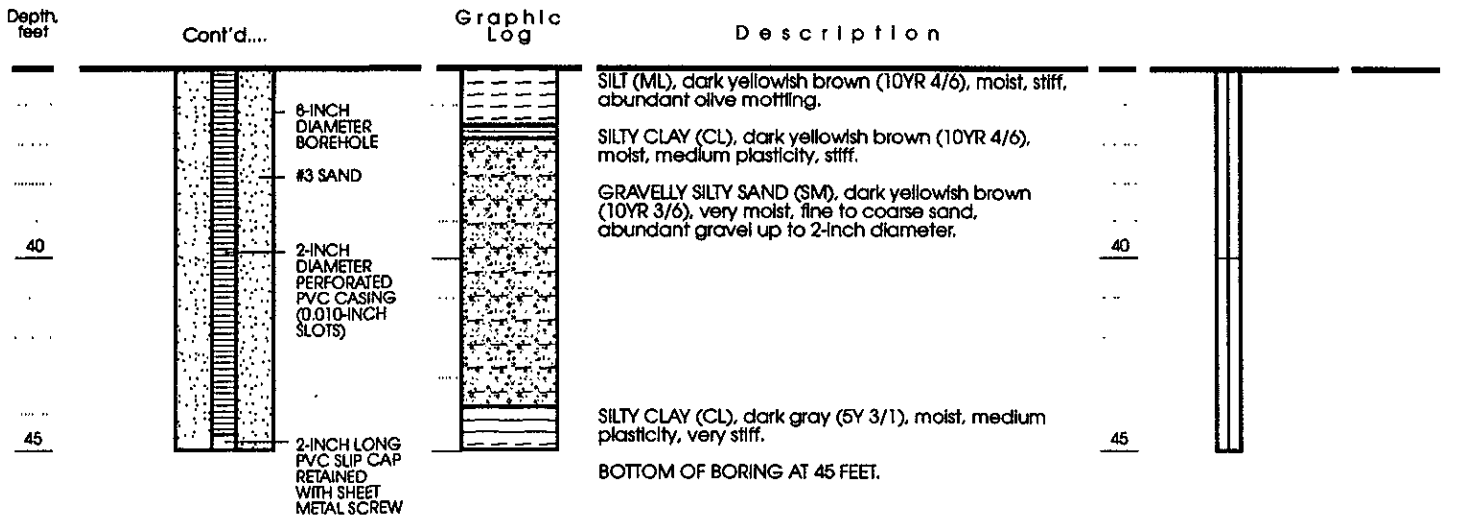
WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-9D (page 1 of 2)

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L025.LPL:JSC/JSM 102094

WELL CONSTRUCTION	LITHOLOGY	SAMPLE DATA



Well Permit No.: 94411
Date well drilled: July 12 & 14, 1994
Well elevation: 24.17
Drilling company: Gregg Drilling
Hammer weight: 140 lbs.
LF Geologist: Larry Lapuyade

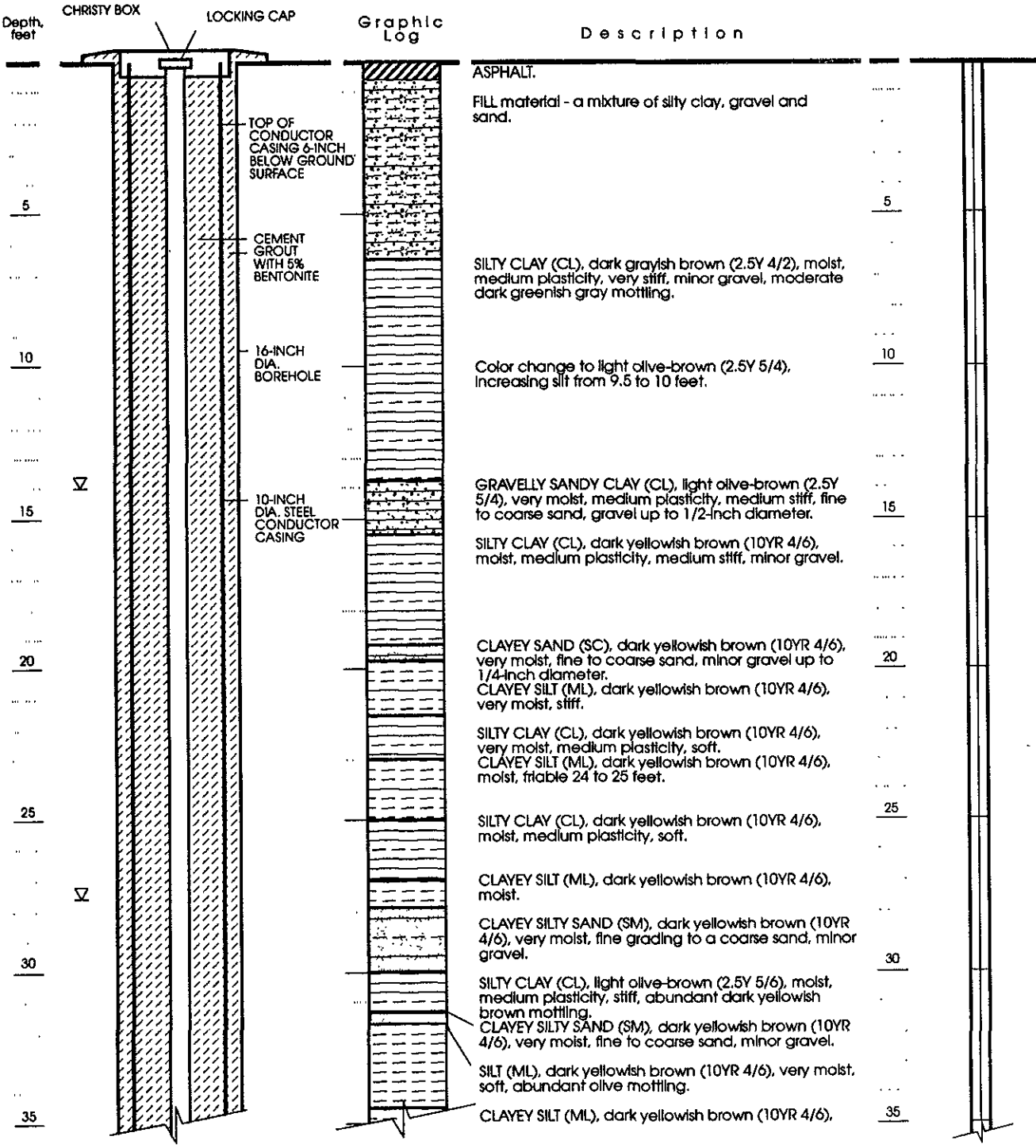
EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- 5-feet continuous core
- ▽ Water level encountered in sediments at time of drilling

Approved by: RG 4592

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-9D (page 2 of 2)

WELL CONSTRUCTION	LITHOLOGY	SAMPLE DATA



Description

ASPHALT.

FILL material - a mixture of silty clay, gravel and sand.

SILTY CLAY (CL), dark grayish brown (2.5Y 4/2), moist, medium plasticity, very stiff, minor gravel, moderate dark greenish gray mottling.

Color change to light olive-brown (2.5Y 5/4), increasing silt from 9.5 to 10 feet.

GRAVELLY SANDY CLAY (CL), light olive-brown (2.5Y 5/4), very moist, medium plasticity, medium stiff, fine to coarse sand, gravel up to 1/2-inch diameter.

SILTY CLAY (CL), dark yellowish brown (10YR 4/6), moist, medium plasticity, medium stiff, minor gravel.

CLAYEY SAND (SC), dark yellowish brown (10YR 4/6), very moist, fine to coarse sand, minor gravel up to 1/4-inch diameter.
CLAYEY SILT (ML), dark yellowish brown (10YR 4/6), very moist, stiff.

SILTY CLAY (CL), dark yellowish brown (10YR 4/6), very moist, medium plasticity, soft.
CLAYEY SILT (ML), dark yellowish brown (10YR 4/6), moist, friable 24 to 25 feet.

SILTY CLAY (CL), dark yellowish brown (10YR 4/6), moist, medium plasticity, soft.

CLAYEY SILT (ML), dark yellowish brown (10YR 4/6), moist.

CLAYEY SILTY SAND (SM), dark yellowish brown (10YR 4/6), very moist, fine grading to a coarse sand, minor gravel.

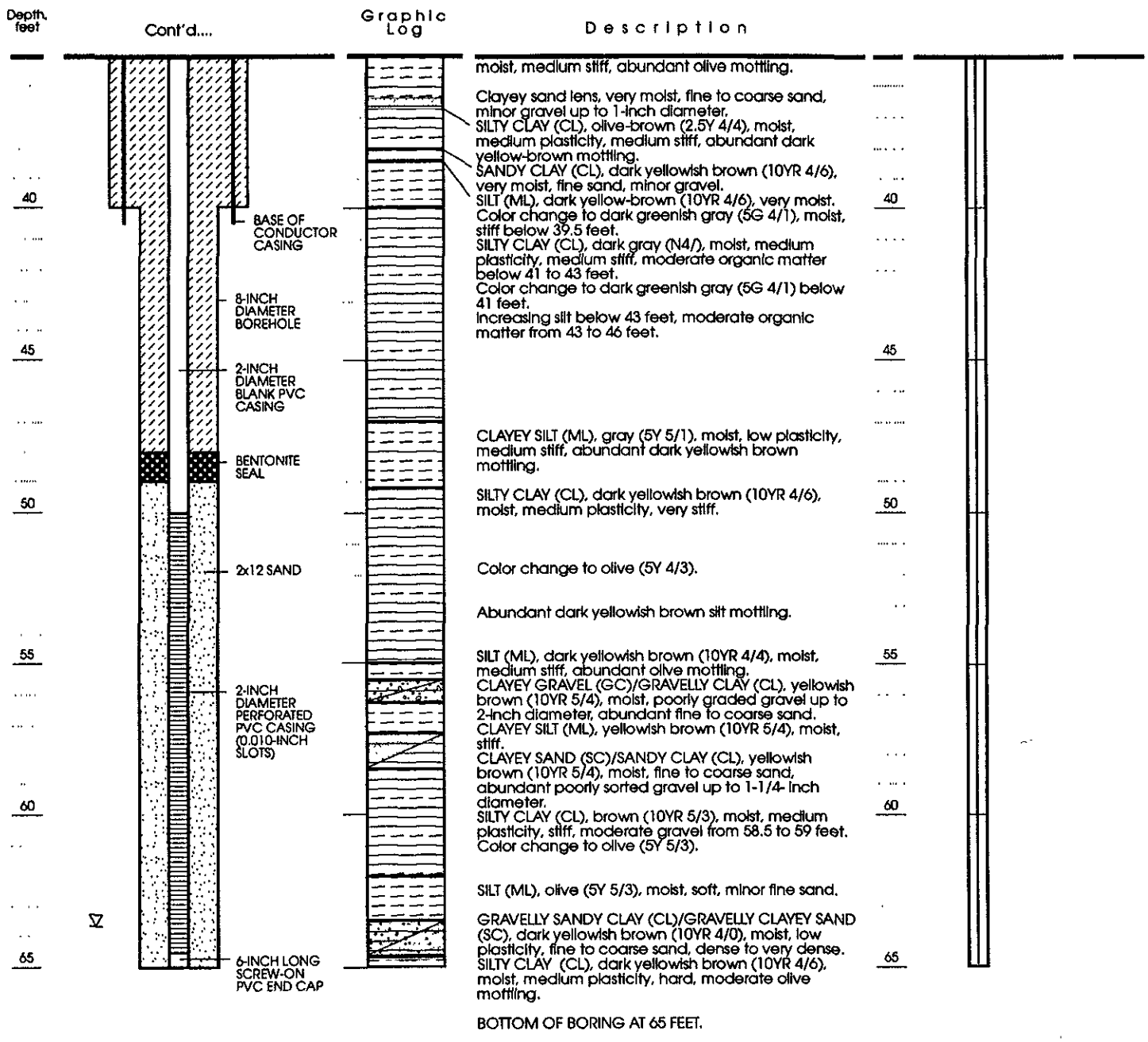
SILTY CLAY (CL), light olive-brown (2.5Y 5/6), moist, medium plasticity, stiff, abundant dark yellowish brown mottling.
CLAYEY SILTY SAND (SM), dark yellowish brown (10YR 4/6), very moist, fine to coarse sand, minor gravel.

SILT (ML), dark yellowish brown (10YR 4/6), very moist, soft, abundant olive mottling.

CLAYEY SILT (ML), dark yellowish brown (10YR 4/6),

Approved by:

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-7Z (page 1 of 2)



Well Permit No.: 94411
Date well drilled: July 8 & 11, 1994
Well elevation: 25.96
Drilling company: Gregg Drilling
Hammer weight: 140 lbs.
LF Geologist: Larry Lapuyade

EXPLANATION

Clay
Silt
Sand
Gravel
5-feet continuous core
▽ Water encountered in sediments at time of drilling

Approved by: [signature] RG 9592

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-7Z (page 2 of 2)

Project No. 1649.18

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

1649L033.LPL:JSC/JSM 102094

APPENDIX C

WATER-QUALITY SAMPLING SHEETS

LEVINE • FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name: EAST BAY BRIDGE — Project No.: 1649.02

Date: 9/13/94 — Sample No.: ~~DF~~ MW-1

Samplers Name: JCK

Sampling Location: MW-1

Sampling Method: HAND BAIL / TEFLON BAILER

Analyses Requested: 3VOA 4 L. GL.

Number and Types of Sample Bottles used: TPH-G, DIRECT FOR OVG

Method of Shipment: COURIER

GROUND WATER		SURFACE WATER	
Well No.	MW-1	Stream Width	
Well Diameter (in.)	2	Stream Depth	
Depth to Water, Static (ft)	14.88	Stream Velocity	
Water in Well Box	NO	Rained recently ?	
Well Depth (ft)	32.24	Other	
Height of Water Column in Well	17.36		
Water Volume in Well	2.78		

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

32.24
14.88
17.36
.16
1041 6
1736
2.7776

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
17:08								START
17:12		3	18.8	7.00	775			TURBID
17:16		6	18.6	6.89	740			TURBID
17:20		9	18.4	6.84	717			TURBID
17:30	14.94							SAMPLE

Suggested Method for Purging Well: _____

LEVINE • FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name: EAST BAY BRIDGE — Project No.: 1649.02

Date: 9/12/94 — Sample No.: MW-3

Samplers Name: JCK

Sampling Location: MW-3

Sampling Method: HAND BAIL / TEFLON BAILER

Analyses Requested: EPA 8010

Number and Types of Sample Bottles used: 3 VOA

Method of Shipment: COURIER

GROUND WATER

Well No.: MW-3

Well Diameter (in.): 2

Depth to Water, Static (ft): 9.88

Water in Well Box: NO

Well Depth (ft): 25.10

Height of Water Column in Well: 15.22

Water Volume in Well: 2.44

SURFACE WATER

Stream Width: _____

Stream Depth: _____

Stream Velocity: _____

Rained recently ? _____

Other: _____

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

25.10
9.88
15.22
.16
9132
1522
2.4352

15.22 25.10
.8 12.18
12.176 1292

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
16:50								START
16:53		2.5	20.2	6.71	876			TURBID
16:56		5	20.1	6.63	887			TURBID
17:01		7.5	20.0	6.71	904			TURBID
17:10	12.81							SAMPLE

Suggested Method for Purging Well _____

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name: EAST BAY BRIDGE — Project No.: 1649.02

Date: 9/13/94 — Sample No.: MW-5

Samplers Name: JCK

Sampling Location: MW-5

Sampling Method: HAND BAIL / TEFLON BAILER

Analyses Requested: EPA 8010

Number and Types of Sample Bottles used: 3 VOA

Method of Shipment: COURIER

GROUND WATER		SURFACE WATER	
Well No.	MW-5	Stream Width	
Well Diameter (in.)	2	Stream Depth	
Depth to Water, Static (ft)	17.15	Stream Velocity	
Water in Well Box		Rained recently ?	
Well Depth (ft)	20.80	Other	
Height of Water Column in Well	3.65		
Water Volume in Well	.59		

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

20.80
17.15
3.65
.16
2190
365
.5845

3.65 2080
.8 29.20
29.20

17.88
80% DTW

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
13:34								START
13:35		1	21.8	6.78	870			TURBID
1337		2	21.7	6.73	880			TURBID
13:42		3	21.5	6.76	889			TURBID
1350								SAMPLE

Suggested Method for Purging Well: _____

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name EAST BAY BRIDGE Project No. 1645.02

Date 9/13/94 Sample No. MW-6

Samplers Name JCK JMR

Sampling Location MW-6

Sampling Method HAND BAIL / TEFLON BAILER

Analyses Requested EPA 8010

Number and Types of Sample Bottles used 3 VOA

Method of Shipment COURIER

21.40
12.58
8.82
.16
5292
882
1.411 2

LOCATION MAP

GROUND WATER

Well No. MW-6

Well Diameter (in.) 2

Depth to Water, Static (ft) ~~12.09~~ 12.58

Water in Well Box NO

Well Depth (ft) 21.40

Height of Water Column in Well 8.82

Water Volume in Well 1.41

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
10:06								START
10:09		1.5	20.6	6.87	1097			TURBID
10:10		3	20.5	6.92	1089			"
10:13		5	20.5	6.75	1082			TURBID
10:20								SAMPLE

Suggested Method for Purging Well

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name: EAST BAY BRIDGE — Project No. 1649.02

Date: 9/13/94 — Sample No. MW-6D

Samplers Name: JCK

Sampling Location: MW-6D

Sampling Method: HAND BAIL / TEFLON BAILER

Analyses Requested: EPA 8010

Number and Types of Sample Bottles used: 3 VOA

Method of Shipment: COURIER

GROUND WATER

Well No. MW-6D

Well Diameter (in.) 2

Depth to Water, Static (ft) 11.09

Water in Well Box: NO

Well Depth (ft) 39.80

Height of Water Column in Well: 18.71

Water Volume in Well: ~~2.99~~ 4.69

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

39.80
11.09
18.71 28.71
.16 .16
11226 17226
1871 2871
2.9936 4.6936

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
9:35								START
9:38		3 gallons	19.6	11.13	654			clear
9:44		3 gallons	19.4	11.60	1414			Turbid
9:51		3 (9)	19.5	11.37	966			Turbid
9:56		3 (12)	19.5	11.08	765			Turbid
10:01		15	19.5	10.90	601			TURBID
10:17		20	19.5	10.77	531			TURBID
10:25								SAMPLE

Suggested Method for Purging Well

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name EAST BAY BRIDGE Project No. 1649.02

Date 9/13/94 Sample No. MW-7

Samplers Name JCK

Sampling Location MW-7

Sampling Method HAND BAIL/TEFLON BAILER

Analyses Requested EPA 8010

Number and Types of Sample Bottles used 3 VOA

Method of Shipment COURIER

GROUND WATER

Well No. MW-7

Well Diameter (in.) 2

Depth to Water, Static (ft) 11.60

Water in Well Box NO

Well Depth (ft) 23.30

Height of Water Column in Well 11.70

Water Volume in Well 1.87

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

23.30
11.60
11.70
.16
7020
1170
18720

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
10:50								START
10:56		2	20.0	6.88	873			TURBID
11:01		4	19.7	6.74	931			"
11:09		6	19.8	6.76	964			TURBID
11:20	11.70							SAMPLE

Suggested Method for Purging Well

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name EAST BAY BRIDGE Project No. 1649.02

Date 9/13/94 Sample No. MW-7D

Samplers Name JCK

Sampling Location MW-7D

Sampling Method HAND BAIL / TEFLON BAILER

Analyses Requested EPA 8010

Number and Types of Sample Bottles used 3 VOA

Method of Shipment COURIER

GROUND WATER

Well No. MW-7D

Well Diameter (in.) 2

Depth to Water, Static (ft) 11.60

Water in Well Box

Well Depth (ft) 39.90

Height of Water Column in Well 28.30

Water Volume in Well 4.53

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

39.90
11.60
28.30
.16
16 9 8 0
28 30
4.5280

28.50 × .8 = 22640

39.90 − 22.64 = 17.26

80% DTW

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
10:48								START
10:55		5	19.2	6.73	788			TURBID
11:03		10	19.3	6.76	780			TURBID
11:11		15	19.4	6.67	798			TURBID
11:25	11.80							SAMPLE

Suggested Method for Purging Well

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name EAST BAY BRIDGE Project No. 1649.02

Date 9/13/94 Sample No. MW-7Z

Samplers Name JCK

Sampling Location MW-7Z

Sampling Method 2" SUB PUMP/TEFLON BAILER

Analyses Requested EPA 8010

Number and Types of Sample Bottles used 3VOA

Method of Shipment COURIER

GROUND WATER

Well No. MW-7Z

Well Diameter (in.) 2

Depth to Water, Static (ft) 11.78

Water in Well Box NO

Well Depth (ft) 64.70

Height of Water Column in Well 52.92

Water Volume in Well 8.47

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

64.70
11.78
52.92
.16
31752
5292
8.4672

52.92 × .8 = 42.336 ≈ 42.34

64.70 − 42.34 = 22.36 (80% DTW)

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
1230								START
1232		9	20.7	6.91	719			CLEAR
12:36		18	20.2	6.87	715			TURBID
12:38	DEWATER	25						OFF
12:45								ON
12:46		27	20.2	[illegible]	696			TURBID/OFF
13:10	20.18							SAMPLE

Suggested Method for Purging Well

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name EAST BAY BRIDGE — Project No. 1649.08.02

Date 9/13/94 — Sample No. MW-8

Samplers Name JCK

Sampling Location MW-8

Sampling Method HAND BAIL/TEFLON BAILER/DEVELOP + SAMPLE

Analyses Requested ~~8010~~ EPA 8010

Number and Types of Sample Bottles used 3 VOA

Method of Shipment COURIER

GROUND WATER

Well No. MW-8

Well Diameter (in.) 2

Depth to Water, Static (ft) 10.08

Water in Well Box NO

Well Depth (ft) 20.10

Height of Water Column in Well 10.02

Water Volume in Well 1.60

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

20.10
10.08
10.02
.16
6012
1002
1.6032

10.02 10.02
6 .8
8016
1002 20.10
2 8.02
1208
80%DTW

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
15:25								START
15:30		3	19.5	6.98	1739			LT BROWN, THICK, TURB
15:35		6	19.5	6.95	1647			" "
15:46		9	18.8	6.90	1570			LT BROWN; TURB
15:56		12	18.7	6.91	1599			" "
15:51		15	18.5	6.94	1601			LT. BROWN TURB
16:01		18	18.6	6.94	1612			" "
16:20	12:42							SAMPLE

Suggested Method for Purging Well

LEVINE-FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name: EAST BAY BRIDGE — Project No.: 1649.02

Date: 9/14/94 — Sample No.: LF-22

Samplers Name: JCK

Sampling Location: LF-22

Sampling Method: CENT PUMP/TEFLON RACER

Analyses Requested: EPA 8010

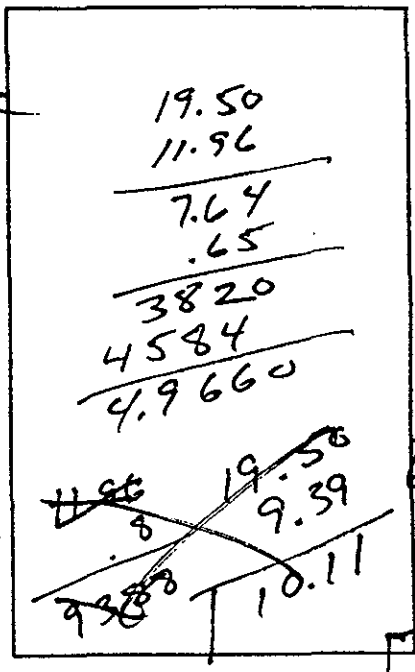
Number and Types of Sample Bottles used: 3 VOA

Method of Shipment: COURIER

GROUND WATER		SURFACE WATER	
Well No.	LF-22	Stream Width	
Well Diameter (in.)	4	Stream Depth	
Depth to Water, Static (ft)	11.96	Stream Velocity	
Water in Well Box		Rained recently ?	
Well Depth (ft)	19.50	Other	
Height of Water Column in Well	7.64	2-inch casing = 0.16 gal/ft	
Water Volume in Well	4.97	4-inch casing = 0.65 gal/ft	
		5-inch casing = 1.02 gal/ft	
		6-inch casing = 1.47 gal/ft	

19.50
11.96
7.64
.65
3820
4584
4.9660

7.64
.8
6.112
19.50
6.11
3.39
80% PT



LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
16:38								START
16:39		5	17.9	7.14	1408			CLEAR
16:40	DEWATER	9	~~180~~	~~2.10~~	~~856~~			OFF
16:44		10	18.0	7.10	856			SLTURBID
16:45	DEWATER	13						OFF
1652								ON
1652		15	18.5	7.13	716			MOD TURBID
17:00								SAMPLE

Suggested Method for Purging Well: _____

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name EAST BAY BRIDGE — Project No. 1649.02

Date 9/14/94 — Sample No. LF-23

Samplers Name JCK

Sampling Location LF-23

Sampling Method CENT PUMP / TEFLON BAILER

Analyses Requested EPA 8010

Number and Types of Sample Bottles used 3 VOA

Method of Shipment COURIER

GROUND WATER

Well No. LF-23

Well Diameter (in.) 4

Depth to Water, Static (ft) 12.24

Water in Well Box

Well Depth (ft) 18.36

Height of Water Column in Well 6.12

Water Volume in Well 3.98

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

18.36
12.24
6.12
.65
3060
3672
3.9780

6.12
.8
.0
4.896

18.36
4.90
13.46

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
17:10								START
17:19		5	16.0	6.88	955			SLTURBID
17:21		10	17.1	6.79	942			CLEAR
17:23	DEWATERED	14	17.7	6.79	972			CLEAR
17:55								SAMPLE
(17:45)	13.40							

Suggested Method for Purging Well

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name EAST BAY BRIDGE Project No. 1649.02

Date 9/14/94 Sample No. EX-3

Samplers Name JCK

Sampling Location SAMPLE PORT @ TREATMENT SYSTEM

Sampling Method PURGE + SAMPLE @ PORT

Analyses Requested EPA 8010

Number and Types of Sample Bottles used 3 VOA

Method of Shipment COURIER

GROUND WATER

Well No. EXTRACTION

Well Diameter (in.) WELL

Depth to Water, Static (ft)

Water in Well Box

Well Depth (ft)

Height of Water Column in Well

Water Volume in Well

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
								START
18:05		1	18.2	7.03	737			SAMPLE

Suggested Method for Purging Well

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name EAST BAY BRIDGE Project No. 1649.02

Date 9/14/94 Sample No. EX-4

Samplers Name JCK

Sampling Location EX SAMPLING PORT @ TREAT SYSTEM

Sampling Method PURGE & SAMPLE @ PORT

Analyses Requested EPA 8010

Number and Types of Sample Bottles used 3 VOA

Method of Shipment COURIER

GROUND WATER

Well No. EX-4

Well Diameter (in.) EXTRACTION WELL

Depth to Water, Static (ft)

Water in Well Box

Well Depth (ft)

Height of Water Column in Well

Water Volume in Well

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
18:10		1	18.5	6.81	743			SAMPLE CLEAR

Suggested Method for Purging Well

APPENDIX D

LABORATORY CERTIFICATES

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

LEVINE-FRICKE
1900 POWELL ST. 12TH FL.
EMERYVILLE, CA 94608

ATTN: RON GOLOUBOW
CLIENT PROJ. ID: 1649.02
CLIENT PROJ. NAME: EAST BAY BRDG.
C.O.C. NUMBER: 12576

REPORT DATE: 10/03/94
DATE(S) SAMPLED: 09/12/94-09/13/94
DATE RECEIVED: 09/14/94
AEN WORK ORDER: 9409157

PROJECT SUMMARY:

On September 14, 1994, this laboratory received 12 water sample(s).

Client requested sample(s) be analyzed for organic parameters. Results of analysis are summarized on the following page(s).

Please see quality control report for a summary of QC data pertaining to this project.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

LEVINE-FRICKE

SAMPLE ID: MW-9
AEN LAB NO: 9409157-01
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/12/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/18/94
Bromoform	75-25-2	ND	0.5	ug/L	09/18/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/18/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/18/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/18/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/18/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/18/94
Chloroform	67-66-3	ND	0.5	ug/L	09/18/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/18/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/18/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/18/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/18/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/18/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/18/94
1,1-Dichloroethane	75-34-3	6 *	0.5	ug/L	09/18/94
1,2-Dichloroethane	107-06-2	0.5 *	0.5	ug/L	09/18/94
1,1-Dichloroethene	75-35-4	120 *	0.5	ug/L	09/20/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/18/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/18/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/18/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/18/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/18/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/18/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/18/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	09/18/94
1,1,1-Trichloroethane	71-55-6	17 *	0.5	ug/L	09/18/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/18/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/18/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/18/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/18/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/18/94

Please see page 14 for comments regarding this sample.

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: MW-9D
AEN LAB NO: 9409157-02
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/12/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/18/94
Bromoform	75-25-2	ND	0.5	ug/L	09/18/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/18/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/18/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/18/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/18/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/18/94
Chloroform	67-66-3	ND	0.5	ug/L	09/18/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/18/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/18/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/18/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/18/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/18/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/18/94
1,1-Dichloroethane	75-34-3	ND	0.5	ug/L	09/18/94
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	09/18/94
1,1-Dichloroethene	75-35-4	ND	0.5	ug/L	09/18/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/18/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/18/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/18/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/18/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/18/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/18/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/18/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	09/18/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	09/18/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/18/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/18/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/18/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/18/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/18/94

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: MW-109
AEN LAB NO: 9409157-03
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/12/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/18/94
Bromoform	75-25-2	ND	0.5	ug/L	09/18/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/18/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/18/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/18/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/18/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/18/94
Chloroform	67-66-3	ND	0.5	ug/L	09/18/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/18/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/18/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/18/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/18/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/18/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/18/94
1,1-Dichloroethane	75-34-3	5 *	0.5	ug/L	09/18/94
1,2-Dichloroethane	107-06-2	0.9 *	0.5	ug/L	09/18/94
1,1-Dichloroethene	75-35-4	120 *	0.5	ug/L	09/20/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/18/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/18/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/18/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/18/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/18/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/18/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/18/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	09/18/94
1,1,1-Trichloroethane	71-55-6	15 *	0.5	ug/L	09/18/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/18/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/18/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/18/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/18/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/18/94

Please see page 14 for comments regarding this sample.

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: MW-6
AEN LAB NO: 9409157-04
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/13/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/18/94
Bromoform	75-25-2	ND	0.5	ug/L	09/18/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/18/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/18/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/18/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/18/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/18/94
Chloroform	67-66-3	2 *	0.5	ug/L	09/18/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/18/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/18/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/18/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/18/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/18/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/18/94
1,1-Dichloroethane	75-34-3	5 *	0.5	ug/L	09/18/94
1,2-Dichloroethane	107-06-2	1 *	0.5	ug/L	09/18/94
1,1-Dichloroethene	75-35-4	280 *	0.5	ug/L	09/20/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/18/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/18/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/18/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/18/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/18/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/18/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/18/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	09/18/94
1,1,1-Trichloroethane	71-55-6	41 *	0.5	ug/L	09/18/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/18/94
Trichloroethene	79-01-6	0.5 *	0.5	ug/L	09/18/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/18/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/18/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/18/94

Please see page 14 for comments regarding this sample.

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: MW-6D
AEN LAB NO: 9409157-05
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/13/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/20/94
Bromoform	75-25-2	ND	0.5	ug/L	09/20/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/20/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/20/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/20/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/20/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/20/94
Chloroform	67-66-3	ND	0.5	ug/L	09/20/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/20/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/20/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/20/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/20/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/20/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/20/94
1,1-Dichloroethane	75-34-3	ND	0.5	ug/L	09/20/94
1,2-Dichloroethane	107-06-2	0.5 *	0.5	ug/L	09/20/94
1,1-Dichloroethene	75-35-4	3 *	0.5	ug/L	09/20/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/20/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/20/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/20/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/20/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/20/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/20/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/20/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	09/20/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	09/20/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/20/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/20/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/20/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/20/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/20/94

Please see page 14 for comments regarding this sample.

ND = Not detected at or above the reporting limit
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LEVINE-FRICKE

SAMPLE ID: MW-7
AEN LAB NO: 9409157-06
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/13/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/19/94
Bromoform	75-25-2	ND	0.5	ug/L	09/19/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/19/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/19/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/19/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/19/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/19/94
Chloroform	67-66-3	ND	0.5	ug/L	09/19/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/19/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/19/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/19/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/19/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/19/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/19/94
1,1-Dichloroethane	75-34-3	3 *	0.5	ug/L	09/19/94
1,2-Dichloroethane	107-06-2	0.9 *	0.5	ug/L	09/19/94
1,1-Dichloroethene	75-35-4	160 *	0.5	ug/L	09/20/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/19/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/19/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/19/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/19/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/19/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/19/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/19/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	09/19/94
1,1,1-Trichloroethane	71-55-6	17 *	0.5	ug/L	09/19/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/19/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/19/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/19/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/19/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/19/94

Please see page 14 for comments regarding this sample.

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* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: MW-7D
AEN LAB NO: 9409157-07
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/13/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/20/94
Bromoform	75-25-2	ND	0.5	ug/L	09/20/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/20/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/20/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/20/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/20/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/20/94
Chloroform	67-66-3	ND	0.5	ug/L	09/20/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/20/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/20/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/20/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/20/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/20/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/20/94
1,1-Dichloroethane	75-34-3	ND	0.5	ug/L	09/20/94
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	09/20/94
1,1-Dichloroethene	75-35-4	3 *	0.5	ug/L	09/20/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/20/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/20/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/20/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/20/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/20/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/20/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/20/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	09/20/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	09/20/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/20/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/20/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/20/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/20/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/20/94

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: MW-7Z
AEN LAB NO: 9409157-08
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/13/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/19/94
Bromoform	75-25-2	ND	0.5	ug/L	09/19/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/19/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/19/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/19/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/19/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/19/94
Chloroform	67-66-3	ND	0.5	ug/L	09/19/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/19/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/19/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/19/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/19/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/19/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/19/94
1,1-Dichloroethane	75-34-3	ND	0.5	ug/L	09/19/94
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	09/19/94
1,1-Dichloroethene	75-35-4	ND	0.5	ug/L	09/19/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/19/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/19/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/19/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/19/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/19/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/19/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/19/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	09/19/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	09/19/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/19/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/19/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/19/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/19/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/19/94

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: MW-5
AEN LAB NO: 9409157-09
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/13/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/19/94
Bromoform	75-25-2	ND	0.5	ug/L	09/19/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/19/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/19/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/19/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/19/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/19/94
Chloroform	67-66-3	ND	0.5	ug/L	09/19/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/19/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/19/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/19/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/19/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/19/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/19/94
1,1-Dichloroethane	75-34-3	2 *	0.5	ug/L	09/19/94
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	09/19/94
1,1-Dichloroethene	75-35-4	3 *	0.5	ug/L	09/19/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/19/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/19/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/19/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/19/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/19/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/19/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/19/94
Tetrachloroethene	127-18-4	0.7 *	0.5	ug/L	09/19/94
1,1,1-Trichloroethane	71-55-6	1 *	0.5	ug/L	09/19/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/19/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/19/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/19/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/19/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/19/94

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: MW-8
AEN LAB NO: 9409157-10
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/13/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/19/94
Bromoform	75-25-2	ND	0.5	ug/L	09/19/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/19/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/19/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/19/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/19/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/19/94
Chloroform	67-66-3	0.8 *	0.5	ug/L	09/19/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/19/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/19/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/19/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/19/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/19/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/19/94
1,1-Dichloroethane	75-34-3	0.5 *	0.5	ug/L	09/19/94
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	09/19/94
1,1-Dichloroethene	75-35-4	ND	0.5	ug/L	09/19/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/19/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/19/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/19/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/19/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/19/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/19/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/19/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	09/19/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	09/19/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/19/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/19/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/19/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/19/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/19/94

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: MW-1
AEN LAB NO: 9409157-11
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/13/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	09/17/94
Toluene	108-88-3	ND	0.5	ug/L	09/17/94
Ethylbenzene	100-41-4	ND	0.5	ug/L	09/17/94
Xylenes, Total	1330-20-7	ND	2	ug/L	09/17/94
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	09/17/94
#Extraction for TPH	EPA 3510	-		Extrn Date	09/21/94
TPH as Diesel	GC-FID	0.3 *	0.05	mg/L	09/22/94
#Water Extrn for HCs (IR)	SM 5520CF	-		Extrn Date	09/18/94
Hydrocarbons (IR)	SM 5520CF	ND	0.5	mg/L	09/18/94

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: MW-3
AEN LAB NO: 9409157-12
AEN WORK ORDER: 9409157
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/12/94
DATE RECEIVED: 09/14/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/19/94
Bromoform	75-25-2	ND	0.5	ug/L	09/19/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/19/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/19/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/19/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/19/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/19/94
Chloroform	67-66-3	ND	0.5	ug/L	09/19/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/19/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/19/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/19/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/19/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/19/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/19/94
1,1-Dichloroethane	75-34-3	ND	0.5	ug/L	09/19/94
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	09/19/94
1,1-Dichloroethene	75-35-4	ND	0.5	ug/L	09/19/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/19/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/19/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/19/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/19/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/19/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/19/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/19/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	09/19/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	09/19/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/19/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/19/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/19/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/19/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/19/94

ND = Not detected at or above the reporting limit
* = Value above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9409157

CLIENT PROJECT ID: 1649.02

Quality Control and Project Summary

1,2-dichloroethane is a suspected laboratory contaminant for results of up to 1 ppb (samples MW-9, MW-109, MW-6, MW-6D, and MW-7).

All other laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

AEN JOB NO: 9409157
DATE EXTRACTED: 09/21/94
INSTRUMENT: C
MATRIX: WATER

Surrogate Standard Recovery Summary
Method: EPA 3510 GCFID

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
09/22/94	MW-1	11	100

Current QC Limits

Surrogate	Percent Recovery
n-Pentacosane	30-120

QUALITY CONTROL DATA

AEN JOB NO: 9409157
DATE EXTRACTED: 09/20/94
DATE ANALYZED: 09/21/94
INSTRUMENT: D
MATRIX: WATER

Method Spike Recovery Summary
Method: EPA 3510 GCFID

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	1.62	99	6	63-109	10

Method Blank Result
Method: EPA 3510 GCFID

Lab Id.	Extractable Hydrocarbons as Diesel (mg/L)
092194-BLANK	ND
Reporting Limit	0.05

QUALITY CONTROL DATA

AEN JOB NO: 9409157
DATE EXTRACTED: 09/08/94
DATE ANALYZED: 09/08/94
INSTRUMENT: IR
MATRIX: WATER

Method Spike Recovery Summary
Method: SM 5520

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Oil	7.5	93	2	83-107	5

Method Blank Result
Method: SM 5520

Lab Id.	Hydrocarbons (mg/L)
091894-BLANK	ND
Reporting Limit	0.5

QUALITY CONTROL DATA

AEN JOB NO: 9409157
DATE ANALYZED: 09/18/94
AEN LAB NO: 0918-BLANK
INSTRUMENT: G
MATRIX: WATER

EPA Method 8010
Halogenated Volatile Organics

Analyte	CAS #	Result (ug/L)	Reporting Limit (ug/L)
Bromodichloromethane	75-27-4	ND	0.5
Bromoform	75-25-2	ND	0.5
Bromomethane	74-83-9	ND	0.5
Carbon Tetrachloride	56-23-5	ND	0.5
Chlorobenzene	108-90-7	ND	0.5
Chloroethane	75-00-3	ND	0.5
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5
Chloroform	67-66-3	ND	0.5
Chloromethane	74-87-3	ND	0.5
Dibromochloromethane	124-48-1	ND	0.5
1,2-Dichlorobenzene	95-50-1	ND	0.5
1,3-Dichlorobenzene	541-73-1	ND	0.5
1,4-Dichlorobenzene	106-46-7	ND	0.5
Dichlorodifluoromethane	75-71-8	ND	0.5
1,1-Dichloroethane	75-34-3	ND	0.5
1,2-Dichloroethane	107-06-2	ND	0.5
1,1-Dichloroethene	75-35-4	ND	0.5
cis-1,2-Dichloroethene	156-59-2	ND	0.5
trans-1,2-Dichloroethene	156-60-5	ND	0.5
1,2-Dichloropropane	78-87-5	ND	0.5
cis-1,3-Dichloropropene	10061-01-5	ND	0.5
trans-1,3-Dichloropropene	10061-02-6	ND	0.5
Methylene Chloride	75-09-2	ND	0.5
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Tetrachloroethene	127-18-4	ND	0.5
1,1,1-Trichloroethane	71-55-6	ND	0.5
1,1,2-Trichloroethane	79-00-5	ND	0.5
Trichloroethene	79-01-6	ND	0.5
Trichlorofluoromethane	75-69-4	ND	0.5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ND	0.5
Vinyl Chloride	75-01-4	ND	0.5

QUALITY CONTROL DATA

AEN JOB NO: 9409157
DATE ANALYZED: 09/19/94
AEN LAB NO: 0919-BLANK
INSTRUMENT: G
MATRIX: WATER

EPA Method 8010
Halogenated Volatile Organics

Analyte	CAS #	Result (ug/L)	Reporting Limit (ug/L)
Bromodichloromethane	75-27-4	ND	0.5
Bromoform	75-25-2	ND	0.5
Bromomethane	74-83-9	ND	0.5
Carbon Tetrachloride	56-23-5	ND	0.5
Chlorobenzene	108-90-7	ND	0.5
Chloroethane	75-00-3	ND	0.5
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5
Chloroform	67-66-3	ND	0.5
Chloromethane	74-87-3	ND	0.5
Dibromochloromethane	124-48-1	ND	0.5
1,2-Dichlorobenzene	95-50-1	ND	0.5
1,3-Dichlorobenzene	541-73-1	ND	0.5
1,4-Dichlorobenzene	106-46-7	ND	0.5
Dichlorodifluoromethane	75-71-8	ND	0.5
1,1-Dichloroethane	75-34-3	ND	0.5
1,2-Dichloroethane	107-06-2	ND	0.5
1,1-Dichloroethene	75-35-4	ND	0.5
cis-1,2-Dichloroethene	156-59-2	ND	0.5
trans-1,2-Dichloroethene	156-60-5	ND	0.5
1,2-Dichloropropane	78-87-5	ND	0.5
cis-1,3-Dichloropropene	10061-01-5	ND	0.5
trans-1,3-Dichloropropene	10061-02-6	ND	0.5
Methylene Chloride	75-09-2	ND	0.5
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Tetrachloroethene	127-18-4	ND	0.5
1,1,1-Trichloroethane	71-55-6	ND	0.5
1,1,2-Trichloroethane	79-00-5	ND	0.5
Trichloroethene	79-01-6	ND	0.5
Trichlorofluoromethane	75-69-4	ND	0.5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ND	0.5
Vinyl Chloride	75-01-4	ND	0.5

QUALITY CONTROL DATA

AEN JOB NO: 9409157
DATE ANALYZED: 09/20/94
AEN LAB NO: 0920-BLANK
INSTRUMENT: G
MATRIX: WATER

EPA Method 8010
Halogenated Volatile Organics

Analyte	CAS #	Result (ug/L)	Reporting Limit (ug/L)
Bromodichloromethane	75-27-4	ND	0.5
Bromoform	75-25-2	ND	0.5
Bromomethane	74-83-9	ND	0.5
Carbon Tetrachloride	56-23-5	ND	0.5
Chlorobenzene	108-90-7	ND	0.5
Chloroethane	75-00-3	ND	0.5
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5
Chloroform	67-66-3	ND	0.5
Chloromethane	74-87-3	ND	0.5
Dibromochloromethane	124-48-1	ND	0.5
1,2-Dichlorobenzene	95-50-1	ND	0.5
1,3-Dichlorobenzene	541-73-1	ND	0.5
1,4-Dichlorobenzene	106-46-7	ND	0.5
Dichlorodifluoromethane	75-71-8	ND	0.5
1,1-Dichloroethane	75-34-3	ND	0.5
1,2-Dichloroethane	107-06-2	ND	0.5
1,1-Dichloroethene	75-35-4	ND	0.5
cis-1,2-Dichloroethene	156-59-2	ND	0.5
trans-1,2-Dichloroethene	156-60-5	ND	0.5
1,2-Dichloropropane	78-87-5	ND	0.5
cis-1,3-Dichloropropene	10061-01-5	ND	0.5
trans-1,3-Dichloropropene	10061-02-6	ND	0.5
Methylene Chloride	75-09-2	ND	0.5
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Tetrachloroethene	127-18-4	ND	0.5
1,1,1-Trichloroethane	71-55-6	ND	0.5
1,1,2-Trichloroethane	79-00-5	ND	0.5
Trichloroethene	79-01-6	ND	0.5
Trichlorofluoromethane	75-69-4	ND	0.5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ND	0.5
Vinyl Chloride	75-01-4	ND	0.5

QUALITY CONTROL DATA

AEN JOB NO: 9409157
INSTRUMENT: G
MATRIX: WATER

Surrogate Standard Recovery Summary
Method: EPA 8010

Date Analyzed	Client Id.	Lab Id.	Percent Recovery: Bromochloro-methane	Percent Recovery: 1-Bromo-3-chloro-propane
09/18/94	MW-9	01	113	102
09/18/94	MW-9D	02	100	97
09/18/94	MW-109	03	106	95
09/18/94	MW-6	04	106	91
09/20/94	MW-6D	05	90	94
09/19/94	MW-7	06	98	87
09/20/94	MW-7D	07	98	99
09/19/94	MW-7Z	08	83	83
09/19/94	MW-5	09	98	87
09/19/94	MW-8	10	94	86
09/19/94	MW-3	12	91	87

Current QC Limits

Surrogate	Percent Recovery
Bromochloromethane	78-153
1-Bromo-3-chloropropane	74-143

QUALITY CONTROL DATA

AEN JOB NO: 9409157
DATE ANALYZED: 09/17/94
SAMPLE SPIKED: 9409091-06
INSTRUMENT: G
MATRIX: WATER

Matrix Spike Recovery Summary
Method: EPA 8010

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
1,1-Dichloroethene	50	93	10	40-130	18
Trichloroethene	50	91	2	67-136	17
Chlorobenzene	50	79	2	59-123	15

QUALITY CONTROL DATA

AEN JOB NO: 9409157
INSTRUMENT: F
MATRIX: WATER

Surrogate Standard Recovery Summary
Method: EPA 8020, 5030 GCFID

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
09/17/94	MW-1	11	97

Current QC Limits

Surrogate	Percent Recovery
Fluorobenzene	86-110

QUALITY CONTROL DATA

AEN JOB NO: 9409157
DATE ANALYZED: 09/15/94
SAMPLE SPIKED: 9409113-07
INSTRUMENT: F
MATRIX: WATER

Matrix Spike Recovery Summary
Method: EPA 8020, 5030

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	18	97	6	82-125	15
Toluene	47	99	6	75-126	17
Hydrocarbons as Gasoline	500	98	4	75-132	16

AEN LAB NO: 0917-BLANK
DATE ANALYZED: 09/17/94

BTEX and Hydrocarbons
Method: EPA 8020, 5030 GCFID

	CAS #	Result (ug/L)	Reporting Limit (ug/L)
Benzene	71-43-2	ND	0.5
Toluene	108-88-3	ND	0.5
Ethylbenzene	100-41-4	ND	0.5
Xylenes, Total	1330-20-7	ND	2
Purgeable Hydrocarbons as: Gasoline		ND mg/L	0.05 mg/L

*** END OF REPORT ***

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

9409157

Project No.: 1649.02	Field Logbook No.:	Date: 9/13/94	Serial No.: № 12576
Project Name: EAST BAY BRIDGE	Project Location: EMERYVILLE, CA.		
Sampler (Signature): [signature]			Samplers: JCK

SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CONTAINERS	SAMPLE TYPE	EPA 601	TO ~~EPA 624~~ O+G	EPA 8010	TPH D mod 8015	TPH-G mod 8015	BTEX 8020	HOLD	RUSH	REMARKS
MW-9	9/12/94	15:45	01A-C	3				X						STANDARD TAT
MW-9D	↓	15:15	02A-C	↓			—	X						
MW-109	↓	16:45	03A-C	↓				X						RESULTS TO
MW-6	9/13/94	10:20	04A-C	↓				X						RON GOLOUBOW
MW-6D	↓	10:25	05A-C	↓				X						
MW-7	↓	11:20	06A-C	↓				X						
MW-7D	↓	11:25	07A-C	↓				X						TOG = 5530F
MW-7Z	↓	13:10	08A-C	↓				X						
MW-5	↓	13:50	09A-C	↓				X						
MW-8	↓	16:20	10A-C	↓				X						
MW-1	↓	17:30	11A-G	7			X		X	X	X			
MW-3	9/12/94	17:10	12A-C	3				X						

RELINQUISHED BY: (Signature) [signature]	DATE 9/14/94	TIME 10:20	RECEIVED BY: (Signature) Michael E McMillan	DATE 9/14/94	TIME 10:20
RELINQUISHED BY: (Signature) Michael E McMillan	DATE 9/14	TIME 11:20	RECEIVED BY: (Signature) [signature]	DATE 9-14-94	TIME 1130
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	DATE	TIME
METHOD OF SHIPMENT:	DATE	TIME	LAB COMMENTS:		

Sample Collector: LEVINE-FRICKE 1900 Powell Street, 12th Floor Emeryville, California 94608 (510) 652-4500	Analytical Laboratory: AEN PLEASANT HILL, CA.

Shipping Copy (White) Lab Copy (Green) File Copy (Yellow) Field Copy (Pink) FORM NO. 86/COC/ARF

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

LEVINE-FRICKE
1900 POWELL ST. 12TH FL.
EMERYVILLE, CA 94608

ATTN: RON GOLOUBOW
CLIENT PROJ. ID: 1649.02
CLIENT PROJ. NAME: EAST BAY BRDG.
C.O.C. NUMBER: 12579

REPORT DATE: 10/03/94
DATE(S) SAMPLED: 09/14/94
DATE RECEIVED: 09/15/94
AEN WORK ORDER: 9409181

PROJECT SUMMARY:

On September 15, 1994, this laboratory received 5 water sample(s).

Client requested sample(s) be analyzed for organic parameters. Results of analysis are summarized on the following page(s).

Please see quality control report for a summary of QC data pertaining to this project.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

RECEIVED
OCT - 5 1994
LEVINE-FRICKE

LEVINE-FRICKE

SAMPLE ID: LF-22
AEN LAB NO: 9409181-01
AEN WORK ORDER: 9409181
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/14/94
DATE RECEIVED: 09/15/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/26/94
Bromoform	75-25-2	ND	0.5	ug/L	09/26/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/26/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/26/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/26/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/26/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/26/94
Chloroform	67-66-3	2 *	0.5	ug/L	09/26/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/26/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/26/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/26/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/26/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/26/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/26/94
1,1-Dichloroethane	75-34-3	1 *	0.5	ug/L	09/26/94
1,2-Dichloroethane	107-06-2	0.7 *	0.5	ug/L	09/26/94
1,1-Dichloroethene	75-35-4	3 *	0.5	ug/L	09/26/94
cis-1,2-Dichloroethene	156-59-2	4 *	0.5	ug/L	09/26/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/26/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/26/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/26/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/26/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/26/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/26/94
Tetrachloroethene	127-18-4	8 *	0.5	ug/L	09/26/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	09/26/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/26/94
Trichloroethene	79-01-6	4 *	0.5	ug/L	09/26/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/26/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/26/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/26/94

Results up to 1 ppb of 1,2-Dichlorethane are a suspected lab contaminant.

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: LF-23
AEN LAB NO: 9409181-02
AEN WORK ORDER: 9409181
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/14/94
DATE RECEIVED: 09/15/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/26/94
Bromoform	75-25-2	ND	0.5	ug/L	09/26/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/26/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/26/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/26/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/26/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/26/94
Chloroform	67-66-3	ND	0.5	ug/L	09/26/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/26/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/26/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/26/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/26/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/26/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/26/94
1,1-Dichloroethane	75-34-3	3 *	0.5	ug/L	09/26/94
1,2-Dichloroethane	107-06-2	0.7 *	0.5	ug/L	09/26/94
1,1-Dichloroethene	75-35-4	2 *	0.5	ug/L	09/26/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/26/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/26/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/26/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/26/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/26/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/26/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/26/94
Tetrachloroethene	127-18-4	0.6 *	0.5	ug/L	09/26/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	09/26/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/26/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/26/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/26/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/26/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/26/94

Results up to 1 ppb of 1,2-Dichlorethane are a suspected lab contaminant.

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: EX-3
AEN LAB NO: 9409181-03
AEN WORK ORDER: 9409181
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/14/94
DATE RECEIVED: 09/15/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/26/94
Bromoform	75-25-2	ND	0.5	ug/L	09/26/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/26/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/26/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/26/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/26/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/26/94
Chloroform	67-66-3	ND	0.5	ug/L	09/26/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/26/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/26/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/26/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/26/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/26/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/26/94
1,1-Dichloroethane	75-34-3	5 *	0.5	ug/L	09/26/94
1,2-Dichloroethane	107-06-2	1 *	0.5	ug/L	09/26/94
1,1-Dichloroethene	75-35-4	100 *	0.5	ug/L	09/27/94
cis-1,2-Dichloroethene	156-59-2	0.8 *	0.5	ug/L	09/26/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/26/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/26/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/26/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/26/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/26/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/26/94
Tetrachloroethene	127-18-4	42 *	0.5	ug/L	09/26/94
1,1,1-Trichloroethane	71-55-6	14 *	0.5	ug/L	09/26/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/26/94
Trichloroethene	79-01-6	4 *	0.5	ug/L	09/26/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/26/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/26/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/26/94

Results up to 1 ppb of 1,2-Dichlorethane are a suspected lab contaminant.

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: EX-4
AEN LAB NO: 9409181-04
AEN WORK ORDER: 9409181
CLIENT PROJ. ID: 1649.02

DATE SAMPLED: 09/14/94
DATE RECEIVED: 09/15/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/26/94
Bromoform	75-25-2	ND	0.5	ug/L	09/26/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/26/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/26/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/26/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/26/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/26/94
Chloroform	67-66-3	ND	0.5	ug/L	09/26/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/26/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/26/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/26/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/26/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/26/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/26/94
1,1-Dichloroethane	75-34-3	6 *	0.5	ug/L	09/26/94
1,2-Dichloroethane	107-06-2	1 *	0.5	ug/L	09/26/94
1,1-Dichloroethene	75-35-4	220 *	0.5	ug/L	09/27/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/26/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/26/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/26/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/26/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/26/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/26/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/26/94
Tetrachloroethene	127-18-4	10 *	0.5	ug/L	09/26/94
1,1,1-Trichloroethane	71-55-6	25 *	0.5	ug/L	09/26/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/26/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/26/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/26/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/26/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/26/94

Results up to 1 ppb of 1,2-Dichlorethane are a suspected lab contaminant.

ND = Not detected at or above the reporting limit
* = Value above reporting limit

LEVINE-FRICKE

SAMPLE ID: TRIP994
AEN LAB NO: 9409181-05
AEN WORK ORDER: 9409181
CLIENT PROJ. ID: 1649.02

DATE SAMPLED:
DATE RECEIVED: 09/15/94
REPORT DATE: 10/03/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	09/26/94
Bromoform	75-25-2	ND	0.5	ug/L	09/26/94
Bromomethane	74-83-9	ND	0.5	ug/L	09/26/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	09/26/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	09/26/94
Chloroethane	75-00-3	ND	0.5	ug/L	09/26/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	09/26/94
Chloroform	67-66-3	ND	0.5	ug/L	09/26/94
Chloromethane	74-87-3	ND	0.5	ug/L	09/26/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	09/26/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	09/26/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	09/26/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	09/26/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	09/26/94
1,1-Dichloroethane	75-34-3	ND	0.5	ug/L	09/26/94
1,2-Dichloroethane	107-06-2	1 *	0.5	ug/L	09/26/94
1,1-Dichloroethene	75-35-4	ND	0.5	ug/L	09/26/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	09/26/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	09/26/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	09/26/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	09/26/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	09/26/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	09/26/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	09/26/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	09/26/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	09/26/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	09/26/94
Trichloroethene	79-01-6	ND	0.5	ug/L	09/26/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	09/26/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	09/26/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	09/26/94

ND = Not detected at or above the reporting limit
* = Value above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9409181

CLIENT PROJECT ID: 1649.02

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

AEN JOB NO: 9409181
DATE ANALYZED: 09/26/94
AEN LAB NO: 0926-BLANK
INSTRUMENT: G
MATRIX: WATER

EPA Method 8010
Halogenated Volatile Organics

Analyte	CAS #	Concentration (ug/L)	Reporting Limit (ug/L)
Bromodichloromethane	75-27-4	ND	0.5
Bromoform	75-25-2	ND	0.5
Bromomethane	74-83-9	ND	0.5
Carbon Tetrachloride	56-23-5	ND	0.5
Chlorobenzene	108-90-7	ND	0.5
Chloroethane	75-00-3	ND	0.5
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5
Chloroform	67-66-3	ND	0.5
Chloromethane	74-87-3	ND	0.5
Dibromochloromethane	124-48-1	ND	0.5
1,2-Dichlorobenzene	95-50-1	ND	0.5
1,3-Dichlorobenzene	541-73-1	ND	0.5
1,4-Dichlorobenzene	106-46-7	ND	0.5
Dichlorodifluoromethane	75-71-8	ND	0.5
1,1-Dichloroethane	75-34-3	ND	0.5
1,2-Dichloroethane	107-06-2	ND	0.5
1,1-Dichloroethene	75-35-4	ND	0.5
cis-1,2-Dichloroethene	156-59-2	ND	0.5
trans-1,2-Dichloroethene	156-60-5	ND	0.5
1,2-Dichloropropane	78-87-5	ND	0.5
cis-1,3-Dichloropropene	10061-01-5	ND	0.5
trans-1,3-Dichloropropene	10061-02-6	ND	0.5
Methylene Chloride	75-09-2	ND	0.5
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Tetrachloroethene	127-18-4	ND	0.5
1,1,1-Trichloroethane	71-55-6	ND	0.5
1,1,2-Trichloroethane	79-00-5	ND	0.5
Trichloroethene	79-01-6	ND	0.5
Trichlorofluoromethane	75-69-4	ND	0.5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ND	0.5
Vinyl Chloride	75-01-4	ND	0.5

QUALITY CONTROL DATA

AEN JOB NO: 9409181
INSTRUMENT: G
MATRIX: WATER

Surrogate Standard Recovery Summary
Method: EPA 8010

Date Analyzed	Client Id.	Lab Id.	Percent Recovery: Bromochloro-methane	Percent Recovery: 1-Bromo-3-chloro-propane
09/26/94	LF-22	01	117	121
09/26/94	LF-23	02	110	100
09/26/94	EX-3	03	112	110
09/26/94	EX-4	04	116	110
09/26/94	TRIP994	05	103	97

Current QC Limits

Surrogate	Percent Recovery
Bromochloromethane	78-153
1-Bromo-3-chloropropane	74-143

QUALITY CONTROL DATA

AEN JOB NO: 9409181
DATE ANALYZED: 09/23/94
SAMPLE SPIKED: 9409231-04
INSTRUMENT: G
MATRIX: WATER

Matrix Spike Recovery Summary
Method: EPA 8010

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
1,1-Dichloroethene	50	84	4	40-130	18
Trichloroethene	50	86	3	67-136	17
Chlorobenzene	50	75	3	59-123	15

*** END OF REPORT ***

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

9409181

Project No.: 1649.02	Field Logbook No.:	Date: 9/14/94	Serial No.: No 12579
Project Name: EAST BAY BRIDGE	Project Location: EMERYVILLE, CA.		
Sampler (Signature):			

SAMPLES						ANALYSES								
SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CONTAINERS	SAMPLE TYPE	EPA 601	EPA 624	EPA 8010				HOLD	RUSH	REMARKS
LF-22	9/14/94		01A-C	3	H2O			X						STANDARD TAT
LF-23	↓	17:35	02A-C	↓	↓			X						
EX-3		18:05	03A-C					X						
EX-4		18:10	04A-C					X						RESULTS TO RON GOLOUBOW
TRIP994	9/12/94	09:00	05AB	2	H2O			X						

Samplers: JCK

RELINQUISHED BY: (Signature)	DATE 9-15-94	TIME 11:00	RECEIVED BY: (Signature)	DATE 9-15-94	TIME 11:00
RELINQUISHED BY: (Signature)	DATE 9-15-94	TIME 12:00	RECEIVED BY: (Signature) Gina Gillespie	DATE 9-15-94	TIME 1200
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	DATE	TIME
METHOD OF SHIPMENT:	DATE	TIME	LAB COMMENTS:		

Sample Collector: LEVINE-FRICKE
1900 Powell Street, 12th Floor
Emeryville, California 94608
(510) 652-4500

Analytical Laboratory: AEN
PLEASANT HILL, CA.

Shipping Copy (White) Lab Copy (Green) File Copy (Yellow) Field Copy (Pink) FORM NO. 86/COC/ARF