Environmental
Science &
Engineering, Inc.

A CILCORP Company

TO: Alameda County Health Care Services Agency, Department of Environmental Health
1131 Harbor Bay Parkway (2nd floor)
Alameda, California 94502

DATE: January 9, 1995

ATTN: Ms. Susan L. Hugo

JOB NUMBER: 6-94-5219

SUBJECT: AUTOPRO, 5200 TELEGRAPH AVENUE, OAKLAND, CALIFORNIA

WE ARE TRANSMITTING THE FOLLOWING:

Fourth Quarter 1994 Ground Water Monitoring Report.

Please contact Mike Quillin at (510) 685-4053 with any questions regarding this report

CC: Mr. Onarej M. Kojnok, Attorney at Law

DIST:
LB
File
Originator

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

BY: Michael E. Quillin

Michael E. Quillin, RG 5315
Senior Hydrogeologist

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

Environmental
Science &
Engineering, Inc.

A CILCORP Company

TO: Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Fifth Floor
Oakland, California 94612

DATE: January 9, 1995

ATTN: Toxics Cleanup Division

JOB NUMBER: 6-94-5219

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REPORT OF FINDINGS
FOURTH QUARTER 1994
GROUND WATER MONITORING
AUTOPRO
5200 TELEGRAPH AVENUE,
OAKLAND, CALIFORNIA

ESE PROJECT #6-94-5219

PREPARED FOR:

TRI-STAR PARTNERSHIP
C/O MR. ONDREJ M. KOJNOK, ATTORNEY AT LAW
762 EL PASEO DE SARATOGA
SAN JOSE, CALIFORNIA

PREPARED BY:

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
4090 NELSON AVENUE, SUITE J
CONCORD, CALIFORNIA 94520

January 6, 1995

ESE
A CHICORP Company

This report has been prepared by Environmental Science & Engineering, Inc. for the exclusive use of Mr. George Tuma of Autopro and Mr. Ondrej M. Kojnok, Attorney at Law, as it pertains to their site located at 5200 Telegraph Avenue in Oakland, California. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by other geologists and engineers practicing in this field. No other warranty, express or implied, is made regarding professional advice provided in this report.

REPORT PREPARED BY:

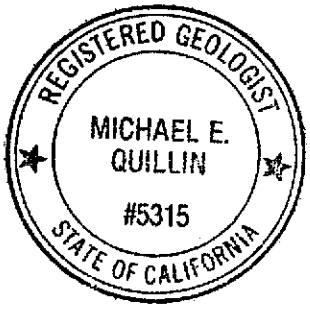
Christopher H. Valcheff
Staff Geologist

JAN. 6, 1995
Date

UNDER THE PROFESSIONAL REVIEW AND SUPERVISION OF:

Michael E. Quillin, California R.G. No. 5315
Senior Hydrogeologist
Manager, Geosciences

JAN. 6, 1995
Date



ESE PROJECT NO. 6-94-5219

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1.0 INTRODUCTION

This report presents the results of Fourth Quarter 1994 ground water monitoring conducted by Environmental Science & Engineering, Inc. (ESE) at the Autopro Facility (site) located at 5200 Telegraph Avenue in Oakland, California (Figure 1). The site is located at the northeastern corner of the intersection of Telegraph and Claremont Avenues in Oakland, California (Figure 2), in a mixed commercial and residential area within the northern portion of the City of Oakland. The site is at an approximate elevation of 120 feet above mean sea level (U.S.G.S., 1959). Regional topography slopes gently southwest toward the San Francisco Bay. The facility performs maintenance and repair on foreign and domestic automobiles.

Ground water monitoring activities included the collection of depth to ground water measurements, collection and analysis of ground water samples from four existing on site wells (MW-1 through MW-4; Figure 2), analysis and interpretation of the field and laboratory data, comparison of the data to previous data collected at the site, and preparation of this quarterly ground water monitoring report. Field activities were conducted on October 21, 1994.

ESE's report titled *Report of Findings: Preliminary Site Assessment* for the site, dated May 24, 1994 (ESE, 1994a), summarized the site investigation background, presented the results of a preliminary site assessment, and presented the results of the first quarterly ground water monitoring event at the site (First Quarter 1994). Five underground storage tanks (USTs) were removed from three separate excavations at the site in December 1990, prior to ESE's involvement. The USTs had previously contained gasoline, diesel, and waste oil. Soil and ground water samples collected from the UST excavations during the UST removal program reported detectable concentrations of total petroleum hydrocarbons as gasoline (TPH-G) and TPH as diesel (TPH-D). These samples also reported detectable concentrations of benzene, toluene, ethylbenzene, and total xylenes (BTEX), and total lead. Soil samples collected and analyzed from the waste oil UST excavation also reported detectable concentrations of petroleum oil and grease (O&G).

Some overexcavation of soils containing petroleum hydrocarbons was apparently conducted in July 1991, prior to ESE's involvement.

In April 1993, ESE performed a limited soil and ground water investigation at the site. The investigation included drilling two soil borings through the backfill material of two of the former UST excavations on site, into the native material beneath, and collecting ground water samples using a temporary sampling probe. The conclusions of the limited investigation were that the soil and ground water samples collected at those locations contained total semi-volatile petroleum hydrocarbons (TSVPH), and that these hydrocarbons did not appear to consist of diesel fuel or gasoline components (ESE, 1993).

In April 1994, ESE conducted a preliminary site assessment (PSA) at the site. The investigation consisted of drilling four soil borings and installing four ground water monitoring wells in the borings (MW-1 through MW-4; Figure 2) and collecting soil and ground water samples from the four borings/wells. The PSA concluded that native soils beneath the site consist of silty clay from beneath the asphalt surface subgrade to approximately 10 to 13 feet below ground surface (bgs). The silty clay is generally underlain by saturated sandy gravel. The static ground water level in the wells installed at the site was found to range from approximately 10.9 to 12.7 feet bgs, with an apparent flow direction to the southwest. Soil and ground water samples collected and analyzed during the PSA reported detectable concentrations of petroleum hydrocarbons. The lateral extent of petroleum hydrocarbons in ground water off site to the southwest was not delineated during the PSA.

2.0 FOURTH QUARTER 1994 GROUND WATER MONITORING

2.1 GROUND WATER ELEVATIONS

On October 21, 1994, ESE personnel measured static water levels in the four wells using an electric water level tape. Measurements were made relative to the surveyed datum for each well. ESE calculated ground water elevations for each well by subtracting the depth to ground water measurement from the datum elevation. The ground water elevation data were used to construct a ground water elevation contour map, from which ESE estimated the direction and magnitude of ground water flow beneath the site (Figure 2). Field documentation of water level measurements are included with well purging results in Appendix A - Well Purging and Sampling Data.

2.2 GROUND WATER SAMPLING AND ANALYSIS

Ground water samples were collected from each of the wells on October 21, 1994, after they were purged of approximately three casing volumes of water and allowed to recover, in accordance with ESE Standard Operating Procedure (SOP) No. 3 for Ground Water Monitoring and Sampling from Monitoring Wells (Appendix B). Samples were analyzed by Sequoia Analytical (Sequoia), a State-certified laboratory, for TPH-G with BTEX distinction according to United States Environmental Protection Agency (EPA) Method 5030/8015/8020; for total extractable petroleum hydrocarbons (TEPH) according to EPA Method 3510/3520/8015; and for cadmium, chromium, nickel, lead, and zinc according to EPA Method 200.7.

Purge water and decontamination rinseate were stored in DOT-rated 55-gallon drums pending analytical profiling for appropriate disposal.

3.0 FOURTH QUARTER 1994 RESULTS

3.1 GROUND WATER ELEVATIONS

Table 1 presents a historical summary of ground water elevation data, inclusive of the current monitoring event. Ground water elevation contours based on the October 1994 monitoring data are shown on Figure 2. The ground water elevation in all wells at the site decreased between 0.52 and 0.86 feet between the July and October 1994 monitoring events (Table 1). No free phase petroleum hydrocarbons (free product) were observed in any of the wells.

Based on current data, ground water flow direction and magnitude varied across the site. In the northeast portion of the site (between wells MW-1 and MW-4; Figure 2), ground water flow was estimated to be to the northwest, with a gradient of about 0.006 (33 feet per mile). In the southwestern portion of the site (in the vicinity of wells MW-2, MW-3, and MW-4), the gradient is oriented to the west-southwest, which is generally consistent with anticipated regional ground water flow for the area. In this area, the gradient is approximately 0.029 (154 feet per mile).

3.2 GROUND WATER CHEMISTRY

Current analytical results are summarized along with historical data in Table 2. The laboratory report and chain of custody documentation are presented in Appendix C - Laboratory Reports and Chain of Custody Documentation for Ground Water Samples. Based on these laboratory results, the estimated extent of TPH-G in ground water beneath the site is shown on Figure 3.

Evaluation of Table 2 indicates that concentrations of petroleum hydrocarbons and heavy metals generally declined during the current monitoring period. Most notable were the reductions in TPH-G concentrations in wells MW-1, MW-3, and MW-4 (MW-2 has reported no detectable petroleum hydrocarbons since ESE installed the well in April 1994). Slight increases in TEPH (quantitated in the TPH-D range) and total xylenes were noted for well MW-1; the toluene concentration in MW-4 also increased slightly. Metals concentrations in all samples remained generally low, and are below applicable State and Federal drinking water standards.

Comparison of Figure 3 with it's counterpart in ESE's Second Quarter (August) 1994 monitoring – report (ESE, 1994b) indicates that although TPH-G concentrations declined during the current quarter, the approximate extent of TPH-G in ground water has not changed significantly. These results confirm that the extent of petroleum hydrocarbons in ground water has not been fully defined to the west and southwest of the site.

4.0 SUMMARY AND CONCLUSIONS

- The predominant ground water flow direction during the Fourth Quarter 1994 appears to be to the southwest, with an approximate gradient of 0.029 (154 feet per mile). The second component of ground water flow is to the northwest, with an approximate gradient of 0.006 (33 feet per mile). This flow regime implies that dissolved petroleum hydrocarbons in ground water would be expected to migrate generally west toward Telegraph Avenue.

- TPH-G concentrations decreased between July and October 1994 in ground water samples collected from wells MW-1, MW-3, and MW-4. No TPH-G have been detected in well MW-2 since its installation in April 1994.

- TEPH concentrations (quantitated in the TPH-D range) increased in well MW-1, decreased in wells MW-3 and MW-4, and remained nondetectable in well MW-2 relative to Second Quarter 1994 findings.

- In general, BTEX concentrations declined or remained relatively stable during the current monitoring period.

- Metals concentrations have generally decreased since July 1994 and are below applicable State and Federal drinking water standards.

- The continued nondetectable results for TPH-D, TPH-G, and BTEX in well MW-2 support the ground water elevation data which indicate that well MW-2 is an up-gradient (background) well.

- The areal extent of the plume of dissolved petroleum hydrocarbons in ground water does not appear to have changed significantly between July and October 1994.

- The existing monitoring well network is sufficient to confirm with current data that petroleum hydrocarbons do appear to be migrating offsite to the southwest, but is not sufficient to confirm the extent to which this is occurring.

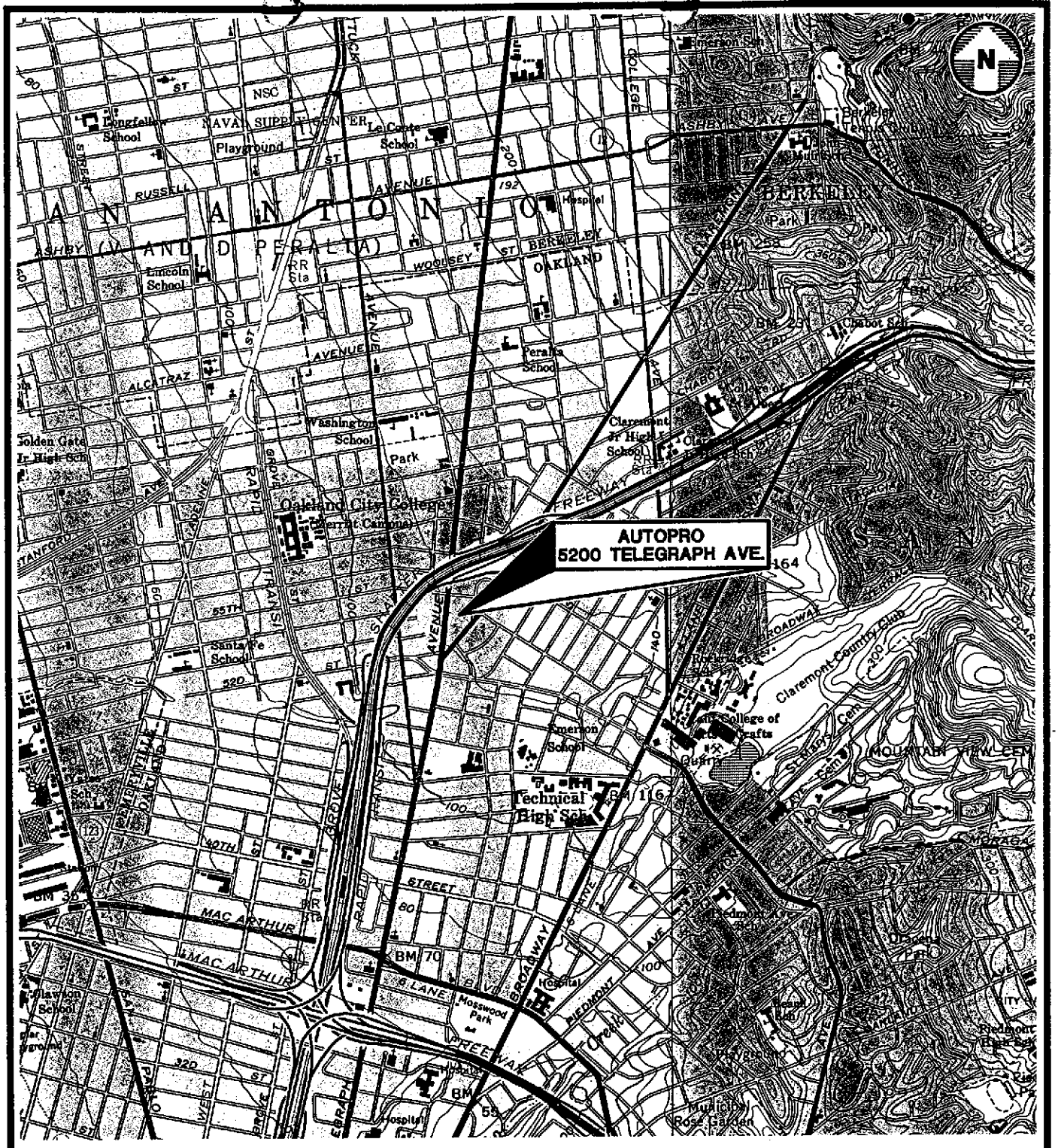
5.0 REFERENCES

Environmental Science & Engineering, Inc. (ESE), 1993, Autopro, 5200 Telegraph Avenue, Oakland, California, Letter to Mr. Jeff Widman, dated April 19, 1993.

_____, 1994a, Report of Findings: Preliminary Site Assessment, Autopro, 5200 Telegraph Avenue, Oakland, California, dated May 24, 1994.

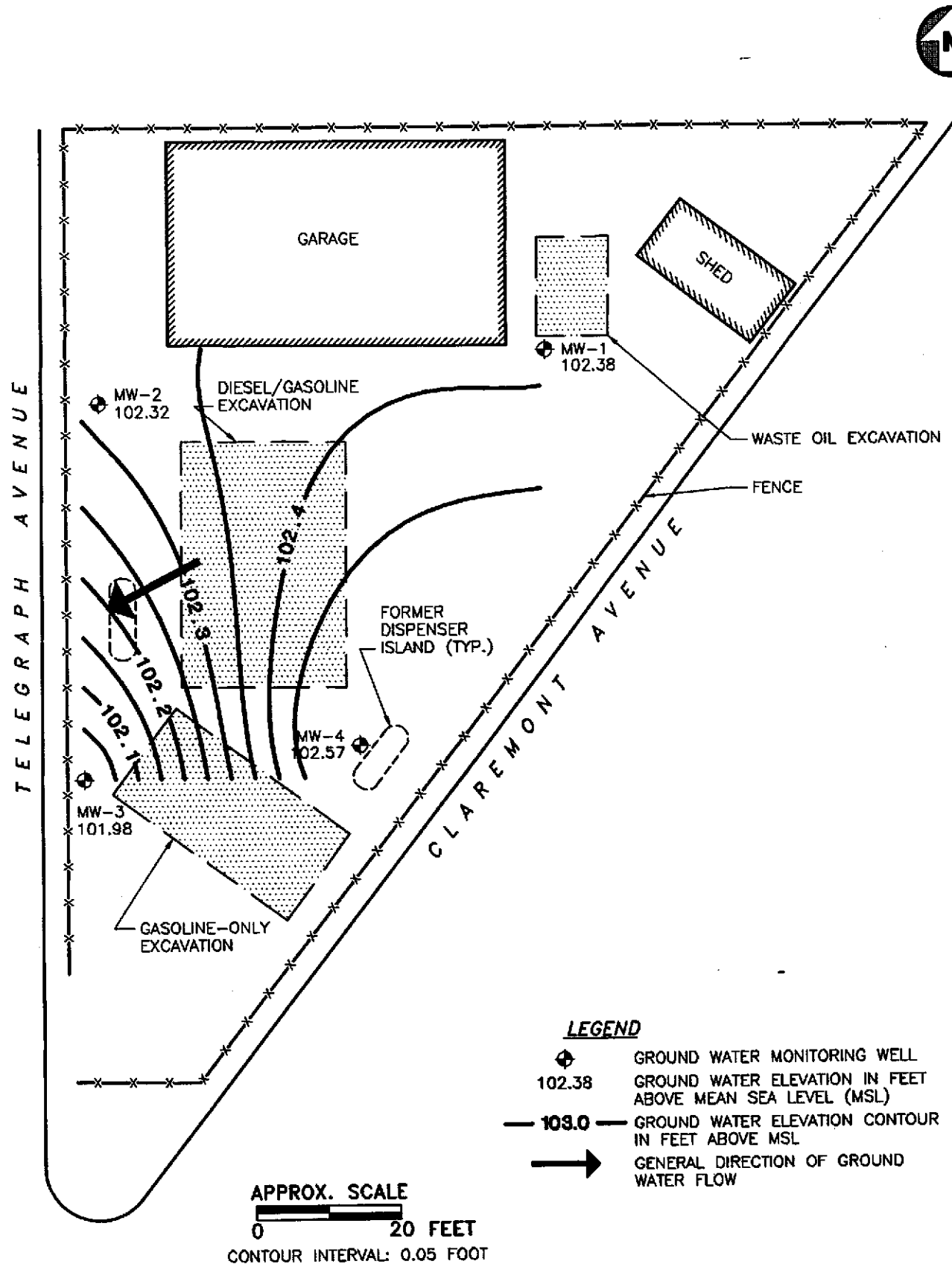
_____, 1994b, Report of Findings: Second Quarter 1994 Ground Water Monitoring, Autopro, 5200 Telegraph Avenue, Oakland, California, dated August 16, 1994.

United States Geologic Survey, 1959 Oakland East and Oakland West 7.5 Minute Topographic Quadrangles, Photorevised 1980.

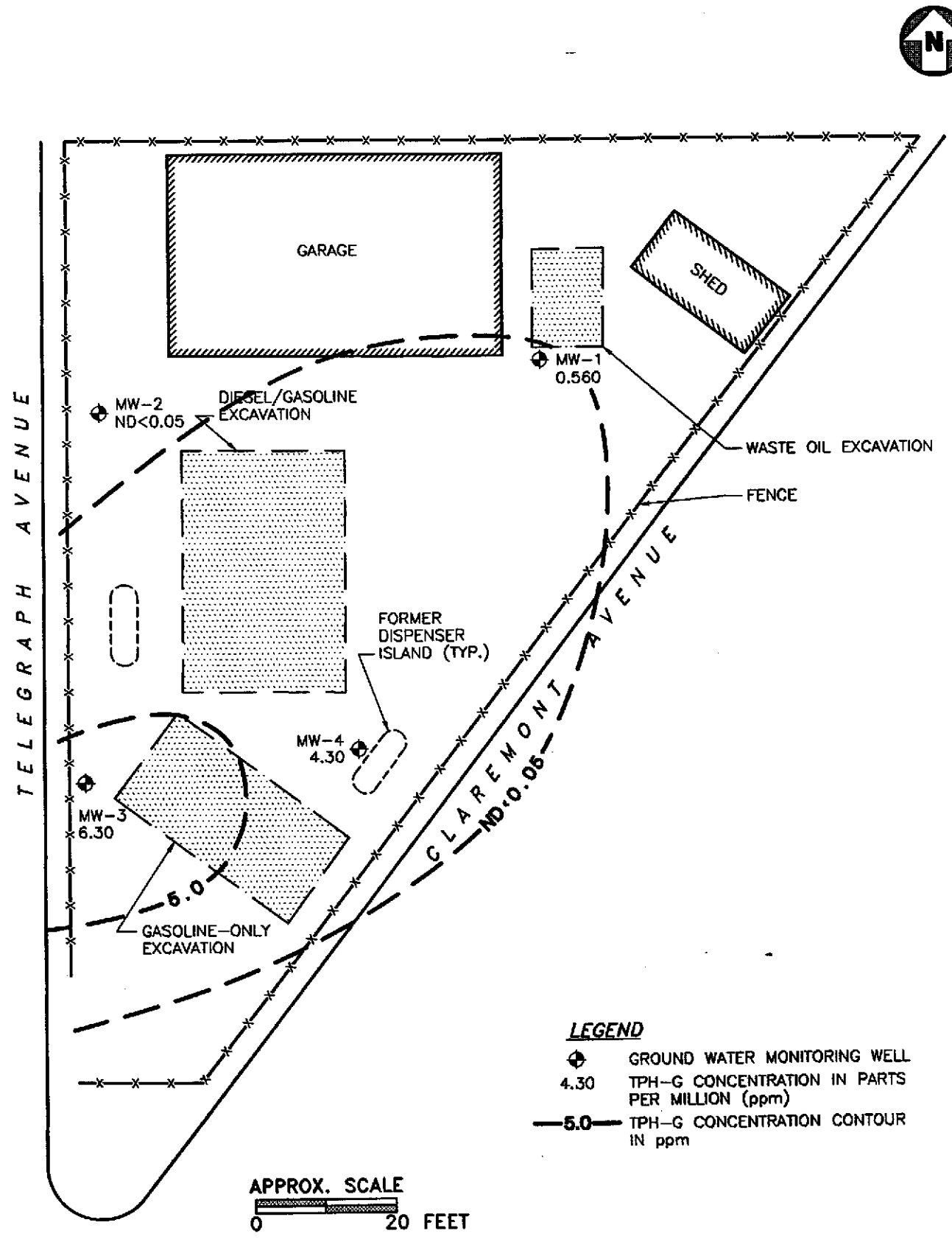


ADAPTED FROM U.S.G.S. OAKLAND EAST AND OAKLAND WEST 7.5 MINUTE TOPOGRAPHIC QUADRANGLE MAPS, 1959, PHOTOREVISED 1980.

ESE A CILCORP Company — Environmental Science & Engineering, Inc.	DATE 3/94	LOCATION MAP	FIGURE NO. 1
4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	REVISED	AUTOPRO 5200 TELEGRAPH AVENUE OAKLAND, CALIFORNIA	PROJ. NO. 6-94-5219
	CAD FILE 52191001		



Environmental Science & Engineering, Inc. 4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	DATE 3/94 REVISED 12/8/94 CAD FILE 52191003	GROUND WATER ELEVATIONS OCTOBER 21, 1994 AUTOPRO 5200 TELEGRAPH AVENUE OAKLAND, CALIFORNIA	FIGURE NO. 2 PROJ. NO. 6-94-5219



Environmental Science & Engineering, Inc.	DATE 3/94	TPH-G CONCENTRATION CONTOUR MAP OCTOBER 21, 1994	FIGURE NO. 3
	REVISED 12/8/94	AUTOPRO 5200 TELEGRAPH AVENUE OAKLAND, CALIFORNIA	
4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	CAD FILE 52191004		PROJ. NO. 6-94-5219

TABLE 1

HISTORICAL GROUND WATER ELEVATION DATA

Autopro
5200 Telegraph Avenue
Oakland, California

Well	Date	Datum (ft. AMSL)	Depth to Water	Piezometric Surface Elevation	Change in Elevation
MW-1	10/21/94	115.44	13.06	102.38	-0.67
	07/20/94		12.39	103.05	0.30
	04/26/94		12.69	102.75	--
MW-2	10/21/94	114.62	12.30	102.32	-0.86
	07/20/94		11.44	103.18	-0.29
	04/26/94		11.15	103.47	--
MW-3	10/21/94	113.90	11.92	101.98	-0.71
	07/20/94		11.21	102.69	-0.24
	04/26/94		10.97	102.93	--
MW-4	10/21/94	114.25	11.68	102.57	-0.52
	07/20/94		11.16	103.09	-0.19
	04/26/94		10.97	103.28	--

NOTES:

ft. AMSL = Feet Above Mean Sea Level
Negative change in elevation denotes a decrease in piezometric surface elevation

TABLE 2

HISTORICAL GROUND WATER ANALYTICAL DATA

Autopro
5200 Telegraph Avenue
Oakland, California

Sample I.D.	Date Sampled	TPH-G (µg/L)	TPH-D (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	1,2-Dichlorethane (µg/L)	Ethylene dibromide (µg/L)	Metals (mg/L)				
										Cd	Cr	Pb	Ni	Zn
MW-1	04/26/94	1,400	<50	<0.50	<0.50	4.5	2.1	<0.50	<0.50	0.001	<0.05	<0.005	0.12	<0.10
	07/20/94	1,200	100	19	2.5	2.4	1.6	--	--	<0.010	0.22	0.044	0.36	0.35
	10/21/94	560	130	8.4	1.1	0.90	1.8	--	--	<0.010	<0.010	<0.020	0.041	0.077
MW-2	04/26/94	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.001	<0.05	<0.005	0.06	<0.10
	07/20/94	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	<0.010	0.022	<0.020	0.045	0.068
	10/21/94	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	<0.010	0.031	<0.020	0.027	0.044
MW-3	04/26/94	10,000	<3,000	70	40	40	50	<30	<30	<0.001	<0.05	0.043	0.10	0.10
	07/20/94	7,500	1,400	120	38	36	39	--	--	<0.010	0.099	0.14	0.12	0.25
	10/21/94	6,300	1,200	69	37	29	38	--	--	<0.010	<0.010	<0.020	0.036	0.14
MW-4	04/26/94	6,800	<300	<3.0	<3.0	3.0	4.0	<3.0	<3.0	<0.001	<0.05	0.007	0.06	<0.10
	07/20/94	5,600	1,500	35	11	12	17	--	--	<0.010	0.023	<0.020	0.048	0.060
	10/21/94	4,300	870	26	19	12	20	--	--	<0.010	0.013	<0.020	<0.020	0.092
TRIP	04/26/94	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--

Notes:

TPH-G = Total Petroleum Hydrocarbons as Gasoline
TPH-D = Total Petroleum Hydrocarbons as Diesel
µg/L = Micrograms per liter or parts per billion (ppb)
mg/L = Milligrams per liter or parts per million (ppm)
Cd = Cadmium
Cr = Chromium
Pb = Lead
Ni = Nickel
Zn = Zinc
< = Less than listed detection limits
-- = Not analyzed

APPENDIX A

WELL PURGING AND SAMPLING DATA

Environmental Science & Engineering, Inc.
A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: AUTOPRO
PROJECT NO.: 6-94-5219
DATE: OCTOBER 21, 1994

SAMPLE LOCATION I.D.: MW-1
SAMPLER: CHRIS VALCHEFF
PROJECT MANAGER: MIKE QUILLIN

CASING DIAMETER

2" X
4" ____
Other ____

SAMPLE TYPE

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

WELL VOLUMES PER UNIT

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

DEPTH TO PRODUCT: — (ft.) PRODUCT THICKNESS: — (ft.) MINIMUM PURGE VOLUME
DEPTH TO WATER: 13.06 (ft.) WATER COLUMN: 11.19 (ft.) (3 or 4 WCV): 5.48 (gal)
DEPTH OF WELL: 24.25 (ft.) WELL CASING VOLUME: 1.83 (gal) ACTUAL VOLUME PURGED: 6.00 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
1055	0	7.06	0.41	68.6	—	BROWN/SILTY
1059	2	6.93	0.38	68.6	—	↓
1102	4	6.90	0.38	68.4	—	↓

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE HYDAC UNIT# 9308A DATE: 10-21-94 TIME: 0800 BY: CHV
TURBIDITY: TYPE ____ UNIT# ____ DATE: ____ TIME: ____ BY: ____

PURGE METHOD

___Displacement Pump ___Other
X Bailer (Teflon/PVC/SS) ___Submersible Pump

SAMPLE METHOD

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

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	MW-1	1120	10-21-94		
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS: ____

SAMPLER: Chris Valcheff PROJECT MANAGER: M. Quillin

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Environmental Science & Engineering, Inc.
A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: AUTOPRO
PROJECT NO.: 6-94-5219
DATE: OCTOBER 21, 1994

SAMPLE LOCATION I.D.: MW-2
SAMPLER: CHRIS VALCHEFF
PROJECT MANAGER: MIKE QUILLIN

CASING DIAMETER

2" X
4"
Other

SAMPLE TYPE

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

WELL VOLUMES PER UNIT

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

DEPTH TO PRODUCT: - (ft.) PRODUCT THICKNESS: - (ft.) MINIMUM PURGE VOLUME
DEPTH TO WATER: 12.30 (ft.) WATER COLUMN: 12.2 (ft.) (3 or 4 WCV): 5.97 (gal)
DEPTH OF WELL: 24.50 (ft.) WELL CASING VOLUME: 1.99 (gal) ACTUAL VOLUME PURGED: 6.25 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
1124	0	6.97	0.22	68.4	-	Brown/silty
1128	2	7.00	0.22	69.8	-	↓
1132	4	6.98	0.22	70.5	-	

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE HYDAC UNIT# 9308A DATE: 10-21-94 TIME: 0800 BY: CHV
TURBIDITY: TYPE ____ UNIT# ____ DATE: ____ TIME: ____ BY: ____

PURGE METHOD

___Displacement Pump ___Other
X Bailer (Teflon/PVC/SS) ___Submersible Pump

SAMPLE METHOD

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

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	MW-2	1155	10-21-94		
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS:

SAMPLER: [signature] PROJECT MANAGER [signature]

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Environmental Science & Engineering, Inc.
A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: AUTOPRO
PROJECT NO.: 6-94-5219
DATE: OCTOBER 21, 1994

SAMPLE LOCATION I.D.: MW-3
SAMPLER: CHRIS VALCHEFF
PROJECT MANAGER: MIKE QUILLIN

CASING DIAMETER

2" X
4"
Other

SAMPLE TYPE

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

WELL VOLUMES PER UNIT

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

DEPTH TO PRODUCT: (ft.)
DEPTH TO WATER: 11.92 (ft.)
DEPTH OF WELL: 29.50 (ft.)

PRODUCT THICKNESS: — (ft.)
WATER COLUMN: 17.58 (ft.)
WELL CASING VOLUME: 2.05 (gal)

MINIMUM PURGE VOLUME (3 or 4 WCV): 6.15 (gal)
ACTUAL VOLUME PURGED: 6.25 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
1226	0	6.39	0.29	69.8	—	BLACK/SILTY
1230	2	5.98	0.31	72.5	—	
	4	5.90	0.39	73.9	—	

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE HYDAC UNIT# 9308A DATE: 10-21-94 TIME: 0800 BY: CHV
TURBIDITY: TYPE UNIT# DATE: TIME: BY:

PURGE METHOD

___Displacement Pump ___Other
X Bailer (Teflon/PVC/SS) ___Submersible Pump

SAMPLE METHOD

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

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	MW-3	1245	10-21-94		
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS:

SAMPLER: Chris Valcheff PROJECT MANAGER: M. Quillin

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Environmental Science & Engineering, Inc.
A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: AUTOPRO
PROJECT NO.: 6-94-5219
DATE: OCTOBER 21, 1994

SAMPLE LOCATION I.D.: MW-4
SAMPLER: CHRIS VALCHEFF
PROJECT MANAGER: MIKE QUILLIN

CASING DIAMETER

2" X
4"
Other

SAMPLE TYPE

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

WELL VOLUMES PER UNIT

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

DEPTH TO PRODUCT: — (ft.) PRODUCT THICKNESS: — (ft.) MINIMUM PURGE VOLUME
DEPTH TO WATER: 11.68 (ft.) WATER COLUMN: 12.72 (ft.) (3) or 4 WCV): 6.23 (gal)
DEPTH OF WELL: 24.40 (ft.) WELL CASING VOLUME: 2.08 (gal) ACTUAL VOLUME PURGED: 6.5 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
1156	0	7.00	0.14	68.9	—	CLEAR/SLIGHT
1159	2	6.87	0.15	71.8	—	"
1203	4	6.86	0.18	71.9	—	"

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE HYDAC UNIT# 9308A DATE: 10-21-94 TIME: 0800 BY: CHV
TURBIDITY: TYPE ____ UNIT# ____ DATE: ____ TIME: ____ BY: ____

PURGE METHOD

___Displacement Pump ___Other
X Bailer (Teflon/PVC/SS) ___Submersible Pump

SAMPLE METHOD

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

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	MW-4	1220	10-21-94		
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS:

SAMPLER: _____ PROJECT MANAGER _____

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

APPENDIX B

ESE STANDARD OPERATING PROCEDURE NO. 3 FOR GROUND WATER MONITORING AND SAMPLING FROM MONITORING WELLS

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
CONCORD, CALIFORNIA OFFICE
STANDARD OPERATING PROCEDURE NO. 3
FOR GROUND-WATER MONITORING AND SAMPLING FROM MONITORING WELLS

Environmental Science & Engineering, Inc. (ESE) typically performs ground-water monitoring at project sites on a quarterly basis. As part of the monitoring program an ESE staff member will first gauge the depth to water and free product (if present) in each well, then collect ground-water samples from each well. Depth to water measurements are taken by lowering an electric fiberglass tape measure into the well and recording the occurrence of water in feet below a fixed datum set on the top of the well-casing. If free-phase liquid hydrocarbons (free product) are known or suspected to be present in the well, then an electric oil/water interface probe is used to determine the depth to the occurrence of ground-water and the free product in feet below the fixed datum on the top of the well-casing. Depth to water and depth to product measurements are measured and recorded within an accuracy of 0.005-foot. The electric tape and the electric oil/water interface probe are washed with an Alconox® detergent and tap water solution then rinsed with tap water between uses in different wells.

Ground-water samples are collected from a well subsequent to purging a minimum of three to four well-casing volumes of ground water from the well, if the well bails dry prior to the removal of the required minimum volume, then the samples are collected upon the recovery of the ground water in that well to 80% of its initial static level. Ground water is typically purged from monitoring wells using either a hand-operated positive displacement pump, constructed of polyvinylchloride (PVC); a new (precleaned), disposable polyethylene bailer; or, a variable-flow submersible pump, constructed of stainless steel and Teflon®. The hand pumps and the submersible pumps are cleaned between each use with an Alconox® detergent and tap water solution followed by a tap water rinse. During the well purging process the conductivity, pH and temperature of the ground water are monitored by the ESE staff member. Ground-water samples are collected from the well subsequent to the stabilization of the of the conductivity, pH and temperature of the purge water, and the removal of four well-casing volumes of ground-water (unless the well bails dry). The parameters are deemed to have stabilized when two consecutive measurements are within 10% of each other, for each respective parameter. The temperature, pH, conductivity and purge volume measurements, and observations of water clarity and sediment content will be documented by the ESE staff member on ESE Ground-Water Sampling Data Forms.

Ground-water samples are collected by lowering a new (precleaned), disposable polyethylene bailer into the well using new, disposable nylon cord. The filled bailer is retrieved, emptied, then filled again. The ground water from this bailer is decanted into appropriate laboratory supplied glassware and/or plastic containers (if sample preservatives are required, they are added to the empty containers at the laboratory prior to the sampling event). The containers are filled carefully so that no headspace is present to avoid volatilization of the sample. The filled sample containers are then labeled and placed in a cooler with ice for transport under chain of custody documentation to the designated analytical laboratory. The ESE staff member will document the time and method of sample collection, and the type of sample containers and preservatives (if any) used. These facts will appear on the ESE Ground-Water Sampling Data Forms. ESE will collect a duplicate ground-water sample from one well for every ten wells sampled at each site. The duplicate will be a blind sample (its well designation will be unknown to the laboratory). The duplicate sample is for Quality Assurance and Quality Control (QA/QC) purposes, and provides a check on ESE sampling procedures and laboratory sample handling procedures. When VOCs are included in the laboratory analyses, ESE will include a trip blank, if required, in the cooler with the ground-water samples for analysis for the identical VOCs. The trip blank is supplied by the laboratory and consists of deionized water. The trip blank is for QA/QC purposes and provides a check on both ESE and laboratory sample handling and storage procedures. Since disposable bailers are used for sample collection, and are not reused, no equipment blank (rinsate) samples are collected.

APPENDIX C

LABORATORY REPORTS AND CHAIN OF CUSTODY DOCUMENTATION FOR GROUND WATER SAMPLES

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.
4090 Nelson Ave., Ste J
Concord, CA 94520
Attention: Mike Quillin

Client Project ID: Tri-Star Partnership, 6-94-5219
Sample Matrix: Water
Analysis Method: EPA 5030/8015/8020
First Sample #: 410-1394

Sampled: Oct 21, 1994
Received: Oct 21, 1994
Reported: Nov 4, 1994

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 410-1394 MW-1	Sample I.D. 410-1395 MW-2	Sample I.D. 410-1396 MW-3	Sample I.D. 410-1397 MW-4
Purgeable Hydrocarbons	50	560	N.D.	6,300	4,300
Benzene	0.50	8.4	N.D.	69	26
Toluene	0.50	1.1	N.D.	37	19
Ethyl Benzene	0.50	0.90	N.D.	29	12
Total Xylenes	0.50	1.8	N.D.	38	20
Chromatogram Pattern:		Gasoline	--	Gasoline	Gasoline

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	40	20
Date Analyzed:	10/28/94	10/28/94	10/28/94	10/28/94
Instrument Identification:	HP-4	HP-4	HP-4	HP-5
Surrogate Recovery, %: (QC Limits = 70-130%)	121	96	116	84

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

4101394.ESE <1>

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.
4090 Nelson Ave., Ste J
Concord, CA 94520
Attention: Mike Quillin

Client Project ID: Tri-Star Partnership, 6-94-5219
Sample Matrix: Water
Analysis Method: EPA 3510/3520/8015
First Sample #: 410-1394

Sampled: Oct 21, 1994
Received: Oct 21, 1994
Reported: Nov 4, 1994

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 410-1394 MW-1	Sample I.D. 410-1395 MW-2	Sample I.D. 410-1396 MW-3	Sample I.D. 410-1397 MW-4
Extractable Hydrocarbons	50	130	N.D.	1,200	870
Chromatogram Pattern:		Undentified Hydrocarbons < C14	--	Undentified Hydrocarbons < C16; >C 20	Undentified Hydrocarbons < C14

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0
Date Extracted:	10/27/94	10/27/94	10/27/94	10/27/94
Date Analyzed:	10/28/94	10/28/94	10/28/94	10/28/94
Instrument Identification:	HP-3A	HP-3A	HP-3A	HP-3A

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

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Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.
4090 Nelson Ave., Ste J
Concord, CA 94520
Attention: Mike Quillin

Client Project ID: Tri-Star Partnership, 6-94-5219
Sample Descript: Water, MW-1
Lab Number: 410-1394

Sampled: Oct 21, 1994
Received: Oct 21, 1994
Analyzed: Oct 27, 1994
Reported: Nov 4, 1994

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Cadmium	0.010	N.D.
Chromium	0.010	N.D.
Lead	0.020	N.D.
Nickel	0.020	0.041
Zinc	0.020	0.077

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.	Client Project ID:	Tri-Star Partnership, 6-94-5219	Sampled:	Oct 21, 1994
4090 Nelson Ave., Ste J	Sample Descript:	Water, MW-2	Received:	Oct 21, 1994
Concord, CA 94520			Analyzed:	Oct 27, 1994
Attention: Mike Quillin	Lab Number:	410-1395	Reported:	Nov 4, 1994

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Cadmium	0.010	N.D.
Chromium	0.010	0.031
Lead	0.020	N.D.
Nickel	0.020	0.027
Zinc	0.020	0.044

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.	Client Project ID:	Tri-Star Partnership, 6-94-5219	Sampled:	Oct 21, 1994
4090 Nelson Ave., Ste J	Sample Descript:	Water, MW-3	Received:	Oct 21, 1994
Concord, CA 94520			Analyzed:	Oct 27, 1994
Attention: Mike Quillin	Lab Number:	410-1396	Reported:	Nov 4, 1994

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Cadmium	0.010	N.D.
Chromium	0.010	N.D.
Lead	0.020	N.D.
Nickel	0.020	0.036
Zinc	0.020	0.14

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

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Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.	Client Project ID:	Tri-Star Partnership, 6-94-5219	Sampled: Oct 21, 1994
4090 Nelson Ave., Ste J	Sample Descript:	Water, MW-4	Received: Oct 21, 1994
Concord, CA 94520			Analyzed: Oct 27, 1994
Attention: Mike Quillin	Lab Number:	410-1397	Reported: Nov 4, 1994

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Cadmium	0.010	N.D.
Chromium	0.010	0.013
Lead	0.020	N.D.
Nickel	0.020	N.D.
Zinc	0.020	0.092

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.
4090 Nelson Ave., Ste J
Concord, CA 94520
Attention: Mike Quillin

Client Project ID: Tri-Star Partnership, 6-94-5219
Matrix: Liquid
QC Sample Group: 4101394-397

Reported: Nov 4, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Cadmium	Chromium	Lead	Nickel	Zinc
Method:	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7
Analyst:	J. Dinsay	J. Dinsay	J. Dinsay	J. Dinsay	J. Dinsay
MS/MSD Batch#:	4101394	4101394	4101394	4101394	4101394
Date Prepared:	10/26/94	10/26/94	10/26/94	10/26/94	10/26/94
Date Analyzed:	10/27/94	10/27/94	10/27/94	10/27/94	10/27/94
Instrument I.D.#:	Liberty-100	Liberty-100	Liberty-100	Liberty-100	Liberty-100
Conc. Spiked:	1.0 mg/L	1.0 mg/L	1.0 mg/L	1.0 mg/L	1.0 mg/L
Matrix Spike % Recovery:	91	89	87	87	88
Matrix Spike Duplicate % Recovery:	93	90	89	91	90
Relative % Difference:	2.2	1.1	2.3	4.5	2.3
LCS Batch#:	BLK102694	BLK102694	BLK102694	BLK102694	BLK102694
Date Prepared:	10/26/94	10/26/94	10/26/94	10/26/94	10/26/94
Date Analyzed:	10/27/94	10/27/94	10/27/94	10/27/94	10/27/94
Instrument I.D.#:	Liberty-100	Liberty-100	Liberty-100	Liberty-100	Liberty-100
LCS % Recovery:	91	90	90	94	93
% Recovery Control Limits:	75-125	75-125	75-125	75-125	75-125

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

Sequoia Analytical

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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.
4090 Nelson Ave., Ste J
Concord, CA 94520
Attention: Mike Quillin

Client Project ID: Tri-Star Partnership, 6-94-5219
Matrix: Liquid
QC Sample Group: 4101394-397
Reported: Nov 4, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha
MS/MSD Batch#:	4101738	4101738	4101738	4101738
Date Prepared:	10/28/94	10/28/94	10/28/94	10/28/94
Date Analyzed:	10/28/94	10/28/94	10/28/94	10/28/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike % Recovery:	80	90	90	92
Matrix Spike Duplicate % Recovery:	85	90	90	92
Relative % Difference:	6.1	0.0	0.0	0.0
LCS Batch#:	2LCS102894	2LCS102894	2LCS102894	2LCS102894
Date Prepared:	10/28/94	10/28/94	10/28/94	10/28/94
Date Analyzed:	10/28/94	10/28/94	10/28/94	10/28/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4
LCS % Recovery:	79	86	87	88
% Recovery Control Limits:	71-133	72-128	72-130	71-120

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

CHAIN OF CUSTODY RECORD

DATE Oct. 21, 1994 PAGE 1 OF 1

PROJECT NAME TRI-STAR PARTNERSHIP

ADDRESS 5200 TELEGRAPH AVE
OAKLAND, CA

PROJECT NO. 6-94-5219

SAMPLED BY CHRIS VALLIOFF

LAB NAME SEQUOIA

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

SAMPLE #	DATE	TIME	LOCATION	TPH-G	BTEX	TPH-D	Cadmium, Chromium, Lead, Nickel, Zinc	MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
MW-1	10-21-94	1120	OAKLAND	X	X	X		H2O	5	3 VOAs, 2 LRS 4101394 A-E
MW-2	↓	1155	↓	X	X	X		↓	5	4101395
MW-3		1245		X	X	X			5	4101396
MW-4		1220		X	X	X			5	4101397

RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1. Chris Valliof	Melissa Crewse	10/21/94	1405
2.			
3.			
4.			
5.			

20 TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO: MIKE QUILLIN

SPECIAL SHIPMENT REQUIREMENTS: COLD TRANSPORT/STORAGE

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

STANDARD TAT

SAMPLE RECEIPT

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