7-0222

GROUNDWATER TECHNOLOGY
Consulting Groundwater Geologists
A Division of Oil Recovery Systems, Inc.
5047 CLAYTON ROAD • CONCORD, CA 94521 • (415) 671-2387

May 19, 1986

930 Spring town Rd.
Tank s/s removed

R.J. Wark
Texaco U.S.A., Inc.
10 Universal City Plaza
Universal City, Ca. 91608

Re: Update Report, Former Texaco Service Station, Livermore, California

Dear Mr. Wark,

Please find enclosed the Project Update Report for the site of the former Texaco Service Station located at the corner of Springtown Boulevard and Lassen Road in Livermore, California. This report presents a review of Groundwater Technology's work at the site during the period between February 28, 1986 and May 13, 1986.

If you have any questions on this report or would like to discuss any aspects of this project please call our Concord office at (415) 671-2387.

Yours Very Truly,
GROUNDWATER TECHNOLOGY, INC.

Cori Condon

Cori Condon
Project Hydrogeologist

CC/asj

GROUNDWATER TECHNOLOGY
Consulting Groundwater Geologists
A Division of Oil Recovery Systems, Inc.
5047 CLAYTON ROAD • CONCORD, CA 94521 • (415) 671-2387

STATUS REPORT
FORMER TEXACO SERVICE STATION
SPRINGTOWN BOULEVARD AND LASSEN ROAD
LIVERMORE, CALIFORNIA

May 19, 1986

Prepared for:

R.J. Wark
Texaco U.S.A., Inc.
P.O. Box 3756
Los Angeles, Ca. 90051

Prepared by:

Groundwater Technology, Inc.
5047 Clayton Rd.
Concord, Ca. 94583

Cori Condon
Project Hydrogeologist

Lynn E. Pera
Registered Civil
Engineer No. 33,431

TABLE OF CONTENTS

STATUS REPORT
FORMER TEXACO SERVICE STATION
SPRINGTOWN BOULEVARD AND LASSEN ROAD
LIVERMORE, CALIFORNIA

INTRODUCTION

This report presents an update of Groundwater Technology's ongoing monitoring program at the site of the former Texaco Service Station in Livermore, California. More specifically, the property is located on the southeast corner of Sprintown Boulevard and Lassen Road (See Figure 1, Site Plan). This report covers the period between February 28, 1986 and May 13, 1986.

BACKGROUND

As discussed in our previous report titled "Hydrocarbon Investigation, Springtown Boulevard and Lassen Road, Livermore, California" and dated August 1985, the property is now owned by the Southland Corporation which has since constructed a 7-Eleven store on the site.

To date, a total of six monitoring wells have been installed at the site. As a prerequisite to purchase of the property, two of the wells were installed by Kleinfelder and Associates, under the direction of Southland Corporation to investigate for potential soil and groundwater contamination at the site. This investigation indicated that soil and groundwater contamination by hydrocarbons existed on the property. Groundwater Technology was then retained by Texaco U.S.A. to confirm the findings of the Kleinfelder report and identify the extent and magnitude of groundwater degradation that may have occurred in the area. This phase of the project involved the drilling and installation of three more wells on

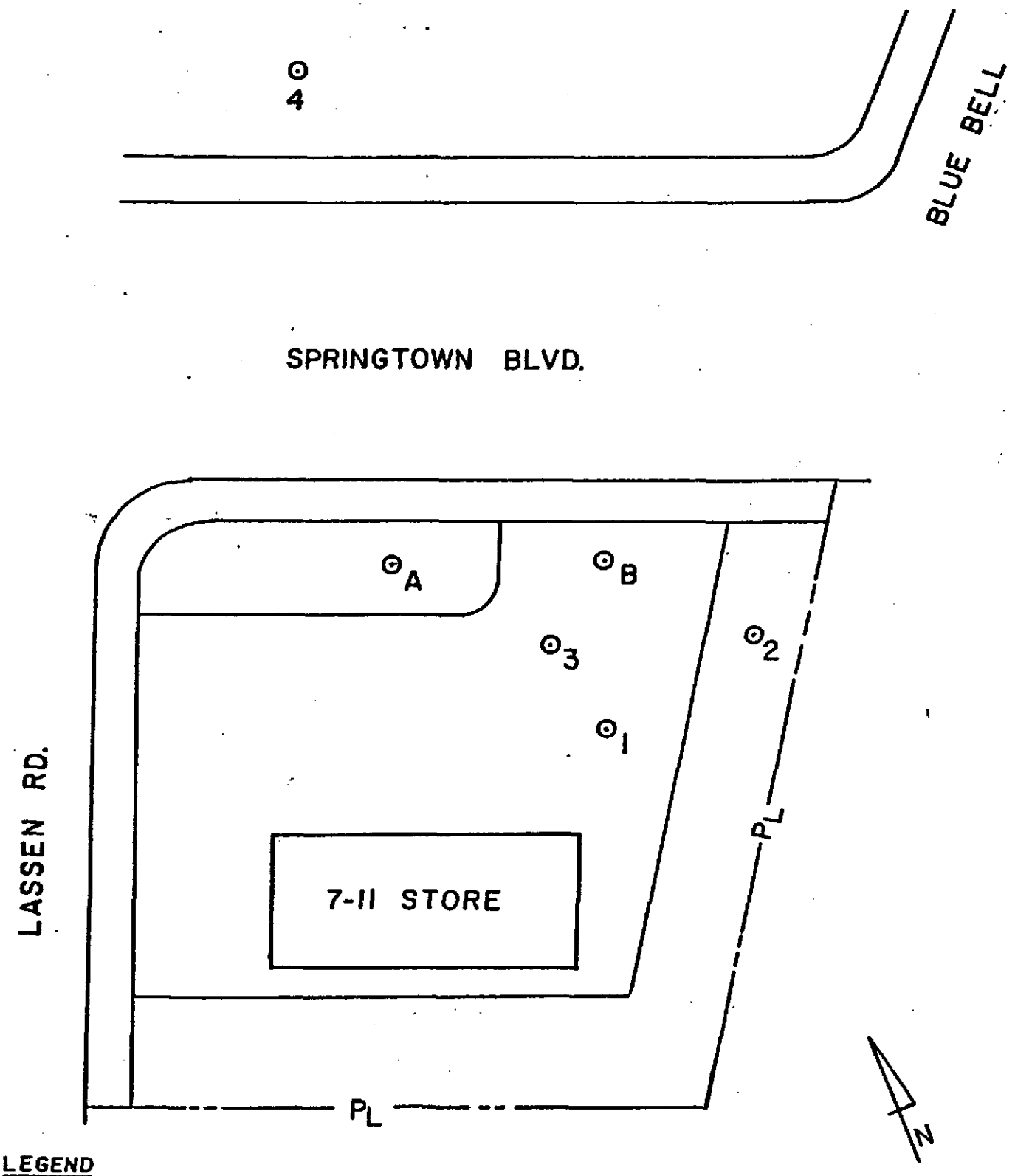


FIGURE 1
SITE PLAN

TEXACO INC.
LIVERMORE, CALIF.

SCALE: 1" = 40'

GROUNDWATER TECHNOLOGY

GROUNDWATER MONITORING

Groundwater Technology has continued to monitor all six monitoring wells on a monthly schedule. The monitoring procedure followed guidelines set forth in Groundwater Technology's Standard Operating Procedure, SOP 8, regarding groundwater monitoring (See Appendix I). The tabulated groundwater monitoring data for monitorings conducted between February 28 and May 13, 1986 are presented in Table 1. The data from March 28 and May 13, 1986 monitorings are plotted and contoured on the Groundwater Gradient Maps (Figures 2 and 3).

DISSOLVED HYDROCARBON MONITORING

Groundwater Technology sampled all six monitoring wells for analyses of dissolved hydrocarbon concentrations. The groundwater samples were obtained after purging four well casing volumes by hand bailing before withdrawing a sample with a teflon bailer. The samples were collected in vials designed to prevent loss of volatile constituents from the sample. Samples were placed on ice and sent via next day delivery to Groundwater Technology Laboratory in Greenville, New Hampshire. The Laboratory analyses from the months of March and April are presented in Appendix II.

The results of the laboratory analyses indicate that the subsurface hydrocarbon contamination remains high in the areas adjacent to the abandoned tank pit and former product lines (See Figure 4). Elevated concentrations in the area of wells A and B suggest that hydrocarbon products have been adsorbed onto the soils in this area.

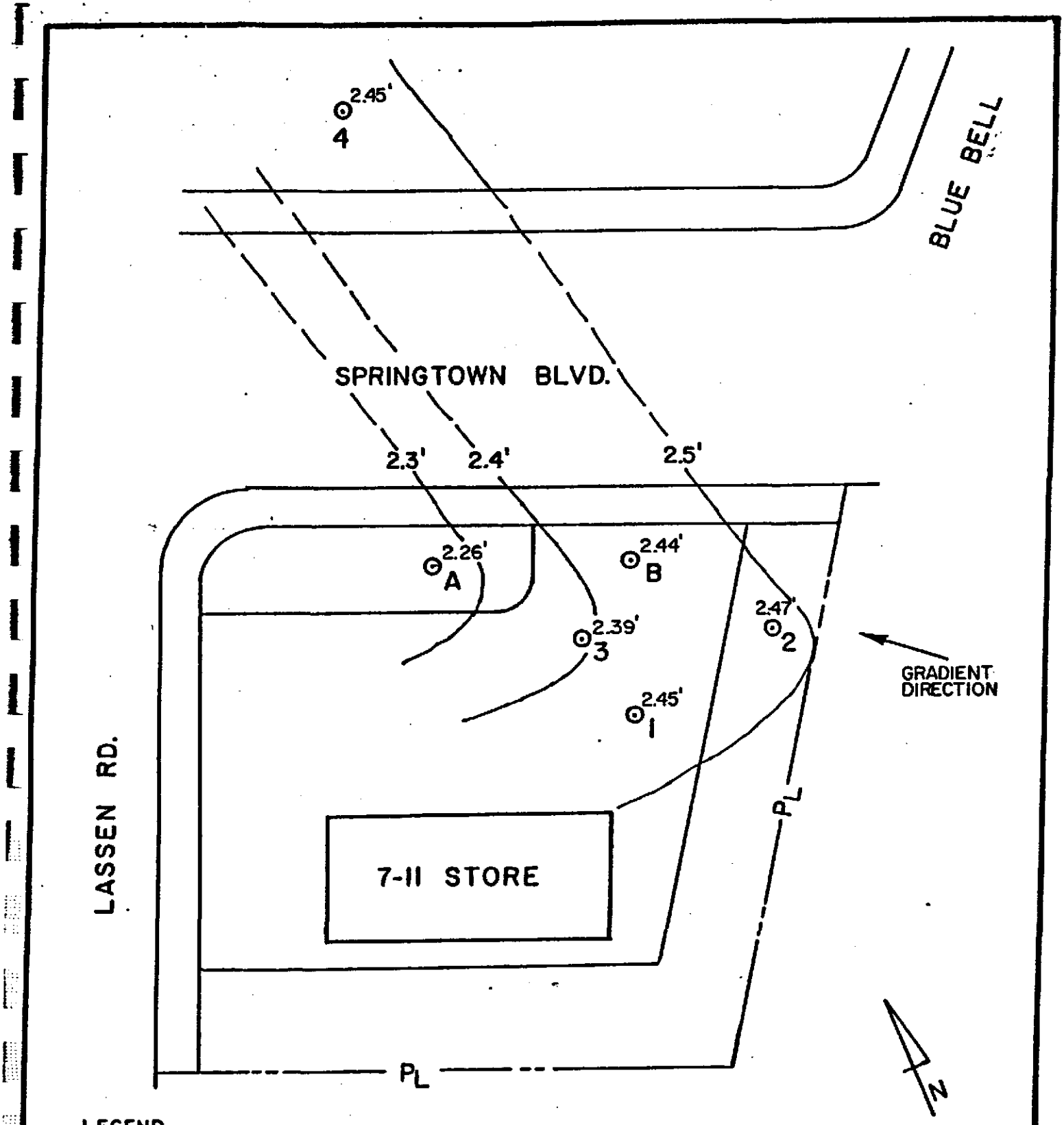
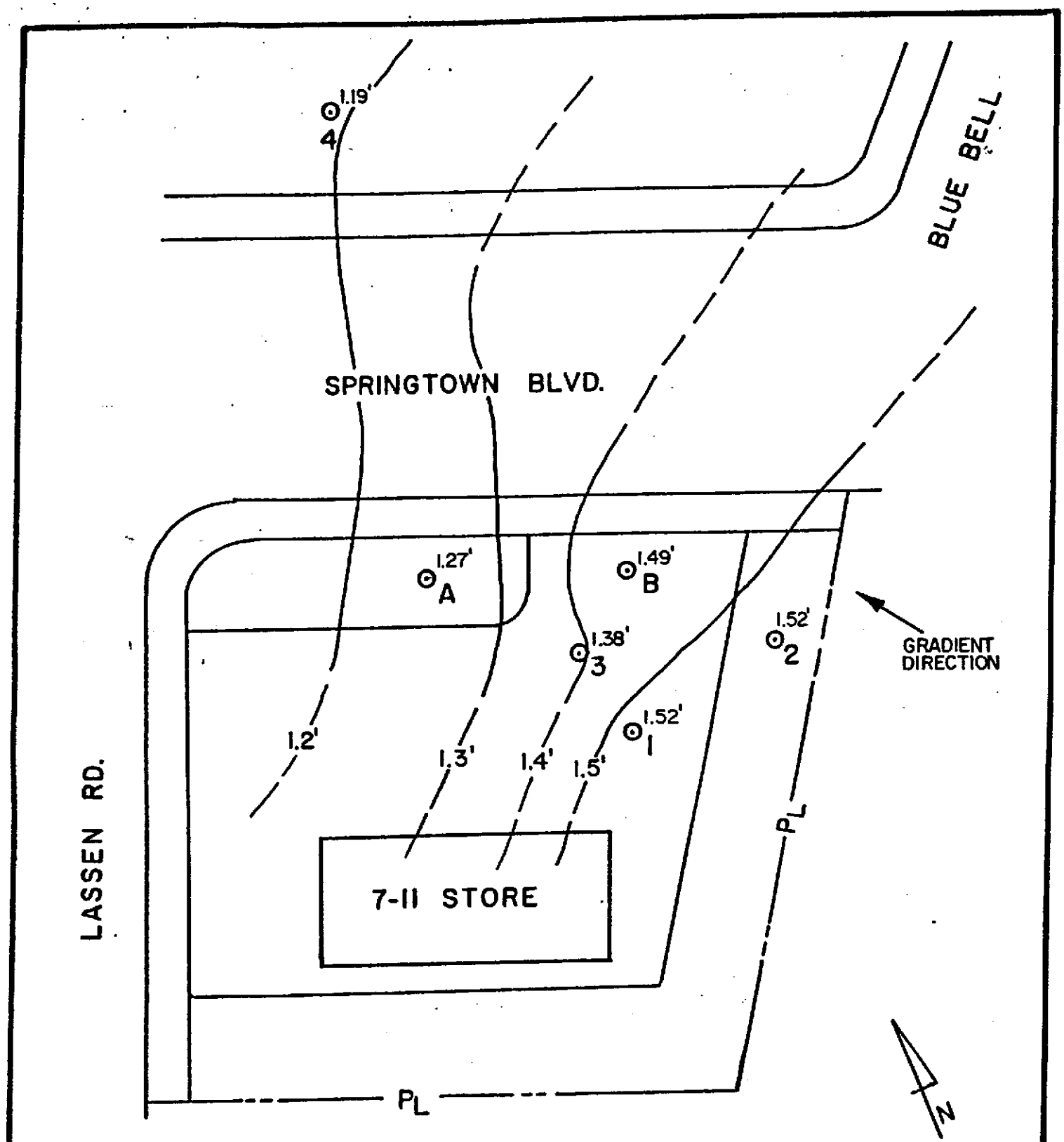


FIGURE 2
GROUNDWATER GRADIENT MAP
28 MARCH 1986

TEXACO INC.
LIVERMORE, CALIF.

SCALE: 1" = 40'

GROUNDWATER TECHNOLOGY



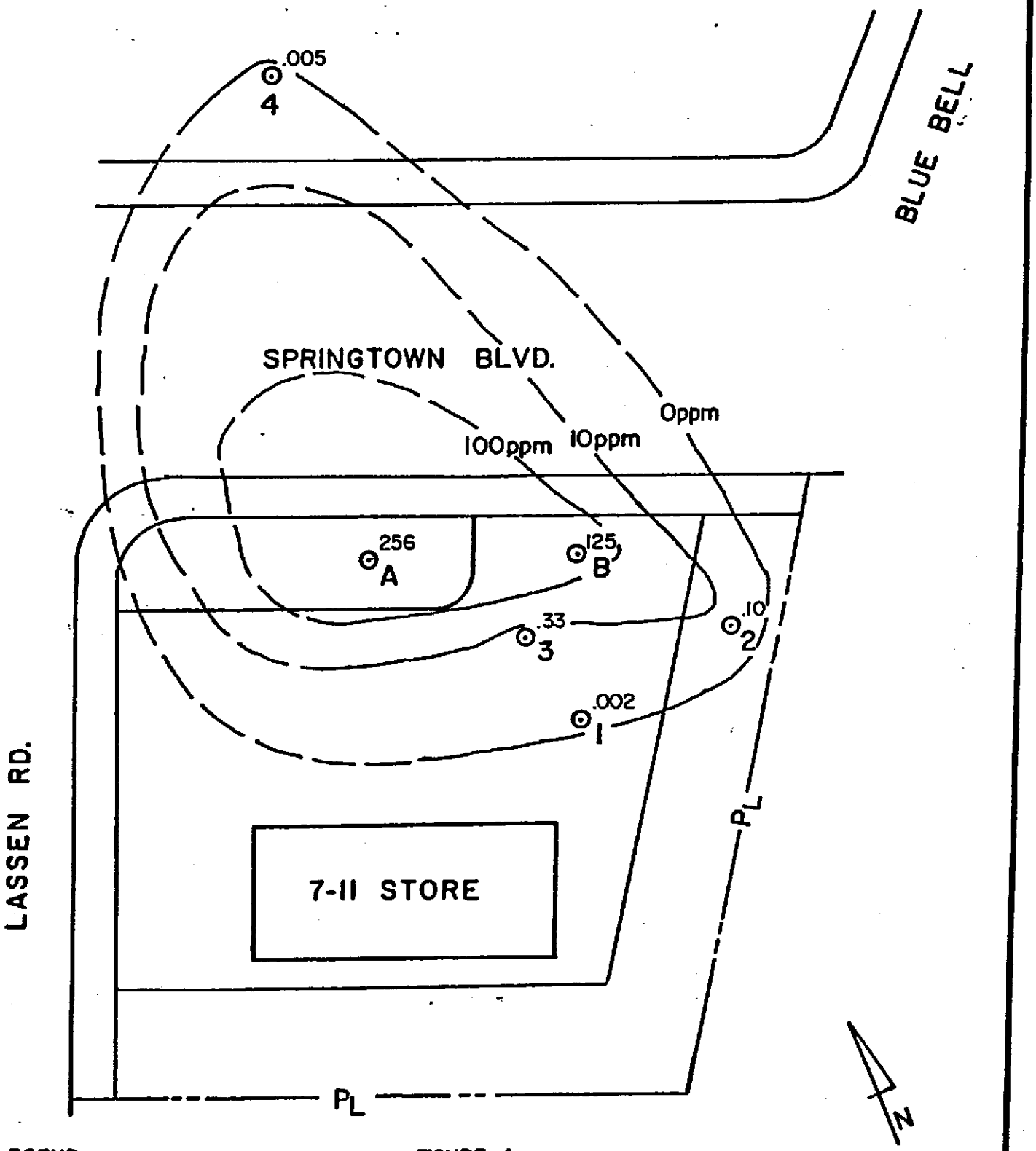
LEGEND
⊙ MONITORING WELL

FIGURE 3
GROUNDWATER GRADIENT MAP
13 MAY 1986

TEXACO INC.
LIVERMORE, CALIF.

SCALE: 1" = 40'

GROUNDWATER TECHNOLOGY



LEGEND
⊙ MONITORING WELL

FIGURE 4
DISSOLVED HYDROCARBON
ISOPACH MAP ppm
28 MARCH 1986

TEXACO INC.
LIVERMORE, CALIF.

SCALE: 1" = 40'

GROUNDWATER TECHNOLOGY

GROUNDWATER TECHNOLOGY
Consulting Groundwater Geologists
A Division of Oil Recovery Systems, Inc.
5047 CLAYTON ROAD • CONCORD, CA 94521 • (415) 671-2387

PROJECT: Texaco/Livermore
JOB NUMBER: 20-4051
DATE: Feb.-May 1986

DATE		WELL 1	WELL 2	WELL 3	WELL 4	WELL A	WELL B
	ELEV. (ft.)	102.78	100.47	101.34	100.33	101.91	100.24
02-28-86	DTW	10.61	8.29	9.23	8.26	9.88	8.08
	DTP	-	-	-	-	-	-
	PT	0	0	0	0	0	0
03-28-86	DTW	10.33	8.00	8.95	7.88	9.65	7.80
	DTP	-	-	-	-	-	-
	PT	0	0	0	0	0	0
04-24-86	DTW	11.23	8.90	9.86	8.98	10.57	10.31
	DTP	-	-	-	-	-	-
	PT	0	0	0	0	0	0
05-13-86	DTW	11.26	8.95	9.96	9.14	10.64	8.75
	DTP	-	-	-	-	-	-
	PT	0	0	0	0	0	0

DTW = Depth To Water
DTP = Depth To Product
PT = Product Thickness

SUMMARY CONCLUSION

To date no recoverable amounts of free product have been observed at the site of the former Texaco Service Station. However, dissolved hydrocarbon concentrations have remained high in the area of the abandoned tank pit and former product lines. This is apparently the result of leaching and weathering of adsorbed hydrocarbon products from the soils in this area. Well 4, located across Springtown Boulevard from the site, has not been impacted by any significant amounts of hydrocarbon contamination.

An analysis of recent groundwater monitoring data indicates that well 4 is not located directly down gradient from the study site. In order to more precisely determine the contaminant plume, Groundwater Technology recommends that an additional investigation be undertaken in the northwestern portion of the Lassen and Springtown property down gradient from the abandoned tank pit and product lines. Two additional monitoring wells; one in the planter area in the northwest corner and another in the pavement area along Lassen Road are recommended. If free floating product is encountered in these areas it may be necessary to drill across Lassen Road. Groundwater Technology would prefer to take a stepwise approach to this investigative procedure however, to avoid involvement of off site property owners until any contamination is verified in this direction.

One soil sample from each of the proposed wells would be obtained at a depth of between 8.5 and 10 feet just above the known water table interface. These samples would be used to determine concentrations of hydrocarbons if any, adsorbed onto the soils in these areas. The data could then be used to assess any concerns to local water quality.

Subsequent to development and stabilization of the newly installed wells a complete round of water samples would be taken to document the extent of dissolved hydrocarbon contamination. If dissolved hydrocarbon levels remain elevated, as at present, a suitable plan for abatement measures would be prepared for Texaco's review.

GROUNDWATER TECHNOLOGY
STANDARD OPERATING PROCEDURE
CONCERNING GROUNDWATER MONITORING
SOP 8

Groundwater monitoring of wells at the site shall be conducted using an ORS Interface Probe and Surface Sampler. The Interface Probe is a hand held, battery operated device for measuring depth to petroleum product and depth to water as measured from an established datum (i.e., top of the well casing which has been surveyed). Product thickness is then calculated by subtracting the depth to product from the depth to water. In addition, water elevations are adjusted for the presence of fuel with the following calculation:

(Product Thickness)(.8)+(Water Elevation)
= Corrected Water Elevation

Note: The factor of 0.8 accounts for the density difference between water and petroleum hydrocarbons.

The Interface Probe consists of a dual sensing probe utilizing an optical liquid sensor and electrical conductivity to distingish between water and petroleum products. A coated steel measuring tape transmits the sensor's signals to the reel assembly, where an audible alarm sounds a continuous tone when the sensor is immersed in petroleum product and an oscillating tone when immersed in water. The Interface Probe is accurate to 1/16-inch.

A Surface Sampler shall be used for visual inspection of the groundwater to note sheens (difficult to detect with the Interface Probe), odors, microbial action, etc.

The Surface Sampler used consists of a 12-inch long cast acrylic tube with a Delrin ball which closes onto a conical surface creating a seal as the sampler is pulled up. The sampler is calibrated in inches and centimeters for visual inspection of product thickness.

To reduce the potential for cross contamination between wells the monitorings shall take place in order from the least to most contaminated wells. Wells containing free product should be monitored last. Between each monitoring the equipment shall be washed with laboratory grade detergent and double rinsed with distilled water.

GROUNDWATER TECHNOLOGY LABORATORY

ANALYTICAL & CONSULTING SERVICES
Division of Oil Recovery Systems, Inc.
4 Mill St., Greenville, NH 03048
Tel: (603) 878-2500

Laboratory Test Results

Ans'd.....

4/5/86
Report No. 20-4051-4
Submitted to: TEXACO/LIVERMORE

Cori Condon
Groundwater Technology
5047 Clayton Rd.
Concord, CA. 94521

Sample Identification:
The attached report covers water samples #24323-24328 taken by F. Seiler using 40 ml septum-capped glass vials at site #20-4051, Livermore, California.

Method:
Analysis was performed for purgeable aromatic priority pollutants and xylenes by purge and trap gas chromatography with flame ionization detection as per EPA Method 602. Quantification was performed on a very polar open tubular fused silica capillary column which fractionates aliphatics (up to C12) away from volatile aromatics. Qualitative confirmation was performed for all samples on a dissimilar column. Chromatographic conditions are referenced in GTL Method Code 103. Hexane and ortho-xylene are used as calibration standards for the aliphatic hydrocarbons and miscellaneous aromatics, respectively, if reported.

Minimum Detection Limit (MDL) at 5 times background is 0.5 ppb for all parameters. The level for reliable quantitation for the summed groups such as aliphatics is 20 ppb. Samples diluted in order to maintain the calibrated range are so indicated by a footnote giving the factor by which the MDL is raised.

Sampling and sample handling and preservation are specified by this laboratory to be as per EPA Method 602. Any irregularities are referenced in the attached quality assurance report.

Results:
Results are reported in ppb (ug/l).

Prepared by:
Eileen Foley
Analytical Program Manager

S.E.B./P.L.
Analysts

GROUNDWATER TECHNOLOGY LABORATORY

ANALYTICAL & CONSULTING SERVICES
Division of Oil Recovery Systems, Inc.
4 Mill St., Greenville, NH 03048
Tel: (603) 878-2500

HYDROCARBONS IN WATER ug/L (ppb)
REPORT NO. 20-4051-4

Sample I.D.		DATE SAMPLED	DATE RUN	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	TOTAL BTEX
24323	MW-A	3/28/86	4/1/86	5880	14700	4260	29000	53800
24324	MW-B	3/28/86	4/1/86	3400	5630	1510	5450	16000
24325	MW-1	3/28/86	4/1/86	ND	ND	ND	ND	ND
24326	MW-2	3/28/86	4/1/86	1	1	ND	1	3
24327	MW-3	3/28/86	4/2/86	27	2	8	5	42
24328	MW-4	3/28/86	4/2/86	ND	ND	ND	ND	ND

*NOTES:

ND = BELOW DETECTION LIMIT

TOTAL BTEX = THE SUM OF BENZENE, TOLUENE, ETHYL BENZENE, AND XYLENES, ROUNDED TO THREE SIGNIFICANT FIGURES.

GROUNDWATER TECHNOLOGY LABORATORY

ANALYTICAL & CONSULTING SERVICES
Division of Oil Recovery Systems, Inc.
4 Mill St., Greenville, NH 03048
Tel: (603) 878-2500

HYDROCARBONS IN WATER ug/l
REPORT NO. 20-4051-4

SAMPLE NO.	I.D.	C4-C12 ALIPHATIC HYDROCARBONS	MISC AROMATICS C8-C10	TOTAL	
24323	MW-A	95000	96700	256000	*4,5
24324	MW-B	71000	87600	125000	*4,5
24325	MW-1	2	ND	2	
24326	MW-2	74	19	96	
24327	MW-3	29	255	326	
24328	MW-4	5	ND	5	

*NOTES:

TOTAL = THE SUM OF THE TOTAL BTEX AND THE ABOVE PARAMETERS.

ND = BELOW DETECTION LIMIT
4 = SAMPLE DILUTED; MDL TIMES 52
5 = UNCATEGORIZED COMPOUNDS PRESENT AT LESS THAN 500 PPB.
MW = MONITORING WELL

GROUNDWATER TECHNOLOGY LABORATORY

ANALYTICAL & CONSULTING SERVICES
Division of Oil Recovery Systems, Inc.
4 Mill St., Greenville, NH 03048
Tel: (603) 878-2500

Quality Assurance Documentation

Statement of Sample Integrity:
The samples in this data set meet the Groundwater Technology Laboratory criteria for physical integrity as per GTL Method Code 103 throughout the sampling, handling and analytical process.

Quality Assurance Specifications:
The data in this set conforms to the GTL Quality Assurance program and provisions specified in EPA Method 602 including daily calibration with freshly made standards, blanks before trace level samples, surrogate spikes, spikes in untested matrices, a minimum of 10% duplicates and a minimum of 6% reference samples traceable to the U.S. EPA.

Certification:
The data in this report have been checked for accuracy and completeness.

Respectfully Submitted,

Michael D. Webb

Michael D. Webb
Technical Director

GROUNDWATER TECHNOLOGY LABORATORY

ANALYTICAL & CONSULTING SERVICES
Division of Oil Recovery Systems, Inc.
4 Mill St., Greenville, NH 03048
Tel: (603) 878-2500

Laboratory Test Results

5/15/86
Report No. 20-4051-5
Submitted to: Cori Condon
Groundwater Technology
5047 Clayton Rd.
Concord, CA. 94521

This report replaces one of the same number, dated 5/6/86.

Sample Identification:
The attached report covers water samples #25304-25309 taken by D. Kaufman using 40 ml septum-capped glass vials at site #20-4051, Livermore, California.

Method:
Analysis was performed for purgeable aromatic priority pollutants and xylenes by purge and trap gas chromatography with flame ionization detection as per EPA Method 602. Quantification was performed on a very polar column which fractionates aliphatics (up to C12) away from volatile aromatics. Chromatographic conditions are referenced in GTL Method Code 110. Hexane and ortho-xylene are used as calibration standards for the aliphatic hydrocarbons and miscellaneous aromatics, respectively, if reported.

Minimum Detection Limit (MDL) at 5 times background is 0.5 ppb for all parameters. The level for reliable quantitation for the summed groups such as aliphatics is 20 ppb. Samples diluted in order to maintain the calibrated range are so indicated by a footnote giving the factor by which the MDL is raised.

Sampling and sample handling and preservation are specified by this laboratory to be as per EPA Method 602. Any irregularities are referenced in the attached quality assurance report.

Results:
Results are reported in ppb (ug/l).

Prepared by:
Eileen Foley
Analytical Program Manager

L.L./E.S.L.
Analysts

GROUNDWATER TECHNOLOGY LABORATORY

ANALYTICAL & CONSULTING SERVICES
Division of Oil Recovery Systems, Inc.
4 Mill St., Greenville, NH 03048
Tel: (603) 878-2500

HYDROCARBONS IN WATER ug/L (ppb)
REPORT NO. 20-4051-5

Sample I.D.		DATE SAMPLED	DATE RUN	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	TOTAL BTEX
25304	MW-1	4/25/86	4/29/86	ND	1	ND	3	4
25305	MW-2	4/25/86	4/29/86	ND	ND	ND	ND	ND
25306	MW-3	4/25/86	4/30/86	11	2	3	8	24
25307	MW-4	4/25/86	4/30/86	ND	ND	ND	ND	ND
25308	MW A	4/25/86	4/30/86	5330	7580	2590	11400	26900
25309	MW B	4/25/86	NOT RUN, DROPLETS OF HYDROCARBON PRESENT.					

*NOTES:

ND = BELOW DETECTION LIMIT

TOTAL BTEX = THE SUM OF BENZENE, TOLUENE, ETHYL BENZENE, AND XYLENES, ROUNDED TO THREE SIGNIFICANT FIGURES.

GROUNDWATER TECHNOLOGY LABORATORY

ANALYTICAL & CONSULTING SERVICES
Division of Oil Recovery Systems, Inc.
4 Mill St., Greenville, NH 03048
Tel: (603) 878-2500

HYDROCARBONS IN WATER ug/l
REPORT NO. 20-4051-5

SAMPLE NO.	I.D.	C4-C12 ALIPHATIC HYDROCARBONS	MISC AROMATICS C8-C10	TOTAL
25304	MW-1	1	40	45
25305	MW-2	2	4	6
25306	MW-3	108	466	598 *5
25307	MW-4	1	1	2
25308	MW-A	234000	128000	389000 *4,6
25309	MW-B	NOT RUN, DROPLETS OF HYDROCARBON PRESENT		

*NOTES:

TOTAL = THE SUM OF THE TOTAL BTEX AND THE ABOVE PARAMETERS.

ND = BELOW DETECTION LIMIT
MW = MONITORING WELL
4 = SAMPLE DILUTED; MDL TIMES 52.
5 = UNCATEGORIZED COMPOUNDS PRESENT AT LESS THAN 5 PPB.
6 = UNCATEGORIZED COMPOUNDS PRESENT AT LESS THAN 1350 PPB.

GROUNDWATER TECHNOLOGY LABORATORY

ANALYTICAL & CONSULTING SERVICES
Division of Oil Recovery Systems, Inc.
4 Mill St., Greenville, NH 03048
Tel: (603) 878-2500

Quality Assurance Documentation

Statement of Sample Integrity:
The samples in this data set meet the Groundwater Technology Laboratory criteria for physical integrity as per GTL Method Code 103 throughout the sampling, handling and analytical process.

Quality Assurance Specifications:
The data in this set conforms to the GTL Quality Assurance program and provisions specified in EPA Method 602 including daily calibration with freshly made standards, blanks before trace level samples, surrogate spikes, spikes in untested matrices, a minimum of 10% duplicates and a minimum of 6% reference samples traceable to the U.S. EPA.

Certification:
The data in this report have been checked for accuracy and completeness.

Respectfully Submitted,

Michael D. Webb

Michael D. Webb
Technical Director