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GEOLOGICAL AND ENVIRONMENTAL SERVICES

QUARTERLY MONITORING REPORT
BECK ROOFING
APRIL 11, 1995
HAYWARD, CALIFORNIA

LUSH GEOSCIENCES JOB NO. 423-001

APRIL 21, 1995

F. William Welter
Project Manager

Andrew P. Lush
RG 4421

REGISTERED GEOLOGIST
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STATE OF CALIFORNIA

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1.0 INTRODUCTION

This report was prepared to summarize quarterly monitoring work performed in the investigation of contamination associated with one former 1,000-gallon underground gasoline storage tank at the Beck Roofing Facility in Hayward, California (site). The report describes methods and procedures used to evaluate groundwater quality near the former tank. The methods and procedures used during this phase of investigation included:

- Collecting groundwater samples from the four previously installed wells;
- Analyzing the groundwater samples; and,
- Preparing this report.

This report summarizes the field and laboratory operations conducted, the methods and procedures used, the data obtained, and presents conclusions and recommendations.

2.0 SITE BACKGROUND

The site is an operating roofing company. One wooden structure located on the northwest side of the site contains office and warehouse space. The remainder of the site is used for equipment and materials storage. In May of 1990, a 1,000-gallon underground fuel tank, used to store gasoline, was removed. When the tank was removed, evidence of leakage was noted in soil adjacent to the tank.

We have attached a Generalized Site Plan (Figure 2), showing the site configuration.

2.1 Previous Work

Previous work, performed by other consultants, includes excavation of approximately 350 cubic yards of contaminated soil, drilling and sampling 20 soil borings, installation of four groundwater monitoring wells, excavation of an additional 400 cubic yards of contaminated soil, and quarterly monitoring of the wells. Previous analyses have shown variable contaminant concentrations in one well (MW3), and slight to non detectable levels in the remaining wells.

3.0 QUARTERLY GROUNDWATER SAMPLING

3.1 Field Procedures

Groundwater samples were collected from each well on April 11, 1995. Sampling activities were conducted as follows:

- Water and product levels were determined using an electronic water sensitive measuring device. Depth to water or product was measured to an accuracy of 0.01 ft. No free product was encountered.

- Prior to sampling, each well was purged with a submersible pump until at least 3 well volumes of water were removed. The purged water was monitored for temperature, pH, and electrical conductivity (Table 1). Purging continued until these parameters stabilized. The well was allowed to recover until at least 80% of the initial water level had been reached.

- After each well stabilized, a sample was collected with an unused, clean, disposable polyethylene bailer. The collected sample was transferred from the bailer to appropriate 40-ml glass sample vials. All sample containers were filled completely with a convex meniscus to eliminate any trapped air or headspace. Each sample container cap was fitted with a Teflon septum.

- After sampling, the samples were labeled, showing the sample number, well number, date, time, samplers name, and preservation. The samples were refrigerated in a cooler containing ice until delivery to the laboratory to perform the specified analyses. Chain-of-custody documentation was maintained from the sampling location to the laboratory. The chain-of custody was signed by the sampler and placed in the container holding the samples. Condition of the samples was noted on the chain-of-custody document by the laboratory.

TABLE 1

PURGED WATER PARAMETERS
GROUNDWATER MONITORING WELLS
BECK ROOFING FACILITY
HAYWARD, CALIFORNIA

Well	Date	Subjective Evidence	T(°F)	pH	K	3WV	Volume Purged
MW1	10/25/94	No Odor	64.7	6.98	1930	27	30
MW2	10/25/94	No Odor	63.8	6.92	2600	27	30
MW3	10/25/94	No Odor	66.5	6.90	2600	27	30
MW4	10/25/94	No Odor	64.5	8.61	2400	27	30
MW1	1/20/95	No Odor	62.9	7.37	570	27	30
MW2	1/20/95	No Odor	62.1	7.20	775	27	30
MW3	1/20/95	No Odor	63.6	7.10	870	27	30
MW4	1/20/95	No Odor	63.3	7.26	728	27	30
MW1	4/11/95	No Odor	65.9	6.66	637	30	35
MW2	4/11/95	No Odor	72.9	6.63	926	30	35
MW3	4/11/95	Odor	70.8	6.62	873	30	35
MW4	4/11/95	No Odor	69.2	6.68	791	30	35

K = Conductivity in micromhos
T = Temperature in degrees Fahrenheit
pH = Hydrogen ion concentration
3WV = Calculated three well volumes in gallons

* Data for previous sampling events are not available

3.2 Groundwater Analyses

Groundwater samples from each well were analyzed for TPHg using Environmental Protection Agency (EPA) Method 8015 (modified for gasoline) with purge and trap EPA Method 5030, and for the associated volatile constituents BTEX using EPA Method 602 with purge and trap EPA Method 5030. Results of the analyses are summarized in Table 2; copies of laboratory reports are attached as Appendix A. All analyses were conducted by Sparger Technology Laboratories, of Sacramento, California, which is certified by the State of California for the requested analyses.

TABLE 2
RESULTS OF LABORATORY ANALYSES
GROUNDWATER SAMPLES
BECK ROOFING FACILITY
HAYWARD, CALIFORNIA

Well Number and Date	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW1					
8/4/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0005
10/25/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0003
1/20/95	<0.05	<0.0003	<0.0003	<0.0003	<0.0003
4/11/95	<0.05	<0.0003	<0.0003	<0.0003	<0.0003
MW2					
8/4/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0005
10/25/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0003
1/20/95	<0.05	**0.0010**	<0.0003	<0.0003	<0.0003
4/11/95	<0.05	**0.0012**	<0.0003	<0.0003	<0.0003
MW3					
8/4/94	**4.2**	**0.45**	<0.003	**0.18**	**0.16**
10/25/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0003
1/20/95	**4.4**	**0.58**	**0.002**	**0.130**	**0.160**
4/11/95	**1.8**	**0.088**	**0.0014**	**0.033**	**0.027**
MW4					
8/4/94	<0.05	<0.003	0.0005	<0.0003	<0.0005
10/25/94	<0.05	<0.0003	<0.0003	<0.0003	<0.0003
1/20/95	<0.05	<0.0003	<0.0003	<0.0003	<0.0003
4/11/95	<0.05	<0.0003	<0.0003	<0.0003	<0.0003

TPHg = Total petroleum hydrocarbons
Results given in milligrams per liter (parts per million)
< = Less than laboratory minimum detection limits
MW1 = Monitoring well number

3.3 Groundwater Gradient

The groundwater gradient was approximated from calculations made using surveyed wellhead elevations and locations in combination with depth to groundwater measurements made on April 11, 1995 (Table 3) (Figure 2). The groundwater elevation data indicate that groundwater was flowing S24°W with a gradient of 0.0009 ft per ft at the time the measurements were made.

TABLE 3
GROUNDWATER ELEVATION DATA
BECK ROOFING FACILITY
HAYWARD, CALIFORNIA

Well Number	Elevation of Top of Casing (ft. above MSL)	Depth to Water (ft. below top of casing)	Water-level Elevation (ft. above MSL)	Gradient and Direction
8/4/94				
MW1	58.55	29.96	29.29	
MW2	58.65	29.35	29.30	
MW3	58.52	29.27	29.25	
MW4	58.01	28.80	29.21	
10/25/94				
MW1	58.55	30.10	28.45	
MW2	58.65	30.15	28.50	0.0009 ft/ft
MW3	58.52	30.10	28.42	S22°W
MW4	58.01	29.60	28.41	
1/20/95				
MW1	58.55	26.57	31.98	
MW2	58.65	26.65	32.00	0.0002 ft/ft
MW3	58.52	26.54	31.98	S0°W
MW4	58.01	26.03	31.98	
4/11/95				
MW1	58.55	23.87	34.68	
MW2	58.65	23.92	34.73	0.0009 ft/ft
MW3	58.52	23.87	34.65	S24°W
MW4	58.01	23.38	34.63	

TOC = Top of the well casing (elevation in ft. above mean sea level- AMSL)
Gradient = groundwater gradient in ft per ft
Direction = groundwater flow direction

3.4 Quality Assurance/Quality Control

All field equipment was cleaned and decontaminated prior to being introduced into the sampling environment. Each sample was collected using a dedicated, disposable bailer. Care was taken to prevent the bailer from becoming contaminated prior to being introduced into the sampling environment.

3.4.1 Laboratory QA/QC

Sparger is certified by the CalEPA Hazardous Waste Testing Laboratory Certification Program to conduct the analyses requested. The methods used by the laboratory are published, approved analytical methods which have built-in QA/QC practices. Other QA/QC practices are part of CalEPA's certification program. The laboratory provided pertinent QA/QC documents pertaining to the analytical protocol. These QA/QC documents include surrogate recovery data and analytical charts including those of the spikes and matrix spike duplicates. Copies of these documents were incorporated into the laboratory reports of analyses (Appendix A).

4.0 CONCLUSIONS AND DISCUSSION

Consistent with data presented in previous quarterly monitoring reports, groundwater contamination was not detected in monitoring wells MW1 and MW4. Benzene was detected in MW2 at a concentration of 0.0012 ppm during this sampling event. Gasoline and benzene were detected in MW3 at concentrations of 1.8 and 0.088 ppm, respectively. The contaminant concentrations detected in MW3 attenuated somewhat since the previous sampling event. The groundwater elevation was roughly 2.7 feet higher than the elevation measured during the previous sampling event.

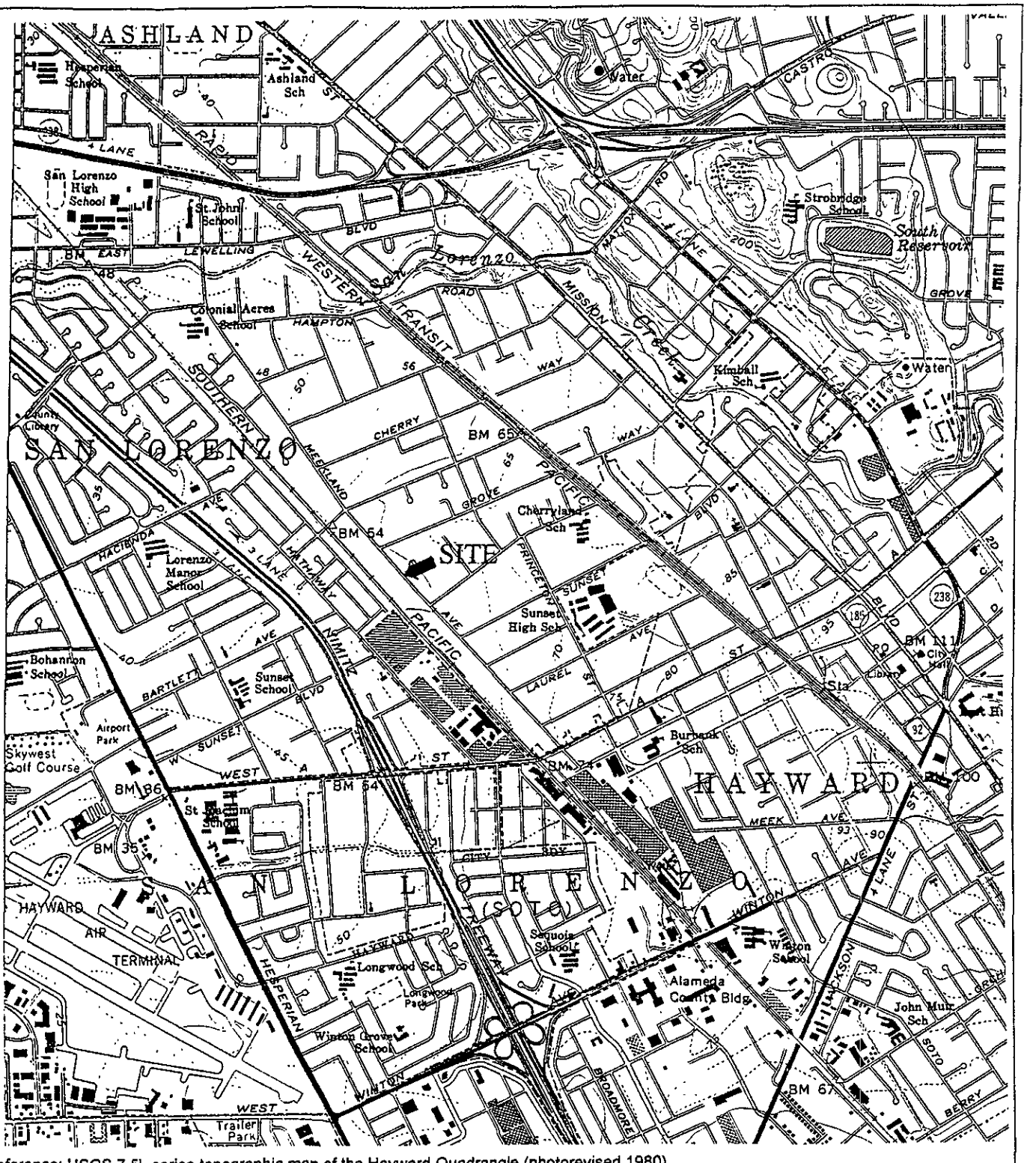
5.0 RECOMMENDATIONS

The present data suggest that there is minimal effect on, and minimal risk to, the public from the contamination present. Excavation of approximately 400 cubic yards of contaminated soil underlying the former tank location was completed in November 1994. Confirmation soil samples collected from the sidewalls indicated that significant contaminant concentrations remains in the subsurface at the perimeter of the excavation. Consequently, further remedial action is being considered. Sampling of all of the onsite monitoring wells should continue on a quarterly basis until completion of all remedial action, or until otherwise directed.

6.0 LIMITATIONS

The above conclusions are based on our assessment of conditions indicated to exist as of the dates of our field work. Our assessment included review of previous documents and interviews with state or local regulatory persons familiar with the area. This assessment was conducted in accordance with generally accepted standards of environmental geological practice at the time it was performed. The results of this assessment do not preclude the possibility that substances that are currently, or which in the future may be defined as hazardous, may be present on the property because of activities that we could not identify, or in locations which were not sampled.

Our conclusions are based on groundwater sample analyses representative of contaminant concentrations at the locations sampled. These results are considered indicative of site conditions, but such conditions may vary away from the points sampled. Further investigation, including additional subsurface exploration and laboratory testing of soil and groundwater samples can reduce the uncertainties inherent in this type of limited environmental assessment. No soil engineering or geotechnical references are made, nor should they be inferred.



Reference: USGS 7.5'- series topographic map of the Hayward Quadrangle (photorevised 1980)

SITE LOCATION MAP
BECK ROOFING FACILITY
21123 MEEKLAND AVENUE

HAYWARD, CALIFORNIA

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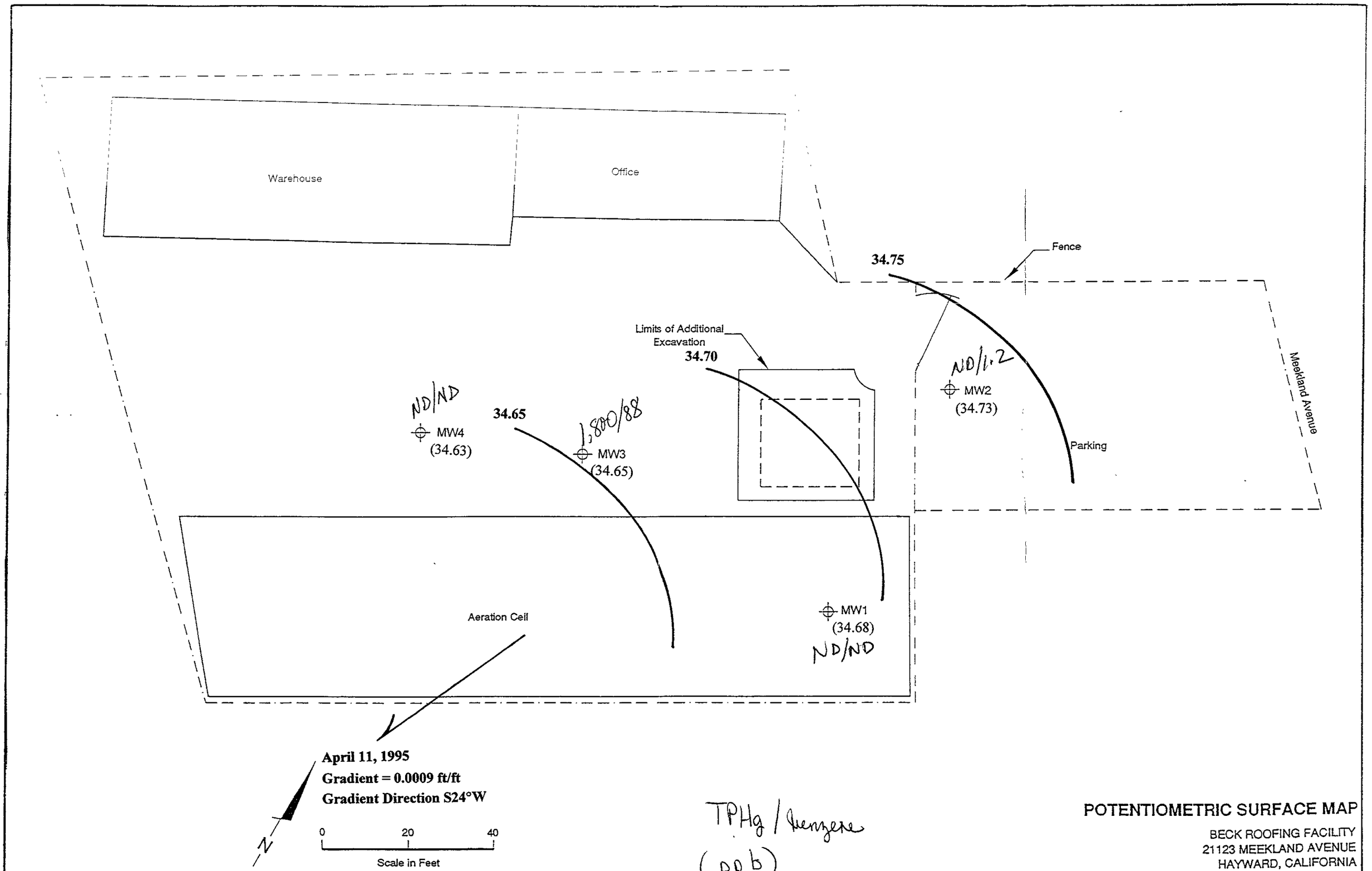
FIGURE 1



POTENTIOMETRIC SURFACE MAP

BECK ROOFING FACILITY
21123 MEEKLAND AVENUE
HAYWARD, CALIFORNIA

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APPENDIX A

RESULTS OF GROUNDWATER SAMPLE ANALYSES

CHAIN OF CUSTODY RECORD

LABORATORY REPORTS OF ANALYSES

LUSH GEOSCIENCES

SPARGER TECHNOLOGY, INC.

Analytical Laboratory

3050 Fite Circle, #112 Sacramento, CA 95827

Phone: (916) 362-8947

FAX: (916) 362-0947

CHAIN OF CUSTODY RECORD

4622

STAL Invoice Number:

Company: LUSH GEOSCIENCES Phone: (916) 737-9294

Project Manager: FAX (916) 737-9298

Report Address: Billing Name & Address:

3560 BUSINESS DRIVE, SUITE 120

SACRAMENTO, CA 95820

Project Name: Beck Roofing Project/Job #:

Project Location: HAYWARD P.O. #:

ANALYSIS REQUEST

REMARKS:

SAMPLE ID	Sampling: Date	Sampling: Time	Container: 40 mL VOA	Container: Brass Sleeve	Container: 1 L amber bottle	Container: 250 mL Plastic	Container: Other:	Preservative Used: HCl/HNO3/ICE	Preservative Used: None	Preservative Used: Other:	Matrix: Water	Matrix: Soil	Matrix: Air	Matrix: Other:	TCLP: BTEX (602/8020)/503.1	TCLP: BTEX/TPHgas (602/8020/8015)	TCLP: TPHdiesel/TPHmotor oil/kerosene(8015)	TCLP: EPA 601/8010/502.2/504	TCLP: EPA 602/8020	TCLP: EPA 608/8080 (Pesticides)/505/508	TCLP: EPA 608/8080 (PCB's)	TCLP: EPA 624/8240/524.2	TCLP: EPA 625/8270/525	Total Oil & Grease (5520)	Non-Polar O & G/TRPH (418.1)	Organic Lead	RCI	WET (STLC): CAM-17 Metals	TCLP: CAM-5 Metals (Cd, Cr, Pb, Ni, Zn)	Total: Lead	TAT: Standard	TAT: Rush Services (72hr / 48hr / 24hr / 12hr)	TAT: Holiday/Weekend Rush
MW-1	4-11	1335	2								X					X															X		
MW-2	4-11	1340	2								X					X															X		
MW-3	4-11	1130	2								X					X															X		
MW-4	4-11	1350	2								X					X															X		

Relinquished by: Date: 4-12-95 Time: 930

Received by: Date: 4-12-95 Time: 9:37

Relinquished by: Date: Time:

Received by:

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

April 24, 1995

Mr. Andrew Lush
Lush Geosciences
3560 Business Drive, Suite 120
Sacramento, CA 95820

Dear Mr. Lush:

Enclosed is the report for the four (4) water samples. The samples were received at Sparger Technology Analytical Lab on April 12, 1995.

The samples were received in eight (8) 40 mL VOA vials. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

The report consists of the following sections:

I. Sample Description
II. Analysis Request
III. Quality Control Report
IV. Analysis Results

No problems were encountered with the analysis of your samples.

If you have questions, please feel free to call.

Sincerely,

R. L. James
Principal Chemist

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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

I Sample Description

See attached Samples Description Information.

The samples were received under chain-of-custody.

II Analysis Request

The following analytical tests were requested:

Lab ID	Your ID	Analysis Description
ST95-04-274A	MW-1	TPHgas & BTEX
ST95-04-275A	MW-2	TPHgas & BTEX
ST95-04-276A	MW-3	TPHgas & BTEX
ST95-04-277A	MW-4	TPHgas & BTEX

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III Quality Control

A. **Project Specific QC.** No project specific QC (i.e., spikes and/or duplicates) was requested.

B. **Method Blank Results.** A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your sample.

No target parameters were detected in the method blank associated with your sample at the reporting limit levels noted on the data sheets in the Analytical Results section.

C. **Laboratory Control Spike.** A Laboratory Control Spike (LCS) is a sample which is spiked with known analyte concentrations, and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The LCS results associated with your samples are on the attached Laboratory Control Spike and Laboratory Control Spike Duplicate Analysis Report.

D. **Matrix Spike Results.** A Matrix Spike is a sample which is spiked with known analyte concentrations, and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The Matrix Spike results associated with your samples are on the attached Matrix Spike and Matrix Spike Duplicate Analysis Report.

Accuracy is measured by Percent Recovery as in:

$$\% \text{ recovery} = \frac{(\text{measured concentration}) \times 100}{(\text{actual concentration})}$$

IV Analysis Results

Results are on the attached data sheets.

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8015/8020 Modified Analysis Report

Attention:	Mr. Andrew Lush Lush Geosciences 3560 Business Drive, Suite 120 Sacramento, CA 95820	Date Sampled: Date Received: Date Analyzed:	Apr 11, 1995 Apr 12, 1995 Apr 12, 1995
Project #:		Project Name:	Beck Roofing
Client ID:	MW-1	LAB ID:	ST95-04-274A
Matrix:	Water	Dilution:	1 : 1

Name	Amount	Detection Limits	Units
Benzene	ND	0.3	ug/L
Toluene	ND	0.3	ug/L
Ethylbenzene	ND	0.3	ug/L
Xylenes	ND	0.3	ug/L
TPHgas	ND	50	ug/L

Surrogate % Recovery of Trifluorotoluene = 90%

ppb = parts per billion = ug/L = micrograms per Liter
ppm= parts per million = ug/mL = micrograms per milliliter
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit

R. L. James, Principal Chemist

Apr 18, 1995
Date Reported

SPARGER TECHNOLOGY ANALYTICAL LABORATORY, INC IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 1614)

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Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8015/8020 Modified Analysis Report

Attention:	Mr. Andrew Lush Lush Geosciences 3560 Business Drive, Suite 120 Sacramento, CA 95820	Date Sampled: Date Received: Date Analyzed:	Apr 11, 1995 Apr 12, 1995 Apr 13, 1995
Project #:		Project Name:	Beck Roofing
Client ID:	MW-2	LAB ID:	ST95-04-275A
Matrix:	Water	Dilution:	1 : 1

Name	Amount	Detection Limits	Units
Benzene	1.2	0.3	ug/L
Toluene	ND	0.3	ug/L
Ethylbenzene	ND	0.3	ug/L
Xylenes	ND	0.3	ug/L
TPHgas	ND	50	ug/L

Surrogate % Recovery of Trifluorotoluene = 90%

ppb = parts per billion = ug/L = micrograms per Liter
ppm= parts per million = ug/mL = micrograms per milliliter
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit

R. L. James, Principal Chemist

Apr 18, 1995
Date Reported

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8015/8020 Modified Analysis Report

Attention:	Mr. Andrew Lush Lush Geosciences 3560 Business Drive, Suite 120 Sacramento, CA 95820	Date Sampled: Date Received: Date Analyzed:	Apr 11, 1995 Apr 12, 1995 Apr 13, 1995
Project #:		Project Name:	Beck Roofing
Client ID:	MW-3	LAB ID:	ST95-04-276A
Matrix:	Water	Dilution:	1 : 1

Name	Amount	Detection Limits	Units
Benzene	88	0.3	ug/L
Toluene	1.4	0.3	ug/L
Ethylbenzene	33	0.3	ug/L
Xylenes	27	0.3	ug/L
TPHgas	1800	50	ug/L

Surrogate % Recovery of Trifluorotoluene = 108%

ppb = parts per billion = ug/L = micrograms per Liter
ppm= parts per million = ug/mL = micrograms per milliliter
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

Apr 18, 1995
Date Reported

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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8015/8020 Modified Analysis Report

Attention:	Mr. Andrew Lush Lush Geosciences 3560 Business Drive, Suite 120 Sacramento, CA 95820	Date Sampled: Date Received: Date Analyzed:	Apr 11, 1995 Apr 12, 1995 Apr 13, 1995
Project #:		Project Name:	Beck Roofing
Client ID:	MW-4	LAB ID:	ST95-04-277A
Matrix:	Water	Dilution:	1 : 1

Name	Amount	Detection Limits	Units
Benzene	ND	0.3	ug/L
Toluene	ND	0.3	ug/L
Ethylbenzene	ND	0.3	ug/L
Xylenes	ND	0.3	ug/L
TPHgas	ND	50	ug/L

Surrogate % Recovery of Trifluorotoluene = 88%

ppb = parts per billion = ug/L = micrograms per Liter
ppm= parts per million = ug/mL = micrograms per milliliter
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

Apr 18, 1995
Date Reported

SPARGER TECHNOLOGY ANALYTICAL LABORATORY, INC. IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
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8020 Modified Laboratory Control Spike (LCS) & Laboratory Control Spike Duplicate (LCSD) BTEX Analysis Report

Attention:	Mr. Andrew Lush Lush Geosciences 3560 Business Drive, Suite 120 Sacramento, CA 95820	Date Sampled: Date Received: Date Analyzed:	Apr 11, 1995 Apr 12, 1995 Apr 13, 1995
Project ID:		Project Name:	Beck Roofing
Client ID:	LCS/LCSD	LAB ID:	ST95-04-013 LCS ST95-04-013 LCSD
Matrix:	Water	Dilution:	

Name	Conc. Spike Added	Sample Result	LCS Result	LCSD Result	Units	LCS % Recovery	LCSD % Recovery	% RPD Recovery
Benzene	30 ppb	ND	30	31	ug/L	100%	103%	3%
Toluene	30 ppb	ND	29	31	ug/L	97%	103%	7%
Ethylbenzene	30 ppb	ND	29	32	ug/L	97%	107%	10%
Xylenes	30 ppb	ND	29	31	ug/L	97%	103%	7%

Surrogate % Recovery of Trifluorotoluene = 88% LCS 109% LCSD

ppb = parts per billion = ug/L = micrograms per Liter
ppm= parts per million = ug/mL = micrograms per milliliter
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit

R. L. James, Principal Chemist

Apr 18, 1995
Date Reported

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8020 Modified Matrix Spike (MS) & Matrix Spike Duplicate (MSD)
BTEX Analysis Report

Attention:	Mr. Andrew Lush Lush Geosciences 3560 Business Drive, Suite 120 Sacramento, CA 95820	Date Sampled: Date Received: Date Analyzed:	Apr 11, 1995 Apr 12, 1995 Apr 13, 1995
Project ID:		Project Name:	Beck Roofing
Client ID:	MS/MSD (Batch)	LAB ID:	ST95-04-299A MS ST95-04-299A MSD
Matrix:	Water	Dilution:	

Name	Conc. Spike Added	Sample Result	MS Result	MSD Result	Units	MS % Recovery	MSD % Recovery	% RPD Recovery
Benzene	30 ppb	ND	31	33	ug/L	103%	110%	6%
Toluene	30 ppb	ND	30	32	ug/L	100%	107%	6%
Ethylbenzene	30 ppb	ND	31	32	ug/L	103%	107%	3%
Xylenes	30 ppb	ND	31	31	ug/L	103%	103%	0%

Surrogate % Recovery of Trifluorotoluene = 100% MS 96% MSD

ppb = parts per billion = ug/L = micrograms per liter
ppm= parts per million = ug/ml = micrograms per milliliter
ND = Not Detected Compound(s) may be present at concentrations below the detection limit

R. L. James, Principal Chemist

Apr 18, 1995
Date

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