

100 Pine Street, 10th Floor
San Francisco, CA 94111
(415) 434-9400 • FAX (415) 434-1365



31 October 1991
Project 1459.05

91 NOV -5 PM 1:20

Mr. John Adams, Project Manager
Kaiser Foundation Health Plan
1950 Franklin Street, 11th Floor
Oakland, California 94612-2998

Subject: Groundwater Monitoring Report: April-September 1991
Kaiser Permanente Medical Center
280 West MacArthur Boulevard
Oakland, California

Dear Mr. Adams:

Enclosed is the subject report for groundwater monitoring at the Kaiser Permanente Medical Center construction site behind the hospital on Broadway. One copy of this report should be sent to Ms. Susan Hugo at the Alameda County Department of Health Services, and one to Mr. Rich Hyatt at the California Regional Water Quality Control Board, San Francisco Bay Region.

We appreciate the opportunity to provide our consulting engineering services to Kaiser. Please contact either of the undersigned if you have any questions or require further information.

Sincerely yours,

GEOMATRIX CONSULTANTS, INC.

A handwritten signature in cursive script that reads "Cheri D. Young".

Cheri D. Young
Project Geologist

A handwritten signature in cursive script that reads "Tom Graf".

Tom Graf, P.E.
Principal Engineer

CDY/TG/bp
CONTR/1459-SEP.LTR

Enclosure

cc: Mr. Ken Ayers - Kaiser Permanente Medical Center
Ms. Fonda Karelitz - Kaiser Foundation Health Plan
Mr. Tom Wilkes - Kaiser Permanente Medical Center
Mr. Mark Zemelman - Kaiser Foundation Health Plan

Geomatrix Consultants, Inc.
Engineers, Geologists, and Environmental Scientists



**GROUNDWATER MONITORING REPORT
APRIL-SEPTEMBER 1991**

Kaiser Permanente Medical Center
280 West MacArthur Boulevard
Oakland, California

Prepared for

Kaiser Foundation Health Plan
1950 Franklin Street, 11th Floor
Oakland, California 94612

31 October 1991
Project 1459.05

Geomatrix Consultants

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GROUNDWATER MONITORING REPORT APRIL-SEPTEMBER 1991

**Kaiser Permanente Medical Center
280 West MacArthur Boulevard
Oakland, California**

1.0 INTRODUCTION

At the request of Kaiser Foundation Health Plan (Kaiser), Geomatrix Consultants, Inc. (Geomatrix), conducted groundwater monitoring activities between April and September 1991 at the Kaiser Permanente Medical Center (Kaiser Hospital) at 280 W. MacArthur Boulevard in Oakland, California (Figure 1). These activities constitute the second and third quarters of the requested four quarters of groundwater sampling. Previous efforts, including results of the first quarter's groundwater monitoring, are reported in "Site Characterization and Remediation: Mineral Spirits in Soil," dated 5 April 1991 (Geomatrix, 1991). Additional previous soil investigations were reported in "Site Characterization Report: Mineral Spirits in Soil," dated May 1990 (Geomatrix, 1990).

During the six-month period from April through September 1991, groundwater from the monitoring wells was collected and analyzed twice, and water levels were measured monthly. This report describes these activities and the results.

2.0 GROUNDWATER ELEVATIONS

The six project monitoring wells are shown on Figure 2. Depths to groundwater were measured in all six wells on 11 April, 6 May, 11 June, 24 July, 14 August, and 11 September 1991; these water levels were recorded to the nearest 0.01 foot. Water levels were measured from the surveyed measuring point with an electric sounder or a steel tape that was washed with laboratory-grade detergent (Alconox) and water between measurements. Groundwater elevation data are summarized in Table 1. Potentiometric surface maps based on these data are presented as Figures 3 through 8.

3.0 GROUNDWATER SAMPLING

Quarterly sampling for the two quarters was performed on 12 June and 11 September 1991. The sampling methodology and results are described below.

3.1 METHODOLOGY

Before sampling the groundwater, the wells were purged using a stainless steel bailer. All equipment entering monitoring wells was washed with Alconox and rinsed with distilled water before each use. To obtain groundwater representative of site conditions, the wells were purged until the temperature, pH, and specific conductance of the purged groundwater had stabilized and at least four casing volumes had been removed. Groundwater purged from the monitoring wells was placed in a labeled 55-gallon drum on site for temporary storage.

After the monitoring wells were purged, groundwater samples were collected using a clean Teflon bailer. The samples were placed in an ice-cooled chest for delivery to the analytical laboratory under Geomatrix chain-of-custody procedures.

Samples were analyzed by Anamatrix, Inc., of San Jose. Mineral spirits were analyzed by modified EPA Method 8015; volatile organic compounds (VOCs) were analyzed by EPA Method 8240; and semivolatile organic compounds were analyzed by EPA Method 8270. Analytical results are summarized in Table 2. Copies of the laboratory analytical reports and chain-of-custody records are included in Appendix A.

3.2 RESULTS

During the June monitoring event, groundwater samples were collected from MW-2, MW-3, MW-5, and MW-6 for analysis of mineral spirits, and from MW-2 and MW-5 for analysis of VOCs. There was insufficient water in well MW-6 to collect a sample for analysis of semivolatile organic compounds, and there was insufficient water in wells MW-1 and MW-4 to collect any samples during this monitoring event. During the

September sampling event groundwater samples were collected from wells MW-1, MW-2, MW-3, and MW-5 for analysis of mineral spirits, and from wells MW-1, MW-2 and MW-5 for VOC analyses. There was insufficient water in wells MW-4 and MW-6 to collect samples during this sampling round.

Table 2 summarizes the analyses performed and the results for the current quarters as well as all monitoring events to date. No mineral spirits or the related compounds of benzene, toluene, xylene, and ethylbenzene detected in any on-site wells in June or September 1991.

4.0 ESTIMATED SCHEDULE

The following activities are scheduled for October 1991 through February 1992.

- (1) Water levels will be measured monthly in all project monitoring wells.
- (2) The fourth quarter of groundwater samples are scheduled to be collected from all wells in mid-December for analysis of mineral spirits. In addition, any wells in which samples have had detectable concentrations of volatile or semivolatile organic compounds, or which never have been sampled for organic compounds, are also scheduled to be sampled for these compounds.
- (3) A final report will be prepared summarizing the year of quarterly sampling and Geomatrix's conclusions regarding the effectiveness of the monitoring network and whether further sampling is needed. The report, which is scheduled for completion approximately six weeks after the fourth groundwater sampling event is performed, should be submitted to the Alameda County Health Agency and the Regional Water Quality Control Board, San Francisco Bay Region.

5.0 REFERENCES

Geomatrix Consultants, Inc., 1991, Site Characterization and Remediation: Mineral Spirits in Soil; Kaiser Permanente Medical Center, 280 W. MacArthur Boulevard, Oakland, California, 5 April 1991.

Geomatrix Consultants, Inc., 1990, Site Characterization Report: Mineral Spirits in Soil, Kaiser Permanente Medical Center, 280 W. MacArthur Boulevard, Oakland, California, 8 May 1990.

TABLE 1

WATER-LEVEL MEASUREMENTS
November 1990 through September 1991
Kaiser Permanente Medical Center
Oakland, California

Date	Well I.D.	Measuring Point Elevation (ft.)	Depth to Water (ft.)	Groundwater Elevation (ft.)
11/19/90	MW-1	71.78	5.19	66.59
	MW-2	82.10	20.70	61.40
	MW-3	102.04	40.52	61.52
	MW-4	82.57	dry	--
11/20/90	MW-1	71.78	5.20	66.58
	MW-2	82.10	20.42	61.68
	MW-3	102.04	41.08	60.96
	MW-4	82.57	dry	--
11/26/90	MW-1	71.78	4.73	67.05
	MW-2	82.10	20.34	61.76
	MW-3	102.04	40.25	61.79
	MW-4	82.57	dry	--
1/2/91	MW-1	71.78	5.13	66.65
	MW-2	82.10	20.15	61.95
	MW-3	102.04	40.11	61.93
	MW-4	82.57	dry	--
2/7/91	MW-1	71.78	5.67	66.11
	MW-2	82.10	19.96	62.14
	MW-3	102.04	40.07	61.97
	MW-4	82.57	dry	--
	MW-5	71.81	10.62	61.19
	MW-6	71.82	6.29	65.53
3/7/91	MW-1	71.78	5.40	66.38
	MW-2	82.10	19.70	62.40

TABLE 1

WATER-LEVEL MEASUREMENTS

Date	Well I.D.	Measuring Point Elevation (ft.)	Depth to Water (ft.)	Groundwater Elevation (ft.)
	MW-3	102.04	39.55	62.49
	MW-4	82.57 ¹	18.39	64.18
	MW-5	71.81	9.76	62.05
	MW-6	71.82	5.77	66.05
4/11/91	MW-1	71.78	5.14	66.64
	MW-2	82.10	17.97	64.13
	MW-3	102.04	38.05	63.99
	MW-4	82.58 ²	16.85	65.73
	MW-5	71.81	8.43	63.38
	MW-6	71.82	5.57	66.25
5/6/91	MW-1	71.78	6.14	65.64
	MW-2	82.10	18.85	63.25
	MW-3	102.04	38.62	63.42
	MW-4	82.58	18.49	64.09
	MW-5	71.81	9.19	62.62
	MW-6	71.82	6.74	65.08
6/11/91	MW-1	71.78	dry	--
	MW-2	82.10	19.56	62.54
	MW-3	102.04	39.25	62.79
	MW-4	82.58	19.35	63.23
	MW-5	71.81	7.57	62.04
	MW-6	71.82	9.77	64.25
7/24/91	MW-1	71.78	5.75	66.03
	MW-2	82.10	20.17	61.93
	MW-3	102.04	39.62	62.42
	MW-4	82.58	19.85	62.73

TABLE 1
WATER-LEVEL MEASUREMENTS

Date	Well I.D.	Measuring Point Elevation (ft.)	Depth to Water (ft.)	Groundwater Elevation (ft.)
	MW-5	71.81	9.88	61.93
	MW-6	71.82	7.68	64.14
8/14/91	MW-1	71.78	5.32	66.46
	MW-2	82.10	20.17	61.93
	MW-3	102.04	39.81	62.23
	MW-4	82.58	19.71	62.87
	MW-5	71.81	10.30	61.51
	MW-6	71.82	8.79	63.03
9/11/91	MW-1	71.78	5.80	65.98
	MW-2	82.10	20.53	61.57
	MW-3	102.04	40.22	61.91
	MW-4	82.58 ¹	dry	--
	MW-5	71.81	10.67	61.14
	MW-6	71.82	8.95	62.87

¹ Top of casing cracked.

² Measuring point resurveyed on 11 April 1991 by Bates and Bailey Land Surveyors of Berkeley, California.

TABLE 2

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER¹
 November 1990 through September 1991
 Kaiser Permanente Medical Center
 Oakland, California

Concentrations in micrograms per liter ($\mu\text{g/l}$) or parts per billion (ppb)

Well No.	Date Sampled	Mineral Spirits	Benzene	Toluene	Ethyl-benzene	Xylenes	EPA Method 8240 Compounds Detected ²	EPA Method 8270 Compounds Detected
MW-1	11/20/90	<1000 ³	<0.5	<0.5	<0.5	<0.5	-- ⁴	--
	1/2/91	--	--	--	--	--	--	None
	1/4/91	--	--	--	--	--	6.0 Chloroform	--
	2/7/91	<50	<0.5	<0.5	<0.5	<0.5	8.0 1,1,-DCA	--
	3/7/91	<50	--	--	--	--	--	--
	6/12/91	-- ⁷	-- ⁷	-- ⁷	-- ⁷	-- ⁷	-- ⁷	--
	9/11/91	<50	<0.5	<0.5	<0.5	<0.5	None	--
MW-2	11/29/90	<50	<0.5	<0.5	<0.5	<0.5	--	--
	1/3/91	--	--	--	--	--	7.0 PCE 7.0 Freon 11	--
	1/4/91	--	--	--	--	--	--	None ⁵
	2/7/91	<50	<0.5	<0.5	<0.5	<0.5	None	--
	3/7/91	<50	--	--	--	--	--	None
	6/12/91	<50	<0.5	<0.5	<0.5	<0.5	9.0 Freon 11	None
	9/11/91	<50	<0.5	<0.5	<0.5	<0.5	8.0 Freon 11 3.0 Chloroform 11.0 PCE	-- ⁷
MW-3	11/27/90	<50	<0.5	0.6	<0.5	2.3	--	--
	1/3/91	--	--	--	--	--	None	None
	2/7/91	<50	<0.5	<0.5	<0.5	<0.5	--	--
	6/12/91	<50	<0.5	<0.5	<0.5	<0.5	--	--
	9/11/91	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-4	3/11/91	<50	<0.5	<0.5	<0.5	<0.5	9.0 PCE	-- ⁷
	6/12/91	-- ⁷	-- ⁷	-- ⁷	-- ⁷	-- ⁷	-- ⁷	-- ⁷
	9/11/91	-- ⁷	-- ⁷	-- ⁷	-- ⁷	-- ⁷	-- ⁷	-- ⁷
MW-5	2/1/91	<50	-- ⁶	-- ⁶	-- ⁶	-- ⁶	25 Freon 11	None
	2/25/91	--	<0.5	<0.5	<0.5	<0.5	--	--
	3/7/91	<50	<0.5	<0.5	<0.5	<0.5	24 Freon 11	--
	6/12/91	<50	<0.5	<0.5	<0.5	<0.5	26 Freon 11	--
	9/11/91	<50	<0.5	<0.5	<0.5	<0.5	16.0 Freon 11 3.0 PCE	--

TABLE 2

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER¹

Concentrations in micrograms per liter ($\mu\text{g/l}$) or parts per billion (ppb)

Well No.	Date Sampled	Mineral Spirits	Benzene	Toluene	Ethyl-benzene	Xylenes	EPA Method 8240 Compounds Detected ²	EPA Method 8270 Compounds Detected
MW-6	2/1/91	<50	-- ⁶	-- ⁶	-- ⁶	-- ⁶	--	--
	3/7/91	<50	<0.5	<0.5	<0.5	<0.5	None	-- ⁷
	6/12/91	<50	<0.5	<0.5	<0.5	<0.5	--	-- ⁷
	9/11/91	-- ⁷	-- ⁷	-- ⁷	-- ⁷	-- ⁷	-- ⁷	-- ⁷

¹ Total petroleum hydrocarbons as mineral spirits were analyzed by EPA Methods 5030/8015; benzene, toluene, ethylbenzene, and xylenes (BTEX) were analyzed by modified EPA Method 8020. All samples were analyzed by Anamatrix, Inc., except the MW-1 sample on 11/20/90, which was analyzed by BC Analytical. Laboratory reports, including detection limits are included in Appendix A.

² 1,1-DCA = 1,1-dichloroethane; PCE = tetrachloroethane; Freon 11 - trichlorofluoromethane.

³ A hydrocarbon was detected in the sample at a concentration of 150 mg/l or ppm by BC Analytical. Based on a fingerprint characterization using gas chromatography, Friedman and Bruya, Inc., characterized the compound as a naturally occurring biogenic hydrocarbon and did not identify any mineral spirits in the sample.

⁴ -- not analyzed

⁵ Sample volume was 400 ml instead of 1000 ml because of limited well recharge. Detection limits therefore ranged from 25 to 120 ppb instead of 10 to 50 ppb as is typical with EPA Method 8270 analyses.

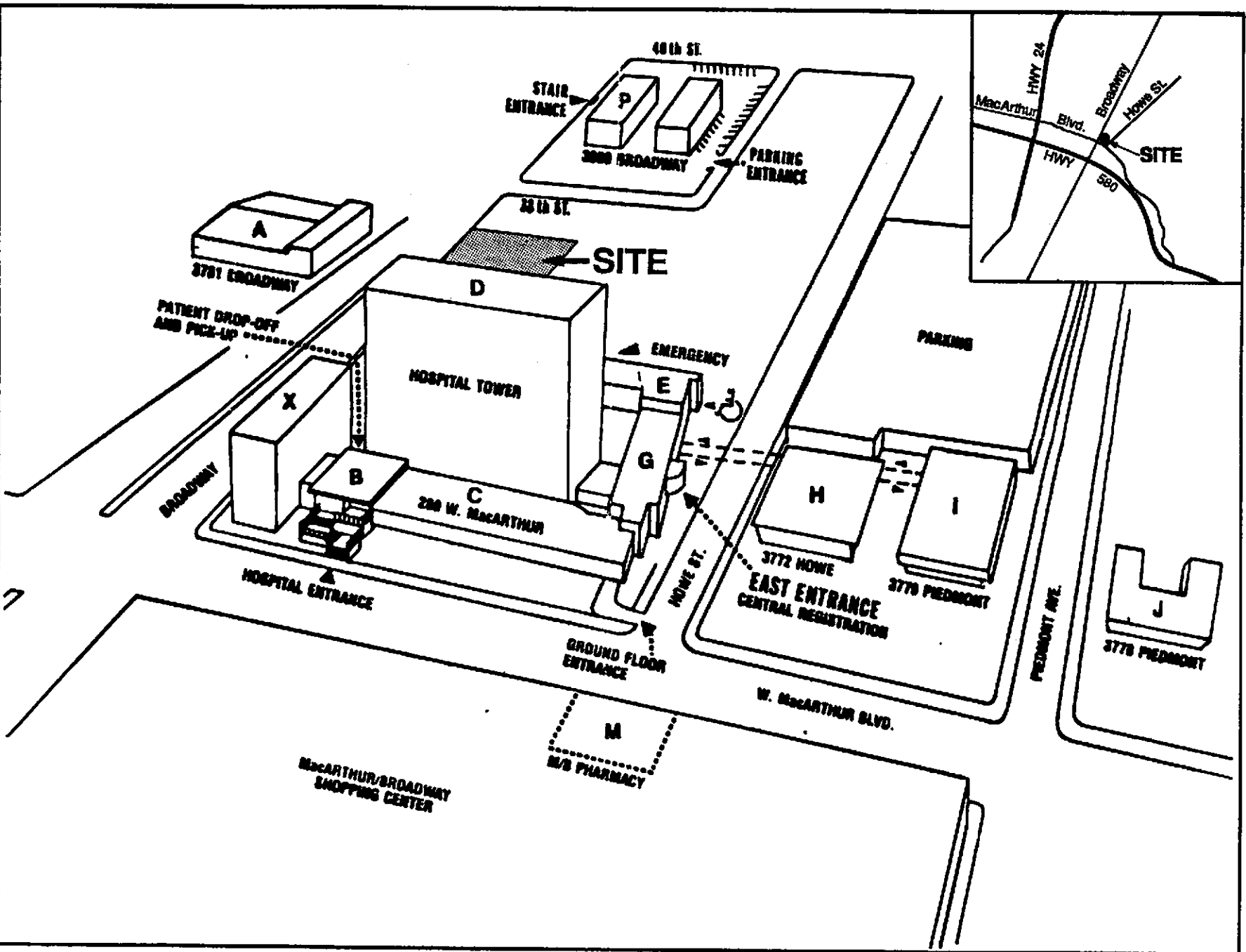
⁶ Analyzed four days after the 14-day holding time, with no BTEX detected.

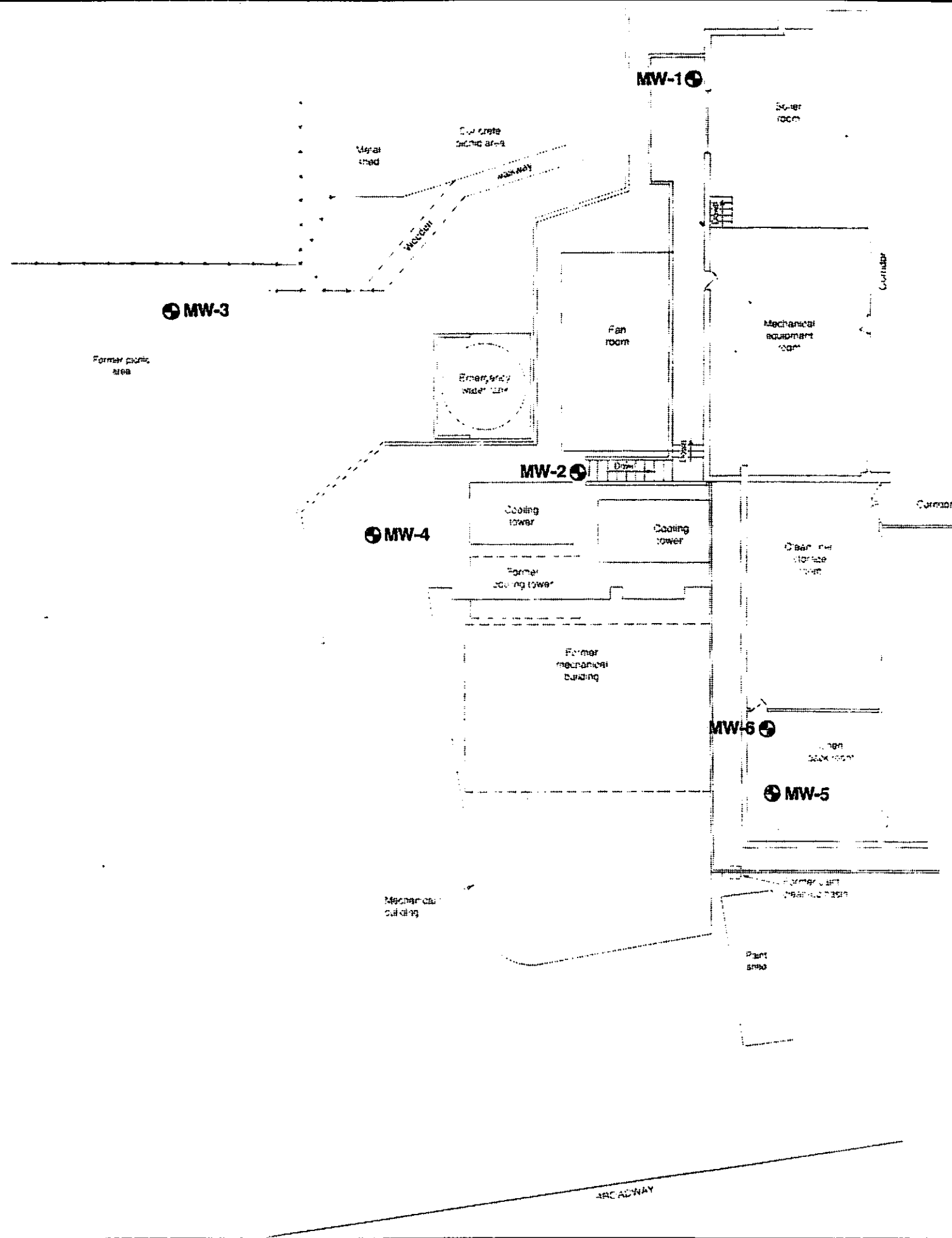
⁷ Insufficient water available for this analysis.



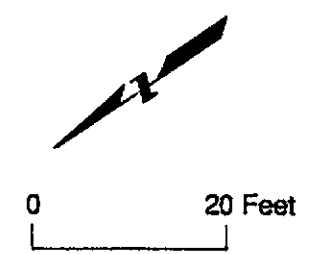
SITE LOCATION
Kaiser Hospital
Oakland, California


Figure
1
Project No.
1459.05

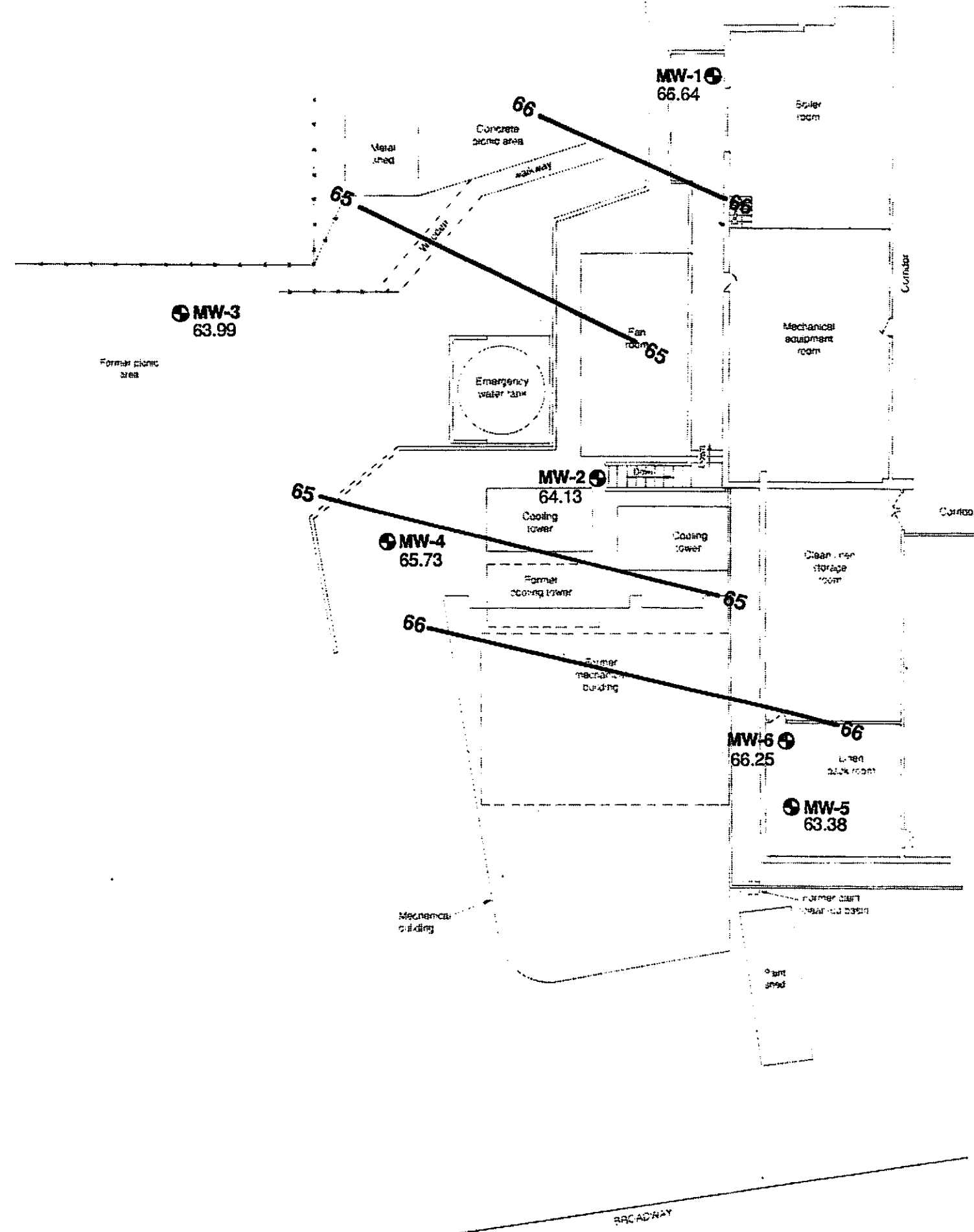




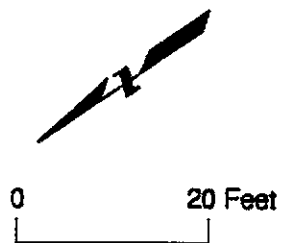
KEY
 MW-1 ⊕ Groundwater monitoring well




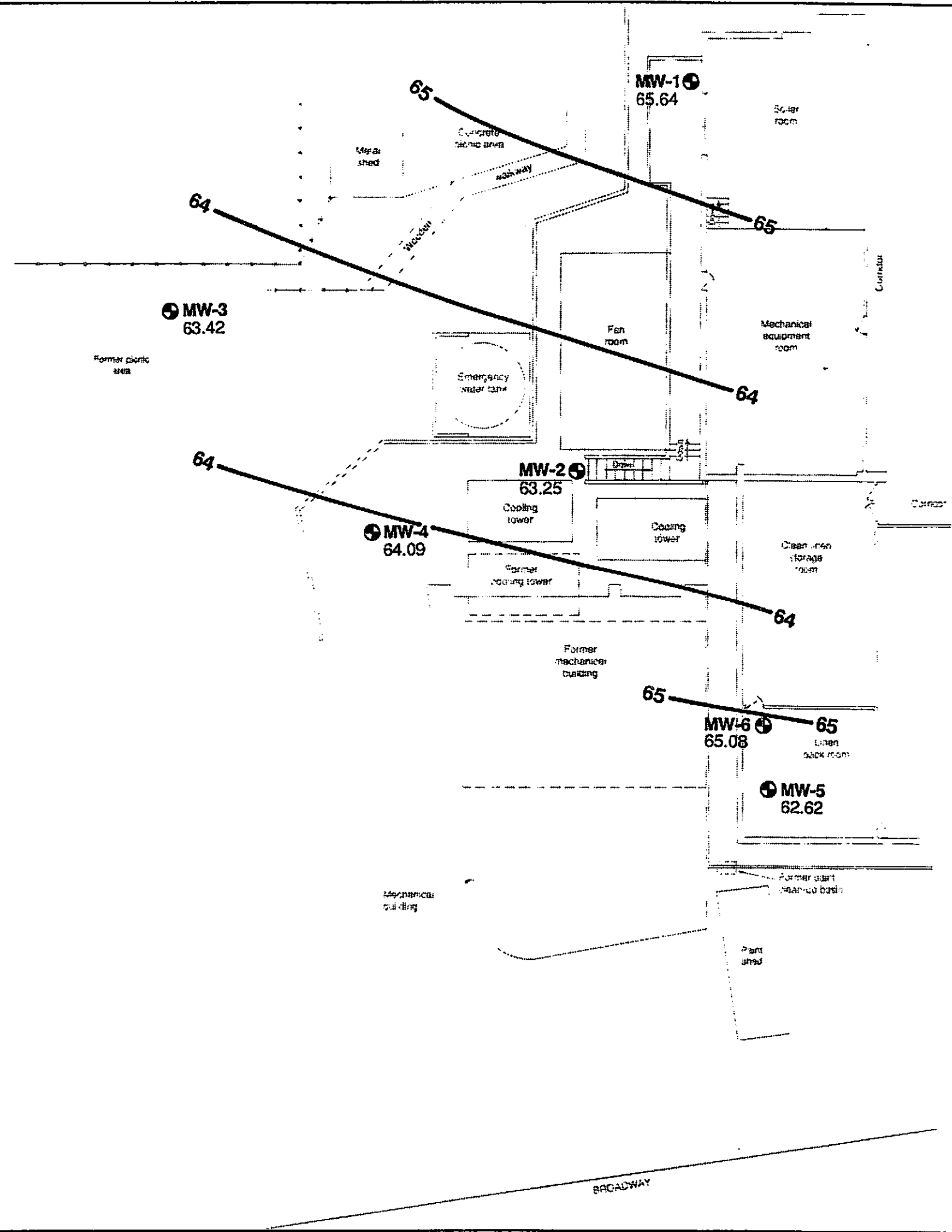
SITE PLAN MONITORING WELL LOCATIONS Kaiser Permanente Medical Center Oakland, California		
 GEOMATRIX	Project No. 1459.05	Figure 2



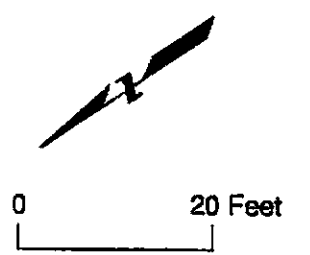
- EXPLANATION**
- 66 — Line of equal elevation of groundwater on 11 April 1991 in first encountered groundwater zone
 - MW-1 ⊕ 66.64 — Groundwater monitoring well with groundwater elevation on 11 April 1991




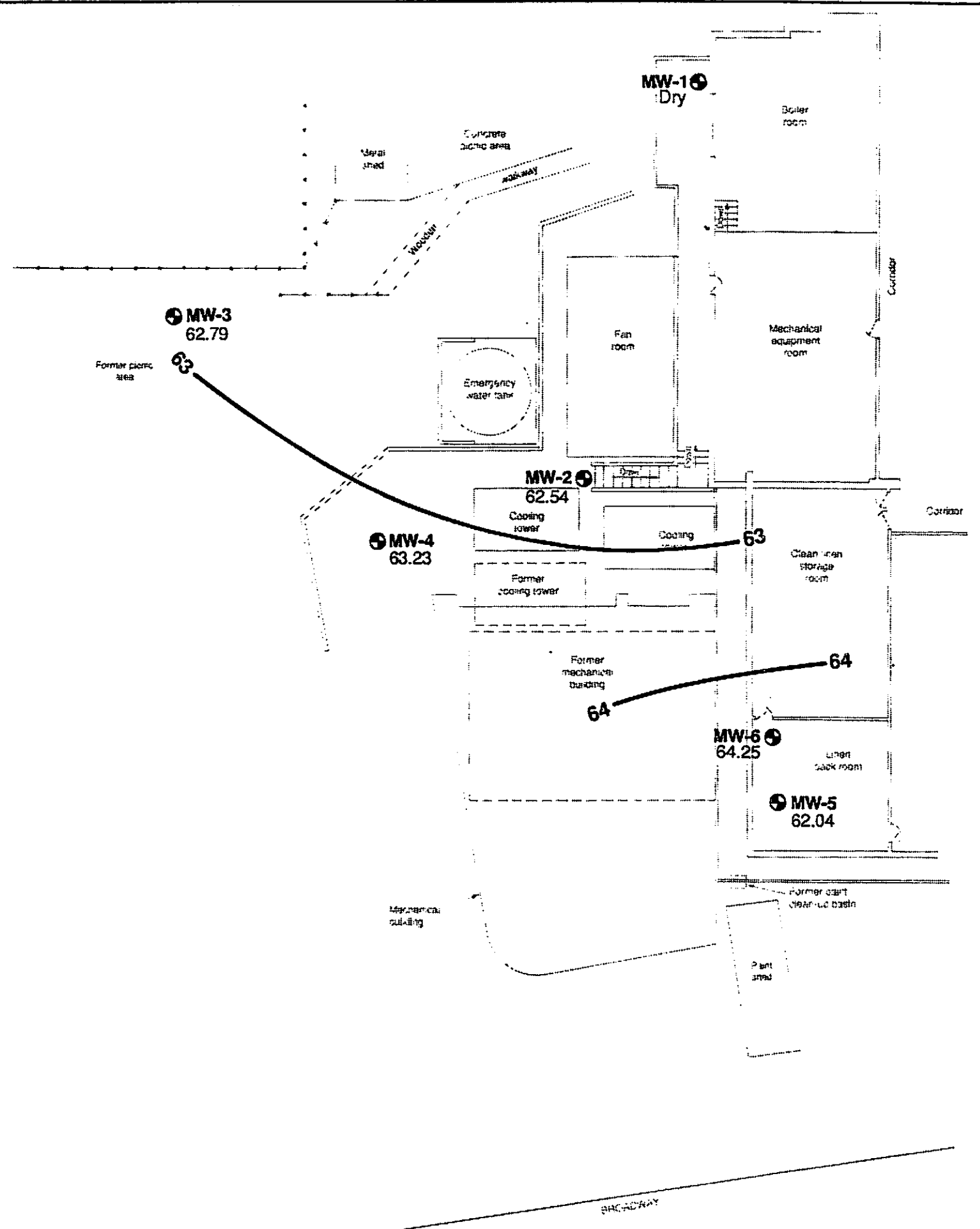
POTENTIOMETRIC SURFACE MAP 11 APRIL 1991 Kaiser Permanente Medical Center Oakland, California		
 GEOMATRIX	Project No. 1459.05	Figure 3



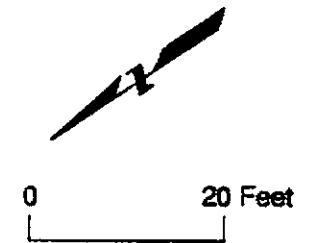
- EXPLANATION**
- 65 ——— Line of equal elevation of groundwater on 6 May 1991 in first encountered groundwater zone
 - MW-1 ⊕ 65.64 Groundwater monitoring well with groundwater elevation on 6 May 1991




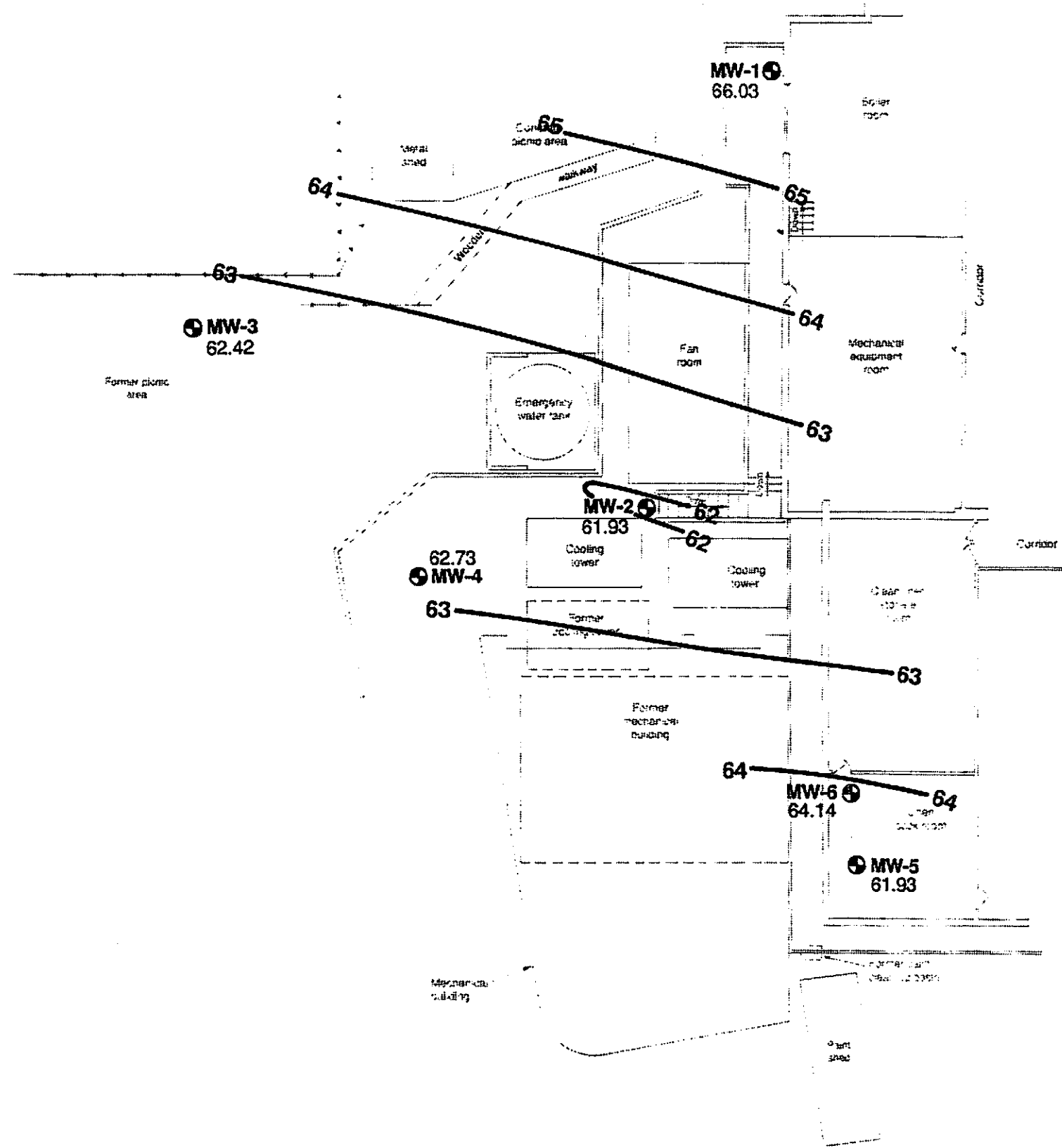
POTENTIOMETRIC SURFACE MAP 6 MAY 1991 Kaiser Permanente Medical Center Oakland, California		
 GEOMATRIX	Project No. 1459.05	Figure 4



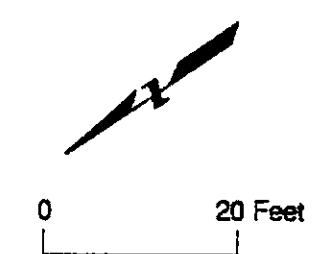
- EXPLANATION**
- 63** ——— Line of equal elevation of groundwater on 11 June 1991 in first encountered groundwater zone
 - MW-2** ⊕ 62.79 Groundwater monitoring well with groundwater elevation on 11 June 1991




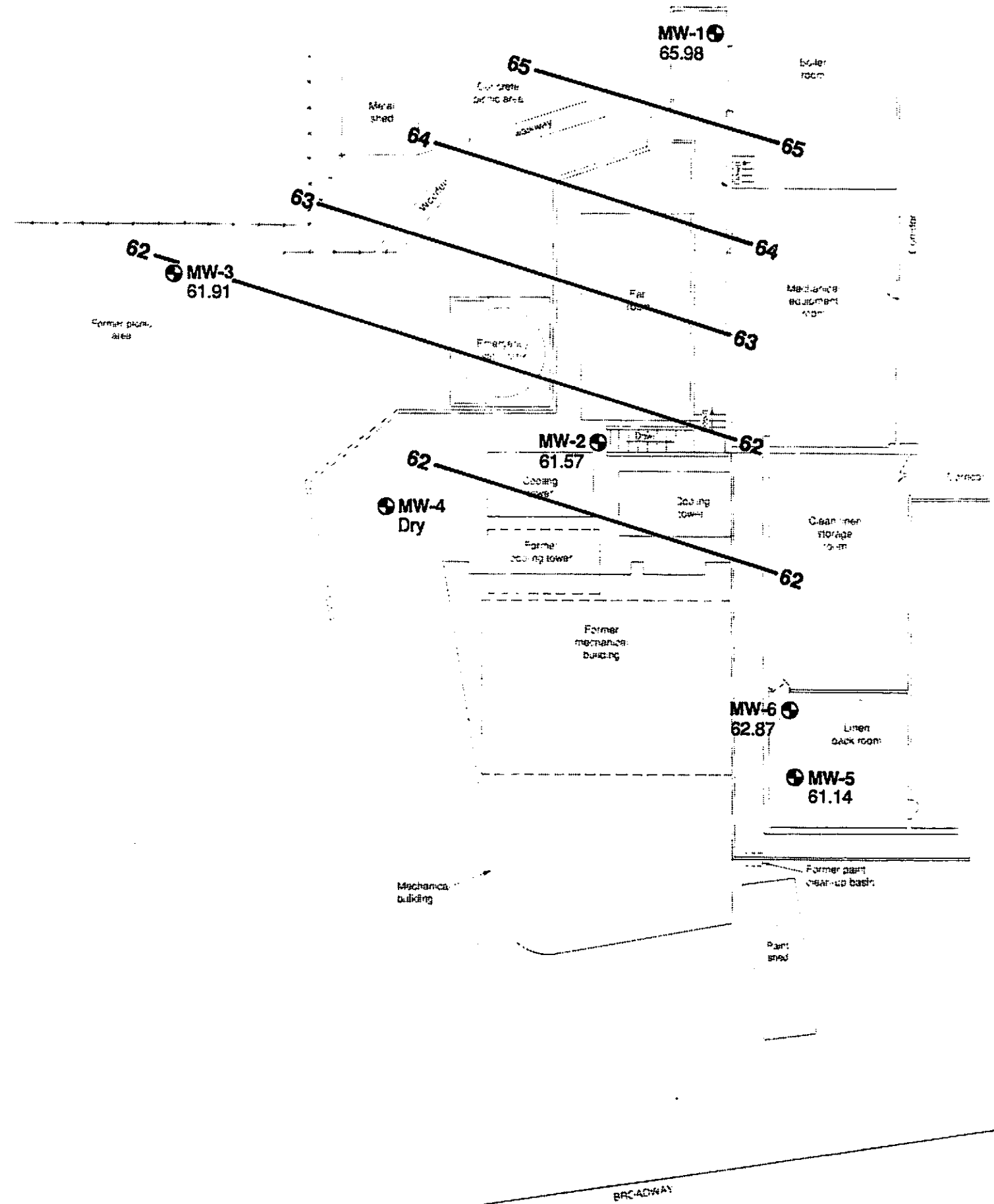
POTENTIOMETRIC SURFACE MAP 11 JUNE 1991 Kaiser Permanente Medical Center Oakland, California		
 GEOMATRIX	Project No. 1459.05	Figure 5



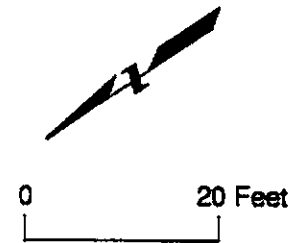
- EXPLANATION**
- 65 ——— Line of equal elevation of groundwater on 24 July 1991 in first encountered groundwater zone
 - MW-1 ⊕ Groundwater monitoring well with groundwater elevation on 24 July 1991




POTENTIOMETRIC SURFACE MAP 24 JULY 1991 Kaiser Permanente Medical Center Oakland, California		
 GEOMATRIX	Project No. 1459.05	Figure 6



- EXPLANATION**
- Line of equal elevation of groundwater on 11 September 1991 in first encountered groundwater zone
 - MW-1 ⊕ 65.98 Groundwater monitoring well with groundwater elevation on 11 September 1991



POTENTIOMETRIC SURFACE MAP 11 SEPTEMBER 1991 Kaiser Permanente Medical Center Oakland, California		
 GEOMATRIX	Project No. 1459.05	Figure 8

APPENDIX A

**ANALYTICAL LABORATORY REPORTS AND
CHAIN-OF-CUSTODY RECORDS FOR GROUNDWATER SAMPLES**

ANAMETRIX INC

Environmental & Analytical Chemistry
 1961 Concourse Drive, Suite E, San Jose, CA 95131
 (408) 432-8192 • Fax (408) 432-8198

**REPORT**

MS. CHERI YOUNG
 GEOMATRIX CONSULTANTS - SAN FRANCISCO
 ONE MARKET PLAZA, SPEAR ST. TOWER STE 717
 SAN FRANCISCO, CA 94105

Workorder # : 9106142
 Date Received : 06/12/91
 Project ID : 1459.05
 Purchase Order: N/A

The following samples were received at Anamatrix, Inc. for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9106142- 1	MW2
9106142- 2	MW3
9106142- 3	MW5
9106142- 4	MW6

This report consists of 12 pages not including the cover letter, and is organized in sections according to the specific Anamatrix laboratory group or section which performed the analysis(es) and generated the data. The Report Summary that precedes each section will help you determine which Anamatrix group is responsible for those test results, and will bear the signatures of the department supervisor and the chemist who have reviewed the analytical data. Please refer all questions to the department supervisor who signed the form.

Anamatrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234. A detailed list of the approved fields of testing can be obtained by calling our office, or the DHS Environmental Laboratory Accreditation Program at (415)540-2800.

If you have any further questions or comments on this report, please give us a call as soon as possible. Thank you for using Anamatrix.

Sarah Schoen

 Sarah Schoen, Ph.D.
 Laboratory Manager

6-27-91

 Date

ANAMETRIX REPORT DESCRIPTION

GCMS

Organic Analysis Data Sheets (OADS)

OADS forms contain tabulated results for target compounds. The OADS are grouped by method and, within each method, organized sequentially in order of increasing Anamatrix ID number.

Tentatively Identified Compounds (TICs)

TIC forms contain tabulated results for non-target compounds detected in GC/MS analyses. TICs must be requested at the time samples are submitted at Anamatrix. TIC forms immediately follow the OADS form for each sample. If TICs are requested but not found, then TIC forms will not be included with the report.

Surrogate Recovery Summary (SRS)

SRS forms contain quality assurance data. An SRS form will be printed for each method, if the method requires surrogate compounds. They will list surrogate percent recoveries for all samples and any method blanks. Any surrogate recovery outside the established limits will be flagged with an "*", and the total number of surrogates outside the limits will be listed in the column labelled "Total Out".

Matrix Spike Recovery Form (MSR)

MSR forms contain quality assurance data. They summarize percent recovery and relative percent difference information for matrix spikes and matrix spike duplicates. This information is a statement of both accuracy and precision. Any percent recovery or relative percent difference outside established limits will be flagged with an "*", and the total number outside the limits will be listed at the bottom of the page. Not all reports will contain an MSR form.

Qualifiers

Anamatrix uses several data qualifiers (Q) in its report forms. These qualifiers give additional information on the compounds reported. They should help a data reviewer to verify the integrity of the analytical results. The following is a list of qualifiers and their meanings:

- U - Indicates that the compound was analyzed for, but was not detected at or above the specified reporting limit.
- B - Indicates that the compound was detected in the associated method blank.
- J - Indicates that the compound was detected at an amount below the specified reporting limit. Consequently, the amount should be considered an approximate value. Tentatively identified compounds will always have a "J" qualifier because they are not included in the instrument calibration.
- E - Indicates that the amount reported exceeded the linear range of the instrument calibration.
- D - Indicates that the compound was detected in an analysis performed at a secondary dilution.
- A - Indicates that the tentatively identified compound is a suspected aldol condensation product. This is common in EPA Method 8270 soil analyses.

Absence of a qualifier indicates that the compound was detected at a concentration at or above the specified reporting limit.

REPORTING CONVENTIONS

- ◆ Due to a size limitation in our data processing step, only the first eight (8) characters of your project ID and sample ID will be printed on the report forms. However, the report cover letter and report summary pages display up to twenty (20) characters of your project and sample IDs.
- ◆ Amounts reported are gross values, i.e., not corrected for method blank contamination.

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MS. CHERI YOUNG
GEOMATRIX CONSULTANTS - SAN FRANCISCO
ONE MARKET PLAZA, SPEAR ST. TOWER STE 717
SAN FRANCISCO, CA 94105

Workorder # : 9106142
Date Received : 06/12/91
Project ID : 1459.05
Purchase Order: N/A
Department : GCMS
Sub-Department: GCMS

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9106142- 1	MW2	WATER	06/11/91	8240
9106142- 3	MW5	WATER	06/11/91	8240

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MS. CHERI YOUNG
GEOMATRIX CONSULTANTS - SAN FRANCISCO
ONE MARKET PLAZA, SPEAR ST. TOWER STE 717
SAN FRANCISCO, CA 94105

Workorder # : 9106142
Date Received : 06/12/91
Project ID : 1459.05
Purchase Order: N/A
Department : GCMS
Sub-Department: GCMS

QA/QC SUMMARY :

- No QA/QC problems encountered.


Department Supervisor 6-26-91
Date


Chemist 6-26-91
Date

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 624/8240
ANAMETRIX, INC. (408)432-8192

Project ID : 1459.05
 Sample ID : MW2
 Matrix : WATER
 Date Sampled : 6/11/91
 Date Analyzed : 6/25/91
 Instrument ID : F3

Anamatrix ID : 9106142-01
 Analyst : DP
 Supervisor : PG
 Dilution Factor : 1.00
 Conc. Units : ug/L

CAS NO.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
74-87-3	CHLOROMETHANE	10.	ND	U
75-01-4	VINYL CHLORIDE	10.	ND	U
74-83-9	BROMOMETHANE	10.	ND	U
75-00-3	CHLOROETHANE	10.	ND	U
75-69-4	TRICHLOROFLUOROMETHANE	5.	9.	U
75-35-4	1,1-DICHLOROETHENE	5.	ND	U
76-13-1	TRICHLOROTRIFLUOROETHANE	5.	ND	U
67-64-1	ACETONE	20.	ND	U
75-15-0	CARBON DISULFIDE	5.	ND	U
75-09-2	METHYLENE CHLORIDE	5.	ND	U
156-60-5	TRANS-1,2-DICHLOROETHENE	5.	ND	U
75-34-3	1,1-DICHLOROETHANE	5.	ND	U
78-93-3	2-BUTANONE	20.	ND	U
156-59-2	CIS-1,2-DICHLOROETHENE	5.	ND	U
67-66-3	CHLOROFORM	5.	ND	U
71-55-6	1,1,1-TRICHLOROETHANE	5.	ND	U
56-23-5	CARBON TETRACHLORIDE	5.	ND	U
71-43-2	BENZENE	5.	ND	U
107-06-2	1,2-DICHLOROETHANE	5.	ND	U
79-01-6	TRICHLOROETHENE	5.	ND	U
78-87-5	1,2-DICHLOROPROPANE	5.	ND	U
75-27-4	BROMODICHLOROMETHANE	5.	ND	U
110-75-8	2-CHLOROETHYL VINYL ETHER	5.	ND	U
108-05-4	VINYL ACETATE	10.	ND	U
10061-01-5	CIS-1,3-DICHLOROPROPENE	5.	ND	U
108-10-1	4-METHYL-2-PENTANONE	10.	ND	U
108-88-3	TOLUENE	5.	ND	U
10061-02-6	TRANS-1,3-DICHLOROPROPENE	5.	ND	U
79-00-5	1,1,2,-TRICHLOROETHANE	5.	ND	U
127-18-4	TETRACHLOROETHENE	5.	ND	U
591-78-6	2-HEXANONE	10.	ND	U
124-48-1	DIBROMOCHLOROMETHANE	5.	ND	U
108-90-7	CHLOROBENZENE	5.	ND	U
100-41-4	ETHYLBENZENE	5.	ND	U
1330-20-7	XYLENE (TOTAL)	5.	ND	U
100-42-5	STYRENE	5.	ND	U
75-25-2	BROMOFORM	5.	ND	U
79-34-5	1,1,2,2-TETRACHLOROETHANE	5.	ND	U
541-73-1	1,3-DICHLOROBENZENE	5.	ND	U
106-46-7	1,4-DICHLOROBENZENE	5.	ND	U
95-50-1	1,2-DICHLOROBENZENE	5.	ND	U

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 624/8240
ANAMETRIX, INC. (408)432-8192

Project ID : 1459.05
 Sample ID : MW5
 Matrix : WATER
 Date Sampled : 6/11/91
 Date Analyzed : 6/22/91
 Instrument ID : F3

Anamatrix ID : 9106142-03
 Analyst : DP
 Supervisor : PG

Dilution Factor : 1.00
 Conc. Units : ug/L

CAS NO.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
74-87-3	CHLOROMETHANE	10.	ND	U
75-01-4	VINYL CHLORIDE	10.	ND	U
74-83-9	BROMOMETHANE	10.	ND	U
75-00-3	CHLOROETHANE	10.	ND	U
75-69-4	TRICHLOROFLUOROMETHANE	5.	26.	U
75-35-4	1,1-DICHLOROETHENE	5.	ND	U
76-13-1	TRICHLOROTRIFLUOROETHANE	5.	ND	U
67-64-1	ACETONE	20.	ND	U
75-15-0	CARBON DISULFIDE	5.	ND	U
75-09-2	METHYLENE CHLORIDE	5.	ND	U
156-60-5	TRANS-1,2-DICHLOROETHENE	5.	ND	U
75-34-3	1,1-DICHLOROETHANE	5.	ND	U
78-93-3	2-BUTANONE	20.	ND	U
156-59-2	CIS-1,2-DICHLOROETHENE	5.	ND	U
67-66-3	CHLOROFORM	5.	ND	U
71-55-6	1,1,1-TRICHLOROETHANE	5.	ND	U
56-23-5	CARBON TETRACHLORIDE	5.	ND	U
71-43-2	BENZENE	5.	ND	U
107-06-2	1,2-DICHLOROETHANE	5.	ND	U
79-01-6	TRICHLOROETHENE	5.	ND	U
78-87-5	1,2-DICHLOROPROPANE	5.	ND	U
75-27-4	BROMODICHLOROMETHANE	5.	ND	U
110-75-8	2-CHLOROETHYL VINYL ETHER	5.	ND	U
108-05-4	VINYL ACETATE	10.	ND	U
10061-01-5	CIS-1,3-DICHLOROPROPENE	5.	ND	U
108-10-1	4-METHYL-2-PENTANONE	10.	ND	U
108-88-3	TOLUENE	5.	ND	U
10061-02-6	TRANS-1,3-DICHLOROPROPENE	5.	ND	U
79-00-5	1,1,2,-TRICHLOROETHANE	5.	ND	U
127-18-4	TETRACHLOROETHENE	5.	ND	U
591-78-6	2-HEXANONE	10.	ND	U
124-48-1	DIBROMOCHLOROMETHANE	5.	ND	U
108-90-7	CHLOROBENZENE	5.	ND	U
100-41-4	ETHYLBENZENE	5.	ND	U
1330-20-7	XYLENE (TOTAL)	5.	ND	U
100-42-5	STYRENE	5.	ND	U
75-25-2	BROMOFORM	5.	ND	U
79-34-5	1,1,2,2-TETRACHLOROETHANE	5.	ND	U
541-73-1	1,3-DICHLOROBENZENE	5.	ND	U
106-46-7	1,4-DICHLOROBENZENE	5.	ND	U
95-50-1	1,2-DICHLOROBENZENE	5.	ND	U

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 624/8240
 ANAMETRIX, INC. (408)432-8192

Project ID :
 Sample ID : BLANK
 Matrix : WATER
 Date Sampled : 0/ 0/ 0
 Date Analyzed : 6/22/91
 Instrument ID : F3

Anamatrix ID : 3CB0622V01
 Analyst : DP
 Supervisor : PG

Dilution Factor : 1.00
 Conc. Units : ug/L

CAS NO.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
74-87-3	CHLOROMETHANE	10.	ND	U
75-01-4	VINYL CHLORIDE	10.	ND	U
74-83-9	BROMOMETHANE	10.	ND	U
75-00-3	CHLOROETHANE	10.	ND	U
75-69-4	TRICHLOROFLUOROMETHANE	5.	ND	U
75-35-4	1,1-DICHLOROETHENE	5.	ND	U
76-13-1	TRICHLOROTRIFLUOROETHANE	5.	ND	U
67-64-1	ACETONE	20.	ND	U
75-15-0	CARBON DISULFIDE	5.	ND	U
75-09-2	METHYLENE CHLORIDE	5.	ND	U
156-60-5	TRANS-1,2-DICHLOROETHENE	5.	ND	U
75-34-3	1,1-DICHLOROETHANE	5.	ND	U
78-93-3	2-BUTANONE	20.	ND	U
156-59-2	CIS-1,2-DICHLOROETHENE	5.	ND	U
67-66-3	CHLOROFORM	5.	ND	U
71-55-6	1,1,1-TRICHLOROETHANE	5.	ND	U
56-23-5	CARBON TETRACHLORIDE	5.	ND	U
71-43-2	BENZENE	5.	ND	U
107-06-2	1,2-DICHLOROETHANE	5.	ND	U
79-01-6	TRICHLOROETHENE	5.	ND	U
78-87-5	1,2-DICHLOROPROPANE	5.	ND	U
75-27-4	BROMODICHLOROMETHANE	5.	ND	U
110-75-8	2-CHLOROETHYL VINYL ETHER	5.	ND	U
108-05-4	VINYL ACETATE	10.	ND	U
10061-01-5	CIS-1,3-DICHLOROPROPENE	5.	ND	U
108-10-1	4-METHYL-2-PENTANONE	10.	ND	U
108-88-3	TOLUENE	5.	ND	U
10061-02-6	TRANS-1,3-DICHLOROPROPENE	5.	ND	U
79-00-5	1,1,2,-TRICHLOROETHANE	5.	ND	U
127-18-4	TETRACHLOROETHENE	5.	ND	U
591-78-6	2-HEXANONE	10.	ND	U
124-48-1	DIBROMOCHLOROMETHANE	5.	ND	U
108-90-7	CHLOROBENZENE	5.	ND	U
100-41-4	ETHYLBENZENE	5.	ND	U
1330-20-7	XYLENE (TOTAL)	5.	ND	U
100-42-5	STYRENE	5.	ND	U
75-25-2	BROMOFORM	5.	ND	U
79-34-5	1,1,2,2-TETRACHLOROETHANE	5.	ND	U
541-73-1	1,3-DICHLOROBENZENE	5.	ND	U
106-46-7	1,4-DICHLOROBENZENE	5.	ND	U
95-50-1	1,2-DICHLOROBENZENE	5.	ND	U

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 624/8240
 ANAMETRIX, INC. (408)432-8192

Project ID :
 Sample ID : BLANK
 Matrix : WATER
 Date Sampled : 0/ 0/ 0
 Date Analyzed : 6/25/91
 Instrument ID : F3

Anamatrix ID : 3CB0625V04
 Analyst : DP
 Supervisor : PG
 Dilution Factor : 1.00
 Conc. Units : ug/L

CAS NO.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
74-87-3	CHLOROMETHANE	10.	ND	U
75-01-4	VINYL CHLORIDE	10.	ND	U
74-83-9	BROMOMETHANE	10.	ND	U
75-00-3	CHLOROETHANE	10.	ND	U
75-69-4	TRICHLOROFLUOROMETHANE	5.	ND	U
75-35-4	1,1-DICHLOROETHENE	5.	ND	U
76-13-1	TRICHLOROTRIFLUOROETHANE	5.	ND	U
67-64-1	ACETONE	20.	ND	U
75-15-0	CARBON DISULFIDE	5.	ND	U
75-09-2	METHYLENE CHLORIDE	5.	ND	U
156-60-5	TRANS-1,2-DICHLOROETHENE	5.	ND	U
75-34-3	1,1-DICHLOROETHANE	5.	ND	U
78-93-3	2-BUTANONE	20.	ND	U
156-59-2	CIS-1,2-DICHLOROETHENE	5.	ND	U
67-66-3	CHLOROFORM	5.	ND	U
71-55-6	1,1,1-TRICHLOROETHANE	5.	ND	U
56-23-5	CARBON TETRACHLORIDE	5.	ND	U
71-43-2	BENZENE	5.	ND	U
107-06-2	1,2-DICHLOROETHANE	5.	ND	U
79-01-6	TRICHLOROETHENE	5.	ND	U
78-87-5	1,2-DICHLOROPROPANE	5.	ND	U
75-27-4	BROMODICHLOROMETHANE	5.	ND	U
110-75-8	2-CHLOROETHYL VINYL ETHER	5.	ND	U
108-05-4	VINYL ACETATE	10.	ND	U
10061-01-5	CIS-1,3-DICHLOROPROPENE	5.	ND	U
108-10-1	4-METHYL-2-PENTANONE	10.	ND	U
108-88-3	TOLUENE	5.	ND	U
10061-02-6	TRANS-1,3-DICHLOROPROPENE	5.	ND	U
79-00-5	1,1,2,-TRICHLOROETHANE	5.	ND	U
127-18-4	TETRACHLOROETHENE	5.	ND	U
591-78-6	2-HEXANONE	10.	ND	U
124-48-1	DIBROMOCHLOROMETHANE	5.	ND	U
108-90-7	CHLOROBENZENE	5.	ND	U
100-41-4	ETHYLBENZENE	5.	ND	U
1330-20-7	XYLENE (TOTAL)	5.	ND	U
100-42-5	STYRENE	5.	ND	U
75-25-2	BROMOFORM	5.	ND	U
79-34-5	1,1,2,2-TETRACHLOROETHANE	5.	ND	U
541-73-1	1,3-DICHLOROBENZENE	5.	ND	U
106-46-7	1,4-DICHLOROBENZENE	5.	ND	U
95-50-1	1,2-DICHLOROBENZENE	5.	ND	U

SURROGATE RECOVERY SUMMARY -- EPA METHOD 624/8240
ANAMETRIX, INC. (408)432-8192

Project ID : 1459.05
Matrix : LIQUID

Anamatrix ID : 9106142
Analyst : DP
Supervisor : PG

	SAMPLE ID	SU1	SU2	SU3	TOTAL OUT
1	BLANK	94	92	101	0
2	MW5	101	91	104	0
3	BLANK	97	96	104	0
4	MW2	95	108	108	0
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

QC LIMITS

SU1 = 1,2-DICHLOROETHANE-D4 (75-113)
SU2 = TOLUENE-D8 (83-110)
SU3 = BROMOFLUOROBENZENE (82-114)

* Values outside of Anamatrix QC limits

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MS. CHERI YOUNG
GEOMATRIX CONSULTANTS - SAN FRANCISCO
ONE MARKET PLAZA, SPEAR ST. TOWER STE 717
SAN FRANCISCO, CA 94105

Workorder # : 9106142
Date Received : 06/12/91
Project ID : 1459.05
Purchase Order: N/A
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9106142- 1	MW2	WATER	06/11/91	TPHg/BTEX
9106142- 2	MW3	WATER	06/11/91	TPHg/BTEX
9106142- 3	MW5	WATER	06/11/91	TPHg/BTEX
9106142- 4	MW6	WATER	06/11/91	TPHg/BTEX

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MS. CHERI YOUNG
GEOMATRIX CONSULTANTS - SAN FRANCISCO
ONE MARKET PLAZA, SPEAR ST. TOWER STE 717
SAN FRANCISCO, CA 94105

Workorder # : 9106142
Date Received : 06/12/91
Project ID : 1459.05
Purchase Order: N/A
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- No QA/QC problems encountered for this workorder.

Cheryl Balmer 6/26/91
Department Supervisor Date

Cheri Young 6/26/91
Chemist Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(GASOLINE WITH BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9106142
Matrix : WATER
Date Sampled : 06/11/91

Project Number : 1459.05
Date Released : 06/26/91

Reporting Limit	Sample I.D.# MW2	Sample I.D.# MW3	Sample I.D.# MW5	Sample I.D.# MW6	Sample I.D.# 04B0621A
COMPOUNDS (ug/L)	-01	-02	-03	-04	BLANK
Benzene	0.5	ND	ND	ND	ND
Toluene	0.5	ND	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND	ND
TPH as Mineral Spirits	50	ND	ND	ND	ND
% Surrogate Recovery	90%	83%	88%	83%	96%
Instrument I.D.	HP4	HP4	HP4	HP4	HP4
Date Analyzed	06/21/91	06/21/91	06/21/91	06/21/91	06/21/91
RLMF	1	1	1	1	1

- ND - Not detected at or above the practical quantitation limit for the method.
- TPHg - Total Petroleum Hydrocarbons as mineral spirits is determined by GCFID using EPA Method 5030.
- BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020.
- RLMF - Reporting Limit Multiplication Factor.
Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 53-147%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Ci Fu 6.26.91
Analyst Date

Cheryl Baeman 6/26/91
Supervisor Date

TOTAL VOLATILE HYDROCARBON MATRIX SPIKE REPORT
 EPA METHOD 5030 WITH GC/FID
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 1459.05 MW6
 Matrix : WATER
 Date sampled : 06/11/91
 Date analyzed : 06/21/91

Anamatrix I.D. : 9106142-04
 Analyst : CF.
 Supervisor : *CS*
 Date Released : 06/26/91

COMPOUND	SPIKE AMT. (UG/L)	MS (UG/L)	%REC MS	MSD (UG/L)	%REC MSD	RPD	%REC LIMITS
MINERAL SPIRITS	1000	1000	100%	1200	120%	18%	48-145
P-BFB			114%		117%		53-147

* Limits established by Anamatrix, Inc.

15
12/11/91

9106142

04688 (2)

GEOMATRIX CONSULTANTS

ONE MARKET PLAZA
SPEAR STREET TOWER SUITE 717
SAN FRANCISCO, CALIFORNIA 94105
(415) 957-9557

Chain of Custody Record

DATE 6/12/91 PAGE 1 OF 1

PROJECT NO.
1459.05

ANALYSES

SAMPLERS: (SIGNATURE)
Mark obloy

REMARKS

(SAMPLE PRESERVATION,
HANDLING PROCEDURES,
OBSERVATIONS, ETC.)

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS	TPH as Mineral Spirits	BTEX	8240	NUMBER OF CONTAINERS
6/11/91		MW 2									X	X	X	5
6/11/91		MW 3									X	X	X	3
6/12		MW 5									X	X	X	5
6/12		MW 6									X	X	X	3
[The remainder of the table is crossed out with a large X]														

• Normal TAT
• Results to Cheri Young

ALL SAMPLES
COLD PROPER CONTAINERED
NO BUBBLES

TOTAL NUMBER OF CONTAINERS 16

RELINQUISHED BY:
SIGNATURE
PRINTED NAME
COMPANY

DATE
RECEIVED BY:
SIGNATURE
PRINTED NAME
COMPANY

RELINQUISHED BY:
Mark obloy
SIGNATURE
Mark obloy
PRINTED NAME
GMTRX
COMPANY

DATE
RECEIVED BY: (LAB)
Benny S. Carrizosa
SIGNATURE
BENNY S. CARRIZOSA
PRINTED NAME
ANAMETRIX
LABORATORY

RELINQUISHED BY:
SIGNATURE
PRINTED NAME
COMPANY

DATE
RECEIVED BY:
SIGNATURE
PRINTED NAME
COMPANY

METHOD OF SHIPMENT:
LABORATORY COMMENTS / OBSERVATIONS 6-12-91
REL. BY: Benny S. Carrizosa 1230
REC BY: Calvin Holman 6-12-91 12:30

ANAMETRIX INC

Environmental & Analytical Chemistry
1961 Concourse Drive, Suite E, San Jose, CA 95131
(408) 432-8192 • Fax (408) 432-8198

**REPORT**

MS. CHERI YOUNG
GEOMATRIX CONSULTANTS INC.
100 PINE STREET, SUITE 1000
SAN FRANCISCO, CA 94111

Workorder # : 9109114
Date Received : 09/12/91
Project ID : 1459.05
Purchase Order: N/A

The following samples were received at Anamatrix, Inc. for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9109114- 1	MW-1
9109114- 2	MW-2
9109114- 3	MW-3
9109114- 4	MW-5

This report consists of 12 pages not including the cover letter, and is organized in sections according to the specific Anamatrix laboratory group or section which performed the analysis(es) and generated the data. The Report Summary that precedes each section will help you determine which Anamatrix group is responsible for those test results, and will bear the signatures of the department supervisor and the chemist who have reviewed the analytical data. Please refer all questions to the department supervisor who signed the form.

Anamatrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234. A detailed list of the approved fields of testing can be obtained by calling our office, or the DHS Environmental Laboratory Accreditation Program at (415)540-2800.

If you have any further questions or comments on this report, please give us a call as soon as possible. Thank you for using Anamatrix.

Sarah Schoen, Ph.D.
Laboratory Manager

9-26-91

Date

ANAMETRIX REPORT DESCRIPTION

GCMS

Organic Analysis Data Sheets (OADS)

OADS forms contain tabulated results for target compounds. The OADS are grouped by method and, within each method, organized sequentially in order of increasing Anamatrix ID number.

Tentatively Identified Compounds (TICs)

TIC forms contain tabulated results for non-target compounds detected in GC/MS analyses. TICs must be requested at the time samples are submitted at Anamatrix. TIC forms immediately follow the OADS form for each sample. If TICs are requested but not found, then TIC forms will not be included with the report.

Surrogate Recovery Summary (SRS)

SRS forms contain quality assurance data. An SRS form will be printed for each method, if the method requires surrogate compounds. They will list surrogate percent recoveries for all samples and any method blanks. Any surrogate recovery outside the established limits will be flagged with an "**", and the total number of surrogates outside the limits will be listed in the column labelled "Total Out".

Matrix Spike Recovery Form (MSR)

MSR forms contain quality assurance data. They summarize percent recovery and relative percent difference information for matrix spikes and matrix spike duplicates. This information is a statement of both accuracy and precision. Any percent recovery or relative percent difference outside established limits will be flagged with an "**", and the total number outside the limits will be listed at the bottom of the page. Not all reports will contain an MSR form.

Qualifiers

Anamatrix uses several data qualifiers (Q) in its report forms. These qualifiers give additional information on the compounds reported. They should help a data reviewer to verify the integrity of the analytical results. The following is a list of qualifiers and their meanings:

- U - Indicates that the compound was analyzed for, but was not detected at or above the specified reporting limit.
- B - Indicates that the compound was detected in the associated method blank.
- J - Indicates that the compound was detected at an amount below the specified reporting limit. Consequently, the amount should be considered an approximate value. Tentatively identified compounds will always have a "J" qualifier because they are not included in the instrument calibration.
- E - Indicates that the amount reported exceeded the linear range of the instrument calibration.
- D - Indicates that the compound was detected in an analysis performed at a secondary dilution.
- A - Indicates that the tentatively identified compound is a suspected aldol condensation product. This is common in EPA Method 8270 soil analyses.

Absence of a qualifier indicates that the compound was detected at a concentration at or above the specified reporting limit.

REPORTING CONVENTIONS

- ◆ Due to a size limitation in our data processing step, only the first eight (8) characters of your project ID and sample ID will be printed on the report forms. However, the report cover letter and report summary pages display up to twenty (20) characters of your project and sample IDs.
- ◆ Amounts reported are gross values, i.e., not corrected for method blank contamination.

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MS. CHERI YOUNG
GEOMATRIX CONSULTANTS INC.
100 PINE STREET, SUITE 1000
SAN FRANCISCO, CA 94111

Workorder # : 9109114
Date Received : 09/12/91
Project ID : 1459.05
Purchase Order: N/A
Department : GCMS
Sub-Department: GCMS

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9109114- 1	MW-1	WATER	09/11/91	8240
9109114- 2	MW-2	WATER	09/11/91	8240
9109114- 4	MW-5	WATER	09/11/91	8240

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MS. CHERI YOUNG
GEOMATRIX CONSULTANTS INC.
100 PINE STREET, SUITE 1000
SAN FRANCISCO, CA 94111

Workorder # : 9109114
Date Received : 09/12/91
Project ID : 1459.05
Purchase Order: N/A
Department : GCMS
Sub-Department: GCMS

QA/QC SUMMARY :

- No QA/QC problems encountered.

Paul Gowan 9-25-91
Department Supervisor Date

Denise Powell 9-24-91
Chemist Date

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 624/8240
 ANAMETRIX, INC. (408)432-8192

Project ID : 1459.05
 Sample ID : MW-1
 Matrix : WATER
 Date Sampled : 9/11/91
 Date Analyzed : 9/23/91
 Instrument ID : MSD1

Anamatrix ID : 9109114-01
 Analyst : MSJ
 Supervisor : PG
 Dilution Factor : 1.00
 Conc. Units : ug/L

CAS No.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
74-87-3	Chloromethane	10.	ND	U
75-01-4	Vinyl chloride	10.	ND	U
74-83-9	Bromomethane	10.	ND	U
75-00-3	Chloroethane	10.	ND	U
75-69-4	Trichlorofluoromethane	5.	ND	U
75-35-4	1,1-Dichloroethene	5.	ND	U
76-13-1	Trichlorotrifluoroethane	5.	ND	U
67-64-1	Acetone	20.	ND	U
75-15-0	Carbon disulfide	5.	ND	U
75-09-2	Methylene chloride	5.	ND	U
156-60-5	Trans-1,2-dichloroethene	5.	ND	U
75-34-3	1,1-Dichloroethane	5.	ND	U
156-59-2	Cis-1,2-dichloroethene	5.	ND	U
78-93-3	2-Butanone	20.	ND	U
67-66-3	Chloroform	5.	ND	U
71-55-6	1,1,1-Trichloroethane	5.	ND	U
56-23-5	Carbon tetrachloride	5.	ND	U
108-05-4	Vinyl acetate	10.	ND	U
71-43-2	Benzene	5.	ND	U
107-06-2	1,2-Dichloroethane	5.	ND	U
79-01-6	Trichloroethene	5.	ND	U
78-87-5	1,2-Dichloropropane	5.	ND	U
75-27-4	Bromodichloromethane	5.	ND	U
110-75-8	2-Chloroethylvinyl ether	5.	ND	U
10061-01-5	Cis-1,3-dichloropropene	5.	ND	U
108-10-1	4-Methyl-2-pentanone	10.	ND	U
108-88-3	Toluene	5.	ND	U
10061-02-6	Trans-1,3-dichloropropene	5.	ND	U
79-00-5	1,1,2-Trichloroethane	5.	ND	U
127-18-4	Tetrachloroethene	5.	ND	U
591-78-6	2-Hexanone	10.	ND	U
124-48-1	Dibromochloromethane	5.	ND	U
108-90-7	Chlorobenzene	5.	ND	U
100-41-4	Ethylbenzene	5.	ND	U
1330-20-7	Xylene (Total)	5.	ND	U
100-42-5	Styrene	5.	ND	U
75-25-2	Bromoform	5.	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	ND	U
541-73-1	1,3-Dichlorobenzene	5.	ND	U
106-46-7	1,4-Dichlorobenzene	5.	ND	U
95-50-1	1,2-Dichlorobenzene	5.	ND	U

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 624/8240
 ANAMETRIX, INC. (408)432-8192

Project ID : 1459.05
 Sample ID : MW-2
 Matrix : WATER
 Date Sampled : 9/11/91
 Date Analyzed : 9/23/91
 Instrument ID : MSD1

Anamatrix ID : 9109114-02
 Analyst : MCA
 Supervisor : PG
 Dilution Factor : 1.00
 Conc. Units : ug/L

CAS No.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
74-87-3	Chloromethane	10.	ND	U
75-01-4	Vinyl chloride	10.	ND	U
74-83-9	Bromomethane	10.	ND	U
75-00-3	Chloroethane	10.	ND	U
75-69-4	Trichlorofluoromethane	5.	8.	U
75-35-4	1,1-Dichloroethene	5.	ND	U
76-13-1	Trichlorotrifluoroethane	5.	ND	U
67-64-1	Acetone	20.	ND	U
75-15-0	Carbon disulfide	5.	ND	U
75-09-2	Methylene chloride	5.	ND	U
156-60-5	Trans-1,2-dichloroethene	5.	ND	U
75-34-3	1,1-Dichloroethane	5.	ND	U
156-59-2	Cis-1,2-dichloroethene	5.	ND	U
78-93-3	2-Butanone	20.	ND	U
67-66-3	Chloroform	5.	3.	J
71-55-6	1,1,1-Trichloroethane	5.	ND	U
56-23-5	Carbon tetrachloride	5.	ND	U
108-05-4	Vinyl acetate	10.	ND	U
71-43-2	Benzene	5.	ND	U
107-06-2	1,2-Dichloroethane	5.	ND	U
79-01-6	Trichloroethene	5.	ND	U
78-87-5	1,2-Dichloropropane	5.	ND	U
75-27-4	Bromodichloromethane	5.	ND	U
110-75-8	2-Chloroethylvinyl ether	5.	ND	U
10061-01-5	Cis-1,3-dichloropropene	5.	ND	U
108-10-1	4-Methyl-2-pentanone	10.	ND	U
108-88-3	Toluene	5.	ND	U
10061-02-6	Trans-1,3-dichloropropene	5.	ND	U
79-00-5	1,1,2-Trichloroethane	5.	ND	U
127-18-4	Tetrachloroethene	5.	11.	U
591-78-6	2-Hexanone	10.	ND	U
124-48-1	Dibromochloromethane	5.	ND	U
108-90-7	Chlorobenzene	5.	ND	U
100-41-4	Ethylbenzene	5.	ND	U
1330-20-7	Xylene (Total)	5.	ND	U
100-42-5	Styrene	5.	ND	U
75-25-2	Bromoform	5.	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	ND	U
541-73-1	1,3-Dichlorobenzene	5.	ND	U
106-46-7	1,4-Dichlorobenzene	5.	ND	U
95-50-1	1,2-Dichlorobenzene	5.	ND	U

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 624/8240
 ANAMETRIX, INC. (408)432-8192

Project ID : 1459.05 Anamatrix ID : 9109114-04
 Sample ID : MW-5 Analyst : MCT
 Matrix : WATER Supervisor : PG
 Date Sampled : 9/11/91 Dilution Factor : 1.00
 Date Analyzed : 9/23/91 Conc. Units : ug/L
 Instrument ID : MSD1

CAS No.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
74-87-3	Chloromethane	10.	ND	U
75-01-4	Vinyl chloride	10.	ND	U
74-83-9	Bromomethane	10.	ND	U
75-00-3	Chloroethane	10.	ND	U
75-69-4	Trichlorofluoromethane	5.	16.	U
75-35-4	1,1-Dichloroethene	5.	ND	U
76-13-1	Trichlorotrifluoroethane	5.	ND	U
67-64-1	Acetone	20.	ND	U
75-15-0	Carbon disulfide	5.	ND	U
75-09-2	Methylene chloride	5.	ND	U
156-60-5	Trans-1,2-dichloroethene	5.	ND	U
75-34-3	1,1-Dichloroethane	5.	ND	U
156-59-2	Cis-1,2-dichloroethene	5.	ND	U
78-93-3	2-Butanone	20.	ND	U
67-66-3	Chloroform	5.	ND	U
71-55-6	1,1,1-Trichloroethane	5.	ND	U
56-23-5	Carbon tetrachloride	5.	ND	U
108-05-4	Vinyl acetate	10.	ND	U
71-43-2	Benzene	5.	ND	U
107-06-2	1,2-Dichloroethane	5.	ND	U
79-01-6	Trichloroethene	5.	ND	U
78-87-5	1,2-Dichloropropane	5.	ND	U
75-27-4	Bromodichloromethane	5.	ND	U
110-75-8	2-Chloroethylvinyl ether	5.	ND	U
10061-01-5	Cis-1,3-dichloropropene	5.	ND	U
108-10-1	4-Methyl-2-pentanone	10.	ND	U
108-88-3	Toluene	5.	ND	U
10061-02-6	Trans-1,3-dichloropropene	5.	ND	U
79-00-5	1,1,2-Trichloroethane	5.	ND	U
127-18-4	Tetrachloroethene	5.	3.	U
591-78-6	2-Hexanone	10.	ND	U
124-48-1	Dibromochloromethane	5.	ND	U
108-90-7	Chlorobenzene	5.	ND	U
100-41-4	Ethylbenzene	5.	ND	U
1330-20-7	Xylene (Total)	5.	ND	U
100-42-5	Styrene	5.	ND	U
75-25-2	Bromoform	5.	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	ND	U
541-73-1	1,3-Dichlorobenzene	5.	ND	U
106-46-7	1,4-Dichlorobenzene	5.	ND	U
95-50-1	1,2-Dichlorobenzene	5.	ND	U

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 624/8240
 ANAMETRIX, INC. (408)432-8192

Project ID :
 Sample ID : BLANK
 Matrix : WATER
 Date Sampled : 0/ 0/ 0
 Date Analyzed : 9/23/91
 Instrument ID : MSD1

Anamatrix ID : 0923B001
 Analyst : MEX
 Supervisor : PG
 Dilution Factor : 1.00
 Conc. Units : ug/L

CAS No.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
74-87-3	Chloromethane	10.	ND	U
75-01-4	Vinyl chloride	10.	ND	U
74-83-9	Bromomethane	10.	ND	U
75-00-3	Chloroethane	10.	ND	U
75-69-4	Trichlorofluoromethane	5.	ND	U
75-35-4	1,1-Dichloroethene	5.	ND	U
76-13-1	Trichlorotrifluoroethane	5.	ND	U
67-64-1	Acetone	20.	ND	U
75-15-0	Carbon disulfide	5.	ND	U
75-09-2	Methylene chloride	5.	ND	U
156-60-5	Trans-1,2-dichloroethene	5.	ND	U
75-34-3	1,1-Dichloroethane	5.	ND	U
156-59-2	Cis-1,2-dichloroethene	5.	ND	U
78-93-3	2-Butanone	20.	ND	U
67-66-3	Chloroform	5.	ND	U
71-55-6	1,1,1-Trichloroethane	5.	ND	U
56-23-5	Carbon tetrachloride	5.	ND	U
108-05-4	Vinyl acetate	10.	ND	U
71-43-2	Benzene	5.	ND	U
107-06-2	1,2-Dichloroethane	5.	ND	U
79-01-6	Trichloroethene	5.	ND	U
78-87-5	1,2-Dichloropropane	5.	ND	U
75-27-4	Bromodichloromethane	5.	ND	U
110-75-8	2-Chloroethylvinyl ether	5.	ND	U
10061-01-5	Cis-1,3-dichloropropene	5.	ND	U
108-10-1	4-Methyl-2-pentanone	10.	ND	U
108-88-3	Toluene	5.	ND	U
10061-02-6	Trans-1,3-dichloropropene	5.	ND	U
79-00-5	1,1,2-Trichloroethane	5.	ND	U
127-18-4	Tetrachloroethene	5.	ND	U
591-78-6	2-Hexanone	10.	ND	U
124-48-1	Dibromochloromethane	5.	ND	U
108-90-7	Chlorobenzene	5.	ND	U
100-41-4	Ethylbenzene	5.	ND	U
1330-20-7	Xylene (Total)	5.	ND	U
100-42-5	Styrene	5.	ND	U
75-25-2	Bromoform	5.	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	ND	U
541-73-1	1,3-Dichlorobenzene	5.	ND	U
106-46-7	1,4-Dichlorobenzene	5.	ND	U
95-50-1	1,2-Dichlorobenzene	5.	ND	U

SURROGATE RECOVERY SUMMARY -- EPA METHOD 624/8240
 ANAMETRIX, INC. (408)432-8192

Project ID : 1459.05
 Matrix : LIQUID

Anamatrix ID : 9109114
 Analyst : MCT
 Supervisor : PG

	SAMPLE ID	SU1	SU2	SU3	TOTAL OUT
1	BLANK	101	98	102	0
2	MW-1	108	98	102	0
3	MW-2	96	96	104	0
4	MW-5	110	98	106	0
5					
6					
7					
8					
9					
10					
11					
12					
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25					
26					
27					
28					
29					
30					

QC LIMITS

SU1 = 1,2-Dichloroethane-d4 (75-113)
 SU2 = Toluene-d8 (83-110)
 SU3 = 1,4-Bromofluorobenzene (82-114)

* Values outside of Anamatrix QC limits

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MS. CHERI YOUNG
GEOMATRIX CONSULTANTS INC.
100 PINE STREET, SUITE 1000
SAN FRANCISCO, CA 94111

Workorder # : 9109114
Date Received : 09/12/91
Project ID : 1459.05
Purchase Order: N/A
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9109114- 1	MW-1	WATER	09/11/91	TPHg/BTEX
9109114- 2	MW-2	WATER	09/11/91	TPHg/BTEX
9109114- 3	MW-3	WATER	09/11/91	TPHg/BTEX
9109114- 4	MW-5	WATER	09/11/91	TPHg/BTEX

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MS. CHERI YOUNG
GEOMATRIX CONSULTANTS INC.
100 PINE STREET, SUITE 1000
SAN FRANCISCO, CA 94111

Workorder # : 9109114
Date Received : 09/12/91
Project ID : 1459.05
Purchase Order: N/A
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- No QA/QC problems encountered for these samples.

Cheryl Balmer 9/14/91
Department Supervisor Date

Cheri Young 9.19.91
Chemist Date

TOTAL VOLATILE HYDROCARBON MATRIX SPIKE REPORT
 EPA METHOD 5030 WITH GC/FID
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 1459.05 MW-5
 Matrix : WATER
 Date Sampled : 09/11/91
 Date analyzed : 09/16/91

Anamatrix I.D. : 9109114-04
 Analyst : CF.
 Supervisor : *CB*
 Date Released : 09/19/91

COMPOUND	SPIKE AMT. (UG/L)	MS (UG/L)	%REC MS	MSD (UG/L)	%REC MSD	RPD	REC LIMITS
MINERAL SPIRITS	1000	780	78%	860	86%	10%	48-145%

* Limits established by Anamatrix, Inc.

#15 #16 #2 19-00 9109114

GEOMATRIX CONSULTANTS
 ONE MARKET PLAZA
 SPEAR STREET TOWER SUITE 717
 SAN FRANCISCO, CALIFORNIA 94105
 (415) 957-9557

Chain of Custody Record
 04590

DATE 9/11/91 PAGE 1 OF 1

PROJECT NO. 1459.05			ANALYSES								REMARKS (SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)		
SAMPLERS: (SIGNATURE) <i>Stephanie Roberson</i>			GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS		TPH as Mineral Spirits BTEX - 8020 8240	NUMBER OF CONTAINERS
DATE	TIME	SAMPLE NUMBER											
9/11/91	1525	MW-1									X X X	6	Standard TAT Results to Cheri Young Note: MW-2 - could only get 2 VDAS 1 for 8240, 1 for mineral spirits/BTEX all samples are cold, in proper container, #1 has bubbles, 2mm, 3mm, 1mm, 2mm in 4 vials. #3 has 2mm bubbles in one vial. #4 has 2mm, 2mm, 1mm bubbles in 3 vials. all vials are preserved. F-B
	1540	MW-2									X X X	2	
	1455	MW-3									X X X	3	
		MW-4									X X X		
	1145	MW-5									X X X	6	
		MW-6									X X X		
TOTAL NUMBER OF CONTAINERS 17													

RELINQUISHED BY: <i>Stephanie A. Roberson</i> SIGNATURE	DATE 9/11/91	RECEIVED BY: <i>Benny S. Carrizosa</i> SIGNATURE	RELINQUISHED BY: <i>Benny S. Carrizosa</i> SIGNATURE	DATE 9/11/91	RECEIVED BY: (LAB)
PRINTED NAME: Geomatrix	TIME 2:55	PRINTED NAME: ANAMETRIX	PRINTED NAME: ANAMETRIX	TIME 1800	SIGNATURE: Farah Badie
COMPANY		COMPANY	COMPANY		PRINTED NAME: FARAH BADIE
RELINQUISHED BY:	DATE	RECEIVED BY:	METHOD OF SHIPMENT:		
SIGNATURE		SIGNATURE	LABORATORY COMMENTS / OBSERVATIONS		
PRINTED NAME	TIME	PRINTED NAME			
COMPANY		COMPANY			