IMPLEMENTATION OF CORRECTIVE ACTION PLAN

SECOND QUARTERLY MONITORING PROGRAM

2504 MacARTHUR BOULEVARD

OAKLAND, CALIFORNIA

Prepared for

MARR & ASSOCIATES

27737 Fallen Leaf Court
Hayward, California 94542

Project No. MAR-101J

October 1997

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CORRECTIVE ACTION PLAN FOR
HYDROCARBON CONTAMINATED SOIL AND GROUNDWATER

2504 MacArthur Boulevard
Oakland, California

SECOND QUARTERLY GROUNDWATER MONITORING PROGRAM

A. INTRODUCTION/BACKGROUND

Four underground storage tanks were removed from the site located at 2504 MacArthur Boulevard in Oakland, California (Site) on June 27, 1994. During the excavation, extensive visible staining in the sidewalls was observed and strong hydrocarbon fuel odor was detected. Soil samples obtained from the tank excavation area confirmed that the subsurface had been moderately to highly impacted by fuel hydrocarbons. Upon removal of the tanks, the tank pits were overexcavated and the contaminated soil was stockpiled at the Site. Subsequently, the contaminated soil was removed from the Site. Site Location Map is presented in Figure 1.

Upon approval of the Alameda County Environmental Health Services (County), a program of subsurface investigation was implemented in July 1995. The services were based on the requirements of the County and RWQCB. It was intended that the investigation would reasonably define the horizontal and vertical extent of the pollutants in and around the location of former underground tanks, and would also initially define the geologic and hydrogeologic parameters needed for determining an effective and feasible remedial action for the Site.

The investigation consisted of advancing five soil borings at pre-determined locations; collecting soil samples; converting three soil borings into monitoring wells; obtaining groundwater samples; chemical analyses of selected samples; establishing horizontal and vertical control of the wells, and calculating the groundwater potentiometric levels and flow direction; and identifying and recommending appropriate remedial technology. Figure 2-A depicts the locations of soil borings and monitoring wells.

During the performance of the investigation, groundwater was encountered at a depth of 34 feet bgs in both borings B-1 and B-3, but immediately rose. Boring B-5, drilled to a depth of 20 feet bgs, was dry when the drill rig broke down. Five days later, upon resumption of drilling activities, groundwater was encountered at the depth of 10 feet. This indicated the existence of a confined water zone. The regional groundwater flow is estimated to be generally in a south/southwesterly direction toward the San Francisco Bay.

After review of available information, it was determined that some immediate interim remediation measure should be implemented. The intended purpose of the measure was to establish control, reduce the rate of migration and expansion of the existing plume of hydrocarbon to the adjacent property(ies), and to remove the potential source of groundwater contamination. Eventually, after approval of the County, a corrective action plan (CAP) consisting of excavation and off-site disposal was implemented at the Site. Also, as part of CAP, a program of groundwater monitoring was implemented.

The first episode of the quarterly groundwater monitoring program was performed in December 1996. Groundwater samples collected from the three monitoring wells indicated non-detectable concentrations of TPH-G, BTEX, and MTBE. Groundwater level measurements also indicated that Site-specific groundwater flow direction was reasonably consistent with general regional groundwater flow direction and was undulating between southeast and southwest with gradient ranging from 0.036 ft/ft to 0.007 ft/ft. Further, it was surmised that contaminants at higher elevations did not migrate sufficiently down to reach the groundwater table.

Accordingly, because of the relatively stable groundwater flow direction toward the south, and the absence of any contaminants in groundwater, it was recommended that the next episode of groundwater monitoring program at the Site be performed in July 1997.

This report presents the results of the second episode of the groundwater monitoring program.

B. METHODOLOGIES

B-1. Pollutants of Concern

To date, the pollutants that have been identified at this Site are Total Petroleum Hydrocarbons as Gasoline (TPH-G), plus Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX). This program of groundwater sampling and analysis is primarily concerned with petroleum hydrocarbons. Specifically, water samples were tested for the following:

1. Total Purgeable Petroleum Hydrocarbons as Gasoline (TPH-G) by GCFID (LUFT Method) following sample purge and trap by EPA Method 5030/8015 Mod. /8020;
2. Volatile hydrocarbon constituents: Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX) by EPA Method 8020;
3. Methyl Tertiary Butyl Ether (MTBE) by EPA Method 8020.

B-2. Analytical Laboratory

For this project, IMFC utilized the services of Sequoia Analytical, Inc. (Sequoia Analytical) in Walnut Creek, California. Sequoia is a State-certified environmental laboratory; (Environmental Laboratory Accreditation Program [ELAP] # 1271). All samples were analyzed on the standard laboratory turnaround time.

C. FIELD ACTIVITIES

All fieldwork was performed in accordance with the requirements of the California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region. IMFC's Sampling Protocol (Appendix B) was followed for all sampling activities.

C-1. Groundwater Elevation Measurements

Static depth-to-water (DTW) levels were measured in the three groundwater monitoring wells at the Site on February 27, 1997, March 26, 1997, April 25, 1997, May 24, 1997 June 27, 1997 July 22, 1997 and August 22, 1997. The static DTW level in each monitoring well was measured to the nearest 0.01-foot using an electronic water-level sounder cleaned with TSP and water before each use. Subsequent to measuring the DTW levels, IMFC collected water samples from each of the three monitoring wells for visual examination. Table 1 summarizes the measured DTW levels, well-head elevations and cumulative groundwater elevations at the Site since July 1995. Figures 2-1 through 2-7 show the relevant groundwater potentiometric levels for the Site on February 27, 1997, March 26, 1997, April 25, 1997, May 24, 1997 June 27, 1997 July 22, 1997 and August 22, 1997, respectively.

C-2. Groundwater Sampling

On July 22, 1997, IMFC collected groundwater samples from the three groundwater monitoring wells (MW-B1, MW-B3, and MW-B5) at the Site. These groundwater monitoring wells have been constructed in the first-encountered water-bearing zone beneath the Site. Before obtaining the groundwater samples, each well was purged until the electrical conductivity, pH, temperature and turbidity values of the groundwater had stabilized. During the purging process for each well, on July 22, 1997, IMFC periodically measured and recorded these parameters. Each well was purged of at least three well volumes.

Before sample collection, the water level in each well was allowed to recover to at least 80% of the initial water level. A sample of the formation water was then collected from the water in each of the wells using a new disposable Teflon® bailer. The water samples were then gently decanted into laboratory-cleaned, 40-milliliter (ml) glass vials and sealed with Teflon®-lined caps. All containers were inspected for air bubbles to check for head-space, which would allow volatilization to occur.

The samples were labeled in the field with the date, project location, and sample identification, and immediately chilled in an ice chest for transport under Chain-of-Custody to the Sequoia Analytical laboratory in Walnut Creek, California. No evidence of measurable floating product, hydrocarbon vapor or perceptible odors were noted in the water samples collected from the wells. Appendix C contains the Monitoring Well Sampling Data Sheets, which indicates well development data, and stabilization measurements.

Purged water from the wells was temporarily stored on-site in labeled 55-gallon metal drums approved by the Department of Transportation. This drummed purge water was later disposed of after laboratory results indicated absence of any contaminants.

C-3 Chemical Analysis

On July 23, 1997, IMFC submitted the groundwater samples collected from each of the three groundwater monitoring wells at the Site to Sequoia Analytical. Each of the water samples was analyzed for TPH-G, BTEX and MTBE. The laboratory chemical analyses indicated that none of the groundwater samples contained any analyte above the laboratory detection limits. Appendix B contains a copy of the original laboratory analytical reports and the Chain-of-Custody Records.

C-4. Discussion of Sampling Results

The results of laboratory chemical analyses on water samples collected from monitoring wells MW-B1, MW-B3, and MW-B5 indicated non-detectable levels of contaminants tested for above the laboratory detection limits.

D. CONCLUSIONS

Based on work performed at the Site by IMFC, and previous site data available to IMFC, the following conclusions were reached:

- Groundwater flow direction was found to be basically toward the south/southwest. Groundwater gradient was computed to be 0.029, 0.013, 0.011, 0.017, 0.016, 0.0125, and 0.029 ft/ft on February 27, 1997, March 26, 1997, April 25, 1997, May 24, 1997 June 27, 1997 July 22, 1997 and August 22, 1997, respectively.

- The south/southwesterly groundwater flow direction appears to be reasonably consistent with general regional groundwater flow direction and with the previous groundwater measurements collected at the Site.

- Groundwater samples collected from the three monitoring wells indicated non-detectable concentrations of TPH-G, BTEX, and MTBE. The absence of pollutants in groundwater signifies that apparently due to the removal of contaminated soil, and tight substrata formation, contaminants at higher horizon have not migrated down to reach the groundwater table.

E. RECOMMENDATIONS

Based upon the results of generated data during the performance of the two quarterly monitoring episodes, as well as information available to IMFC from previous investigations, and guidelines established by the California Regional Water Quality

Control Board, IMFC recommends that the quarterly monitoring program at the Site be suspended. It is also recommended that the monthly schedule for groundwater level monitoring be reduced to a quarterly schedule for one year to monitor the groundwater regime. If no significant changes develop during this period, IMFC recommends requesting Site Closure from the County.

F. LIMITATIONS

The data, information, interpretations, and recommendations contained in this technical report are presented solely as bases and guides to the existing environmental conditions of the site located at 2504 MacArthur Boulevard, Oakland, Alameda County, California. The conclusions and professional opinions presented herein were developed by IMFC in accordance with generally accepted engineering principles and practices. As with all geotechnical and environmental reports, the opinions expressed here are subject to revisions in light of new information, new governmental regulations or new interpretations of existing regulations, which may be developed in the future, and no warranties are expressed or implied.

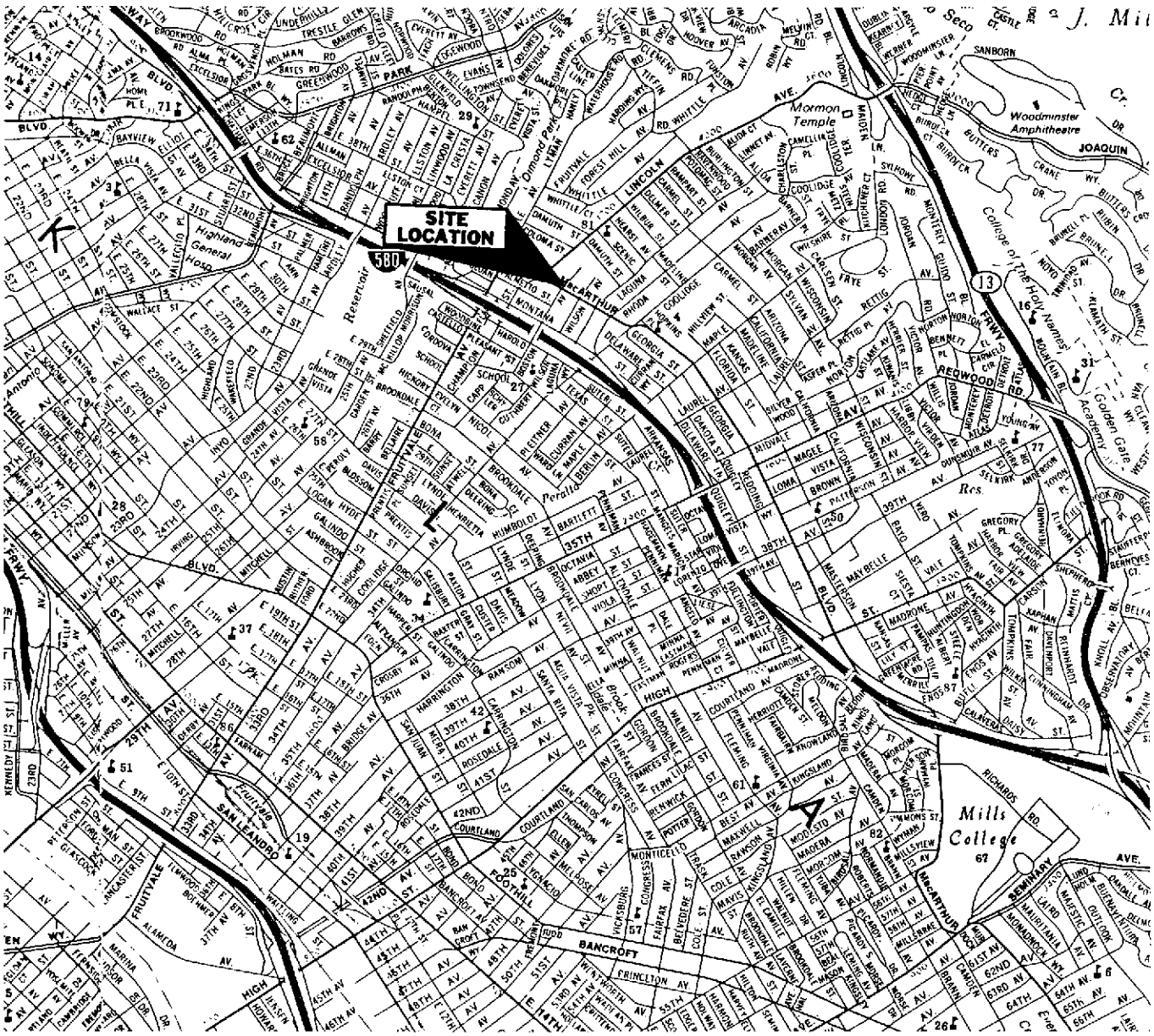
Soil deposits may vary in type, strength, permeability, and many other important properties between points of observation and exploration. Additionally, changes can occur in groundwater and soil moisture conditions due to seasonal variations, or for other reasons. Furthermore, the distribution of chemical concentrations in the soil and groundwater can vary spatially and over time. The chemical analysis results presented herein are illustrative of only the sampling locations at the time of sampling. Therefore, it must be recognized that IMFC does not and cannot have complete knowledge of the subsurface conditions underlying the subject site. The opinions presented are based upon the findings at the points of exploration and upon interpretative data, including interpolation and extrapolation of information obtained at points of observation.

The services provided represent professional opinions, formulated within specific budget limits, upon which client can base actions to reduce the potential for exposure to liability for the consequence of the occurrence of hazardous waste.

This report has not been prepared for use by parties other than Mr. Michael Marr. It may not contain sufficient information for the purposes of other parties or other uses. If any changes are made in the project as described in this report, the conclusions and recommendations contained herein should not be considered valid, unless the changes are reviewed by IMFC, and the conclusions and recommendations are modified or approved in writing.

Well Date	Wellhead * Elevation	Depth to Water	Elevation of Groundwater	Field Observations
MW-B1				
07/11/95	198.19	9.70	188.49	None
11/06/96		8.60	189.59	None
12/12/96		7.40	190.79	None
01/23/97		5.20	192.99	None
02/27/97		5.95	192.24	None
03/26/97		6.03	192.16	None
04/25/97		6.21	191.98	None
05/23/97		7.01	191.18	None
06/27/97		7.06	191.13	None
07/22/97		7.66	190.53	None
08/22/97		8.20	189.99	None
MW-B3				
07/11/95	201.41	9.22	192.19	None
11/06/96		11.38	190.03	None
12/12/96		9.28	192.13	None
01/23/97		8.05	193.36	None
02/27/97		8.40	193.01	None
03/26/97		8.49	192.92	None
04/25/97		8.72	192.69	None
05/23/97		9.18	192.23	None
06/27/97		9.32	192.09	None
07/22/97		10.26	191.15	None
08/22/97		10.27	191.14	None
MW-B5				
07/11/95	201.39	9.26	192.13	None
11/06/96		10.28	191.11	None
12/12/96		9.58	191.81	None
01/23/97		8.28	193.11	None
02/27/97		8.40	192.99	None
03/26/97		8.53	192.86	None
04/25/97		8.88	192.51	None
05/23/97		9.51	191.88	None
06/27/97		9.73	191.66	None
07/22/97		10.20	191.19	None
08/22/97		10.23	191.16	None

* Wellhead Elevations based on a site survey by Brian Kangas Foulk Consulting Engineers of Walnut Creek, California, dated July 14, 1995.



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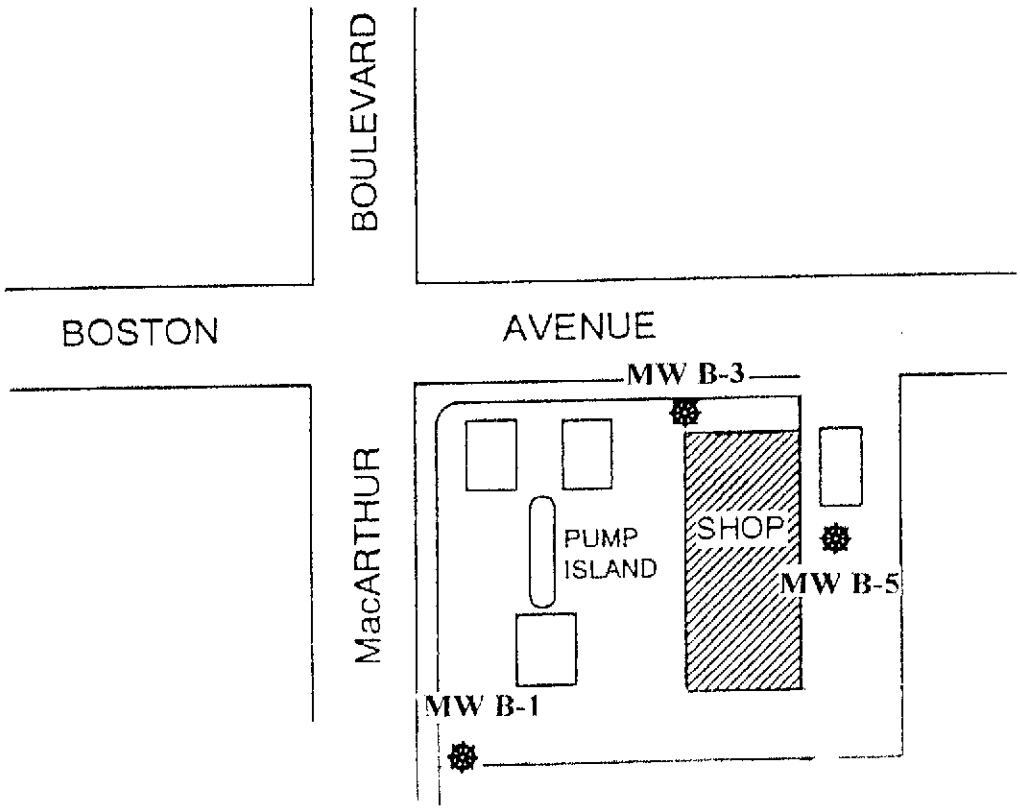
2504 MacArthur Blvd.
Oakland, California

SITE LOCATION MAP

PROJECT NO.	DATE	FIGURE NO.
MAR-101J	OCTOBER 97	1



LEGEND

- Location of Monitoring Wells
- Location of Former Tanks

Not to Scale

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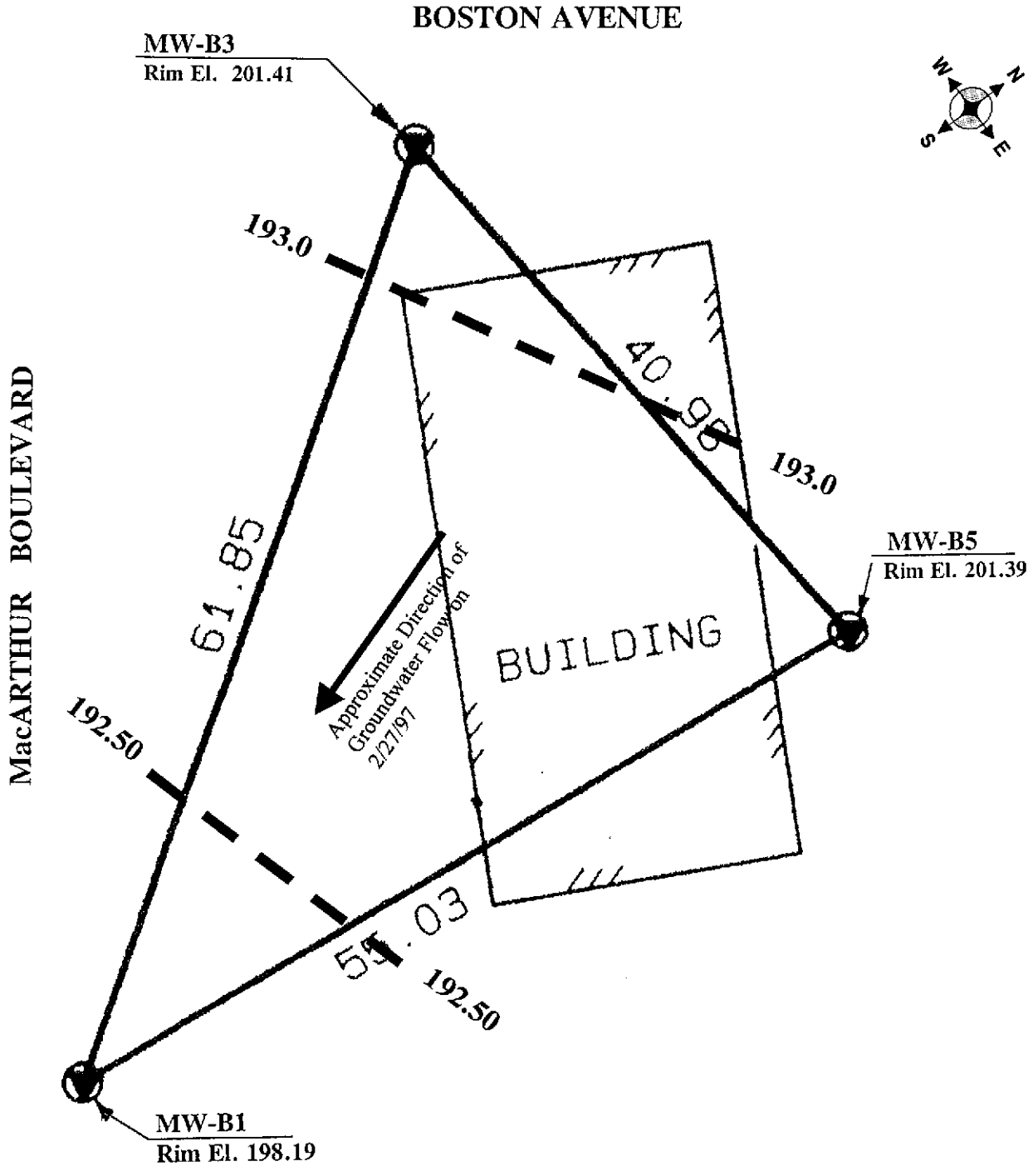
Oakland, California

LOCATIONS OF MONITORING WELLS

PROJECT NO.	DATE	FIGURE NO.
MAR-101J	*OCTOBER 97*	*2-A*



LEGEND

---191--- Groundwater Contours & Elevations

10 0 10 20

GRAPHIC SCALE (FEET)

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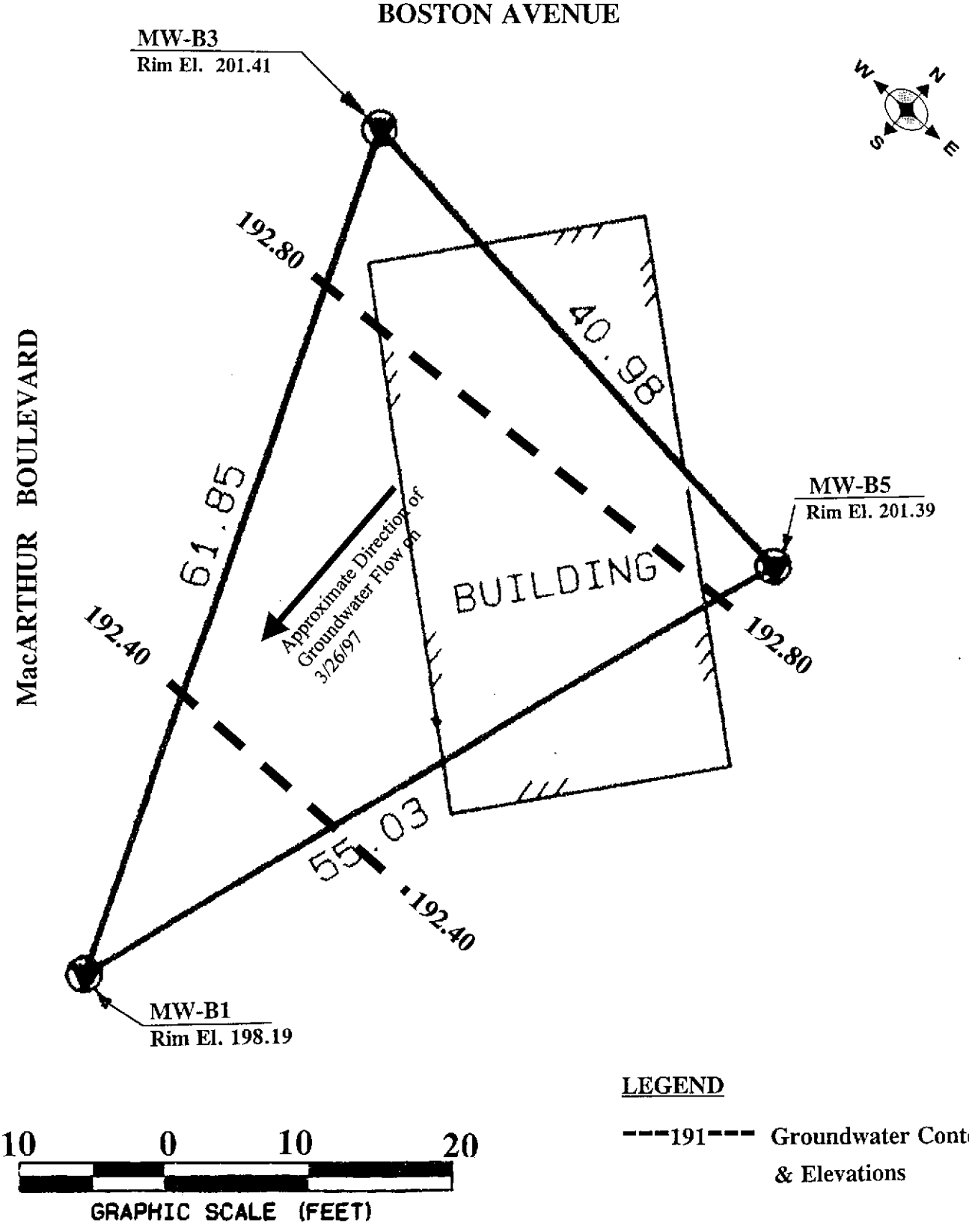
2504 MacArthur Boulevard
Oakland, California

GROUNDWATER POTENTIOMETRIC LEVELS
FEBRUARY 1997

PROJECT NO.	DATE	FIGURE NO.
MAR-101J	OCTOBER 1997	2-1



IMFC

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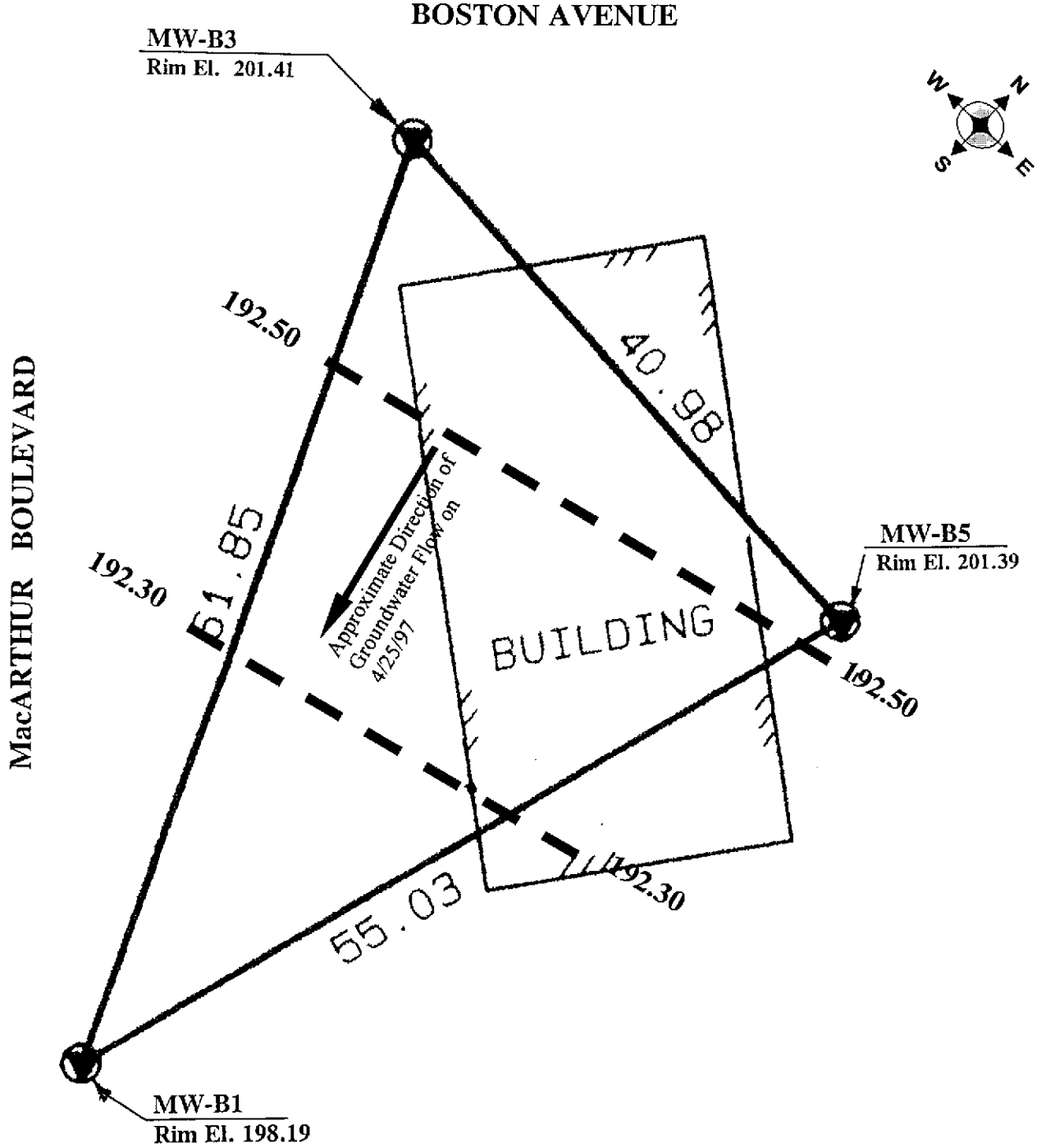
2504 MacArthur Boulevard
Oakland, California

GROUNDWATER POTENTIOMETRIC LEVELS
MARCH 1997

PROJECT NO.	DATE	FIGURE NO.
MAR-101J	OCTOBER 1997	2-2



LEGEND

---191--- Groundwater Contours & Elevations

10 0 10 20

GRAPHIC SCALE (FEET)

IMFC

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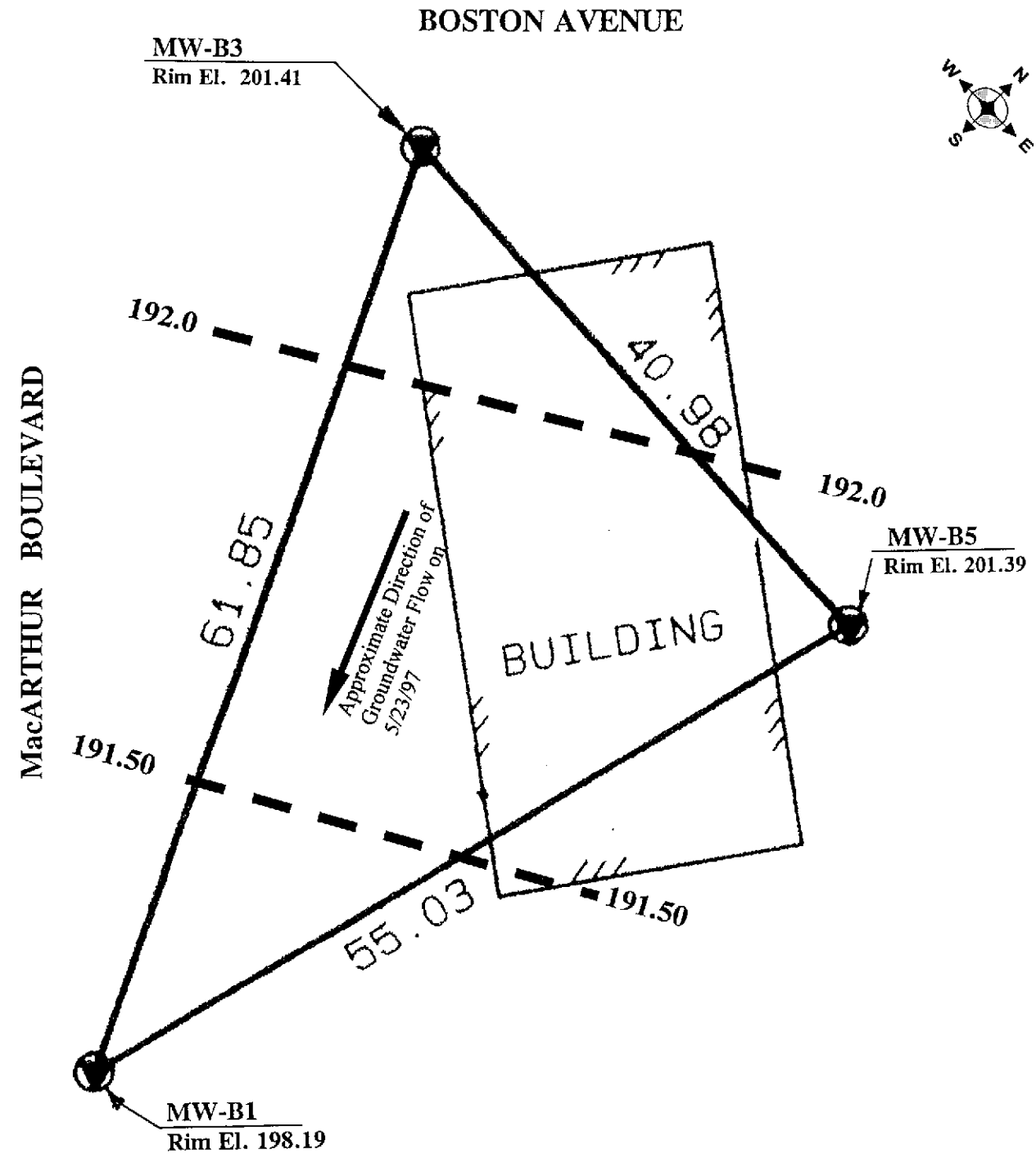
2504 MacArthur Boulevard
Oakland, California

GROUNDWATER POTENTIOMETRIC LEVELS
APRIL 1997

PROJECT NO.	DATE	FIGURE NO.
MAR-101J	OCTOBER 1997	2-3



LEGEND

---191--- Groundwater Contours & Elevations

10 0 10 20

GRAPHIC SCALE (FEET)

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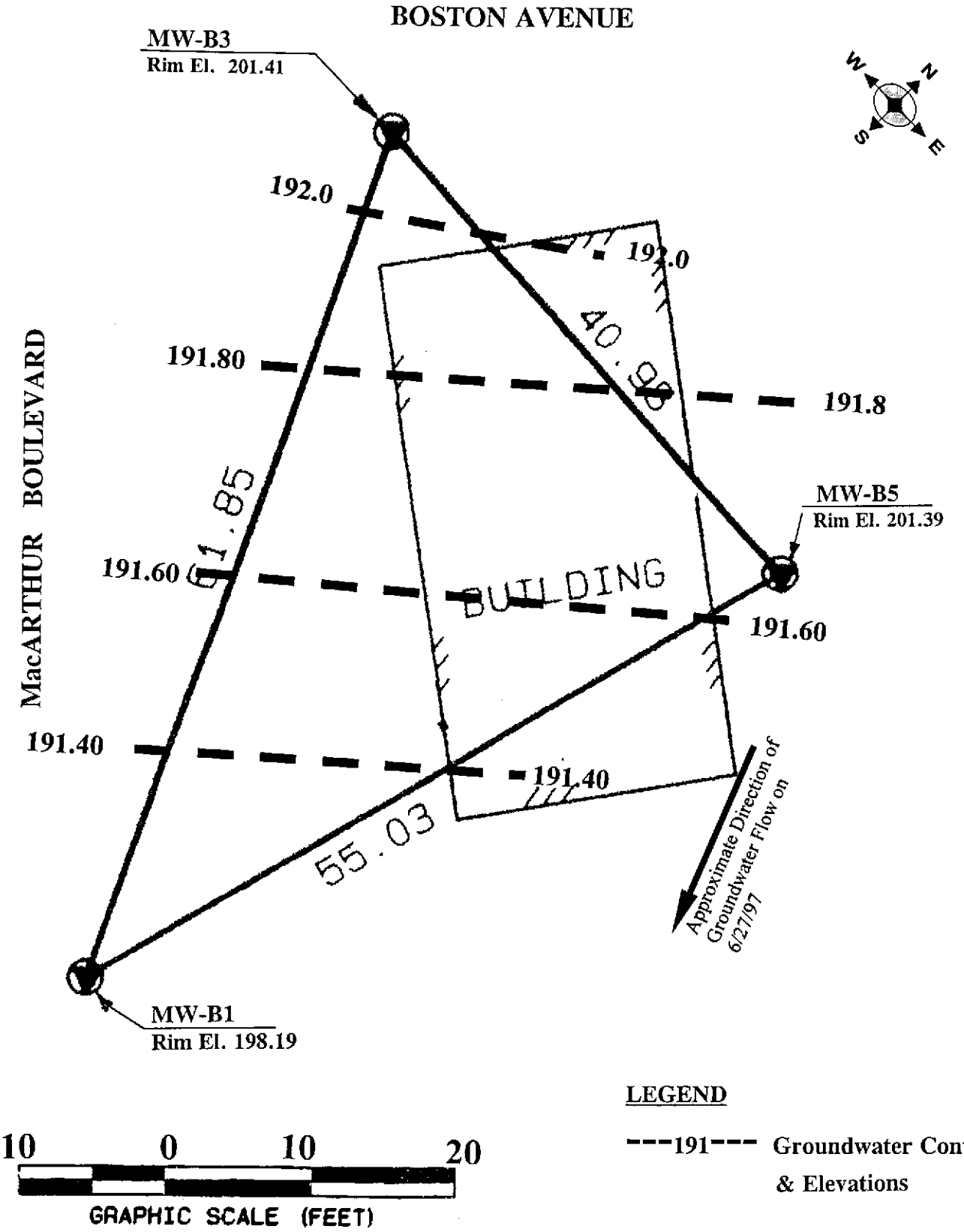
2504 MacArthur Boulevard
Oakland, California

GROUNDWATER POTENTIOMETRIC LEVELS
MAY 1997

PROJECT NO.	DATE	FIGURE NO.
MAR-101J	OCTOBER 1997	2-4



IMEC

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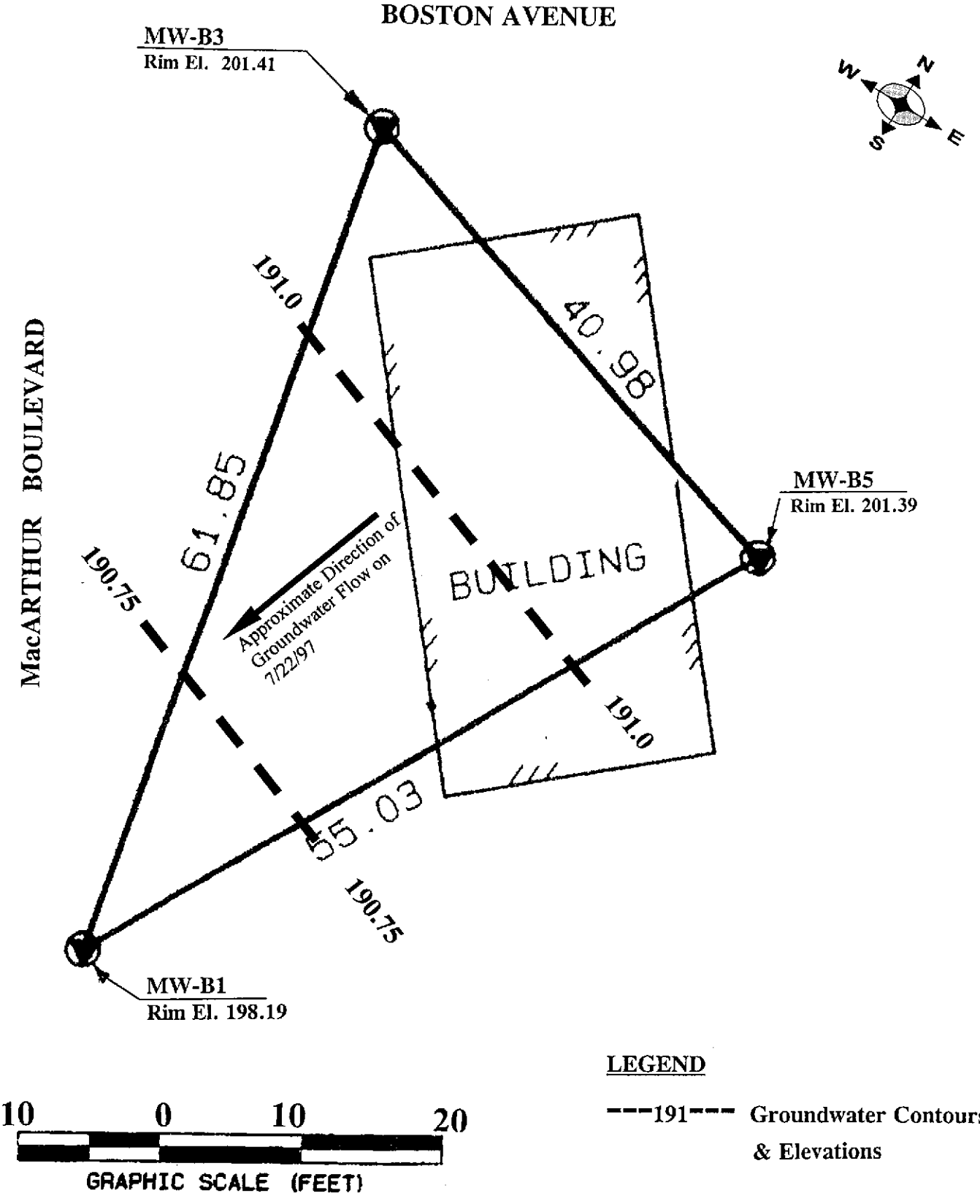
2504 MacArthur Boulevard
Oakland, California

GROUNDWATER POTENTIOMETRIC LEVELS
JUNE 1997

PROJECT NO.	DATE	FIGURE NO.
MAR-101J	OCTOBER 1997	2-5



IMEC

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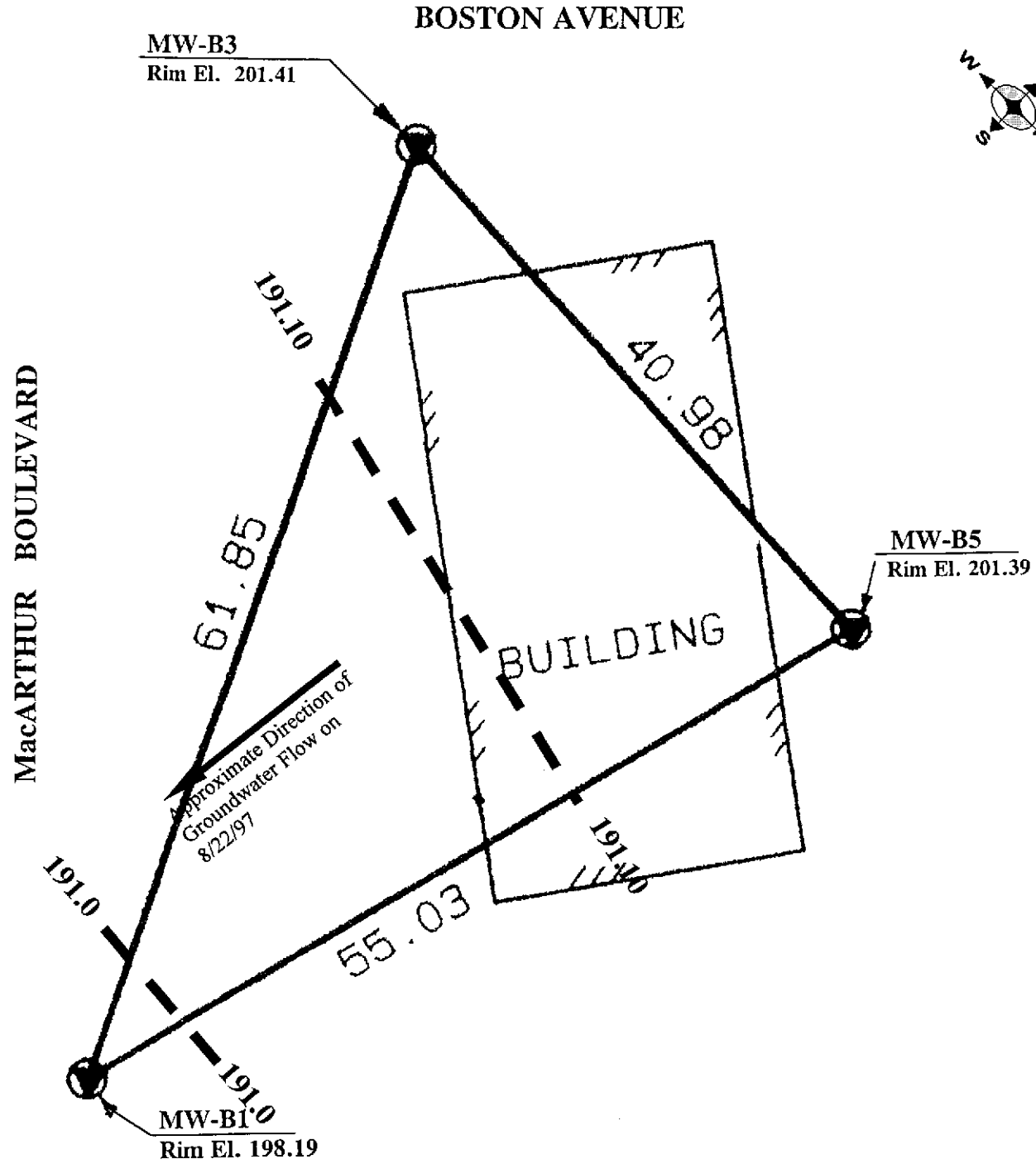
2504 MacArthur Boulevard
Oakland, California

GROUNDWATER POTENTIOMETRIC LEVELS
JULY 1997

PROJECT NO.	DATE	FIGURE NO.
MAR-101J	OCTOBER 1997	2-6



10 0 10 20

GRAPHIC SCALE (FEET)

LEGEND

---191--- Groundwater Contours & Elevations

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2504 MacArthur Boulevard
Oakland, California

GROUNDWATER POTENTIOMETRIC LEVELS
AUGUST 1997

PROJECT NO.	DATE	FIGURE NO.
MAR-101J	OCTOBER 1997	2-7

SAMPLING (GENERAL)

1. Any materials supplied by the client will reduce the cost of our work. These may include tap water, 55-gallon drums, and DI-water. Arrangements will be made before the start of the project.

2. Chemical sampling procedures and sample storage will be conducted under the direction of our consulting laboratory or a consulting analytical chemist.

3. All equipment used during the sampling process will be thoroughly steam-cleaned prior to its use.

4. All samples will be stored in an ice chest and packed in blue ice or ice in such a manner as to prevent sample immersion in melted ice.

5. All samples will be delivered to the consulting laboratory as soon as possible after collection.

6. All sample containers will be opened only by the consulting laboratory which performs the chemical testing.

SOIL SAMPLES

1. Soil samples will be attempted at 5-foot intervals or more frequently as determined in the field.

2. Sample container cleaning blanks may be taken of the steam-cleaned brass liners for quality control purposes at the rate of one per boring.

3. All soil sampling equipment will be disassembled and thoroughly steam-cleaned prior to each usage.

4. The ends of all soil sample liners will be covered with aluminum foil and an air-tight cap which will be wrapped with aluminized tape and properly labeled. All soil samples will be immediately stored in an ice chest and packed with blue ice or ice in such a manner as to prevent immersion in melted ice.

5. All excess soils will be place in 55-gallon drums for proper disposal.

6. The center of each soil liner will be extracted at the consulting laboratory for appropriate analysis.

WATER SAMPLES

1. At least 3 to 5 well bore volumes will be purged from each well prior to sampling for volatile organic compounds. Purging will be accomplished using a bladder or centrifugal pump, a Honda jet pump with foot valve, or by hand-bailing with a clean teflon bailer. During evacuation, pH, conductivity, and temperature will be monitored and recorded. All samples will be retrieved with a steam-cleaned teflon bailer. Cleaning blanks of the teflon bailer will be taken between each well to be sampled if the client so desires.

2. Samples will not be taken until the pH, conductivity, and temperature measurements have stabilized during well purging.

3. All sampling equipment, including gloves and tape measures will be properly decontaminated between each well.

4. All samples will be place in the appropriate cleaned containers provided by the project laboratory. The type of container necessary is contingent upon the analysis needed.

SAMPLE RECORDS AND CUSTODY

1. Records will be maintained for all samples collected by Ingram Mason & Fairbairn.

2. A positive chain-of-custody record will be maintained by Ingram Mason & Fairbairn for future reference.

3. All records will be maintained under strict confidence by Ingram Mason & Fairbairn and will be released only by written authorization of the client.

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Ingram Mason & Fairbairn	Client Project ID:	MARR	Sampled: Jul 22, 1997
One Sansome St., Suite 1900	Sample Matrix:	Water	Received: Jul 23, 1997
San Francisco, CA 94104	Analysis Method:	EPA 5030/8015 Mod./8020	Reported: Aug 4, 1997
Attention: Fred Serafin	First Sample #:	707-1125	

QC Batch Number: GC073097 802005A | GC073097 802005A | GC073097 802005A

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 707-1125 B-1	Sample I.D. 707-1126 B-3	Sample I.D. 707-1127 B-5
Purgeable Hydrocarbons	50	N.D.	N.D.	N.D.
Benzene	0.50	N.D.	N.D.	N.D.
Toluene	0.50	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.	N.D.
Chromatogram Pattern:		--	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0
Date Analyzed:	7/30/97	7/30/97	7/30/97
Instrument Identification:	HP-5	HP-5	HP-5
Surrogate Recovery, %: (QC Limits = 70-130%)	97	102	95

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

SEQUOIA ANALYTICAL, #1271

Jim Bava
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Ingram Mason & Fairbairn
One Sansome St., Suite 1900
San Francisco, CA 94104
Attention: Fred Serafin

Client Project ID: MARR
Matrix: Liquid
QC Sample Group: 7071125-127

Reported: Aug 4, 1997

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC073097	GC073097	GC073097	GC073097
Analy. Method:	802005A EPA 8020	802005A EPA 8020	802005A EPA 8020	802005A EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	D. Newcomb	D. Newcomb	D. Newcomb	D. Newcomb
MS/MSD #:	7071119	7071119	7071119	7071119
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	7/30/97	7/30/97	7/30/97	7/30/97
Analyzed Date:	7/30/97	7/30/97	7/30/97	7/30/97
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Result:	19	19	19	58
MS % Recovery:	95	95	95	97
Dup. Result:	18	18	18	58
MSD % Recov.:	90	90	90	97
RPD:	5.4	5.4	5.4	0.0
RPD Limit:	0-20	0-20	0-20	0-20
LCS #:	5LCS073097	5LCS073097	5LCS073097	5LCS073097
Prepared Date:	7/30/97	7/30/97	7/30/97	7/30/97
Analyzed Date:	7/30/97	7/30/97	7/30/97	7/30/97
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
LCS Result:	20	20	20	63
LCS % Recov.:	100	100	100	105
MS/MSD LCS Control Limits	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL, #1271

Jim Bava
Project Manager

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

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

IMFC

INGRAM MASON & FAIRBAIRN
A DIVISION OF IMFC CORPORATION

ONE SANSOME STREET, SUITE 1900
SAN FRANCISCO, CALIFORNIA 94104

TEL (415) 951-4793
FAX (415) 951-4701 FAX (800) 804-IMFC

Project: MARR
Job Number: MAR-101.1
Project Manager: Fred Serafin
Date: 7/23/1997

CHAIN OF CUSTODY FORM

Laboratory: Sequoia Analytical
Turnaround Time: 10-DAYS
Results To: Fred Serafin
Samplers: ES/TR

ITEM NO.	SAMPLE NUMBER	DATE AND TIME SAMPLED		MATRIX	# CONTAINERS & PRESERVATIVES						ANALYSIS REQUESTED / TYPE OF CONTAINER							COMMENTS
		Date	Time		UNPRESERVED	H_2SO_4	HNO_3	HCl			TPH-G BTEX & MTBE							
1	B-1	7-22-97	11:30	H_2O				2			✓			7071125	A-B			
2	B-3	7-22-97	2:10	"				2			✓			7071126				
3	B-5	7-22-97	4:30	"				2			✓			7071127	J			
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		

MISCELLANEOUS

Number of Coolers	Type of Coolant
1	ICE

COMMENTS:
Please contact Fred Serafin with the results.

Page 1 of 1

CHAIN OF CUSTODY RECORD

Relinquished by: (signature & affiliation)	Date/Time	Received by: (signature & affiliation)	Date/Time
F. D. S.	7/23/97		
Relinquished by: (signature & affiliation)		Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)		Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)		Received by: (signature & affiliation)	Date/Time
Dispatched by: (signature & affiliation)	Date/Time	Received for lab by: Shanna	7/23/97 1205

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FAX (415) 951-4701 (800) 804-IMFC

WATER LEVEL RECORDS

DATE: 3/26/97 PROJECT NO.: MAR-101J

LOCATION: Oakland TECHNICIAN: [illegible]

WELL NO.	WATER LEVEL	TIME	BOTTOM OF WELL
B-1	6.03	9:20	40.3
B-3	8.49	9:30	35.0
B-5	8.53	9:40	33.0

COMMENTS: .....

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WATER LEVEL RECORDS

DATE: 4/25/97 PROJECT NO.: NAR-1015

LOCATION: Oakland TECHNICIAN: Tetra

WELL NO.	WATER LEVEL	TIME	BOTTOM OF WELL
B-1	6.21	8:50	40.3
B-3	6.72	8:58	35.0
B-5	8.28	9:10	23.0

COMMENTS: .....

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WATER LEVEL RECORDS

DATE: 5-23-97 PROJECT NO.: MAK-1[illegible]

LOCATION: Oakland - Marr Site TECHNICIAN: Keith

WELL NO.	WATER LEVEL	TIME	BOTTOM OF WELL
B-1	7.01	2:30 p	40.3
B-3	8.18	2:40 p	35.0
B-5	9.57	2:55 p	33.0

COMMENTS: .....

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WATER LEVEL RECORDS

DATE: 6-27-97 PROJECT NO.: MAR-101J

LOCATION: 2504 MacArthur, Oakland, TECHNICIAN: FS

WELL NO.	WATER LEVEL	TIME	BOTTOM OF WELL
B-1	7.06	11:25	40.3
B-3	9.32	11:38	35.0
B-5	9.73	11:49	23.0

COMMENTS: .....

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WATER LEVEL RECORDS

DATE: 7-22-97 PROJECT NO.: MAR-10LJ

LOCATION: 2504 MacArthur Blvd. TECHNICIAN: TR

WELL NO.	WATER LEVEL	TIME	BOTTOM OF WELL
B-1	7.66	9:00	40.3
B-3	10.26	9:02	35.0
B-5	10.20	9:04	23.0

COMMENTS: W.L. readings were taken before well development for Sampling

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WATER LEVEL RECORDS

DATE: 8-22-97 PROJECT NO.: MAR-101J

LOCATION: 3504 MacArthur Blvd, Oakland TECHNICIAN: FS

WELL NO.	WATER LEVEL	TIME	BOTTOM OF WELL
B-1	8.20		40.3
B-3	10.27		35.0
B-5	10.23		23.0

COMMENTS: .....

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GROUND-WATER SAMPLING FORM

Well Number: B-1
Well Type: ☑ Monitor ☐ Extraction ☐ Other:
Well Material: ☑ PVC ☐ Steel ☐ Other
Sampled By: FS/TR

Job Number: MAR-101J
Location: ~~4505~~ 2504 MacArthur
Date: 7/22/97

WELL PURGING

PURGE VOLUME

Casing Diameter(D in inches):
☑ 2" ☐ 4" ☐ 6" ☐ Other

Total Depth of Well (BOW): 40.3
Water Level: 7.66
Well Volumes To Be Purged:

Well Volume Factors:

Well Casing ID (inches)	(Vol. Factor)
2.0	0.1632
3.0	0.3672
4.0	0.6528
4.5	0.826
6.0	1.469

Purge Volume:

40.3 (total depth) - 7.66 (water level) x 0.1632 (Well Vol. Fac.) x 3 (# of vol. to purge) = 15.98 gallons (calculated purge volume)

PURGE TIME
9:10 Start 10:45 Stop ____ Elapsed

PURGE RATE
Initial ____ gpm Final ____ gpm

ACTUAL VOL. PURGED
25 gallons

PURGE METHOD
☐ Jet Pump ☐ Bailer ☑ Dedicated Pump ☐ Other

WELL SAMPLING PARAMETERS:

Gallons Removed	Time	Temp. C	pH	Cond. (umhos/cm)	Turbidity (NTU)	Other
0	9:10		7.3	760		
15	10:00		7.3	630		
25	10:45		7.1	650		

SAMPLING METHOD:
Time Sampled:
☑ Bailer ☐ Bladder Pump ☐ Other

Samples collected	No. of	Container	Preservatives
EPA 8240			
EPA 8270			
EPA 8010			
TPH (Gas) + BTEX	2	VOAS	
METALS			

COMMENTS:

G.W. Rose to 9.4 @ 1:15 p.m.

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GROUND-WATER SAMPLING FORM

Job Number: MAR - 101J
Location: 2504 MacArthur
Date: 7/22/93

Well Number: B-3
Well Type: ☑ Monitor ☐ Extraction ☐ Other:
Well Material: ☑ PVC ☐ Steel ☐ Other
Sampled By: FS/TR

WELL PURGING

PURGE VOLUME

Casing Diameter(D in inches):
☑ 2" ☐ 4" ☐ 6" ☐ Other

Total Depth of Well (BOW) 35.0
Water Level 10.26
Well Volumes To Be Purged:

Well Volume Factors:

Well Casing ID (inches)	(Vol. Factor)
2.0	0.1632
3.0	0.3672
4.0	0.6528
4.5	0.826
6.0	1.469

Purge Volume:

35.0 (total depth) - 10.26 (water level) x 0.1632 (Well Vol. Fac.) x 3 (# of vol. to purge) = 12.1 (calculated purge volume) gallons

PURGE TIME
11:30 Start 1:00 Stop 1.5Hr Elapsed

PURGE RATE
Initial ____ gpm Final ____ gpm

ACTUAL VOL. PURGED
20 gallons

PURGE METHOD
☐ Jet Pump ☐ Bailer ☑ Dedicated Pump ☐ Other

WELL SAMPLING PARAMETERS:

Gallons Removed	Time	Temp. C	pH	Cond. (umhos/cm)	Turbidity (NTU)	Other
0	11:30		7.6	820		
15	12:45		7.5	870		
20	1:00		7.42	640		

SAMPLING METHOD:

Time Sampled:
☑ Bailer ☐ Bladder Pump ☐ Other

COMMENTS:

Samples collected	No. of	Container	Preservatives
EPA 8240			
EPA 8270			
EPA 8010			
TPH (Gas) + BTEX	2	VOAS	
METALS			

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GROUND-WATER SAMPLING FORM

Job Number: MAR -101J
Location: 2504 MacArthur
Date: 7/22/97

Well Number: B-5
Well Type: ☑ Monitor ☐ Extraction ☐ Other:
Well Material: ☑ PVC ☐ Steel ☐ Other
Sampled By: FS / TR

WELL PURGING

PURGE VOLUME

Casing Diameter(D in inches):
☑ 2" ☐ 4" ☐ 6" ☐ Other

Total Depth of Well (BOW) 23.0
Water Level 10.20
Well Volumes To Be Purged:

Well Volume Factors:

Well Casing ID (inches)	(Vol. Factor)
2.0	0.1632
3.0	0.3672
4.0	0.6528
4.5	0.826
6.0	1.469

Purge Volume:

23.0 (total depth) - 10.20 (water level) x 0.1632 (Well Vol. Fac.) x 3 (# of vol. to purge) = 6.3 gallons (calculated purge volume)

PURGE TIME
1:30 Start 3:00 Stop ____ Elapsed

PURGE RATE
Initial ____ gpm Final ____ gpm

ACTUAL VOL. PURGED
8 gallons

PURGE METHOD
☐ Jet Pump ☐ Bailer ☑ Dedicated Pump ☐ Other

WELL SAMPLING PARAMETERS:

Gallons Removed	Time	Temp. C	pH	Cond. (umhos/cm)	Turbidity (NTU)	Other
0	1:30		7.1	1400		
8	3:00		7.35	1180		

SAMPLING METHOD:
Time Sampled:
☑ Bailer ☐ Bladder Pump ☐ Other

Samples collected	No. of	Container	Preservatives
EPA 8240			
EPA 8270			
EPA 8010			
TPH (Gas) + BTEX	2	VOAS	
METALS			

COMMENTS:
- Well dry in 5 Min.
- 30 Minutes later tried again - Well went dry in 2 Minutes.