#5814

October 20, 1999
Project Number 1124SC01
Via Facsimile & US Mail

99 OCT 21 PM 4:27

McMorgan & Company
One Bush Street, Suite 800
San Francisco, CA 94104

ATTN: Mr. Patrick G. Murray
SUBJECT: **QUARTERLY GROUNDWATER MONITORING THIRD QUARTER 1999**
444 Hegenberger Road, Oakland, California

Dear Mr. Murray:

E_2C, Inc. presents herein the results of third quarter groundwater monitoring performed at 444 Hegenberger Road, Oakland, California (Site) (see Figure 1). The work was performed in accordance with the Alameda County Health Care Services' (ACHCS) approved Groundwater Monitoring Workplan for the Site prepared by Northwest Envirocon, Inc. (NWE, 1999). The Scope of Work consisted of the following:

- Measurement of groundwater elevations,
- Purging and subsequent sampling of groundwater from Groundwater Monitoring Wells MW-1, MW-2, MW-3, MW-4, and MW-5 (see Figure 2),
- Chemical analyses of the groundwater samples,
- Analysis of the data, and
- Preparation of this report.

CURRENT GROUNDWATER MONITORING

Five shallow wells are located on the Site. Figure 2 depicts the locations of the wells. These wells are used specifically for monitoring the physical and chemical conditions of groundwater in the uppermost groundwater-bearing zone beneath the Site.

On September 15, 1999, the third quarter monitoring round was performed. Prior to the collection of groundwater samples, the water level in each well was measured using a Solinst water level meter. These water levels were then used to calculate the groundwater elevation at each well. After groundwater levels were measured and recorded. Three to five bore volumes were purged at each well using, either a bailer or an ABS submersible pump, as the physical parameters (temperature, pH, electrical conductivity, and turbidity) were measured. When the parameters stabilized, a groundwater sample was collected (data is summarized in Table 1 and Field Data Sheets are included as Appendix A).

Due to receiving ACHCS' comments on the second quarter groundwater monitoring report after this quarter's sampling and analyses were performed, dissolved oxygen and oxygen-

reduction potentials were not acquired. These data will be acquired in the next sampling round.

Once the wells had been purged, groundwater samples were collected using a dedicated disposable bailer. Sample material was dispensed into containers appropriate for the required analyses. The containers were then secured, labeled, and placed on ice in a cooler for transport to Entech Analytical Labs, Inc. of Sunnyvale, California, a State-certified analytical laboratory.

DISCUSSION OF GROUNDWATER ELEVATIONS

Groundwater level measurement data were used to calculate groundwater elevations, groundwater flow direction, and groundwater gradient at the Site (Table 2 summarizes historical and current groundwater flow data).

Groundwater elevations remained somewhat constant from last quarter. Elevation changes were minimal from 0.01-foot (Well MW-4) to 0.07-foot (Well MW-1) from last quarter to this quarter. However, due to the flat-like nature of the groundwater flow regime at the Site, even small changes will affect the groundwater gradient. The data for the third quarter were plotted onto a base map (Figure 3 depicts third quarter groundwater flow conditions). This plot was then compared to plots prepared for previous reporting periods and is discussed in the following Section.

DISCUSSION OF GROUNDWATER GRADIENT PLOTS

Several features are prominent on the groundwater gradient plot (see Figure 3). The general steepness of the groundwater gradient at the Site is relatively flat, as the highest gradient appears to be 0.04089 feet vertical per feet horizontal distance (ft/ft) with a northerly direction. This is an average between Well MW-2 and MW-4. There is also a flow component between Well MW-1 and the area encompassing Wells MW-5 and MW-3. The gradient between these wells is extremely flat, ranging from 0.00111 ft/ft to 0.00125 ft/ft.

The contour interval used was 0.50 of a foot except for that area from Well MW-1 to Well MW-5, where 0.05 of a foot was used. South of well MW-2, the gradient is flatter than it is north of that well. This condition extends generally from Well MW-1 west through the Well MW-2 area and west towards Well MW-3.

In general, unless a boundary condition exists, steepening gradient is indicative of groundwater coming into a zone of soils with lower permeability. The movement of groundwater in the subsurface is dependent upon four principal factors. These are the discharge (Q) across the system, the hydraulic conductivity (K), the groundwater gradient (i), and the area (A) across the system's discharge surface.

The area is a constant as is the hydraulic conductivity, or permeability. In order to change permeability, the materials would have to be removed, reworked, and replaced. As a unit of water (constant discharge) is moving across the Site of constant area (A), then a change in the gradient (i) reflects a change in the hydraulic conductivity (K) of the flow-medium materials. As groundwater flows through materials that are smaller in size and more densely packed, such as Bay muds, the greater friction reduces the magnitude of the flow, thus a

lower permeability, so K is decreased. In order to maintain Q, i must increase. This condition is in evidence between Wells MW-2 and MW-4. These two wells are screened at about the same depths and apparently in the same water-bearing zone based on a review of the boring logs for those locations. No significant differences are seen in the boring logs, however, a boring log only depicts conditions at that point. Significant lateral variations can and do exist in the subsurface especially in an area where alluvial materials have been splayed out into Bay-type muds.

The cross-sections and boring logs from the NWE 1998 report were also reviewed in an attempt to ascertain if a boundary condition exists at the Site. A boundary condition is not apparent. It must be noted, though, that boundary conditions may not become apparent until aquifer testing is performed, such as a pumping test.

Conclusions of Groundwater Discussion

If an imaginary line were drawn from Well MW-1 through Well MW-2 to Well MW-3, the soils along that line would be more permeable than those soils north of that line. The comparison of all the groundwater flow plots suggests that the soils in the groundwater-bearing zone between Wells MW-1, MW-2, and MW-3 have a higher permeability than that seen in other areas of the site. The soils in the subsurface in the area of Well MW-5 are slightly less permeable and the soils between Wells MW-2 and MW-4 are even less permeable.

As groundwater elevations have only been measured four times at the Site, there are not enough data to determine significant trends as to seasonal changes over the long term.

GROUNDWATER ANALYSES

The groundwater samples were analyzed for Total Petroleum Hydrocarbons as diesel (TPHd) and gasoline (TPHg) and for Benzene, Toluene, Ethylbenzene, and Xylenes (total) (BTEX) using Environmental Protection Agency Test Methods 8015M, and 8020, respectively. The results of the sample analyses are presented in Table 3 and are shown on Figure 4. Copies of the laboratory report and the corresponding chain-of-custody form are presented in Appendix B.

Discussion of Analytical Results

Benzene in groundwater is of primary concern as it has the lowest action limit of those compounds found at the Site and it is a known carcinogenic compound. Benzene concentrations detected ranged from non-detect (Well MW-1) to a high of 350 micrograms per liter (µg/L), which is equivocal to parts per billion (ppb), at Well MW-3. The Maximum Contaminant Limit (MCL) for Benzene is 1 µg/L.

Benzene concentrations have increased in three wells (Wells MW-2, MW-3, and MW-4) since last quarter. The greatest increase is seen at Well MW-3 (1 µg/L last quarter, 330 µg/L this quarter). Benzene decreased at Well MW-5 (160 µg/L last quarter, 64 µg/L this quarter). Benzene has not been detected in Well MW-1 in any sampling round to date. Benzene data has been plotted on an isoconcentration plot (see Figure 4).

As seen on Figure 4, the highest concentration of Benzene was detected at the extreme western corner of the Site at Well MW-3. The second highest concentration is found at Well MW-2. An isoconcentration plot of TPHg concentrations (see Figure 5) is similar except for the new detection at well MW-1.

The concentrations of TPHg decreased in Wells MW-2, MW-3, MW-4, and MW-5. However, TPHg (3,100 µg/L) was detected in the groundwater sample collected at Well MW-1. TPHg has been non-detect in groundwater at this well in previous sampling rounds.

TPHd (190 µg/L), also appeared in groundwater at well MW-1 for the first time. TEX (9.6 µg/L of Toluene, 7.8 µg/L of Ethylbenzene, and 12 µg/L of Xylenes) was also detected in Well MW-1 for the first time. TEX concentrations in all wells are significantly less than their respective MCLs.

Groundwater at Well MW-1 has been non-detect for the compounds tested for the first three sampling rounds since its installation. The well is upgradient and groundwater gradient plots suggest that groundwater has not moved in that direction. The likelihood of an off-site source cannot be precluded.

As only four sampling rounds have been performed at the Site, there are not enough data to determine significant concentration trends.

RECOMMENDATIONS

Based on the data collected and the requirements of ACHCS, E_2C, Inc. recommends that groundwater monitoring be continued in accordance with the approved sampling schedule. Copies of this and future reports will be sent to Mr. Barney Chan of ACHCS. For the next sampling quarter, dissolved oxygen and oxygen-reduction potentials will be measured, pre and post purging as requested by the ACHCS (ACHCS, 1999).

As TPHg was found in the groundwater sample from upgradient Well MW-1, E_2C recommends that a data base review be performed to determine potential upgradient sources or sites with known fuel UST leaks. Sources for the review would be the ACHCS, the Alameda County Water District, the City of Oakland, and the California Regional Water Quality Control Board.

E_2C, Inc. appreciates the opportunity to be of service to you on this project and looks forward to working with McMorgan & Company in the future. If you have any questions or would like any further information, please call us at your convenience.

Sincerely,

William A. Lawson
Project Geologist

Kendall W. Price, CEG/REA
President

WAL: 1124SC01 Quarterly GW Monitoring 1099
cc: Mr. Barney M. Chan/Alameda County Health Care Service
Walter H. Kim, E_2C

REFERENCES

Alameda County Health Care Services, September 22, 1999, Quarter Monitoring Report for 444 Hegenberger Loop, Oakland, CA 94621 (ACHCS, 1999).

Northwest Envirocon, Inc., December 18, 1998, Supplemental Soil and Groundwater Assessment, 444 Hegenberger Road, Oakland, CA; NEW Project No. 05-001594 (NWE, 1998)

Northwest Envirocon, Inc., February 19, 1999, Groundwater Monitoring Work Plan for 444 Hegenberger Loop, Oakland 94621 (NWE, 1999)

FIGURES

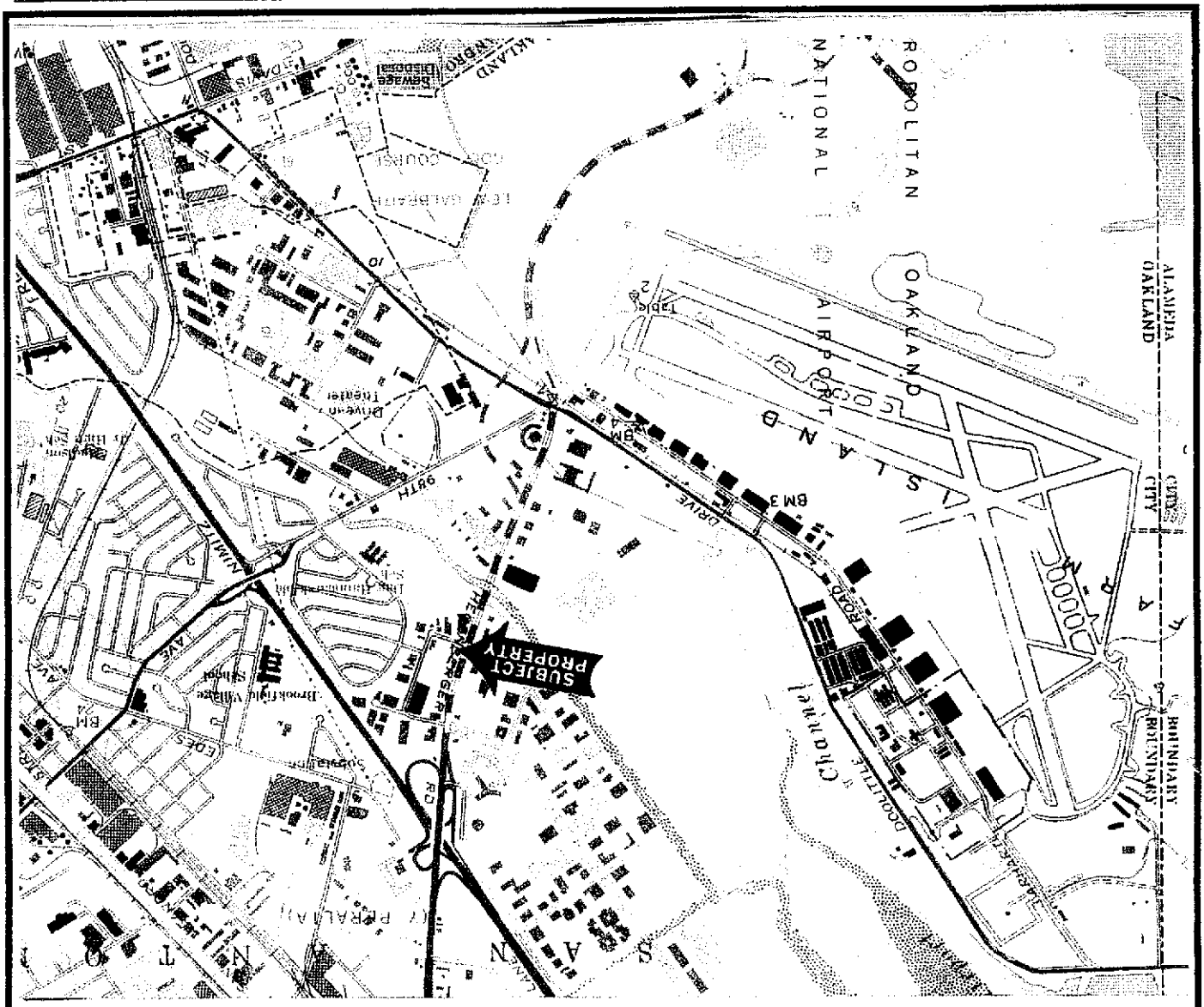


FIGURE 1 - SITE LOCATION MAP

Address: 444 Hegenberger Loop	Client Name: McMorgan & Company
City/State: Oakland, California	E_2C Project Number: 1124SC01

E_2C INC.
Environmental/Engineering Consultants

382 Martin Avenue . Santa Clara, CA 95050

Source:
Thomas Brothers 1994

HEGENBERGER ROAD

HEGENBERGER LOOP

MW-3

MW-4

FORMER PUMP ISLANDS

MW-2

CONCRETE SLAB

MW-5

CONCRETE SLAB

FORMER WASTE OIL TANK

GATE

MW-1

SCALE IN FEET

0' 10' 20' 30'

NORTH

EXPLANATION

MW-5 GROUNDWATER MONITORING WELL LOCATION

Figure - 2 SITE PLAN

Environmental/Engineering Consultants
382 Martin Avenue
Santa Clara, California 95050-3112
Tel: 408.327.5700 Fax: 408.327.5707

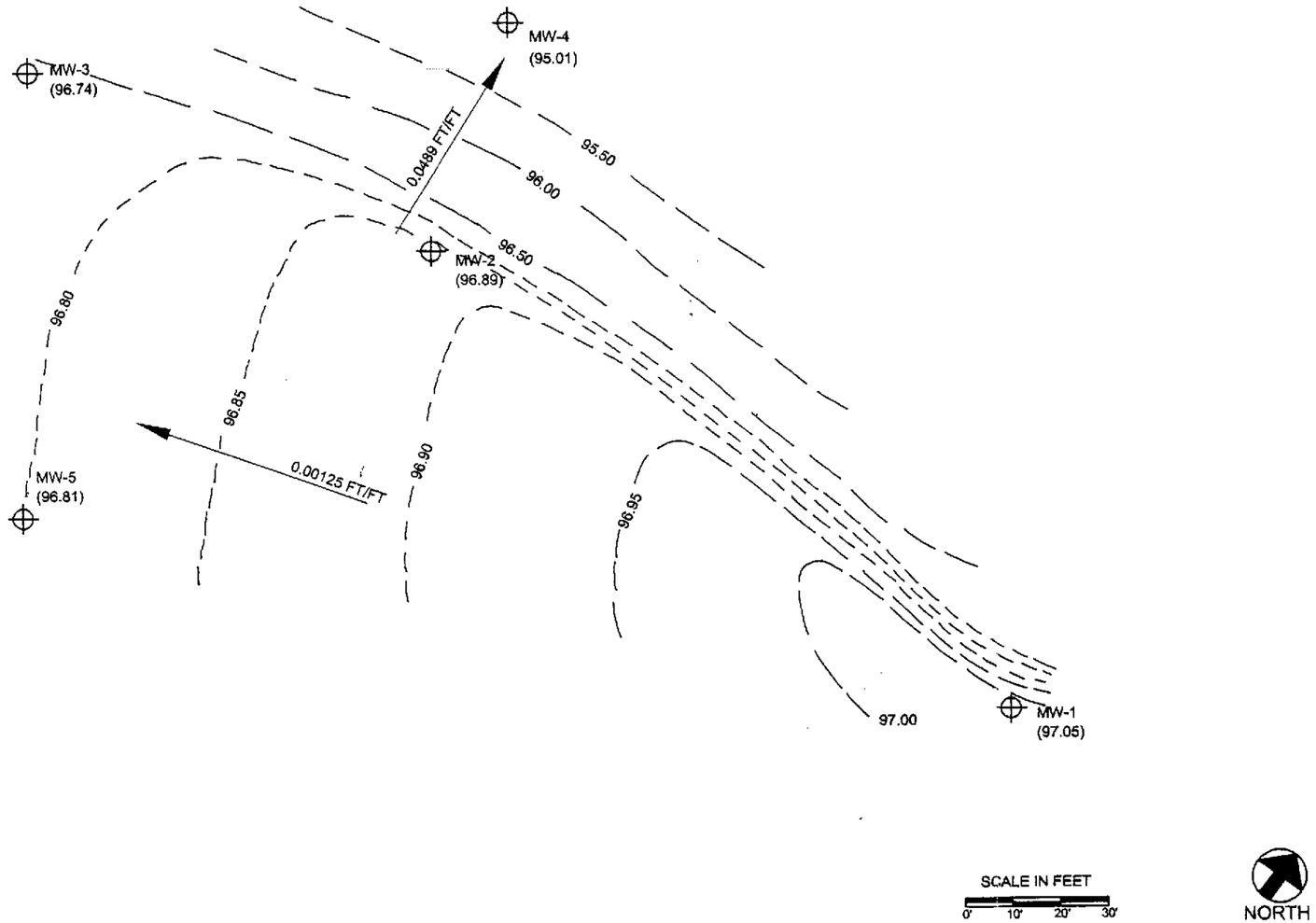
444 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

FILENAME: 1124SC01
DATE: OCTOBER 1999
REVISION:
DRAWN:LJUSTUS

Job Number:
1124SC01

HEGENBERGER ROAD

HEGENBERGER LOOP



EXPLANATION

MW-5 GROUNDWATER MONITORING WELL LOCATION

(97.05) GROUNDWATER ELEVATION (FEET MSL)

GROUNDWATER CONTOUR
(DASHED WHERE APPROXIMATE; QUERIED WHERE UNKNOWN)
(CONTOUR LINTERVAL 0.50; 0.05)

(0.0489; 0.00125) GROUNDWATER FLOW DIRECTION AND GRADIENT

Figure 3 - GROUNDWATER GRADIENT (09.15.1999)

Environmental/Engineering Consultants
382 Martin Avenue
Santa Clara, California 95050-3112
Tel: 408.327.5700 Fax: 408.327.5707

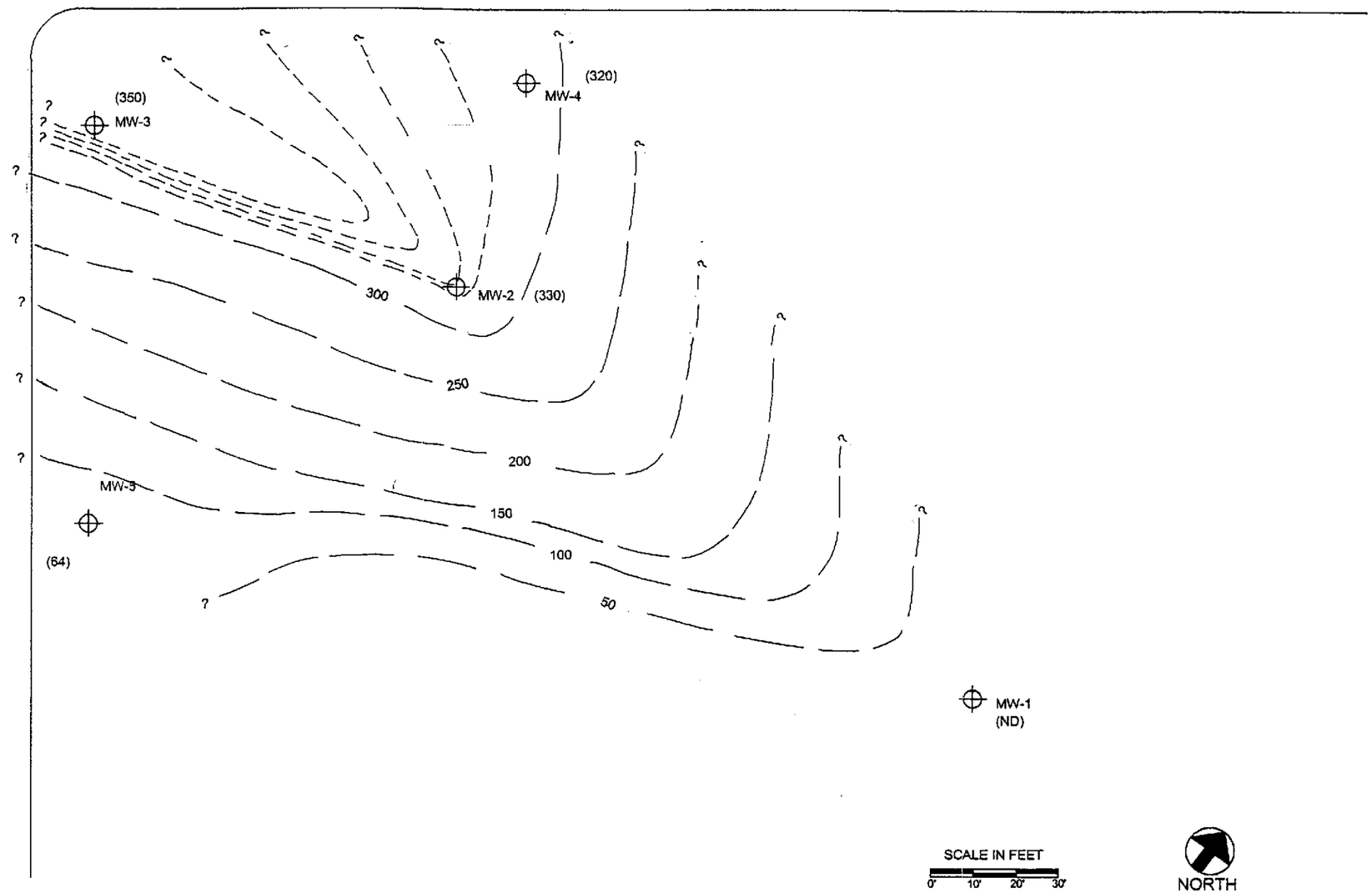
444 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

FILENAME: 1124SC01
DATE: OCTOBER 1999
REVISION:
DRAWN: J.STUS

Job Number:
1124SC01

HEGENBERGER ROAD

HEGENBERGER LOOP



EXPLANATION

MW-5 GROUNDWATER MONITORING WELL LOCATION

ISOCONCENTRATION CONTOUR
(DASHED WHERE APPROXIMATE; QUERIED WHERE UNKNOWN)
(CONTOUR LINTERVAL = 100 µg/L EXCEPT WHERE NOTED)

(350) BENZENE CONCENTRATION (µg/L)

ND NOT DETECTED AT METHOD DETECTION LIMITS

Figure 4 - THIRD QUARTER 1999 BENZENE ISOCONCENTRATION PLOT

Environmental/Engineering Consultants
382 Martin Avenue
Santa Clara, California 95050-3112
Tel: 408.327.5700 Fax: 408.327.5707

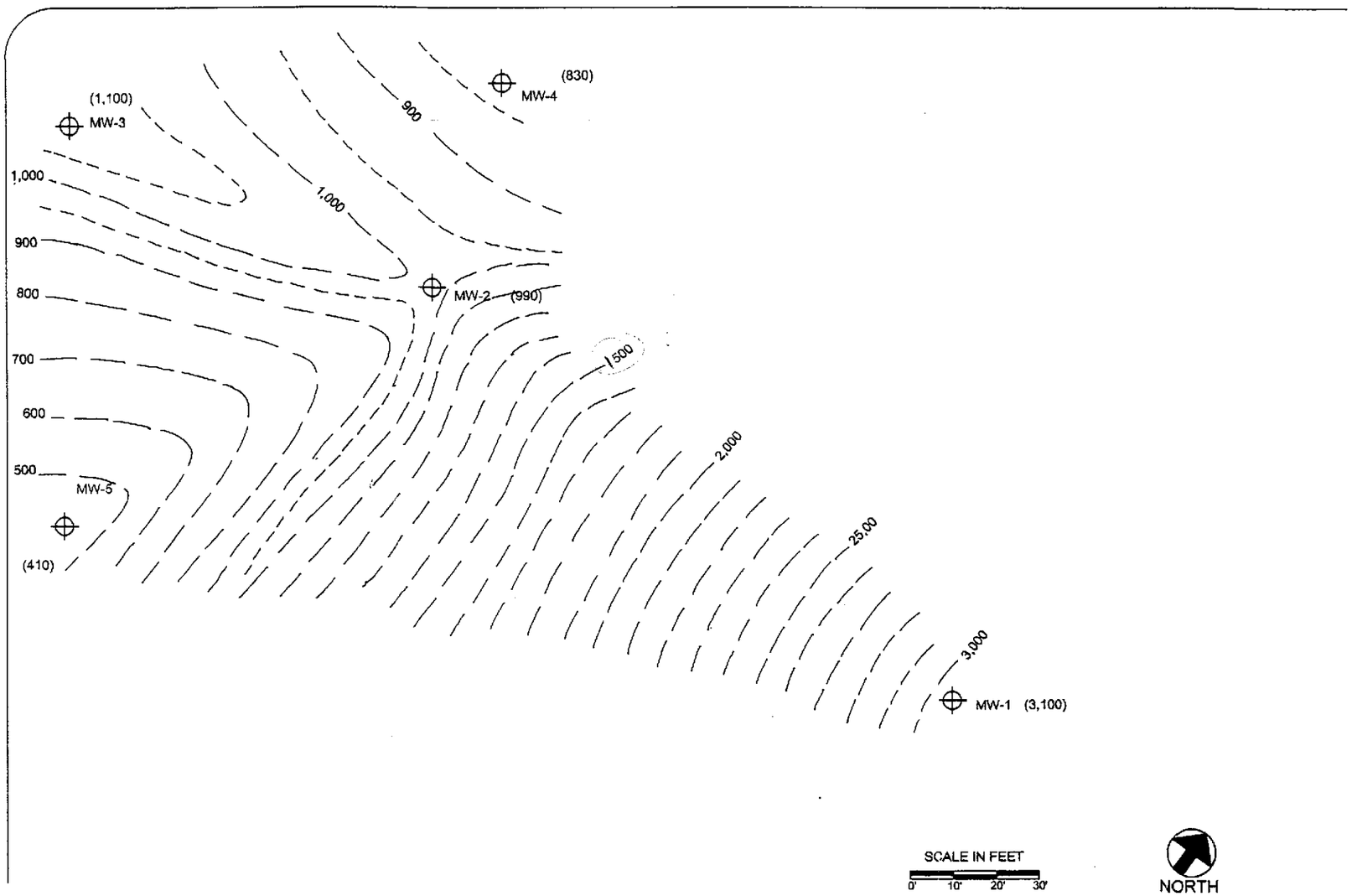
444 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

FILENAME: 1124SC01
DATE: OCTOBER 1999
REVISION:
DRAWN/...USTUS

Job Number:
1124SC01

HEGENBERGER ROAD

HEGENBERGER LOOP



SCALE IN FEET
0' 10' 20' 30'

NORTH

EXPLANATION

MW-5 GROUNDWATER MONITORING WELL LOCATION

(990) TPHg CONCENTRATION

TPHg CONCENTRATION CONTOUR
(DASHED WHERE APPROXIMATE; QUERIED WHERE UNKNOWN)
(CONTOUR LINTERVAL = 100 µg/L EXCEPT WHERE NOTED)

Figure 5 - THIRD QUARTER 1999 TPHg ISOCONCENTRATION PLOT

Environmental/Engineering Consultants
382 Martin Avenue
Santa Clara, California 95050-3112
Tel: 408.327.5700 Fax: 408.327.5707

444 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

FILENAME: 1124SC01
DATE: OCTOBER 1999
REVISION:
DRAWN:L.JUSTUS

Job Number:
1124SC01

BLAINE
TECH SERVICES INC.

1680 ROGERS AVENUE
SAN JOSE, CALIFORNIA 95112-1105
(408) 573-7771 FAX
(408) 573-0555 PHONE

DATE 9/20/99

Total pages including cover sheet 2

TO MARA

OF Enkel
735-1554

FROM Billy x200

REMARKS: Please note Correction to Sample I.D. (BTS Project # 990915-P1 FEC Project # 112450 01)
SHOULD BE "MW-5"
-Please call if any Q's.
THX

BLAINE TECH SERVICES INC.
1680 ROGERS AVENUE
SAN JOSE, CALIFORNIA 95112-1105
FAX (408) 573-7771
PHONE (408) 573-0555

16375

CHAIN OF CUSTODY 9906[illegible] P1

CLIENT E&C

SITE 444 Hegenberger Loop
Oakland, CA

CONDUCT ANALYSIS TO DETECT

LAB Entech DHS #

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND

☐ EPA ☐ RWQCB REGION ____
☐ LIA
☐ OTHER

SPECIAL INSTRUCTIONS

Invoice & Report to:
E&C
Attn: Bill Lawson
Proj # 112450

SAMPLE I.D.	Date	Time	MATRIX S = SOIL W = H2O	CONTAINERS TOTAL	C - COMPOSITE ALL CONTAINERS	TPH-Gas	BTEX	TPH-Diesel	ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
MW-1	9/15	9:25		5		X	X	X				
MW-2		10:22		5								
MW-3		10:50		5								
MW-4		11:20		5								
~~MW-6~~ MW-5		9:55		5					MW-5 ③ 9/20/99			

SAMPLING COMPLETED DATE 9/15/99 TIME 11:30

SAMPLING PERFORMED BY Paul Samma

RESULTS NEEDED NO LATER THAN Per Client

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
[signature]	9/16/99	1235	[signature]	9/16/99	12:45
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME

SHIPPED VIA	DATE SENT	TIME SENT	COOLER #	

SEP. -20'99(MON) 14:40 BLAINE TECH SERVICES, INC TEL:408 573 7771 P.002

BLAINE TECH SERVICES INC.

1680 ROGERS AVENUE
SAN JOSE, CALIFORNIA 95112-1105
FAX (408) 573-7771
PHONE (408) 573-0555

CHAIN OF CUSTODY 990915-P1

CLIENT E2C

SITE 444 Hegenberger Loop
Oakland, CA

C = COMPOSITE ALL CONTAINERS

CONDUCT ANALYSIS TO DETECT

LAB Entech DHS #

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND

☐ EPA ☐ RWQCB REGION
☐ LIA
☐ OTHER

SPECIAL INSTRUCTIONS

Invoice & Report to:
E2C
Attn: Bill Lawson
Proj # 112450.01

SAMPLE I.D.	Date	Time	MATRIX S = SOIL W = H2O	CONTAINERS TOTAL	C	TPH-Gas	BTEX	TPH-Diesel	ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
MW-1	9/15	9:25	W	5		X	X	X				16375-001
MW-2		10:22	W	5								-002
MW-3		10:50	W	5								-003
MW-4		11:20	W	5								-004
MW-5		9:55	W	5								-005
SA 9.24.99												

SAMPLING COMPLETED	DATE	TIME
	9/15/99	11:30

SAMPLING PERFORMED BY Paul Sarma

RESULTS NEEDED NO LATER THAN Per Client

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Paul Sarma	9/16/99	1235	Tai Ou	9/16/99	12:45
Tai Ou	9/16/99	13:15			

SHIPPED VIA	DATE SENT	TIME SENT	COOLER #

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography
Laboratory Control Spikes

QC Batch #: DW990909
Matrix: Water
Units: µg/L

Date analyzed: 09/17/99
Date extracted: 09/16/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/L	SA µg/L	SR µg/L	SP µg/L	**SP %R**	SPD µg/L	**SPD %R**	RPD	QC LIMITS RPD	QC LIMITS %R
Diesel	8015M	<50.0	1000	ND	922	**92**	873	**87**	5.4	25	64-120
Hexocosane(S.S.)				106%	108%		104%				65-135

Definition of Terms:

- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SP (%R) Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R) Spike Duplicate % Recovery
- NC: Not Calculated

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography
Laboratory Control Spikes

QC Batch #: DW990910
Matrix: Water
Units: µg/L

Date analyzed: 09/20/99
Date extracted: 09/20/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/L	SA µg/L	SR µg/L	SP µg/L	**SP %R**	SPD µg/L	**SPD %R**	RPD	QC LIMITS RPD	QC LIMITS %R
Diesel	8015M	<50.0	1000	ND	893	**89**	885	**89**	0.8	25	64-120
Hexocosane(S.S.)				93%	88%		87%				65-135

Definition of Terms:

- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SP (%R) Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R) Spike Duplicate % Recovery
- NC: Not Calculated

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography
Laboratory Control Sample

QC Batch #: GBG1990917
Matrix: Water
Units: µg/Liter

Date Analyzed: 09/16/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/Liter	SA µg/Liter	SR µg/Liter	SP µg/Liter	**SP % R**	SPD µg/Liter	**SPD %R**	RPD	QC LIMITS RPD	QC LIMITS %R
Benzene	8020	<0.50	5.0	ND	5.6	**112**	5.4	**109**	3.2	25	69-118
Toluene	8020	<0.50	29.0	ND	32	**110**	32	**109**	1.3	25	82-122
Ethyl Benzene	8020	<0.50	5.7	ND	5.8	**102**	5.7	**100**	2.3	25	77-114
Xylenes	8020	<0.50	30.6	ND	34	**111**	33	**108**	2.8	25	85-125
Gasoline	8015	<50.0	500	ND	501	**100**	430	**86**	15.2	25	75-125
aaa-TFT(S.S.)-PID	8020			97%	93%		83%				65-135
aaa-TFT(S.S.)-FID	8015			97%	92%		91%				65-135

Definition of Terms:

- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SP (%R): Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R): Spike % Recovery
- nc: Not Calculated

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography
Laboratory Control Sample

QC Batch #: GBG2990923
Matrix: Water
Units: µg/Liter

Date Analyzed: 09/23/99
Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/Liter	SA µg/Liter	SR µg/Liter	SP µg/Liter	**SP % R**	SPD µg/Liter	**SPD %R**	RPD	QC LIMITS RPD	QC LIMITS %R
Benzene	8020	<0.50	4.0	ND	4.2	**105**	4.0	**100**	4.4	25	67-115
Toluene	8020	<0.50	25.7	ND	28	**111**	28	**107**	3.4	25	82-122
Ethyl Benzene	8020	<0.50	5.2	ND	5.9	**113**	5.5	**106**	6.0	25	77-114
Xylenes	8020	<0.50	27.9	ND	32	**115**	31	**111**	3.6	25	85-125
Gasoline	8015	<50.0	500	ND	574	**115**	549	**110**	4.5	25	75-125
aaa-TFT(S.S.)-PID	8020			98%	95%		93%				65-135
aaa-TFT(S.S.)-FID	8015			105%	100%		97%				65-135

Definition of Terms:

- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SP (%R): Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R): Spike % Recovery_
- nc: Not Calculated

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

STANDARD LAB QUALIFIERS
July, 1998

All Entech lab reports now reference standard lab qualifiers. These qualifiers are noted in the adjacent column to the analytical result and are adapted from the U.S. EPA CLP program. The current qualifier list is as follows:

Qualifier	Description
U	Compound was analyzed for but not detected
J	Estimated valued for tentatively identified compounds or if result is below PQL but above MDL
N	Presumptive evidence of a compound (for Tentatively Identified Compounds)
B	Analyte is found in the associated Method Blank
E	Compounds whose concentrations exceed the upper level of the calibration range
D	Multiple dilutions reported for analysis; discrepancies between analytes may be due to dilution
X	Results within quantitation range; chromatographic pattern not typical of fuel

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

E2C, Inc.
382 Martin Avenue
Santa Clara, CA 95050
Attn: Bill Lawson

Date: 9/23/99
Date Received: 9/16/99
Project: 1124SCO1
PO #:
Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	MW-4			MW-5							
Sample Date	9/15/99			9/15/99							
Sample Time	11:20			9:55							
Lab #	16375-004			16375-005							
	Result	DF	DLR	Result	DF	DLR				PQL	Method
Results in µg/Liter:											
Analysis Date	9/17/99			9/17/99							
TPH-Diesel	**59** [x]	1.0	50	**ND**	1.0	50				50	8015M
Analysis Date	9/20/99			9/20/99							
TPH-Gas	**830**	2.0	100	**410**	1.0	50				50	8015M
Benzene	**320**	2.0	1	**64**	1.0	0.50				0.50	8020
Toluene	**6.5**	2.0	1	**2.1**	1.0	0.50				0.50	8020
Ethyl Benzene	**1.7**	2.0	1	**1.3**	1.0	0.50				0.50	8020
Xylenes (total)	**ND**	2.0	1	**2.7**	1.0	0.50				0.50	8020

DF=Dilution Factor ND= None Detected above DLR PQL=Practical Quantitation Limit DLR=Detection Reporting Limit

- Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)

Michelle L. Anderson, Lab Director

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

E2C, Inc.
382 Martin Avenue
Santa Clara, CA 95050
Attn: Bill Lawson

Date: 9/23/99
Date Received: 9/16/99
Project: 1124SCO1
PO #:
Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	MW-1			MW-2			MW-3				
Sample Date	9/15/99			9/15/99			9/15/99				
Sample Time	9:25			10:22			10:50				
Lab #	16375-001			16375-002			16375-003				
	Result	DF	DLR	Result	DF	DLR	Result	DF	DLR	PQL	Method
Results in µg/Liter:											
Analysis Date	9/20/99			9/20/99			9/17/99				
TPH-Diesel	**ND**	1.0	50	**100** x	1.0	50	**110** x	1.0	50	50	8015M
Analysis Date	9/23/99			9/20/99			9/20/99				
TPH-Gas	**3,100**	1.0	50	**990**	2.0	100	**1,100**	2.0	100	50	8015M
Benzene	**ND**	1.0	0.50	**330**	2.0	1	**350**	2.0	1	0.50	8020
Toluene	**9.6**	1.0	0.50	**9.7**	2.0	1	**8.3**	2.0	1	0.50	8020
Ethyl Benzene	**7.8**	1.0	0.50	**11**	2.0	1	**5.4**	2.0	1	0.50	8020
Xylenes (total)	**12**	1.0	0.50	**19**	2.0	1	**10**	2.0	1	0.50	8020

DF=Dilution Factor ND= None Detected above DLR PQL=Practical Quantitation Limit DLR=Detection Reporting Limit

· Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)

Michelle L. Anderson, Lab Director

APPENDIX B

LABORATORY REPORT AND CHAIN-OF-CUSTODY DOCUMENTATION

WELL MONITORING DATA SHEET

Project #: 990915-P1	Client: E2C
Sampler: Paul	Start Date: 9-15-99
Well I.D.: MW-5	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 19.55	Depth to Water: 5.41
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method: Bailer / Disposable Bailer ✓ / Middleburg / Electric Submersible / Extraction Pump / Other: _____

Sampling Method: Bailer / Disposable Bailer ✓ / Extraction Port / Other: _____

2.2 (Gals.) X 3 = 6.7 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
9:42	72.4	6.8	1027	167	2.5	
9:46	71.6	6.8	966	129	5.0	
9:50	71.2	6.9	924	96	7	

Did well dewater? Yes (~~No~~)	Gallons actually evacuated: 7
Sampling Time: 9:55	Sampling Date: 9-15-99
Sample I.D.: MW-5	Laboratory: Entech
Analyzed for: (TPH-G BTEX MTBE ~~TPH-D~~)	Other:
Equipment Blank I.D.: @ Time	Duplicate I.D.:
Analyzed for: TPH-G BTEX MTBE TPH-D	Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 990915-P1	Client: E2C
Sampler: Paul	Start Date: 9-15-99
Well I.D.: MW-4	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 19.42	Depth to Water: 4.99
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method: Bailer / Disposable Bailer ✓ / Middleburg / Electric Submersible / Extraction Pump / Other: _____

Sampling Method: Bailer / Disposable Bailer ✓ / Extraction Port / Other: _____

2.3 (Gals.) X 3 = 6.9 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
11:04	72.2	6.8	896	7200	2.5	
11:10	71.6	6.8	854	187	5.0	
11:15	70.8	6.8	831	162	7	

Did well dewater? Yes (No)	Gallons actually evacuated: 7
Sampling Time: 11:20	Sampling Date: 9-15-99
Sample I.D.: MW-4	Laboratory: Entech
Analyzed for: (TPH-G BTEX MTBE TPH-D)	Other:
Equipment Blank I.D.: @ Time	Duplicate I.D.:
Analyzed for: TPH-G BTEX MTBE TPH-D	Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 990915-P1	Client: E2C
Sampler: PA-1	Start Date: 9-15-99
Well I.D.: MW-3	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 19.50	Depth to Water: 5.26
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method: Bailer / Disposable Bailer ✓ / Middleburg / Electric Submersible / Extraction Pump / Other: ____

Sampling Method: Bailer / Disposable Bailer ✓ / Extraction Port / Other: ____

2.2 (Gals.) X	3	= 6.8 Gals.
1 Case Volume	Specified Volumes	Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
10:38	71.2	6.8	867	>200	2.5	
10:42	70.8	6.7	842	>200	5.0	
10:46	69.6	6.7	826	>200	7.0	

Did well dewater? Yes (No)	Gallons actually evacuated: 7.0
Sampling Time: 10:50	Sampling Date: 9-15-99
Sample I.D.: MW-3	Laboratory: Entech
Analyzed for: (TPH-G BTEX MTBE TPH-D)	Other:
Equipment Blank I.D.: @ Time	Duplicate I.D.:
Analyzed for: TPH-G BTEX MTBE TPH-D	Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 990915-P1	Client: EzC
Sampler: PA-1	Start Date: 9-15-99
Well I.D.: MW-2	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 1943	Depth to Water: 5.55
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method: Bailer / Disposable Bailer ✓ / Middleburg / Electric Submersible / Extraction Pump / Other: ____

Sampling Method: Bailer / Disposable Bailer ✓ / Extraction Port / Other: ____

2.2 (Gals.) X 3 = 6.6 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius^2 * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
10:08	71.8	7.0	1273	>200	2.5	
10:12	71.4	7.0	1242	>200	5.0	
10:16	70.6	6.9	1186	>200	7	

Did well dewater? Yes (No)	Gallons actually evacuated: 7
Sampling Time: 10:22	Sampling Date: 9-15-99
Sample I.D.: MW-2	Laboratory: Entech
Analyzed for: (TPH-G BTEX MTBE TPH-D)	Other:
Equipment Blank I.D.: @ Time	Duplicate I.D.:
Analyzed for: TPH-G BTEX MTBE TPH-D	Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 990915-P1	Client: E2C
Sampler: PA-1	Start Date: 9-15-99
Well I.D.: MW-1	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 19.30	Depth to Water: 3.69
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method: Bailer / Disposable Bailer ✓ / Middleburg / Electric Submersible / Extraction Pump / Other: ___

Sampling Method: Bailer / Disposable Bailer ✓ / Extraction Port / Other: ___

2.4 (Gals.) X 3 = 7.4 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
2"	0.16	5"	1.02
3"	0.37	6"	1.47
4"	0.65	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
9:10	74.8	6.7	779	>200	2.5	
9:15	73.6	6.7	769	7200	5.0	
9:20	73.4	6.8	754	7200	7.5	

Did well dewater? Yes (No) Gallons actually evacuated: 7.5

Sampling Time: 9:25 Sampling Date: 9-15-99

Sample I.D.: MW-1 Laboratory: Entech

Analyzed for: (TPH-G BTEX MTBE TPH-D) Other:

Equipment Blank I.D.: @ Time Duplicate I.D.:

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL GAUGING DATA

Project # 990915-P1 Date 9-15-99 Client E2C

Site 444 Hegenberger Rd. Oakland

Well ID	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	
MW-1	2					3.69 WS	19.30		
MW-2	2					5.55 WS	19.43		
MW-3	2					5.26 WS	19.56		
MW-4	2					4.99 WS	19.42		
MW-5	2					5.41 WS	19.55		
		* Triple checked DTW							

APPENDIX A

WELL MONITORING FIELD DATA SHEETS

TABLE 4 - HISTORICAL GROUNDWATER ANALYTICAL DATA

TPHg

WELL I.D.	DATE	TPHd	~~TPHg~~	B	T	E	X
MW-1	12/2/98(a)	<50	<50	<0.05	<0.05	<0.05	<0.05
	3/8/99	190	<50	<0.3	<0.3	<0.3	<0.3
	7/1/99	<50	<50	<0.5	<0.5	<0.5	<0.5D
	9/15/99	<50	3100	<0.5	9.6	7.8	12
MW-2	12/2/98(a)	99	<50	4.6	0.85	0.57	5
	3/8/99	210	180	200(a)	0.74	1.3	2.3
	7/1/99	<50	1,100	190	13	33	36
	9/15/99	100*	990	330	9.7	11	19
MW-3	12/2/98(a)	300	970	160	6.5	16	9
	3/8/99	1,400	2,600	1,800(b)	30(c)	67(c)	26(c)
	7/1/99	150*	3,000	1	<0.5	32	36
	9/15/99	110*	1,100	350	8.3	6.4	10
MW-4	12/2/98(a)	620	<50	1.1	0.37	<0.3	2
	3/8/99	<50	1,300	1,900(b)	9.4	1.2	11
	7/1/99	<50	610**	120	<0.5	<0.5	<0.5
	9/15/99	59*	830	320	6.5	1.7	<2.0
MW-5	12/2/98(a)	620	<50	1.1	0.37	<0.3	2
	3/8/99	<50	58	23	0.31	<0.3	1.5
	7/1/99	64*	1,900	160	10	13	22
	9/15/99	<50	410	64	2.1	1.3	2.7
	MCLs	NE	NE	1	100	680	1,750

Notes:

Shaded values meet or exceed their respective MCLs ← not correctly shaded !

NE = No MCL or Action Level has been established for this substance

MCLs = Maximum Contaminant Levels per State Office of Drinking Water Shaded values exceed MCLs

TPHd = Total petroleum hydrocarbons as diesel

TPHg = Total petroleum hydrocarbons as gasoline

B = Benzene

T = Toluene

E = Ethylbenzene

X = Xylenes (total)

* = Analytical results within quantitation range for diesel, however chromatographic pattern not typical of fuel

** = Analytical results within quantitation range for diesel, however chromatographic pattern not typical of fuel

(a) = Reporting limit for this monitoring event are elevated 10 times due to matrix interference

(b) = Reporting limit is elevated 100 times due to matrix interference

(c) = Reporting limit is elevated 5 times due to matrix interference

TABLE 3 - PHYSICAL GROUNDWATER PARAMETERS						
DATE	WELL I.D.	GALLONS PURGED (cumulative gallons)	pH	ELECTRICAL CONDUCTIVITY (S/cm)	TURBIDITY (NTU)	TEMPERATURE (degrees F)
9/15/99	MW-1	7.5	7.6	751	120	69.6
	MW-2	6	7.1	911	7200	71.1
	MW-3	6	7.6	944	150	69.9
	MW-4	8	7.1	805	140	70.9
	MW-5	7	7.1	1048	180	69.5

Notes: S/cm = seconds per centimeter
NTU = National Turbidity Units

TABLE 2 - SUMMARY OF HISTORICAL GROUNDWATER FLOW CONDITIONS

DATE	WELL I.D.	GROUNDWATER ELEVATION (feet bgs)	GROUNDWATER FLOW DIRECTION	GROUNDWATER GRADIENT (feet/feet)
12/2/98	MW-1	97.84	W	0.00091
	MW-2	97.83		
	MW-3	97.76		
	MW-4	97.80		
	MW-5	97.63		
3/8/99	MW-1	97.31	SW	0.00086
	MW-2	97.28		
	MW-3	97.10		
	MW-4	97.20		
	MW-5	97.02		
7/1/99	MW-1	96.93	SW	0.0011
	MW-2	96.53		
	MW-3	96.65		
	MW-4	94.77		
	MW-5	96.63		
8/18/99	MW-1	97.12	W	0.0013
	MW-2	96.91		
	MW-3	96.79		
	MW-4	95.00		
	MW-5	96.85		
9/15/99	MW-1	97.05	N*	0.04089*
	MW-2	96.89		
	MW-3	96.74		
	MW-4	95.01	W	0.00125**
	MW-5	96.81		

* = Flow component between Wells MW-2 and MW-4
** = Flow component between Wells MW-2, MW-3, and MW-5

TABLE 1 - PHYSICAL PARAMETERS OF GROUNDWATER MONITORING WELLS

WELL I.D.	DATE	INSTALLED WELL DEPTH (feet bgs)	SCREEN INTERVAL (feet bgs)	DEPTH TO BOC (feet bgs)	TOC ELEVATION (feet msl)	DEPTH TO GROUNDWATER (feet bgs)	GROUNDWATER ELEVATION (feet bgs)	COMMENTS
MW-1	12/2/98	20'	5'-20'	19.60	100.74	2.90	97.84	hard bottom
	3/8/99			19.35		3.43	97.31	soft bottom
	7/1/99			19.53		3.81	96.93	
	8/18/99			19.53		3.62	97.12	
	9/15/99			19.30		3.69	97.05	
MW-2	12/2/98	20'	5'-20'	19.79	102.44	4.61	97.83	soft bottom
	3/8/99			19.32		5.16	97.28	soft bottom
	7/1/99			19.43		5.91	96.53	
	8/18/99			19.43		5.53	96.91	
	9/15/99			19.43		5.55	96.89	
MW-3	12/2/98	20'	5'-20'	19.85	102.00	4.24	97.76	soft bottom
	3/8/99			19.24		4.90	97.10	soft bottom
	7/1/99			19.54		5.35	96.65	
	8/18/99			19.54		5.21	96.79	
	9/15/99			19.56		5.26	96.74	
MW-4	12/2/98	20'	5'-20'	19.15	100.00	2.20	97.80	soft bottom
	3/8/99			19.44		2.80	97.20	hard bottom
	7/1/99			19.48		5.23	94.77	
	8/18/99			19.48		5.00	95.00	
	9/15/99			19.42		4.99	95.01	
MW-5	12/2/98	20'	5'-20'	19.72	102.22	4.59	97.63	soft bottom
	3/8/99			19.72		5.20	97.02	hard bottom
	7/1/99			19.61		5.59	96.63	
	8/18/99			19.61		5.37	96.85	
	9/15/99			19.55		5.41	96.81	

bgs = below ground surface
BOC = Bottom of casing
TOC = Top of casing

TABLES

T-1 – PHYSICAL PARAMETERS OF GROUNDWATER MONITORING WELLS

T-2 – SUMMARY OF HISTORICAL GROUNDWATER GRADIENTS

T-3 – PHYSICAL GROUNDWATER PARAMETERS

T-4 - SUMMARY OF GROUNDWATER ANALYTICAL RESULTS