EMCON
1433 North Market Boulevard • Sacramento, CA 95834-1943 • (916) 928-3300 • Fax (916) 928-3341

ENVIRONMENTAL PROTECTION
98 JUL -6 AM 9:10

Date July 1, 1998
Project 22605-103.002

To:
Ms. Susan Hugo
Alameda County Environmental Health Department
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

We are enclosing:

Copies	Description
1	Quarterly Groundwater Monitoring Report, First Quarter 1998, for Interstate Brands Corporation Facility, Located at 1010 - 46th Street, Oakland, California

For your:			Sent by:		
	X	Use		X	Regular mail
		Approval			Standard Air
		Review			Courier
	X	Information			Fedex

Comments: On behalf of Interstate Brands Corporation, we are forwarding a copy of the above-referenced report. If you have any questions, please do not hesitate to call us at (916) 928-3300.

Deanna Santos
Project Assistant

EMCON
1433 North Market Boulevard • Sacramento, CA 95834-1943 • (916) 928-3300 • Fax (916) 928-3341

July 1, 1998
Project 2605-103.002

Mr. Larry Brown
Fleet Superintendent
Interstate Brands Corporation
1324 Arden Way
Sacramento, California 95815

Re: Quarterly Groundwater Monitoring Report, First Quarter 1998, for Interstate Brands Corporation Facility, Located at 1010 - 46th Street, Oakland, California

Dear Mr. Brown:

At the request of Interstate Brands Corporation (IBC), EMCON has conducted quarterly groundwater monitoring at the subject site (see Figure 1). We have prepared this report describing the work conducted during the first quarter 1998. Groundwater monitoring consists of collecting groundwater samples for subjective and laboratory analyses from each monitoring well, measuring groundwater elevation in each monitoring well, and evaluating the groundwater gradient and direction of groundwater flow beneath the site.

The quarterly groundwater monitoring program is in compliance with the Alameda County Environmental Health Department requirements regarding underground storage tank investigations.

GROUNDWATER MONITORING: FIRST QUARTER 1998

On March 30, 1998, an EMCON technician measured depths to groundwater and collected groundwater samples from the monitoring wells for subjective and laboratory analyses. Floating product was not observed in any of the monitoring wells. Copies of field data sheets are presented in Appendix A. The table presents a summary of groundwater monitoring data. Monitoring well locations are shown on Figure 2. EMCON's sampling and analysis procedures are presented in Appendix B.

Approximate depths to groundwater ranged between 7.14 and 12.16 feet below ground surface. Groundwater levels beneath the site increased approximately 1.2 feet from the previous sampling event. The groundwater flow direction was toward the southwest with a hydraulic gradient of 0.04. The groundwater elevation contour map for the March 30, 1998, sampling event is presented on Figure 3.

Groundwater samples collected from wells MW-2 and MW-3 were analyzed for total petroleum hydrocarbons as gasoline (TPHG) and diesel (TPHD), using U.S. Environmental Protection Agency (USEPA) Method 8015 Modified; and for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl tert-butyl ether (MTBE), using USEPA Method 8020. The samples were analyzed at Sequoia Analytical Services, Inc., in Sacramento, California. The analytical results for groundwater samples are summarized in the table, and copies of the laboratory analysis reports and chain-of-custody records are presented in Appendix C. TPHG, BTEX, and MTBE were below laboratory detection limits in both wells MW-2 and MW-3, with the exception of total xylenes, which was detected in well MW-3 at a concentration of 0.64 micrograms per liter (µg/L). TPHD was below laboratory detection limits in well MW-2 and was detected in well MW-3 at a concentration of 75 µg /L. Concentrations of TPHG and benzene in groundwater are shown on Figure 2. A groundwater sample was not collected from well MW-1 due to a large, immovable truck over this well; however, the EMCON technician was able to measure the groundwater elevation (see table).

CONCLUSIONS

Results of this monitoring event indicate that levels of dissolved gasoline hydrocarbons are generally consistent with levels detected during previous sampling events. The groundwater gradient and direction of groundwater flow (southwest) are also consistent with previous monitoring events.

WORK PROPOSED FOR SECOND QUARTER 1998

This site is scheduled for semiannual groundwater sampling and monitoring. The next sampling event is tentatively scheduled for September 1998. Groundwater samples will be collected from monitoring wells MW-1 through MW-3 and analyzed for TPHG, TPHD, BTEX, and MTBE.

Please call if you have any questions regarding this status report.

Sincerely,

EMCON

for

Glen VanderVeen
Project Manager

Jay R. Johnson, R.G. 5867
Senior Project Supervisor

Attachments:

Table 1	Groundwater Monitoring Data
Figure 1	Site Vicinity Map
Figure 2	Generalized Site Plan
Figure 3	Groundwater Contour Map (March 30, 1998)
Appendix A	Field Data Sheets
Appendix B	Sampling and Analysis Procedures
Appendix C	Laboratory Analysis Reports and Chain-of-Custody Records

cc: Travis Bryant, IBC
Susan Hugo, Alameda County Environmental Health Department
Eddy So, California Regional Water Quality Control Board

Table 1

Groundwater Monitoring Data
Interstate Brands Corporation
1010 46th Street
Oakland, California

Well	Date	Top of Casing Elevation (feet)	Depth to Water (feet)	Groundwater Elevation (feet MSL*)	TPH Diesel (µg/L)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Total Oil & Grease (mg/L)	MTBE (µg/L)
MW-1	05/26/94	61.84	9.27	52.57	1,300	12,000	57	340	370	3,100	<5.0	NA
MW-1	07/29/94	61.84	9.81	52.03	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	08/26/94	61.84	9.87	51.97	510/650 [1]	6,700/8,400	22/35	71/97	310/410	1,000/1,400	<5.0/<5.0	NA
MW-1	10/04/94	61.84	9.89	51.95	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	10/27/94	61.84	9.94	51.90	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	11/30/94	61.84	8.92	52.92	1,300	29,000	480	1,100	1,200	5,300	<5.0	NA
MW-1	01/03/95	61.84	8.79	53.05	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	01/31/95	61.84	8.33	53.51	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	03/16/95	61.84	8.07	53.77	1,900	29,000	140	1,400	1,800	9,700	<5.0	NA
MW-1	06/12/95	61.84	9.02	52.82	810/540 [1]	3,900/11,000	23/280	57/610	200/400	680/2,000	<5.0/<5.0	NA
MW-1	08/30/95	61.84	9.44	52.40	350 [1]	3,300	26	36	250	490	<5.0	NA
MW-1	11/29/95	61.84	9.93	51.91	270	1,700	20	21	110	210	<5.0	NA
MW-1	03/06/96	61.84	8.37	53.47	2,500/2,400 [1]	39,000/38,000	690/1,000	1,800/2,000	2,300/2,300	14,000/15,000	5.9	NA
MW-1	07/08/96	61.84	9.10	52.74	670/580 [1]	3,000/2,600	89/9.5	79/85	140/120	350/270	NA	NA
MW-1	04/04/97	61.84	9.14	52.70	1,400	3,500	13	27	190	410	NA	<30 [5]
MW-1	09/23/97	61.84	9.15	52.69	260	2,100	13	11	200	220	NA	<5
MW-1	03/30/98	61.84	8.73	53.11	Well inaccessible for sampling							
MW-2	05/26/94	63.10	9.30	53.80	<50/<50	<50/<50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<5.0	NA
MW-2	07/29/94	63.10	9.70	53.40	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	08/26/94	63.10	9.89	53.21	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	10/04/94	63.10	9.86	53.24	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	10/27/94	63.10	9.96	53.14	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	11/30/94	63.10	8.95	54.15	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	01/03/95	63.10	8.15	54.95	NA	NA	NA	NA	NA	NA	NA	NA

Table 1

Groundwater Monitoring Data
Interstate Brands Corporation
1010 46th Street
Oakland, California

Well	Date	Top of Casing Elevation (feet)	Depth to Water (feet)	Groundwater Elevation (feet MSL*)	TPH Diesel (µg/L)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Total Oil & Grease (mg/L)	MTBE (µg/L)
MW-2	01/31/95	63.10	6.96*	56.14	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	03/16/95	63.10	6.37*	56.73	<50/<50	<50/<50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<5.0	NA
MW-2	06/12/95	63.10	9.07	54.03	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	08/30/95	63.10	9.53	53.57	52 [3]	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	11/29/95	63.10	9.74	53.36	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	03/06/96	63.10	7.23	55.87	68 [4]	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	07/08/96	63.10	8.84	54.26	<50	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
MW-2	04/04/97	63.10	8.70	54.40	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<3
MW-2	09/23/97	63.10	9.18	53.92	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<5
MW-2	03/30/98	63.10	7.14	55.96	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<5
MW-3	05/26/94	62.51	12.88	49.63	99	<50	<0.50	<0.50	<0.50	1.7	<5.0	NA
MW-3	07/29/94	62.51	13.61	48.90	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	08/26/94	62.51	13.71	48.80	66 [2]	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-3	10/04/94	62.51	13.74	48.77	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	10/27/94	62.51	13.77	48.74	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	11/30/94	62.51	11.85	50.66	78/85	100/100	<0.50/1.9	<0.50/<0.50	<0.50/1.0	2.1/4.3	<5.0	NA
MW-3	01/03/95	62.51	12.09	50.42	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	01/31/95	62.51	10.64	51.87	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	03/16/95	62.51	10.79	51.72	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-3	06/12/95	62.51	12.05	50.46	120 [2]	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-3	08/30/95	62.51	13.54	48.97	88/57 [3]	<50/<50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<5.0/<5.0	NA
MW-3	11/29/95	62.51	13.72	48.79	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-3	03/06/96	62.51	10.78	51.73	140 [3]	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-3	07/08/96	62.51	13.39	49.12	<50	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
MW-3	04/04/97	62.51	13.23	49.28	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<3

Table 1

Groundwater Monitoring Data
Interstate Brands Corporation
1010 46th Street
Oakland, California

Well	Date	Top of Casing Elevation (feet)	Depth to Water (feet)	Groundwater Elevation (feet MSL*)	TPH Diesel (µg/L)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Total Oil & Grease (mg/L)	MTBE (µg/L)
MW-3	09/23/97	62.51	13.35	49.16	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<5
MW-3	03/30/98	62.51	12.16	50.35	75	<50	<0.5	<0.5	<0.5	0.64	NA	<5

MSL = Mean sea level.

* Noted to be under pressure when opened.

µg/L = Micrograms per liter.

mg/L = Milligrams per liter.

TPH = Total petroleum hydrocarbons.

MTBE = Methyl-tert-butylether.

NA = Not analyzed.

Results of duplicate sample analyses are shown by a slash ("/").

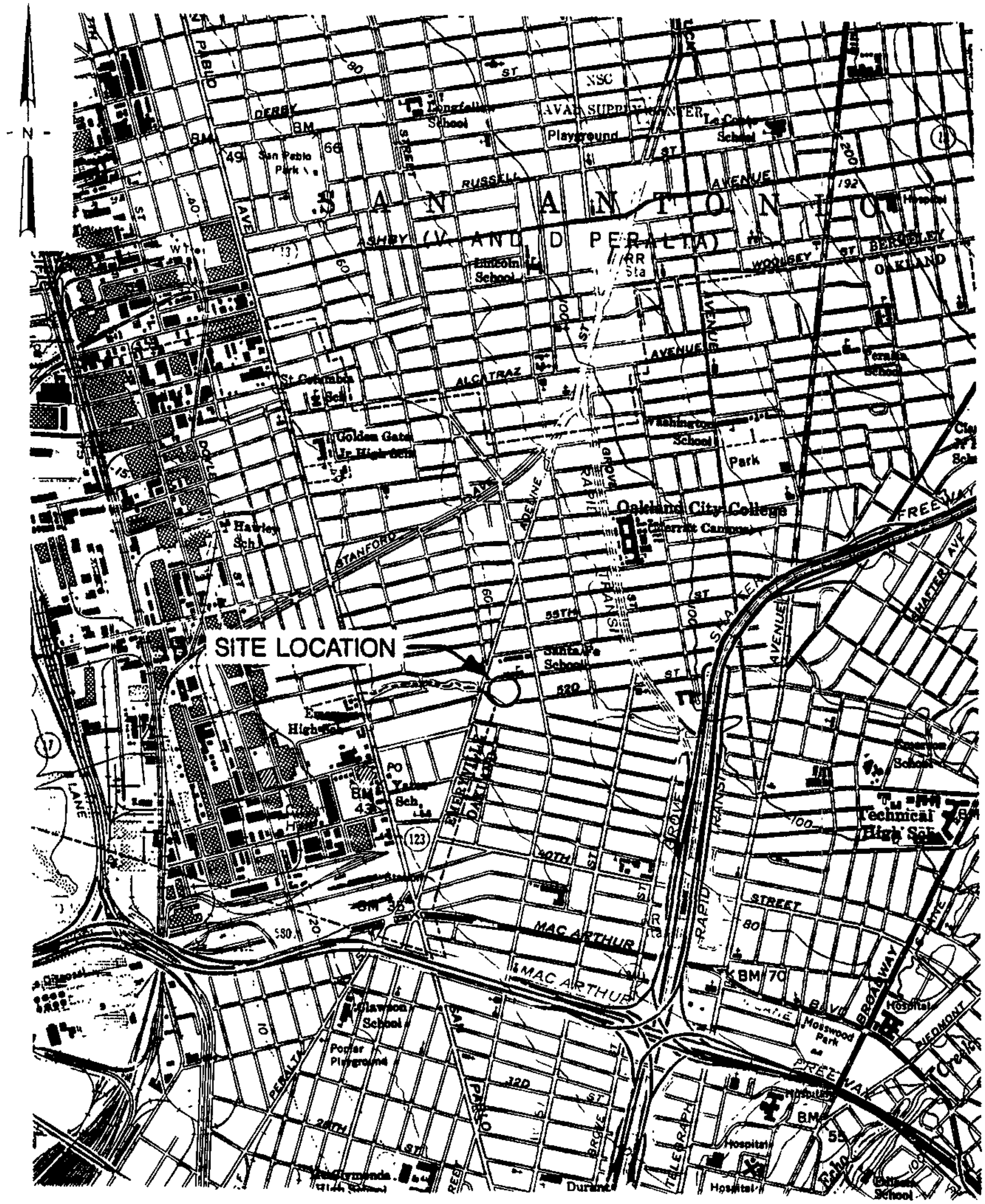
[1] Primarily due to lighter petroleum product of hydrocarbon range C6-C12, possibly gasoline (data obtained from and references made by the Woodward-Clyde report dated 9/24/96).

[2] Primarily due to heavier petroleum product of hydrocarbon range C18-C36 (data obtained from and references made by the Woodward-Clyde report dated 9/24/96)

[3] Due to a combination of diesel and a discrete peak not indicative of diesel fuel (data obtained from and references made by the Woodward-Clyde report dated 9/24/96).

[4] Due to the presence of discrete peaks not indicative of diesel fuel (data obtained from and references made by the Woodward-Clyde report dated 9/24/96).

[5] The MRL was elevated due to high analyte concentration requiring sample dilution



BASE MAP FROM U.S.G.S 7.5 MINUTE SERIES
QUADRANGLE: OAKLAND EAST, CALIFORNIA

SCALE: 0 2000 4000 FEET

emcon

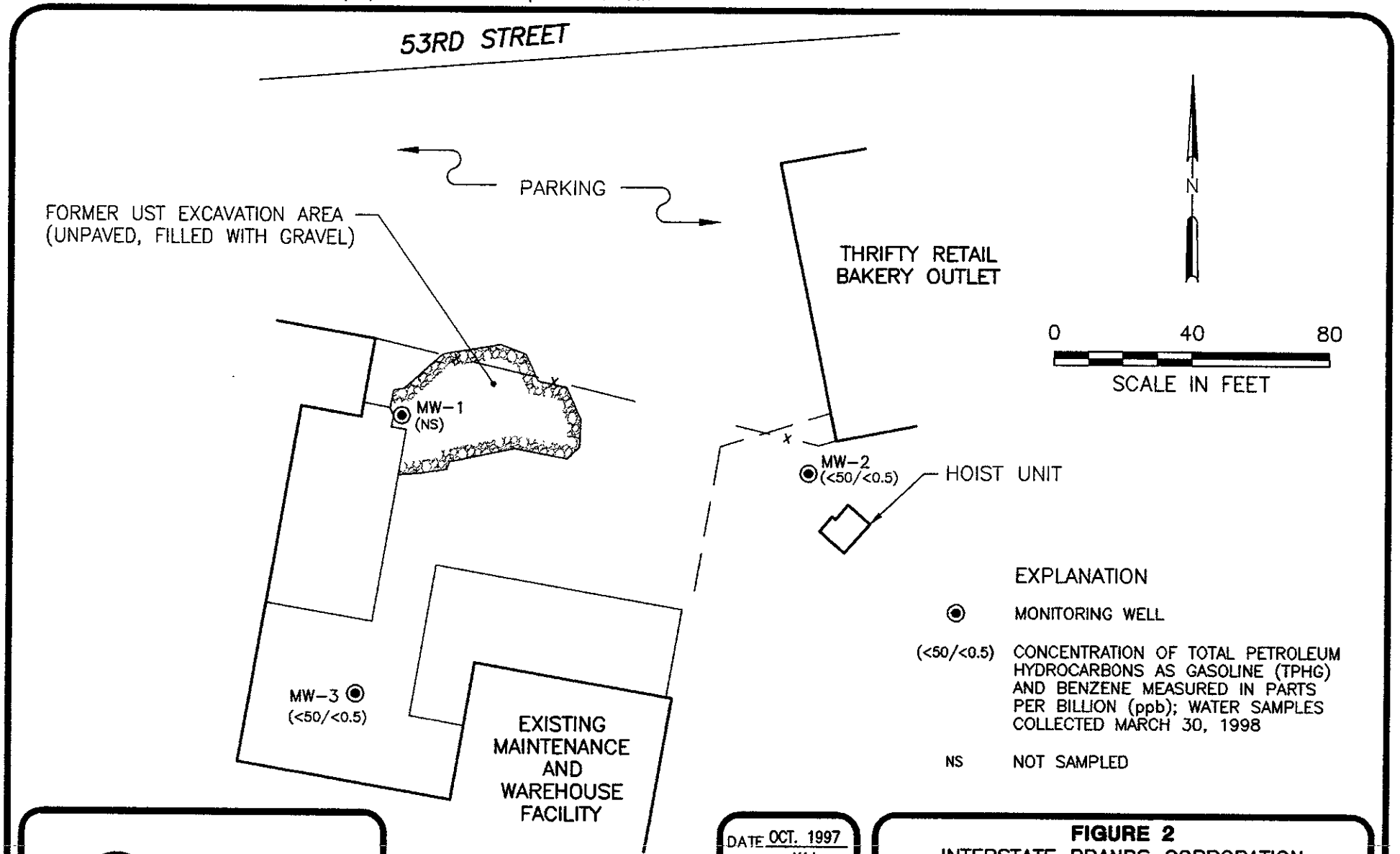
DATE 5/13/97
DWN AVK
APP
REV
PROJECT NO.
22605-103.001

FIGURE 1
INTERSTATE BRANDS CORPORATION
1010 46TH STREET
OAKLAND, CALIFORNIA

SITE LOCATION MAP

EA-SACRAMENTO1/CAD: I:\DWGS\2605\103\SAIBSP01.dwg Xrefs: 8X11P Operator: AVK
Scale: 1 = 1.00 DimScale: 1 = 1.00 Date: 5/19/97 Time: 10:20 AM

EA-SANJOSE-CAD/DRAWINGS: I:\2605103\SJSITE.dwg Xrefs: <NONE>
Scale: 1 = 40.00 DimScale: 1 = 40.00 Date: 6/18/98 Time: 9:50 AM Operator: KJOHNSON



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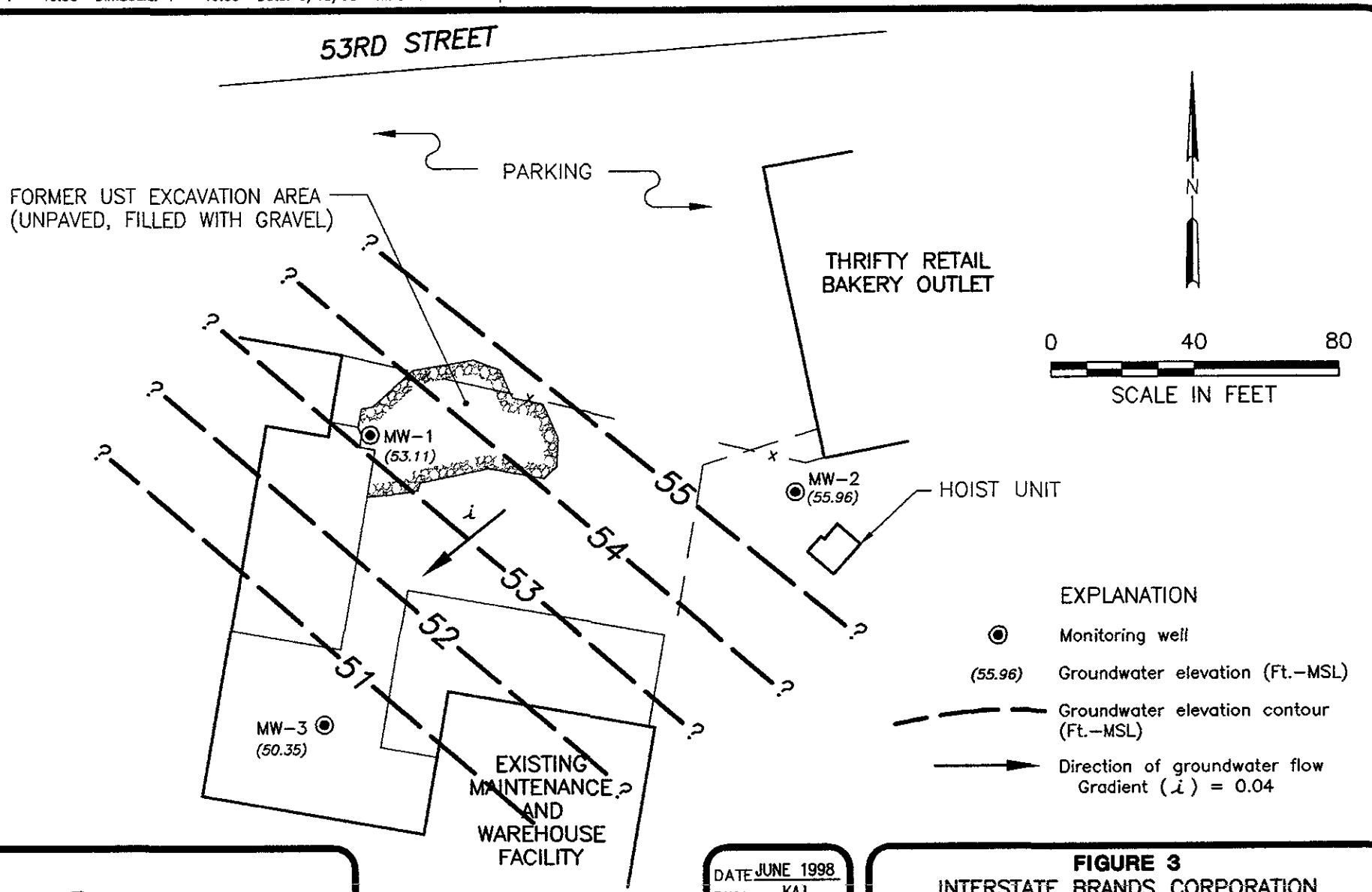
Base map adapted from plan by Woodward-Clyde Consultants, dated 7/8/96

DATE OCT. 1997
DWN KAJ
APP
REV
PROJECT NO.
2605-103.001

FIGURE 2
INTERSTATE BRANDS CORPORATION
1010 46TH STREET
OAKLAND, CALIFORNIA
GENERALIZED SITE PLAN

EA-SANJOSE-CAD/DRAWINGS: I:\2605103\SJGWEL.dwg Xrefs: <NONE>
Scale: 1 = 40.00 DimScale: 1 = 40.00 Date: 6/18/98 Time: 9:45 AM Operator: KJOHNSON



emcon

DATE JUNE 1998
DWN KAJ
APP
REV
PROJECT NO.
2605-103.002

FIGURE 3
INTERSTATE BRANDS CORPORATION
1010 46TH STREET
OAKLAND, CALIFORNIA
GROUNDWATER CONTOUR - 3/30/98

APPENDIX A

FIELD DATA SHEETS

FIELD REPORT
WATER LEVEL / FLOATING PRODUCT SURVEY

EMCON
1433 North Market Boulevard
Sacramento, California 95834
(916) 928-3300

PROJECT NO : 22605-103.001 **LOCATION :** 1010 46th St., Oakland **DATE:** 3/30/98

CLIENT : IBC-Oakland **SAMPLER :** B. Hendricks **DAY OF WEEK:** Monday

WELL ID	CASING ELEVATION (Feet, MSL)	TOTAL DEPTH (Feet)	DEPTH TO WATER (Feet)	DEPTH TO FLOATING PRODUCT (Feet)	FLOATING PRODUCT THICKNESS (Feet)	COMMENTS
MW-1	52.74	20.2	8.73	ND	ND	Inaccessible to sampling equipment
MW-2	54.26	19.5	7.14	ND	ND	
MW-3	49.12	19.3	12.16	ND	ND	

Comments :

Bruce Hendricks
Signature

WATER SAMPLE FIELD DATA SHEET

Rev. 1/97

OWT

PROJECT NO : 22605-103.001 | SAMPLE ID : MW-1

PURGED BY : B. Hawkins | CLIENT NAME : IBC - Oakland

SAMPLED BY : ↓ | LOCATION : Oakland

TYPE: Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches): 2 ____ 3 ____ 4 ✓ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL) : ____ | VOLUME IN CASING (gal.) : ____

DEPTH OF WELL (feet) : 20.2 | CALCULATED PURGE (gal.) : /

DEPTH OF WATER (feet) : 8.73 | ACTUAL PURGE VOL. (gal.) : /

DATE PURGED : 3/30/05 | END PURGE : ____

DATE SAMPLED : ✓ | SAMPLING TIME : ____

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
/	NO	Sample			/	

OTHER: / ODOR: ____ (COBALT 0-100) / (NTU 0-200) /

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1) : /

PURGING EQUIPMENT

____ 2" Bladder Pump ____ Bailer (Teflon)
____ Centrifugal Pump ____ Bailer (PVC)
____ Submersible Pump ____ Bailer (Stainless Steel)
____ Well Wizard™ ____ Dedicated
Other: /

SAMPLING EQUIPMENT

____ 2" Bladder Pump ____ Bailer (Teflon)
____ Bomb Sampler ____ Bailer (Stainless Steel)
____ Dipper ____ Submersible Pump
____ Well Wizard™ ____ Dedicated
Other: /

WELL INTEGRITY: Good 4/16" | LOCK: Dolphin

REMARKS: Well inaccessible to sampling equipment due To a large immovable truck parked on the site. Crawled under to get water level.

pH, E.C., Temp. Meter Calibration:Date: See MW-2 | Time: ____ | Meter Serial No.: ____

E.C. 1000 ____ / ____ | pH 7 ____ / ____ | pH 10 ____ / ____ | pH 4 ____ / ____

Temperature °F ____

SIGNATURE: B Hawkins | REVIEWED BY: ✓ | PAGE 1 OF 3

WATER SAMPLE FIELD DATA SHEET

Rev. 1/97

OWT

PROJECT NO: 22605-103.001 | SAMPLE ID: MW-2
PURGED BY: B. Hendricks | CLIENT NAME: IBC-Oakland
SAMPLED BY: ↓ | LOCATION: Oakland

TYPE: Groundwater ✓ Surface Water ____ Leachate ____ Other ____
CASING DIAMETER (inches): 2 ____ 3 ____ 4 ✓ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL):	—	VOLUME IN CASING (gal.):	8.0
DEPTH OF WELL (feet):	19.5	CALCULATED PURGE (gal.):	24.2
DEPTH OF WATER (feet):	7.14	ACTUAL PURGE VOL. (gal.):	25.0

DATE PURGED: 3/30/98 | END PURGE: 1250
DATE SAMPLED: ↓ | SAMPLING TIME: 1301

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1242	8.5	7.84	457	65.7	clear	low
1246	17.0	7.44	465	65.2	↓	↓
1250	25.0	7.45	494	69.7	↓	↓

OTHER: / ODOR: none | 1 (COBALT 0-100) | 1 (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): /

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
____ 2" Bladder Pump	____ Bailer (Teflon)	____ 2" Bladder Pump	✓ Bailer (Teflon)
✓ Centrifugal Pump	____ Bailer (PVC)	____ Bomb Sampler	____ Bailer (Stainless Steel)
____ Submersible Pump	____ Bailer (Stainless Steel)	____ Dipper	____ Submersible Pump
____ Well Wizard™	____ Dedicated	____ Well Wizard™	____ Dedicated
Other: ____		Other: ____	

WELL INTEGRITY: Good 4/16" | LOCK: Dolphin

REMARKS: Dolphin lock changed to 0464

pH, E.C., Temp. Meter Calibration: Date: 3/30/98 | Time: 1228 | Meter Serial No.: ____
E.C. 1000 9.69 / 1000 | pH 7 7.06 / 7.00 | pH 10 9.95 / 10.00 | pH 4 4.08 /
Temperature °F 73.6
SIGNATURE: B Hendricks | REVIEWED BY: ✓ | PAGE 2 OF 3

WATER SAMPLE FIELD DATA SHEET

Rev. 1/97

OWT

PROJECT NO: 22605-103.001 | SAMPLE ID: MW-3
PURGED BY: S. Hendricks | CLIENT NAME: IBC Oakland
SAMPLED BY: S | LOCATION: Oakland

TYPE: Groundwater ✓ Surface Water ____ Leachate ____ Other ____

CASING DIAMETER (inches): 2 ____ 3 ____ 4 ✓ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL): -	VOLUME IN CASING (gal.): 4.6
DEPTH OF WELL (feet): 19.3	CALCULATED PURGE (gal.): 14.0
DEPTH OF WATER (feet): 12.16	ACTUAL PURGE VOL. (gal.): 15.0

DATE PURGED: 3/30/98 | END PURGE: 1332
DATE SAMPLED: ↓ | SAMPLING TIME: 1343

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1327	5.0	7.29	1039	64.6	clear	low
1329	10.0	7.14	1039	64.4	gray	↓
1332	15.0	7.16	1015	64.8	↓	

OTHER: ____ ODOR: none | (COBALT 0-100) | (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): ____

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
____ 2" Bladder Pump	____ Bailer (Teflon)	____ 2" Bladder Pump	✓ Bailer (Teflon)
✓ Centrifugal Pump	____ Bailer (PVC)	____ Bomb Sampler	____ Bailer (Stainless Steel)
____ Submersible Pump	____ Bailer (Stainless Steel)	____ Dipper	____ Submersible Pump
____ Well Wizard™	____ Dedicated	____ Well Wizard™	____ Dedicated
Other: ____		Other: ____	

WELL INTEGRITY: Good 9/16/4 | LOCK: Dolphin

REMARKS: Dolphin lock changed to 0464 Replaced 4" locking well cap.

pH, E.C., Temp. Meter Calibration: Date: See MW-2 Time: ____ Meter Serial No.: ____

E.C. 1000 ____ / ____ pH 7 ____ / ____ pH 10 ____ / ____ pH 4 ____ / ____

Temperature °F ____

SIGNATURE: S. Hendricks REVIEWED BY: ✓ PAGE 3 OF 3

APPENDIX B

SAMPLING AND ANALYSIS PROCEDURES

APPENDIX B

SAMPLING AND ANALYSIS PROCEDURES

The sampling and analysis procedures for water quality monitoring programs are contained in this appendix. The procedures provided for consistent and reproducible sampling methods, proper application of analytical methods, and accurate and precise analytical results. Finally, these procedures provided guidelines so that the overall objectives of the monitoring program were achieved.

The following documents have been used as guidelines for developing these procedures:

- Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities, Environmental Protection Agency (EPA)-530/SW-611, August 1977
- Resource Conservation and Recovery Act (RCRA) Groundwater Monitoring Technical Enforcement Guidance Document, Office of Solid Waste and Emergency Response (OSWER) 9950.1, September 1986
- Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, 3rd edition, November 1986
- Methods for Organic Chemical Analysis of Municipal and Industrial Waste Water, EPA-600/4-82-057, July 1982
- Methods for Organic Chemical Analysis of Water and Wastes, EPA-600/4-79-020, revised March 1983
- Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, revised October 1989

Sample Collection

Sample collection procedures include equipment cleaning, water level and total well depth measurements, and well purging and sampling.

Equipment Cleaning

Before the sampling event was started, equipment that was used to sample groundwater was disassembled and cleaned with detergent water and then rinsed with deionized water. During field sampling, equipment surfaces that were placed in the well or came into contact with groundwater during field sampling were steam cleaned with deionized water before the next well was purged or sampled.

Water Level, Floating Hydrocarbon, and Total Well Depth Measurements

Before purging and sampling occurred, the depth to water, floating hydrocarbon thickness, and the total well depth were measured using an oil/water interface measuring system. The oil/water interface measuring system consists of a probe that emits a continuous audible tone when immersed in a nonconductive fluid, such as oil or gasoline, and an intermittent tone when immersed in a conductive fluid, such as water. The floating hydrocarbon thickness and water level were measured by lowering the probe into the well. Liquid levels were recorded relative to the tone emitted at the groundwater surface. The sonic probe was decontaminated by being rinsed with deionized water or steam cleaned after each use. A bottom-filling, clear Teflon® bailer was used to verify floating hydrocarbon thickness measurements of less than 0.02 foot. Alternatively, an electric sounder and a bottom-filling Teflon bailer may have been used to record floating hydrocarbon thickness and depth to water.

The electric sounder is a transistorized instrument that uses a reel-mounted, two-conductor, coaxial cable that connects the control panel to the sensor. Cable markings are stamped at 1-foot intervals. The water level was measured by lowering the sensor into the monitoring well. A low-current circuit was completed when the sensor contacted the water, which served as an electrolyte. The current was amplified and fed into an indicator light and audible buzzer, signaling when water had been contacted. A sensitivity control compensated for highly saline or conductive water. The electric sounder was decontaminated by being rinsed with deionized water after each use. The bailer was lowered to a point just below the liquid level, retrieved, and observed for floating hydrocarbon.

Liquid measurements were recorded to the nearest 0.01 foot on the depth to water/floating product survey form. The groundwater elevation at each monitoring well was calculated by subtracting the measured depth to water from the surveyed elevation of the top of the well casing. (Every attempt was made to measure depth to water for all wells on the same day.) Total well depth was then measured by lowering the sensor to the bottom of the well. Total well depth, used to calculate purge volumes and to determine whether the well screen was partially obstructed by silt, was recorded to the nearest 0.1 foot on the depth to water/floating product survey form.

Well Purging

If the depth to groundwater was above the top of screens of the monitoring wells, then the wells were purged. Before sampling occurred, a polyvinyl chloride (PVC) bailer, centrifugal pump, low-flow submersible pump, or Teflon bailer was used to purge standing water in the casing and gravel pack from the monitoring well. Monitoring wells were purged according to the protocol presented in Figure B-1. In most monitoring wells, the amount of water purged before sampling was greater than or equal to three casing volumes. Some monitoring wells were expected to be evacuated to dryness after removing fewer than three casing volumes. These low-yield monitoring wells were allowed to recharge for up to 24 hours. Samples were obtained as soon as the monitoring wells recharged to a level sufficient for sample collection. If insufficient water recharged after 24 hours, the monitoring well was recorded as dry for the sampling event.

Groundwater purged from the monitoring wells was transported in a 500-gallon water trailer, 55-gallon drum, or a 325-gallon truck-mounted tank, to EMCON's San Jose or Sacramento office location for temporary storage. EMCON arranged for transport and disposal of the purged groundwater through Integrated Waste Stream Management, Inc.

Field measurements of pH, specific conductance, and temperature were recorded in a waterproof field logbook. Figure B-2 shows an example of the water sample field data sheet on which field data are recorded. Field data sheets were reviewed for completeness by the sampling coordinator after the sampling event was completed.

The pH, specific conductance, and temperature meter were calibrated each day before field activities were begun. The calibration was checked once each day to verify meter performance. Field meter calibrations were recorded on the water sample field data sheet.

Well Sampling

A Teflon bailer was the only equipment acceptable for well sampling. When samples for volatile organic analysis were being collected, the flow of groundwater from the bailer was regulated to minimize turbulence and aeration. Glass bottles of at least 40-milliliters volume and fitted with Teflon-lined septa were used in sampling for volatile organics. These bottles were filled completely to prevent air from remaining in the bottle. A positive meniscus formed when the bottle was completely full. A convex Teflon septum was placed over the positive meniscus to eliminate air. After the bottle was capped, it was inverted and tapped to verify that it contained no air bubbles. The sample containers for other parameters were filled, filtered as required, and capped.

When required, dissolved concentrations of metals were determined using appropriate field filtration techniques. The sample was filtered by emptying the contents of the Teflon bailer into a pressure transfer vessel. A disposable 0.45-micron acrylic copolymer filter was threaded onto the transfer vessel at the discharge point, and the vessel was sealed. Pressure was applied to the vessel with a hand pump and the filtrate directed into the appropriate containers. Each filter was used once and discarded.

Sample Preservation and Handling

The following section specifies sample containers, preservation methods, and sample handling procedures.

Sample Containers and Preservation

Sample containers vary with each type of analytical parameter. Container types and materials were selected to be nonreactive with the particular analytical parameter tested.

Sample Handling

Sample containers were labeled immediately prior to sample collection. Samples were kept cool with cold packs until received by the laboratory. At the time of sampling, each sample was logged on an chain-of-custody record that accompanied the sample to the laboratory.

Samples that required overnight storage prior to shipping to the laboratory were kept cool (4°C) in a refrigerator. The refrigerator was kept in a warehouse, which was locked when not occupied by an EMCON employee. A sample/refrigerator log was kept to record the date and time that samples were placed into and removed from the refrigerator.

Samples were transferred from EMCON to an approved laboratory by courier or taken directly to the laboratory by the environmental sampler. Sample shipments from EMCON to laboratories performing the selected analyses routinely occurred within 24 hours of sample collection.

Sample Documentation

The following procedures were used during sampling and analysis to provide chain-of-custody control during sample handling from collection through storage. Sample documentation included the use of the following:

- Water sample field data sheets to document sampling activities in the field
- Labels to identify individual samples
- Chain-of-custody record sheets for documenting possession and transfer of samples
- Laboratory analysis request sheets for documenting analyses to be performed

Field Logbook

In the field, the sampler recorded the following information on the water sample field data sheet (see Figure B-2) for each sample collected:

- Project number
- Client's name
- Location
- Name of sampler
- Date and time
- Well accessibility and integrity
- Pertinent well data (e.g., casing diameter, depth to water, well depth)
- Calculated and actual purge volumes
- Purging equipment used
- Sampling equipment used
- Appearance of each sample (e.g., color, turbidity, sediment)
- Results of field analyses (temperature, pH, specific conductance)
- General comments

The water sample field data sheet was signed by the sampler and reviewed by the sampling coordinator.

Labels

Sample labels contained the following information:

- Project number
- Sample number (i.e., well designation)
- Sample depth
- Sampler's initials
- Date and time of collection
- Type of preservation used (if any)

Sampling and Analysis Chain-of-Custody Record

The chain-of-custody record initiated at the time of sampling contained, at a minimum, the sample designation (including the depth at which the sample was collected), sample type, analytical request, date of sampling, and the name of the sampler. The record sheet was signed, timed, and dated by the sampler when transferring the samples. The number of custodians in the chain of possession was minimized. A copy of the chain-of-custody record was returned to EMCON with the analytical results.

Groundwater Sampling and Analysis Request Form

A groundwater sampling and analysis request form (see Figure B-3) was used to communicate to the environmental sampler the requirements of the monitoring event. At a minimum, the groundwater sampling and analysis request form included the following information:

- Date scheduled
- Site-specific instructions
- Specific analytical parameters
- Well number
- Well specifications (expected total depth, depth of water, and product thickness)

MONITORING WELL PURGING PROTOCOL

OWT

MEASURE AND RECORD DEPTH TO WATER AND WELL TOTAL DEPTH

CHECK FOR FLOATING PRODUCT

YES

MEASURE AND DOCUMENT FLOATING PRODUCT THICKNESS. DO NOT SAMPLE WELL FOR DISSOLVED CONSTITUENTS.

NO

CALCULATE PURGE VOLUME BY USING THE FOLLOWING EQUATION:

$P = \pi r^2 \times 7.48 \times 3$

where:

P = calculated purge volume (gallons)

$\pi = 3.14$

r = radius of well casing in feet

h = height of water column in feet

EVACUATE WATER FROM WELL EQUAL TO THE CALCULATED PURGE VOLUME WHILE MONITORING GROUNDWATER STABILIZATION INDICATOR PARAMETERS (pH, CONDUCTIVITY, TEMPERATURE) AT INTERVALS OF ONE CASING VOLUME.

WELL EVACUATED TO PRACTICAL LIMITS OF DRYNESS BEFORE REMOVING CALCULATED PURGE VOLUME

NO

FINAL TWO SETS OF GROUNDWATER STABILIZATION INDICATOR PARAMETER MEASUREMENTS MEET THE FOLLOWING CRITERIA:

pH = ± 0.1 pH units

COND. = ± 10 %

TEMP. = ± 1.0 °F

YES

WELL PURGING CRITERIA MET; PROCEED TO WELL SAMPLING.

NO

CONTINUE PURGING; EVACUATE ADDITIONAL CASING VOLUME OF WATER, MONITORING INDICATOR PARAMETERS FOR STABILITY.

YES

WELL RECHARGES TO A LEVEL SUFFICIENT FOR SAMPLE COLLECTION WITHIN 24 HOURS OF EVACUATION TO DRYNESS.

YES

FIELD TEST FIRST RECHARGE WATER FOR INDICATOR PARAMETERS, THEN PROCEED TO WELL SAMPLING.

NO

RECORD WELL AS DRY FOR PURPOSES OF SAMPLING.

EMCON

MONITORING WELL PURGING PROTOCOL

FIGURE

A-1

WATER SAMPLE FIELD DATA SHEET

Rev. 5/96

OWT

PROJECT NO : _____ SAMPLE ID : _____

PURGED BY : _____ CLIENT NAME : _____

SAMPLED BY : _____ LOCATION : _____

TYPE: Groundwater _____ Surface Water _____ Leachate _____ Other _____

CASING DIAMETER (inches): 2 _____ 3 _____ 4 _____ 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL) : _____ VOLUME IN CASING (gal.) : _____

DEPTH OF WELL (feet) : _____ CALCULATED PURGE (gal.) : _____

DEPTH OF WATER (feet) : _____ ACTUAL PURGE VOL. (gal.) : _____

DATE PURGED : _____ END PURGE : _____

DATE SAMPLED : _____ SAMPLING TIME : _____

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°c)	TEMPERATURE (°F)	TURBIDITY (visual/NTU)	TIME (2400 HR)

OTHER: _____ ODOR: _____ (COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1) : _____

PURGING EQUIPMENT

_____ 2" Bladder Pump _____ Bailer (Teflon)

_____ Centrifugal Pump _____ Bailer (PVC)

_____ Submersible Pump _____ Bailer (Stainless Steel)

_____ Well Wizard™ _____ Dedicated

Other: _____

SAMPLING EQUIPMENT

_____ 2" Bladder Pump _____ Bailer (Teflon)

_____ Bomb Sampler _____ Bailer (Stainless Steel)

_____ Dipper _____ Submersible Pump

_____ Well Wizard™ _____ Dedicated

Other: _____

WELL INTEGRITY: _____ LOCK: _____

REMARKS: _____

pH, E.C., Temp. Meter Calibration:Date: _____ Time: _____ Meter Serial No.: _____

E.C. 1000 _____ / _____ pH 7 _____ / _____ pH 10 _____ / _____ pH 4 _____ / _____

Temperature °F _____

SIGNATURE: _____ REVIEWED BY: _____ PAGE _____ OF _____

EMCON

WATER SAMPLE FIELD DATA SHEET

FIGURE A-2

OWT

EMCON - SACRAMENTO
GROUNDWATER SAMPLING AND ANALYSIS REQUEST FORM

PROJECT NAME :

SCHEDULED DATE :

SPECIAL INSTRUCTIONS / CONSIDERATIONS :

Project Authorization: _____
EMCON Project No.: _____
OWT Project No.: _____
Task Code: _____
Originals To: _____
cc: _____

Well Lock Number (s)

___ CHECK BOX TO AUTHORIZE DATA ENTRY

Site Contact: _____ Name _____ Phone #

Well Number or Source	Casing Diameter (inches)	Casing Length (feet)	Depth to Water (feet)	ANAYSES REQUESTED

Laboratory and Lab QC Istructions:

EMCON

SAMPLING AND ANALYSIS REQUEST FORM

FIGURE
A-3

APPENDIX C

LABORATORY ANALYSIS REPORTS AND CHAIN-OF-CUSTODY RECORDS

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 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

EMCON	Client Project ID:	IBC-Oakland	Sampled: Mar 30, 1998
144 A Mayhew Way	Sample Matrix:	Water	Received: Mar 30, 1998
Walnut Cree, CA 94596	Analysis Method:	EPA 5030/8020, DHS Luft	Reported: Apr 15, 1998
Attention: Glen VanderVeen	First Sample #:	803-1442	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 803-1442 MW-2	Sample I.D. 803-1443 MW-3
Purgeable Hydrocarbons	50	N.D.	N.D.
Benzene	0.50	N.D.	N.D.
Toluene	0.50	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.
Total Xylenes	0.50	N.D.	0.64
Chromatogram Pattern:		--	--

Quality Control Data

Reporting Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	04/07/98	04/07/98
Instrument Identification:	GCHP-1	GCHP-1
Surrogate Recovery, %: (QC Limits = 60-140%)	98	99

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

SEQUOIA ANALYTICAL, ELAP #1624

Ronald W. Bobel
Project Manager/Sacramento Laboratory

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 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

EMCON	Client Project ID:	IBC-Oakland	Sampled:	Mar 30, 1998
144 A Mayhew Way	Sample Matrix:	Water	Received:	Mar 30, 1998
Walnut Cree, CA 94596	Analysis Method:	EPA 5030/8020A Modified	Reported:	Apr 15, 1998
Attention: Glen VanderVeen	First Sample #:	803-1442		

METHYL TERTIARY BUTYL ETHER (MTBE)

Analyte	Reporting Limit µg/L	Sample I.D. 803-1442 MW-2	Sample I.D. 803-1443 MW-3
MTBE	5.0	N.D.	N.D.

Quality Control Data

Reporting Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	04/07/98	04/07/98
Instrument Identification:	GCHP-1	GCHP-1
Surrogate Recovery, %: (Recovery Limits: 60-140%)	98	99

Analytes reported as N.D. were not detected at or above the reporting limit.

SEQUOIA ANALYTICAL, ELAP #1624

Ronald W. Bobel
Project Manager/Sacramento Laboratory

Sequoia Analytical

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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

EMCON	Client Project ID:	IBC-Oakland	Sampled: Mar 30, 1998
144 A Mayhew Way	Sample Matrix:	Water	Received: Mar 30, 1998
Walnut Cree, CA 94596	Analysis Method:	EPA 3510, DHS Luft	Reported: Apr 15, 1998
Attention: Glen VanderVeen	First Sample #:	803-1442	

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 803-1442 MW-2	Sample I.D. 803-1443 MW-3
Extractable Hydrocarbons	50	N.D.	75
Chromatogram Pattern:		--	Unidentified Hydrocarbons C10-C24

Quality Control Data

Reporting Limit Multiplication Factor:	1.0	1.0
Date Extracted:	04/07/98	04/07/98
Date Analyzed:	04/08/98	04/08/98
Instrument Identification:	GCHP-3B	GCHP-3B

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected at or above the reporting limit.

SEQUOIA ANALYTICAL, ELAP #1624

Ronald W. Bobel
Project Manager/Sacramento Laboratory

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 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

EMCON
144 A Mayhew Way
Walnut Cree, CA 94596
Attention: Glen VanderVeen

Client Project ID: IBC-Oakland
Matrix: Water
QC Sample Group 8031442-1443
Reported: Apr 15, 1998

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Diesel
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	DHS LUFT
Analyst:	C. Lee	C. Lee	C. Lee	C. Lee	C. Lee
Concentration Spiked:	10 ug/L	10 ug/L	10 ug/L	30 ug/L	500 ug/L
LCS Batch#:	LCS040898	LCS040898	LCS040898	LCS040898	LCS040798
Date Prepared:	04/08/98	04/08/98	04/08/98	04/08/98	04/07/98
Date Analyzed:	04/08/98	04/08/98	04/08/98	04/08/98	04/07/98
Instrument I.D.#:	GCHP-1	GCHP-1	GCHP-1	GCHP-1	GCHP-3B
LCS % Recovery:	99	91	92	92	88
Control Limits:	70-130%	70-130%	70-130%	70-130%	60-140%
MS/MSD Batch #:	8040005	8040005	8040005	8040005	BS040798
Date Prepared:	04/08/98	04/08/98	04/08/98	04/08/98	04/07/98
Date Analyzed:	04/08/98	04/08/98	04/08/98	04/08/98	04/07/98
Instrument I.D.#:	GCHP-1	GCHP-1	GCHP-1	GCHP-1	GCHP-3B
Matrix Spike % Recovery:	109	103	103	101	88
Matrix Spike Duplicate % Recovery:	110	101	103	102	80
Relative % Difference:	0.91	2.0	0.0	0.98	9.5

SEQUOIA ANALYTICAL

Ronald W. Bobel
Project Manager/Sacramento Laboratory

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 LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 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

EMCON
144 A Mayhew Way
Walnut Cree, CA 94596
Attention: Glen VanderVeen

Client Project ID: IBC-Oakland
Lab Project ID: 8031442-1443
Reported: Apr 15, 1998

LAB NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 6 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL, ELAP #1624

Ronald W. Bobel
Project Manager/Sacramento Laboratory

CHAIN OF CUSTODY / LABORATORY ANALYSIS REQUEST FORM

EMCON

1433 North Market Boulevard, Sacramento, CA 95834
(916) 928-3300 FAX (916) 928-3341

Service Request No: _____ Purchase Order: # 530005

Lab: SEQUOIA

Project Name: IBC-Oakland
Project Number: 22605-103.001
Project Manager: Glen VanderVeen
Company: EMCON-Pinnacle
Address: 144 A Mayhew Way
Walnut Creek, Ca 94596
Phone: (510) 977-9020
FAX: (510) 977-9030
Sampler's Signature: Bruce Hendricks

Analysis Requested

Sample I.D.	Date	Time	LAB I.D.	Sample Matrix	Number of Containers	TPHG/BTEX (8015/8020) MTBE (8020)	TPHD (8015)												REMARKS
						1	6												Container Types
						HCl	NP												Preservations
MW-1	—	no	—	Sample	~~3~~	~~3~~	~~2~~												
MW-2	3/30/98	1301		water	5	3	2	5803		1442									
MW-3	↓	1343		water	5	3	2			-1443									

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Bruce Hendricks			
Signature: Bruce Hendricks	Signature	Signature	Signature
Printed Name: Emcon/OWT	Printed Name	Printed Name	Printed Name
Firm: 3/30/98 1619	Firm	Firm	Firm
Date/Time	Date/Time	Date/Time	Date/Time

TURNAROUND REQUIREMENTS

24 hr ___ 48 hr ___ 5 day
X Standard (~10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX Preliminary Results
Requested Report Date: _____

REPORT REQUIREMENTS

X I. Routine Report
___ II. Report (includes DUP, MS MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ RWQCB (MDLs/PQLs/TRACE#)

RELINQUISHED BY	RECEIVED BY
	S. Hanson
Signature	Signature
Printed Name	Printed Name: Sequoia
Firm	Firm: 3/30/98 1619
Date/Time	Date/Time

Special Instructions/Comments:

Sequoia Analytical
819 Striker Ave, Ste. 8
Sacramento, Ca 95834
916-921-9600
Contact: Ron Bobel

Local EMCON contact: Sheila Richgels
916-928-3300

Container Types Key:

40 ml VOA:	1
250 ml LPE:	2
500 ml LPE:	3
1 liter HDPE:	4
500 ml glass:	5
1 liter glass:	6
2x6 s/s ring:	7