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**QUARTERLY GROUNDWATER  
MONITORING REPORT**  
*Second Quarter 2003*

PROJECT SITE:  
Express Gas & Mart  
2951 High Street  
Oakland, California 94619

PREPARED FOR:  
Mr. Aziz Kandahari  
Himalaya Trading Company  
2951 High Street  
Oakland, California 94619

SUBMITTED TO:  
Alameda County Health Care Services  
Hazardous Materials Division  
1131 Harbor Bay Parkway  
Alameda, California 94502

PREPARED BY:  
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Project No. 3936

August 11, 2003

Alameda County  
AUG 19 2003  
Environmental Health

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# PROFESSIONAL CERTIFICATION

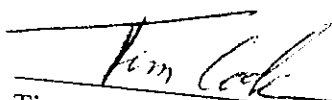
## QUARTERLY GROUNDWATER MONITORING REPORT *Second Quarter 2003*

Express Gas & Mart  
2951 High Street  
Oakland, California 94619

By: W.A. Craig, Inc.  
Project No. 3936  
August 11, 2003

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Tim Cook, P.E.  
Principle Engineer



## INTRODUCTION

This report presents the results of the second quarter 2003 groundwater monitoring at Express Gas & Mart, located at 2951 High Street in Oakland, California (the "Site"). The sampling described herein is part of an ongoing characterization of subsurface contamination that was caused by accidental releases from an underground storage tank (UST) system that was replaced in 2001. The contaminant investigation is being conducted by W.A. Craig, Inc. (WAC) on behalf of Mr. Aziz Kandahari. The lead regulatory agency overseeing the investigation is Alameda County Health Care Services (ACHCS). The groundwater monitoring this quarter was conducted on July 16, 2003.

## PHYSICAL SETTING

### *Site Location*

Express Gas & Mart is a self-service gasoline station and convenience store located on the corner of High Street and Penniman Avenue, in southeastern Oakland. The Site location is shown on **Figure 1** and Site features are shown on **Figure 2**. The surrounding area is densely developed. Neighboring properties include commercial and residential developments.

### *Topography and Drainage*

The Site is located about 3½ miles inland from San Francisco Bay. The Site location is near the base of the Oakland Hills, at a surface elevation of about 132 feet above mean sea level (amsl). Hilly topography occurs directly southeast of the Site, a short distance beyond High Street. The ground surface at the Site slopes toward High Street, but the regional topographic slope is southwesterly away from the Oakland Hills. There are no surface water bodies in the Site vicinity.

### *Geology and Soils*

The Site area is located on an alluvial apron that extends northwest-southeast between San Francisco Bay on the west and the northern Diablo Range on the east. The active Hayward Fault forms a structural boundary between the alluvial apron and the Diablo Range. Surficial sediments at the Site have been classified as Holocene-age alluvial fan and fluvial deposits (Helley, E.J. and Graymer, R.W., 1997). These sediments are described as gravelly sand and sandy gravel that grade into sand and silty clay. The nearby hilly areas directly southeast of the Site are underlain by similar, though older, deposits of Pleistocene age.

WAC has recently drilled and sampled soil borings at the Site to install new monitoring wells. Soils encountered in the 25-foot deep borings were predominantly gravelly to sandy silts with some interbedded silt and silty fine sand. Groundwater was positively identified in two of the four borings, at respective depths of 16 feet below grade (fbg) and 4 fbg. The latter boring was drilled offsite, within High Street.

### *Groundwater*

The Site is within the San Francisco Bay regional watershed. The Quaternary alluvial deposits of the region host important aquifers. Slightly less than half the region's water supply is derived from groundwater. The balance is obtained from imported surface water. Confined groundwater occurs at a depth of approximately 21 fbg at Express Gas & Mart. The aquifer formation is primarily gravelly sandy silt. Static water levels in the onsite monitoring wells have ranged from about 5 to 9 fbg, depending upon the season. The water level data indicate the direction of groundwater flow is south-southwest. Field measurements of specific conductance among the monitoring wells have ranged from approximately 400 to 2,000 microsiemens, suggesting that the mineralogic quality of the groundwater is variable.

## **PROJECT BACKGROUND**

The history of subsurface contamination investigations at the Site predates WAC's involvement starting in 2001. Groundwater monitoring has been conducted periodically at the Site since early 1995. Groundwater has been impacted by gasoline-related volatile organic compounds (VOCs) at concentrations well above regulatory action levels. These VOCs include benzene, toluene, ethylbenzene, xylenes (BTEX) and methyl tert-butyl ether (MtBE). The following information was taken from a groundwater monitoring report dated November 14, 2000 by Aqua Science Engineers, Inc. (ASE). The ASE report indicates that 2,550 pounds of ORC® slurry were injected into borings along the northern and eastern side of the former USTs in June 1997. The ORC® apparently increased the dissolved oxygen (DO) levels in the five pre-existing monitoring wells for approximately one year. Contaminant concentrations were also reduced in well MW-5 during that period. ORC® socks were installed in wells MW-4 and MW-5 in August 1998 after the DO concentrations had declined again. The ORC® socks were removed by ASE in September 2000 after proving ineffective at reducing petroleum hydrocarbon concentrations in the groundwater.

The ASE report indicates that a Tier 2 Risk-Based Corrective Action (RBCA) analysis was performed for the Site in August 1997. The RBCA was conducted to develop site-specific threshold levels (SSTLs) for petroleum hydrocarbon contaminants in soil and groundwater. The RBCA was reviewed and commented on by ACHCS. The comments were addressed in the final

document by the principal consultant, Mr. Christopher Palmer. According to ASE's report, the ACHCS approved the RBCA in a letter dated October 21, 1997.

On February 28, 2001 WAC collected soil samples from along the product line leading to the gas pumps adjacent to High Street. High concentrations of petroleum hydrocarbons were detected in all soil samples. WAC subsequently prepared a *Site Investigation Workplan* dated March 26, 2001 to conduct a soil and groundwater investigation around the gas pumps. ACHCS approved the workplan and requested that the USTs and contaminated soils be removed and properly disposed of.

Six soil borings were drilled and sampled by WAC in late April 2001. Sampling results from the borings confirmed that leakage from the gas pumps had impacted soil and groundwater. The dispenser pumps, product lines, and four steel, gasoline USTs were excavated and removed from the Site by WAC in May 2001. The USTs were inspected and appeared to be in good condition. However, soil samples from the base and the sides of the UST excavation contained high concentrations of gasoline constituents. WAC excavated additional contaminated soil from the Site in a number of separate mobilizations between May 9 and September 27, 2001. Approximately 3,700 tons of petroleum hydrocarbon contaminated soil was removed and disposed of at B&J Class II landfill in Vacaville, California. The over-excavation area is depicted on **Figure 2**.

Following Site restoration and re-opening of the Express Gas & Mart, little additional activity occurred until March 2003, when WAC installed four new monitoring wells to obtain further data on the extent of the MtBE contamination in groundwater. Monitoring well construction information is included in **Table 1**. WAC also resumed quarterly groundwater monitoring in April 2003, for the first time since the September 2000 sampling reported by ASE. The April 2003 analytical data indicated that MtBE was above the SSTL in wells MW-5 and MW-7.

Based on the April 2003 groundwater sampling results, WAC recommended corrective action to remediate the subsurface contamination at the Site to below the SSTLs. WAC prepared a *Feasibility Study/Corrective Action Plan* dated July 28, 2003 and recommended the installation of an ozone sparge remediation system in the vicinity of the former USTs. The ACHCS has not yet given its approval to implement the recommended corrective action.

On July 16, 2003 purging and sampling of groundwater in eight monitoring wells was conducted.

## SCOPE OF WORK

The scope of work performed during this quarter included the following tasks:

- Purged and sampled groundwater from eight monitoring wells;
- Collected field measurements from the eight monitoring wells, including water level, DO, temperature, pH, and specific conductance;
- Analyzed soil and groundwater samples for the following compounds: total petroleum hydrocarbons as gasoline (TPH-g), methyl tert-butyl ether (MtBE), benzene, toluene, ethylbenzene, and xylenes (BTEX), and the fuel additives DIPE, EtBE, MtBE, tAME, tBA, methanol, ethanol, EDB, and 1,2-DCA (see notes on **Table 3** for chemical names), and;
- Prepared this *Quarterly Groundwater Monitoring Report*.

## FIELD PROCEDURES

### *Water Level Measurements*

The water levels in the monitoring wells were obtained using an electronic water level indicator and recorded on monitoring well sampling logs (**Appendix A**). Prior to the measurements, the wells were uncapped and the water levels allowed to equilibrate with atmospheric pressure for at least 30 minutes. Water level measurements were referenced to the top of the well casings. The depth-to-water measurements were used to calculate the standing well volume and the amount of water to be purged prior to collecting groundwater samples. The depth to water and surveyed wellhead elevations are also used to determine the static groundwater elevation and flow direction.

### *Monitoring Well Purging and Sampling*

After obtaining the water level data, WAC staff purged and sampled the monitoring wells. At least three volumes of standing water were purged from each well before collecting groundwater samples. Wells were purged using a clean disposable polyethylene bailer. The turbidity, pH, temperature, and specific conductance (electrical conductivity) of the groundwater were intermittently monitored with portable instrumentation during purging. The DO concentration was measured in-situ immediately after sampling each well. The field water quality measurements were recorded on monitoring well sampling logs (**Appendix A**).

The water level indicator and the instrument probes were decontaminated after each use by washing in an Alconox® detergent solution followed by a tap water rinse. Well purge water was

placed into 55-gallon drums for temporary onsite storage. The drums are emptied as needed by a subcontractor who transports the water by tanker truck to Seaport Environmental, Inc., or by WAC staff who transport the water in the 55-gallon drums to Seaport Environmental, Inc. Seaport Environmental, Inc. is a licensed disposal facility in Redwood City, California.

Upon completion of purging activities, groundwater samples were collected from each monitoring well using a disposable polyethylene bailer. The groundwater samples were decanted from the bailer into laboratory-supplied, 40-ml volatile organic analysis (VOA) vials, pre-preserved with hydrochloric acid (HCl). Care was taken to ensure that the vials were completely filled, leaving no headspace. Each sample container was labeled with the well number, project number, and date. Labeled samples were stored in the field in ice chests cooled with ice until delivery to the laboratory under chain-of-custody control.

### *Laboratory Analyses*

The groundwater samples were submitted under chain-of-custody control to McCampbell Analytical, Inc. (MAI). Samples were analyzed for TPH-g by EPA Method 8015C modified, for MtBE and BTEX by EPA Method 8021B, and for the fuel additives DIPE, EtBE, MtBE, tAME, tBA, methanol, ethanol, EDB, and 1,2-DCA by EPA Method 8260B. The Method 8260B analysis for MtBE is generally considered to be more accurate than Method 8021B. Therefore, discussions in this report will use the MtBE results determined by Method 8260B.

## **DATA EVALUATION**

### *Groundwater Levels and Gradient*

Water level data for the monitoring wells are summarized in **Table 2**. The depth to water this quarter ranged from 5.07 feet below top of casing (toc) in MW-1 to 7.35 feet below toc in MW-9. Groundwater elevations varied from 127.45 feet above mean sea level (amsl) in well MW-6 to 120.13 feet amsl in MW-10. A groundwater elevation contour map for the Site is presented on **Figure 3**. The elevation contours indicate that the direction of groundwater flow is south-westerly. The groundwater gradient was calculated using static water elevations in wells MW-1, MW-8, and MW-9. The resulting flow direction was indicated as S41°W with a gradient of 0.042 ft/ft.

### *Groundwater Analytical Results*

The laboratory test data for the monitoring wells are summarized in **Table 3** and the analytical reports are included in **Appendix B**. The laboratory detected MtBE in all eight monitoring wells. MtBE concentrations were above the SSTL in MW-5 (19,000 µg/L) and MW-7 (26,000



MW-5 and MW-7 are the closest wells to the former USTs. The extent of the MtBE plume above the SSTL is shown on **Figure 4**.

BTEX constituents were only found in samples from MW-5 and MW-7. Benzene was detected in well MW-5 at 1,000 µg/L. The SSTL for benzene is 20 µg/L. No other BTEX constituents were observed above their SSTL in well MW-5.

All BTEX constituents were above their respective SSTLs in well MW-7. Benzene was 1,100 µg/L, toluene was 630 µg/L, ethylbenzene was 1,100 µg/L, and xylene was 2,000 µg/L. This well is immediately adjacent and directly downgradient from the former USTs.

TPH-g was detected in three wells. Well MW-5 yielded 2,800 µg/L, well MW-7 yielded 18,000 µg/L and well MW-10 yielded 73 µg/L. There is no SSTL for TPH-g established for this site.

## CONCLUSIONS

The direction of groundwater flow is southwesterly with a gradient of 0.042 ft/ft. MtBE is the most widely distributed contaminant in groundwater. During this monitoring event MtBE was above the SSTL in two monitoring wells (MW-5 and MW-7) located adjacent to the former USTs.

BTEX constituents were detected in wells MW-5 and MW-7. The only BTEX constituent detected in MW-5 above the SSTL was benzene. All of the BTEX constituents were detected in MW-7 above the SSTL.

The hydrocarbon plume is localized in the area immediately surrounding the former USTs.

## RECOMMENDATIONS

WAC recommends that ozone sparging be implemented to reduce contaminant concentrations to below the SSTL cleanup goals as described in the *Feasibility Study/Corrective Action Plan* dated July 28, 2003.

WAC recommends continued quarterly groundwater monitoring. However, we recommend that well MW-3 be sampled on a semi-annual schedule rather than quarterly. Sampling well MW-3 is redundant, since well MW-1 provides coverage for that part of the Site.

The next quarterly monitoring will occur in October 2003.

**TABLES**

**Table 1**  
**Monitoring Well Construction Information**  
**2951 High Street**  
**Oakland, California**

Well ID	Date Installed	Total Depth (ft)	Screened Interval (ft)	Water-Bearing Unit	Top of Casing Elevation (ft msl)	Northing (ft)	Easting (ft)
MW-1	2/95	25	N/A	N/A	131.64	2,112,552.4	6,070,038.2
MW-3	2/95	25	N/A	N/A	131.05	2,112,539.6	6,070,048.6
MW-5	12/9/96	30	5-30	N/A	131.99	2,112,582.0	6,070,083.6
MW-6	1/7/97	30	5-30	N/A	132.58	2,112,662.5	6,070,113.5
MW-7	3/24/03	25	15-25	gravelly sandy silt	130.93	2,112,533.2	6,070,106.3
MW-8	3/24/03	25	15-25	gravelly sandy silt	131.15	2,112,527.9	6,070,153.7
MW-9	3/25/03	25	15-25	silty gravelly sand	130.00	2,112,484.8	6,070,065.6
MW-10	4/4/03	25	15-25	sandy silt	127.19	2,112,393.3	6,069,984.7

**Notes:**

All wells are 2-inch diameter casing and screen.

ft msl, feet above mean sea level. N/A = data not available.

Wells surveyed by Virgil Chavez Land Surveying on April 15, 2003.

MW-1, MW-3, MW-5, and MW-6 were installed by Aqua Science Engineers, Inc.

MW-7, MW-8, MW-9, and MW-10 were installed by W.A. Craig, Inc.

**Table 2**  
**Groundwater Levels in Monitoring Wells**  
**2951 High Street**  
**Oakland, California**

Well ID	Date	TOC Elevation	DTW	Groundwater Elevation
MW-1	4/4/03	131.64	5.07	126.57
	7/16/03		7.32	124.32
MW-3	4/4/03	131.05	5.86	125.19
	7/16/03		7.86	123.19
MW-5	4/4/03	131.99	6.94	125.05
	7/16/03		8.17	123.82
MW-6	4/4/03	132.58	5.13	127.45
	7/16/03		7.99	124.59
MW-7	4/4/03	130.93	7.06	123.87
	7/16/03		8.11	122.82
MW-8	4/4/03	131.15	6.60	124.55
	7/16/03		7.79	123.36
MW-9	4/4/03	130.00	7.35	122.65
	7/16/03		8.50	121.50
MW-10	4/23/03	127.19	7.06	120.13
	7/16/03		7.72	119.47

**Notes:**

Elevations are in feet above mean sea level.

TOC, Top of casing. DTW, Depth to water in feet below TOC.

**Table 3**  
**Analytical Results for Groundwater Samples**  
**2951 High Street**  
**Oakland, California**

Well ID	Date	TPH-g	benzene	toluene	ethyl-benzene	xylenes	MtBE	DIPE	EtBE	tAME	tBA	methanol	ethanol	EDB	DCA	
MW-1	2/23/95	<50	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	5/26/95	<50	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	8/23/95	<50	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	4/4/03	<50	<0.5	<0.5	<0.5	<0.5	270	<5	<5	<5	<50	<5,000	<500	<5	<5	
	7/16/03	<50	<0.5	<0.5	<0.5	<0.5	420	<10	<10	<10	<100	<10,000	<1,000	<10	<10	
MW-3	2/23/95	<50	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	5/26/95	<50	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	8/23/95	<50	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	
	4/4/03	<50	<0.5	<0.5	<0.5	<0.5	1,600	<25	<25	<25	<250	<25,000	<2,500	<25	<25	
	7/16/03	<50	<0.5	<0.5	<0.5	<0.5	1,200	<50	<50	<50	<500	<50,000	<5,000	<50	<50	
MW-5	12/13/96	3,600	180	350	81	510	430	NT	NT	NT	NT	NT	NT	NT	NT	
	3/27/97	120,000	28,000	16,000	2,600	10,000	64,000	NT	NT	NT	NT	NT	NT	NT	NT	
	*	6/27/97	6,300	10,000	2,400	290	4,500	43,000	NT	NT	NT	NT	NT	NT	NT	NT
	9/22/97	<50,000	7.9	3.3	0.6	3.3	30,000	NT	NT	NT	NT	NT	NT	NT	NT	
	12/6/97	<5,000	33	12	<5	7.3	33,000	NT	NT	NT	NT	NT	NT	NT	NT	
	3/23/98	29,000	150	160	130	320	34,000	NT	NT	NT	NT	NT	NT	NT	NT	
	6/10/98	53,000	7,000	2,400	540	3,400	67,000	NT	NT	NT	NT	NT	NT	NT	NT	
	7/23/98	36,000	1,000	270	<120	740	51,000	NT	NT	NT	NT	NT	NT	NT	NT	
	**	9/16/98	56,000	3,400	1,300	430	1,800	84,000	NT	NT	NT	NT	NT	NT	NT	NT
	11/23/98	63,000	5,700	2,900	500	2,200	87,000	NT	NT	NT	NT	NT	NT	NT	NT	
	3/5/99	42,000	<250	<250	<250	<250	38,000	NT	NT	NT	NT	NT	NT	NT	NT	
	6/17/99	37,000	510	85	5.6	89	61,000	NT	NT	NT	NT	NT	NT	NT	NT	
	9/15/99	54,000	8,500	1,800	420	2,400	55,000	NT	NT	NT	NT	NT	NT	NT	NT	
	12/9/99	34,000	1,600	230	130	570	33,000	NT	NT	NT	NT	NT	NT	NT	NT	
	3/6/00	21,000	7,800	870	440	2,100	30,000	NT	NT	NT	NT	NT	NT	NT	NT	
	6/7/00	<50,000	11,000	890	570	3,000	68,000	NT	NT	NT	NT	NT	NT	NT	NT	
	9/18/00	40,000	4,900	<250	<250	1,700	46,000	NT	NT	NT	NT	NT	NT	NT	NT	
	4/4/03	1,800	560	<5.0	<5.0	30	19,000	<330	<330	<330	<3,300	<330,000	<33,000	<330	<330	
7/16/03	2,800	1,000	<5	10	80	16,000	<200	<200	<200	<2,000	<200,000	<20,000	<200	<200		

**Table 3**  
**Analytical Results for Groundwater Samples**  
**2951 High Street**  
**Oakland, California**

Well ID	Date	TPH-g	benzene	toluene	ethyl-benzene	xylenes	MtBE	DIPE	EtBE	tAME	tBA	methanol	ethanol	EDB	DCA
MW-6	1/13/97	<50	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
	3/27/97	<50	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
	6/27/97	<50	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
	9/22/97	<50	<0.5	<0.5	<0.5	<0.5	24	NT	NT	NT	NT	NT	NT	NT	NT
	12/6/97	94	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
	3/23/98	<50	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
	6/10/98	<50	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
	7/23/98	<50	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
	9/16/98	<50	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
	3/5/99	55	<0.5	0.92	0.5	1.3	<5	NT	NT	NT	NT	NT	NT	NT	NT
	6/17/99	<50	<0.5	<0.5	<0.5	<0.5	8.0	NT	NT	NT	NT	NT	NT	NT	NT
	9/15/99	<50	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
	12/9/99	<50	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
	3/6/00	<50	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
	6/7/00	<50	<0.5	<0.5	<0.5	<0.5	<5	NT	NT	NT	NT	NT	NT	NT	NT
4/4/03	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<500	<50	<0.5	<0.5
7/16/03	<50	<0.5	<0.5	<0.5	<0.5	<0.5	0.54	<0.5	<0.5	<0.5	<5	<500	<50	<0.5	<0.5
MW-7	4/4/03	1,400	54	27	15	180	<b>26,000</b>	<500	<500	<500	<5,000	<500,000	<50,000	<500	<500
	7/16/03	18,000	<b>1,100</b>	<b>630</b>	<b>1,100</b>	<b>2,000</b>	<b>13,000</b>	<200	<200	<200	<2,000	<200,000	<20,000	<200	<200
MW-8	4/4/03	<50	<0.5	<0.5	<0.5	<0.5	230	<5	<5	<5	<50	<5,000	<500	<5	<5
	7/16/03	<50	<0.5	<0.5	<0.5	<0.5	340	<5	<5	<5	<50	<5,000	<500	<5	<5
MW-9	4/4/03	<50	<0.5	<0.5	<0.5	<0.5	85	<1.5	<1.5	<1.5	<12	<1,200	<120	<1.5	2
	7/16/03	<50	<0.5	<0.5	<0.5	<0.5	170	<2.5	<2.5	3	27	<2,500	<250	<2.5	<2.5
MW-10	4/23/03	79	<0.5	<0.5	<0.5	<0.5	1,900	<25	<25	58	<250	<25,000	<2,500	<25	<25
	7/16/03	73	20	<0.5	<0.5	<0.5	1,100	<20	<20	39	<200	<20,000	<2,000	<20	<20
<b>SSTL</b>		<b>NE</b>	<b>200</b>	<b>270</b>	<b>180</b>	<b>470</b>	<b>8,400</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>

**Notes:** SSTLs are site-specific target levels developed for the site by Aqua Science Engineers, Inc. in 1997. **Bold** concentrations exceed the SSTL. Concentrations are micrograms per liter (ug/L). NE, SSTL not established for this compound. NT, analyte not tested. Data prior to April 2003 are from *Groundwater Monitoring Report for September 2000 Sampling* by Aqua Science Engineers, Inc. dated 11/14/2000. \* Oxygen Release Compound (ORC) was injected into borings on the south side of MW-5 in late June 1997. \*\* ORC socks were placed in MW-5 in August 1998 and removed in September 2000.


TPH-g	Total Petroleum Hydrocarbons as gasoline	EtBE	Ethyl tert-Butyl Ether	EDB	Ethylene Dibromide
MtBE	Methyl tert-Butyl Ether	tAME	tert-Amyl Methyl Ether	DCA	1,2-Dichloroethane
DIPE	Di-isopropyl Ether	tBA	tert-Butanol		

**FIGURES**



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 750 ft Scale: 1 : 25,000 Detail: 13-0 Datum: WGS84

Base map is the Oakland East 7.5-minute quad (USGS, 1980).

**W. A. CRAIG, INC.**  
Environmental Contracting and Consulting  
6940 Tremont Road  
Dixon, California 95620

**Site Location Map**  
**Express Gas & Mart**  
**2951 High Street, Oakland, California**

**FIGURE**  
**1**  
Job No. 3936

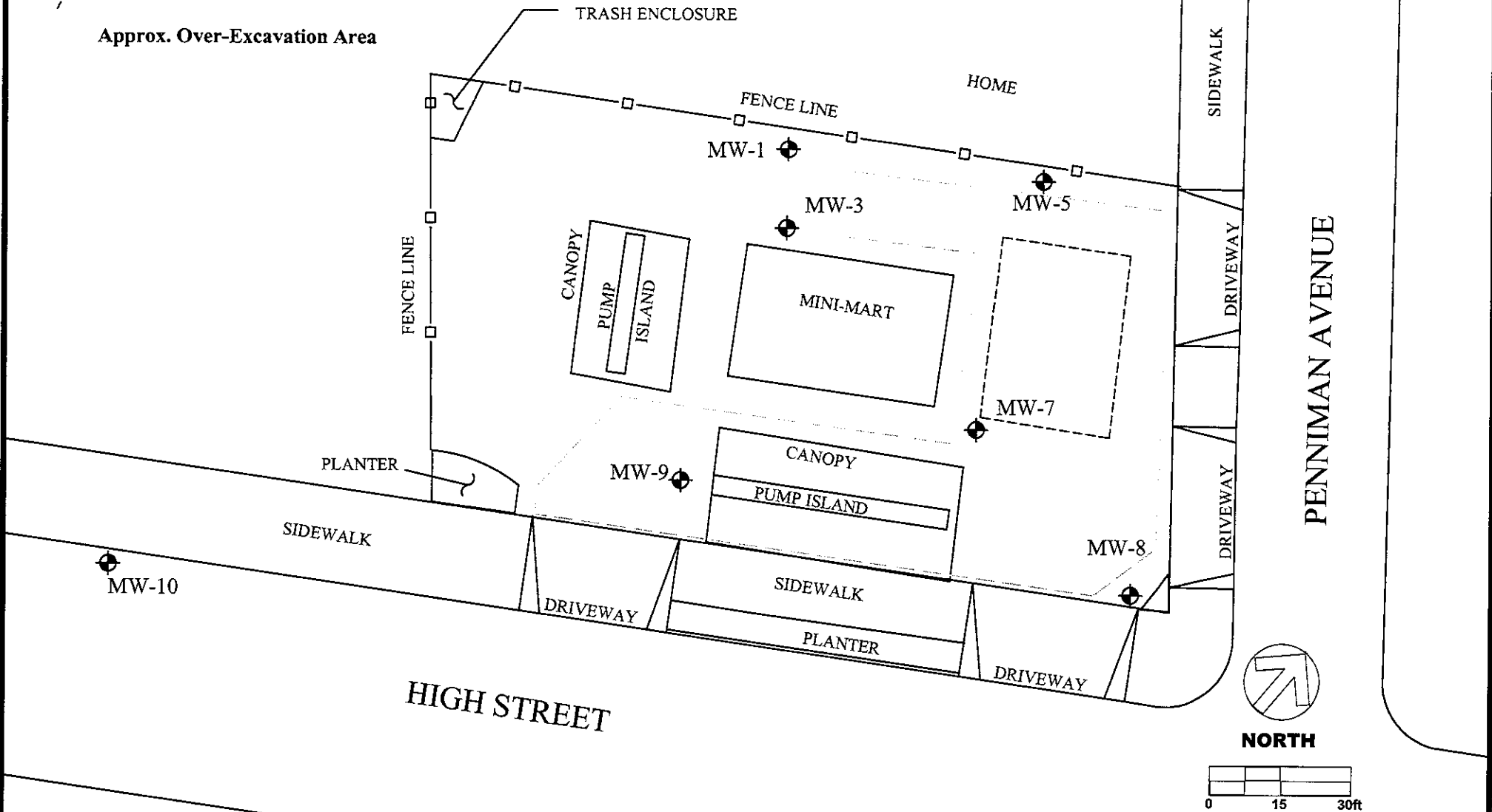


**LEGEND**

⊕ Existing Monitoring Well

--- Former UST Pit

Approx. Over-Excavation Area



**W.A. Craig, Inc.**

6940 Tremont Road LIC# 455752  
 Dixon, California 95620-9603  
 PH# (707) 693-2929 Fax# (707) 693-2922

**Site Plan**

Express Gas & Mart  
 2951 High Street  
 Oakland, California

Project #: 3936	Figure:
Date: 7/16/03	2
Scale: 1"=30'	

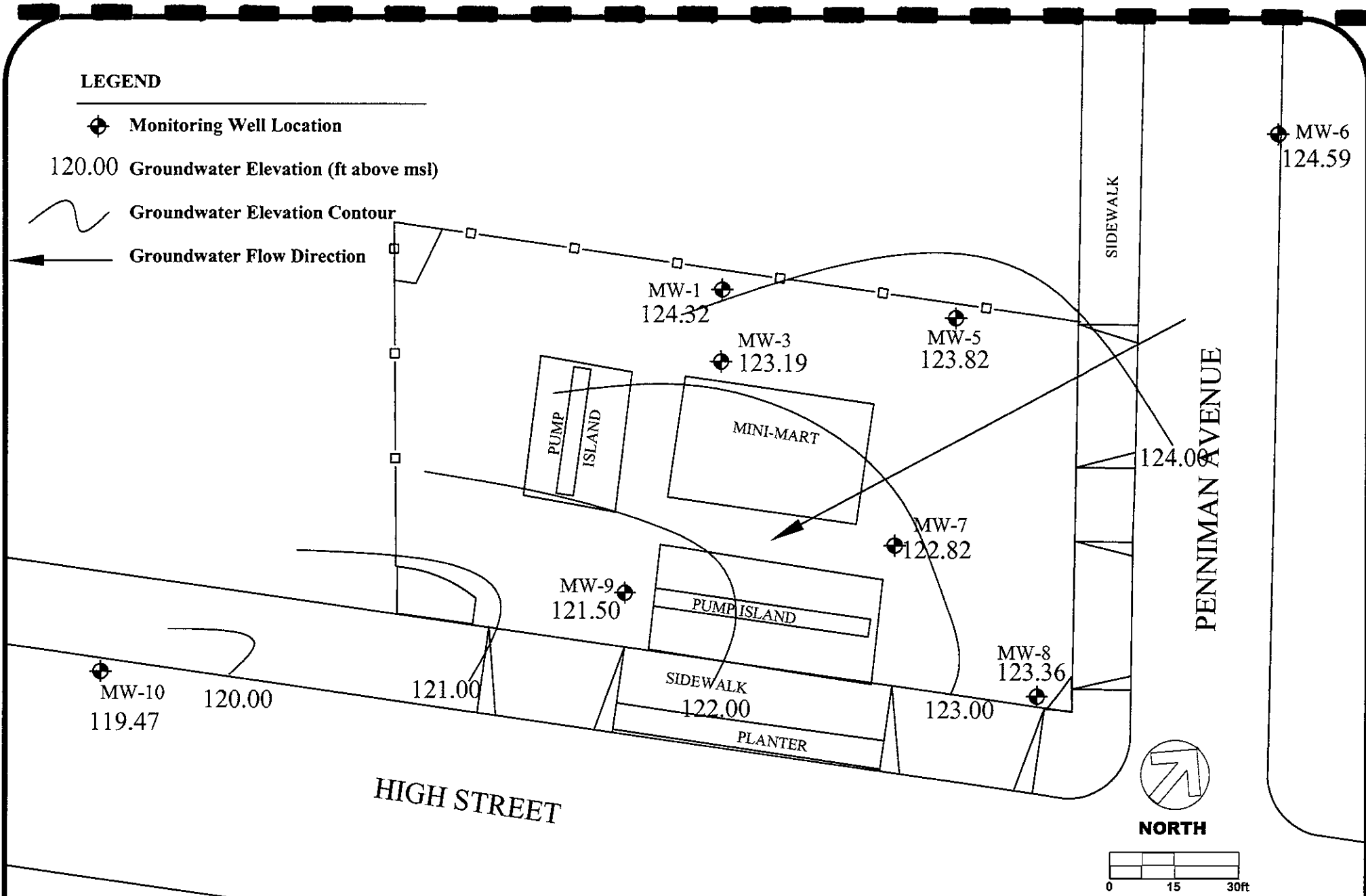
**LEGEND**

⊕ Monitoring Well Location

120.00 Groundwater Elevation (ft above msl)

~ Groundwater Elevation Contour

← Groundwater Flow Direction



**W.A. Craig, Inc.**




6940 Tremont Road LIC# 455752  
 Dixon, California 95620-9603  
 PH# (707) 693-2929 Fax# (707) 693-2922

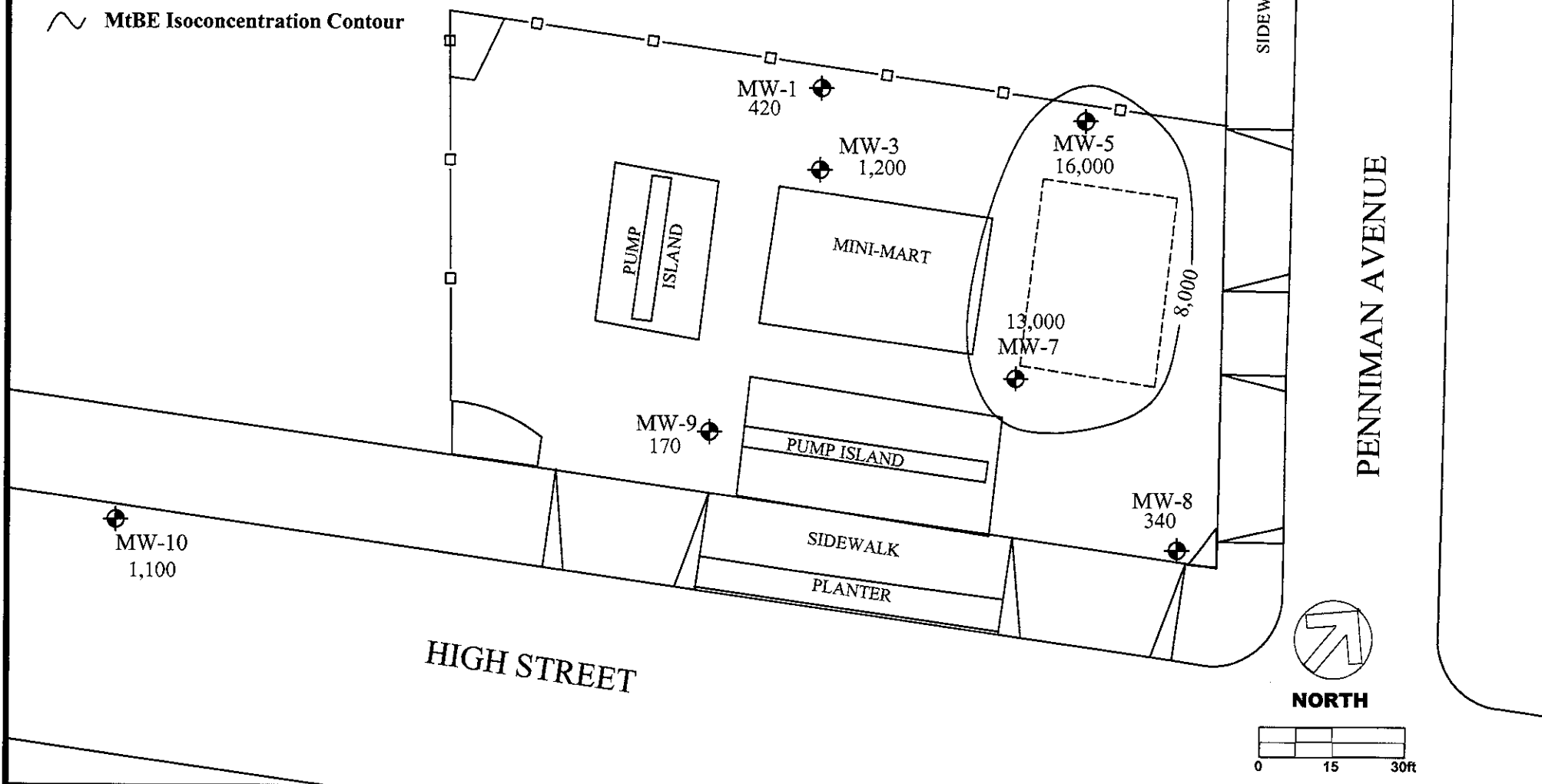
**Groundwater Elevations**

July 16, 2003  
 Express Gas & Mart  
 2951 High Street  
 Oakland, California

Project #: 3936	Figure:
Date: 7/16/03	3
Scale: 1"=30'	

**LEGEND**

-  Monitoring Well Location
-  Former UST Pit
- 420 MtBE Concentration (ug/L)
-  MtBE Isoconcentration Contour



**W.A. Craig, Inc.**

6940 Tremont Road LIC# 455752  
 Dixon, California 95620-9603  
 PH# (707) 693-2929 Fax# (707) 693-2922

**MtBE Concentrations in Groundwater**

July 16, 2003  
 Express Gas & Mart  
 2951 High Street  
 Oakland, California

Project #: 3936	Figure:
Date: 7/18/03	4
Scale: 1"=30'	

**APPENDIX A**  
**MONITORING WELL SAMPLING LOGS**

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## WELL DEVELOPMENT AND SAMPLING LOG

Project Name High St Job No. 3936 Date 7-16-03 Weather Hot / Clear  
 Sampler Clay

Well Data				Well Number <u>MW-5</u>		
Total Depth of Well	<u>30</u>	Casing Elevation		Depth to Water	<u>5.17</u>	Groundwater Elevation
Method of Purging Well	<u>bailey</u>			Method of Sampling Well	<u>bailey</u>	
Casing Volume	<u>3.7</u>	Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft				
Depth to Water Prior to Sampling		<u>purge 11</u>				
Field Parameters						
Time	Volume (gal)	Temperature	SPM <sub>4</sub>	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
10:05	3	21.0	202	7.27	184.3	slight odor / no sheen
	6	19.8	204	8.04	327.8	
	9	19.8	204	8.1	462.5	
Comments: <p style="text-align: center;"><u>Water level drawn down, Cord too short for D.O.</u></p>						

Well Data				Well Number <u>MW-1</u>		
Total Depth of Well	<u>25</u>	Casing Elevation		Depth to Water	<u>7.32</u>	Groundwater Elevation
Method of Purging Well	<u>bailey</u>			Method of Sampling Well	<u>bailey</u>	
Casing Volume	<u>3</u>	Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft				
Depth to Water Prior to Sampling		<u>purge 8.8</u>				
Field Parameters						
Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
10:23	3	20.9	582	6.60	327.4	NO5
	6	19.5	545	6.53	406.9	
	9	19.5	390	6.51		
Comments: <p style="text-align: center;"><u>0.82 @ 18.5° after purge! sample</u></p>						

## WELL DEVELOPMENT AND SAMPLING LOG

Project Name Hwy St. Job No. 3936 Date 7-16-03 Weather Hot/overcast  
 Sampler Almy

<b>Well Data</b>		<b>Well Number</b> <u>MW-10</u>	
Total Depth of Well <u>25</u>	Casing Elevation _____	Depth to Water <u>7.72</u>	Groundwater Elevation _____
Method of Purging Well <u>bailer</u>		Method of Sampling Well <u>bailer</u>	
Casing Volume <u>2.9</u>	Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft		
Depth to Water Prior to Sampling _____	<u>purge 8.6</u>		

Field Parameters						
Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
2:30	3	20.1	769	7.10	316.7	was
	6	20.2	751	7.13	289.5	"
	9	20.0	736	7.07	335.4	"

Comments:  
1.00 @ 19.2° after purge; sample

<b>Well Data</b>		<b>Well Number</b> <u>MW-9</u>	
Total Depth of Well <u>25</u>	Casing Elevation _____	Depth to Water <u>8.50</u>	Groundwater Elevation _____
Method of Purging Well <u>bailer</u>		Method of Sampling Well <u>bailer</u>	
Casing Volume <u>2.5</u>	Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft		
Depth to Water Prior to Sampling _____	<u>purge 7.7</u>		

Field Parameters						
Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
	3	20.8	1140	7.43	246.2	was
	6	20.1	1114	7.47	366.7	"
	9	20.0	1107	7.30	372.4	"

Comments:  
0.82 @ 20.1° after purge + sample

## WELL DEVELOPMENT AND SAMPLING LOG

Project Name High 51 Job No. 3936 Date 7-16-03 Weather Hot/Clear  
 Sampler ALY

Well Data						Well Number <u>MW-7</u>
Total Depth of Well	<u>25</u>	Casing Elevation		Depth to Water	<u>8.1</u>	Groundwater Elevation
Method of Purging Well	<u>bailer</u>			Method of Sampling Well	<u>bailer</u>	
Casing Volume	<u>2.9</u>	Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft				
Depth to Water Prior to Sampling		<u>purge 8.4</u>				
Field Parameters						
Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
<u>17:08</u>	<u>3</u>	<u>20.7</u>	<u>1400</u>	<u>6.56</u>	<u>211.2</u>	<u>some color</u>
	<u>6</u>	<u>20.6</u>	<u>1331</u>	<u>6.50</u>	<u>358.3</u>	
	<u>9</u>	<u>20.5</u>	<u>1373</u>	<u>6.61</u>	<u>382.7</u>	
Comments:						
<u>0.69 @ 19.8° after purge + sample</u>						

Well Data						Well Number <u>MW-8</u>
Total Depth of Well	<u>25</u>	Casing Elevation		Depth to Water	<u>7.79</u>	Groundwater Elevation
Method of Purging Well	<u>bailer</u>			Method of Sampling Well	<u>bailer</u>	
Casing Volume	<u>2.9</u>	Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft				
Depth to Water Prior to Sampling		<u>purge 8.6</u>				
Field Parameters						
Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
<u>17:12</u>	<u>3</u>	<u>21.8</u>	<u>611</u>	<u>6.88</u>	<u>173.4</u>	<u>NO5</u>
	<u>6</u>	<u>20.9</u>	<u>677</u>	<u>6.92</u>	<u>245.7</u>	
	<u>9</u>	<u>21.0</u>	<u>672</u>	<u>6.93</u>		
Comments:						
<u>0.78 @ 20.5° after purge + sample</u>						

## WELL DEVELOPMENT AND SAMPLING LOG

Project Name High St. Job No. 3936 Date 7-16-03 Weather Clear/Warm  
 Sampler Clay

Well Data				Well Number <u>MW-3</u>		
Total Depth of Well	<u>25</u>	Casing Elevation		Depth to Water	<u>7.86</u>	Groundwater Elevation
Method of Purging Well	<u>waiver</u>			Method of Sampling Well	<u>waiver</u>	
Casing Volume	<u>2.9</u>	Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft				
Depth to Water Prior to Sampling		<u>range 8.5</u>				
Field Parameters						
Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
<u>10:51</u>	<u>3</u>	<u>19.5</u>	<u>545</u>	<u>6.31</u>	<u>361.8</u>	<u>NAS</u>
	<u>6</u>	<u>18.7</u>	<u>613</u>	<u>6.4</u>	<u>442.7</u>	<u>"</u>
	<u>9</u>	<u>18.6</u>	<u>621</u>	<u>6.41</u>	<u>424.3</u>	<u>"</u>
Comments:						
<u>D.O. 2.13 @ 18.8°C after purge + sample</u>						

Well Data				Well Number <u>MW-6</u>		
Total Depth of Well	<u>30</u>	Casing Elevation		Depth to Water	<u>7.59</u>	Groundwater Elevation
Method of Purging Well	<u>waiver</u>			Method of Sampling Well	<u>waiver</u>	
Casing Volume	<u>3.74</u>	Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft				
Depth to Water Prior to Sampling		<u>purge 11</u>				
Field Parameters						
Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
<u>9:30</u>	<u>3</u>	<u>19.7</u>	<u>634</u>	<u>6.87</u>	<u>271.4</u>	<u>NAS</u>
	<u>6</u>	<u>19.3</u>	<u>630</u>	<u>6.86</u>	<u>314.8</u>	<u>"</u>
	<u>9</u>	<u>19.3</u>	<u>629</u>	<u>6.87</u>		<u>"</u>
	<u>11</u>	<u>18.4</u>	<u>631</u>	<u>6.86</u>	<u>326.2</u>	
Comments:						
<u>D.O. 0.54 @ 19.1°C after purge + sample</u>						



**APPENDIX B**  
**LABORATORY ANALYTICAL REPORT**

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McC Campbell Analytical Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

W. A. Craig Inc. 6940 Tremont Road Dixon, CA 95620-9603	Client Project ID: #3936; High Street	Date Sampled: 07/16/03
		Date Received: 07/17/03
	Client Contact: Tim Cook	Date Reported: 07/24/03
	Client P.O.:	Date Completed: 07/24/03

**WorkOrder: 0307297**

July 24, 2003

Dear Tim:

Enclosed are:

- 1). the results of 8 analyzed samples from your **#3936; High Street project**,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McC Campbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Angela Rydelius, Lab Manager



McC Campbell Analytical Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
http://www.mccampbell.com E-mail: main@mccampbell.com

W. A. Craig Inc. 6940 Tremont Road Dixon, CA 95620-9603	Client Project ID: #3936; High Street	Date Sampled: 07/16/03
		Date Received: 07/17/03
	Client Contact: Tim Cook	Date Extracted: 07/18/03-07/22/03
	Client P.O.:	Date Analyzed: 07/18/03-07/22/03

**Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE\***

Extraction method: SW5030B

Analytical methods: SW8021B/8015Cm

Work Order: 0307297

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	MW-1	W	ND	470	ND	ND	ND	ND	1	98.3
002A	MW-3	W	ND	1300	ND	ND	ND	ND	1	101
003A	MW-5	W	2800,a	17,000	1000	ND<5.0	9.6	80	10	103
004A	MW-6	W	ND,j	ND	ND	ND	ND	ND	1	98.2
005A	MW-7	W	18,000,a	15,000	1100	630	1100	2000	100	96.9
006A	MW-8	W	ND	410	ND	ND	ND	ND	1	99.6
007A	MW-9	W	ND	220	ND	ND	ND	ND	1	101
008A	MW-10	W	73,f	1600	20	ND	ND	ND	1	114

Reporting Limit for DF=1; ND means not detected at or above the reporting limit	W	50	5.0	0.5	0.5	0.5	0.5	0.5	1	µg/L
	S	NA	NA	NA	NA	NA	NA	NA	1	mg/Kg

\* water and vapor samples and all TCLP & SPLP extracts are reported in ug/L, soil/sludge/solid samples in µg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McC Campbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.

DHS Certification No. 1644

Angela Rydelius, Lab Manager



McC Campbell Analytical Inc.

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 http://www.mcccampbell.com E-mail: main@mcccampbell.com

W. A. Craig Inc. 6940 Tremont Road Dixon, CA 95620-9603	Client Project ID: #3936; High Street	Date Sampled: 07/16/03
		Date Received: 07/17/03
	Client Contact: Tim Cook	Date Extracted: 07/18/03-07/21/03
	Client P.O.:	Date Analyzed: 07/18/03-07/21/03

**Oxygenated Volatile Organics by P&T and GC/MS\***

Extraction Method: SW5030B

Analytical Method: SW8260B

Work Order: 0307297

Lab ID	0307297-001B	0307297-002B	0307297-003B	0307297-004B	Reporting Limit for DF = 1	
Client ID	MW-1	MW-3	MW-5	MW-6		
Matrix	W	W	W	W		
DF	20	100	400	1		
					S	W

Compound	Concentration				ug/kg	ug/L
	Diisopropyl ether (DIPE)	ND<10	ND<50	ND<200	ND	NA
Ethyl tert-butyl ether (ETBE)	ND<10	ND<50	ND<200	ND	NA	0.5
Methyl-t-butyl ether (MTBE)	420	1200	16,000	0.54	NA	0.5
tert-Amyl methyl ether (TAME)	ND<10	ND<50	ND<200	ND	NA	0.5
t-Butyl alcohol (TBA)	ND<100	ND<500	ND<2000	ND	NA	5.0
Ethanol	ND<1000	ND<5000	ND<20,000	ND	NA	50
Methanol	ND<10,000	ND<50,000	ND<200,000	ND	NA	500
1,2-Dibromoethane (EDB)	ND<10	ND<50	ND<200	ND	NA	0.5
1,2-Dichloroethane (1,2-DCA)	ND<10	ND<50	ND<200	ND	NA	0.5

**Surrogate Recoveries (%)**

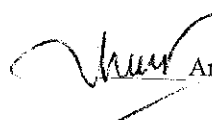
%SS:	100	99.3	97.0	99.3	
Comments				i	

\* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in µg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

# surrogate diluted out of range or surrogate coelutes with another peak.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) sample diluted due to high organic content.

 Angela Rydelius, Lab Manager



McC Campbell Analytical Inc.

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W. A. Craig Inc.  6940 Tremont Road  Dixon, CA 95620-9603	Client Project ID: #3936; High Street	Date Sampled: 07/16/03
	Client Contact: Tim Cook	Date Received: 07/17/03
	Client P.O.:	Date Extracted: 07/18/03-07/21/03
		Date Analyzed: 07/18/03-07/21/03

**Oxygenated Volatile Organics by P&T and GC/MS\***

Extraction Method: SW5030B

Analytical Method: SW8260B

Work Order: 0307297

Lab ID	0307297-005B	0307297-006B	0307297-007B	0307297-008B	Reporting Limit for DF=1	
Client ID	MW-7	MW-8	MW-9	MW-10	S	W
Matrix	W	W	W	W		
DF	400	10	5	40		

Compound	Concentration				ug/kg	ug/L
Diisopropyl ether (DIPE)	ND<200	ND<5.0	ND<2.5	ND<20	NA	0.5
Ethyl tert-butyl ether (ETBE)	ND<200	ND<5.0	ND<2.5	ND<20	NA	0.5
Methyl-t-butyl ether (MTBE)	13,000	340	170	1100	NA	0.5
tert-Amyl methyl ether (TAME)	ND<200	ND<5.0	3.0	39	NA	0.5
t-Butyl alcohol (TBA)	ND<2000	ND<50	27	ND<200	NA	5.0
Ethanol	ND<20,000	ND<500	ND<250	ND<2000	NA	50
Methanol	ND<200,000	ND<5000	ND<2500	ND<20,000	NA	500
1,2-Dibromoethane (EDB)	ND<200	ND<5.0	ND<2.5	ND<20	NA	0.5
1,2-Dichloroethane (1,2-DCA)	ND<200	ND<5.0	ND<2.5	ND<20	NA	0.5

**Surrogate Recoveries (%)**


%SS:	97.9	99.5	99.7	97.9		
Comments						

\* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in µg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

# surrogate diluted out of range or surrogate coelutes with another peak.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) sample diluted due to high organic content.

 Angela Rydelius, Lab Manager



### QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: W

WorkOrder: 0307297

EPA Method: SW8021B/8015Cm		Extraction: SW5030B		BatchID: 7854			Spiked Sample ID: 0307287-001A			
	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(btex) <sup>£</sup>	ND	60	113	112	0.740	95.6	94.1	1.63	70	130
MTBE	140.2	10	NR	NR	NR	105	111	5.02	70	130
Benzene	ND	10	93.3	94.6	1.43	90.9	90.9	0	70	130
Toluene	ND	10	97.3	98.5	1.14	95.5	94.7	0.896	70	130
Ethylbenzene	ND	10	101	102	0.746	98.2	98	0.204	70	130
Xylenes	ND	30	100	103	3.28	100	100	0	70	130
%SS:	107	100	98.9	101	1.68	97.2	98.3	1.12	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery =  $100 \cdot (\text{MS} - \text{Sample}) / (\text{Amount Spiked})$ ; RPD =  $100 \cdot (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \cdot 2$ .

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



**QC SUMMARY REPORT FOR SW8021B/8015Cm**

Matrix: W

WorkOrder: 0307297

EPA Method: SW8021B/8015Cm		Extraction: SW5030B		BatchID: 7868			Spiked Sample ID: 0307298-001A			
	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(btex) <sup>£</sup>	ND	60	101	99.4	1.75	98.4	96.6	1.77	70	130
MTBE	ND	10	96.8	98.9	2.15	98.4	96	2.42	70	130
Benzene	ND	10	95.5	95.8	0.321	93.8	93.5	0.228	70	130
Toluene	ND	10	99.1	100	1.19	98.4	97.5	0.922	70	130
Ethylbenzene	ND	10	102	103	0.420	100	102	1.05	70	130
Xylenes	ND	30	107	107	0	103	103	0	70	130
%SS:	103	100	100	99.9	0.219	97.7	98.5	0.769	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

$\% \text{ Recovery} = 100 * (\text{MS} - \text{Sample}) / (\text{Amount Spiked}); \text{RPD} = 100 * (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) * 2.$

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



### QC SUMMARY REPORT FOR SW8260B

Matrix: W

WorkOrder: 0307297

EPA Method: SW8260B		Extraction: SW5030B		BatchID: 7858			Spiked Sample ID: 0307298-002B			
	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
tert-Amyl methyl ether (TAME)	ND	10	93.5	92.8	0.748	96.8	96	0.817	70	130
1,2-Dibromoethane (EDB)	ND	10	129	126	2.70	130	124	4.28	70	130
1,2-Dichloroethane (1,2-DCA)	ND	10	101	100	1.18	106	104	2.03	70	130
Diisopropyl ether (DIPE)	ND	10	103	100	2.79	103	104	0.912	70	130
Ethanol	ND	500	108	94.3	13.8	107	106	1.46	70	130
Ethyl tert-butyl ether (ETBE)	ND	10	90.8	86.9	4.38	93.9	92.9	1.10	70	130
Methanol	ND	2500	99.4	96.2	3.29	101	98.7	2.42	70	130
Methyl-t-butyl ether (MTBE)	ND	10	95.5	94.4	1.18	98.9	97.6	1.26	70	130
%SS1:	100	100	99.3	96.8	2.54	94.6	93.6	1.11	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / (MS + MSD) \* 2.

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.



WACB 0307297

**McCAMPBELL ANALYTICAL INC.**

110 2<sup>nd</sup> AVENUE SOUTH, #D7  
PACHECO, CA 94553-5560

Telephone: (925) 798-1620

Fax: (925) 798-1622

**CHAIN OF CUSTODY RECORD**

TURN AROUND TIME

RUSH  24 HR  48 HR  72 HR  5 DAY

EDF Required?  Yes  No

Report To: Tim Cook Bill To: W.A. Craig, Inc.

Company: W.A. Craig, Inc.

E-Mail: tech@wacraig.com

Tele: (707) 693-2929 Fax: (707) 693-2922

Project #: 3936 Project Name: High Street

Project Location: Oakland

Sampler Signature: *Clyde Mori*

**Analysis Request**

**Other**

**Comments**

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED								
		Date	Time			Water	Soil	Air	Sludge	Other	Ice	HCl	HNO <sub>3</sub>	Other					
MW-1		7-16-03	10:28	3	Voa	X					X	X							
MW-3			10:51			X					X	X							
MW-5			10:05			X					X	X							
MW-6			9:30			X					X	X							
MW-7			12:08			X					X	X							
MW-8			11:12			X					X	X							
MW-9			11:50			X					X	X							
MW-10			12:30			X					X	X							

BTEX & TPH as Gas (602/8020 + 8015) M/T/B	
TPH as Diesel (8015)	
Total Petroleum Oil & Grease (5520 E&F/B&F)	
Total Petroleum Hydrocarbons (418.1)	
EPA 601 / 8010	
BTEX ONLY (EPA 602 / 8020)	
EPA 608 / 8080	
EPA 608 / 8080 PCB's ONLY	
EPA 624 / 8240 / 8260 9 fuel oxygens only	X
EPA 625 / 8270	X
PAH's / PNA's by EPA 625 / 8270 / 8310	
CAM-17 Metals	
LUFT 5 Metals	
Lead (7240/7421/239.2/6010)	
RCI	

Relinquished By: *Clyde Mori* Date: 7-16-03 Time: 2:40 Received By: *[Signature]*

Relinquished By: *[Signature]* Date: 7-17-03 Time: 6:30 Received By: *[Signature]*

Relinquished By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received By: \_\_\_\_\_

ICE/r°  PRESERVATION  VOAS  O&G  METALS  OTHER

GOOD CONDITION  APPROPRIATE

HEAD SPACE ABSENT  CONTAINERS

DECHLORINATED IN LAB  PERSERVED IN LAB

**McC Campbell Analytical Inc.**

**CHAIN-OF-CUSTODY RECORD**



110 Second Avenue South, #D7  
 Pacheco, CA 94553-5560  
 (925) 798-1620

WorkOrder: 0307297

**Client:**

W. A. Craig Inc.  
 6940 Tremont Road  
 Dixon, CA 95620-9603

TEL: (707) 310-1741  
 FAX: (707) 693-2922  
 ProjectNo: #3936; High Street  
 PO:

Date Received: 7/17/03  
 Date Printed: 7/17/03

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests					
					<	N8021B/8015C	SW8260B			
0307297-001	MW-1	Water	7/16/03 10:28:00 AM	<input type="checkbox"/>	A	A	B			
0307297-002	MW-3	Water	7/16/03 10:51:00 AM	<input type="checkbox"/>		A	B			
0307297-003	MW-5	Water	7/16/03 10:05:00 AM	<input type="checkbox"/>		A	B			
0307297-004	MW-6	Water	7/16/03 9:30:00 AM	<input type="checkbox"/>		A	B			
0307297-005	MW-7	Water	7/16/03 12:08:00 PM	<input type="checkbox"/>		A	B			
0307297-006	MW-8	Water	7/16/03 11:12:00 AM	<input type="checkbox"/>		A	B			
0307297-007	MW-9	Water	7/16/03 11:50:00 AM	<input type="checkbox"/>		A	B			
0307297-008	MW-10	Water	7/16/03 12:30:00 PM	<input type="checkbox"/>		A	B			

Prepared by: Elisa Venegas

**Comments:**

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.