RO-473

ENVIRONMENTAL ENGINEERING, INC
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Fourth Quarter 2002

GROUNDWATER MONITORING REPORT

TEXACO GASOLINE SERVICE STATION

15101 FREEDOM AVENUE

SAN LEANDRO, CALIFORNIA

December 19, 2002

Project 2551

Prepared for

Mr. Mohammad Pazdel
35840 Alcazar Court
Fremont, California

Prepared by

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DEC 2 3 2002

December 19, 2002

Mr. Scott O. Seery
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: Texaco Gasoline Service Station (Formerly Freedom ARCO Station)
Site Address: 15101 Freedom Avenue, San Leandro, California
STID 4473/RO0000473

Dear Scott:

A copy of SOMA's "Fourth Quarter 2002 Groundwater Monitoring Report" for the subject property is enclosed.

Thank you for your time in reviewing our report. If you have any questions or comments, please call me at (925) 244-6600.

Sincerely,

Mansour Sepehr, Ph.D.,P.E.
Principal Hydrogeologist

Enclosure

cc: Mr. Mohammad Pazdel w/enclosure
Mr. Farrokh Hosseinyoun w/enclosure

Certification

This report has been prepared by SOMA Environmental Engineering, Inc. on behalf of Mr. Mohammad Pazdel, for the property located at 15101 Freedom Avenue, San Leandro, California, to comply with the Alameda County Health Care Services' (ACHCS) requirements for the Fourth Quarter 2002 groundwater monitoring event.

DEC 2 3 2002

Mansour Sepehr, Ph.D., P.E.
Principal Hydrogeologist

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1.0 INTRODUCTION

This report has been prepared by SOMA Environmental Engineering, Inc., (SOMA) on behalf of Mr. Mohammad Pazdel, the property owner. Formerly, the property was known as Freedom ARCO Station located at 15101 Freedom Avenue, between 151st Street and Fairmont Boulevard, just west of Interstate 580 in San Leandro, California (the "Site"). The Site is currently operating as a service station under the brand name of Texaco. Figure 1 shows the location of the Site.

Since the 1960's, the Site has been used as a gasoline service station. In 1985, Mr. Mohammad Pazdel purchased the business and in 1992 he purchased the property from Mr. Mohammad Mashhoon. From 1985 until 1997, when Mr. Pazdel sold the business, the Site operated as "Freedom ARCO Station".

This groundwater monitoring report summarizes the results of the Fourth Quarter 2002 groundwater monitoring event conducted at the Site on November 8, 2002. This report includes the results of on-site measurements of the physical and chemical properties of the groundwater, which included pH, temperature, and electrical conductivity (EC). During this monitoring event, five monitoring wells (MW-1 to MW-5) were sampled and analyzed for the following chemicals as requested by the Alameda County of Environmental Health Services (ACEHS):

- Total petroleum hydrocarbons as gasoline (TPH-g)
- Benzene, toluene, ethylbenzene, and total xylenes (collectively referred to as BTEX)
- Methyl tertiary Butyl Ether (MtBE)
- Gasoline Oxygenates, which included tertiary Butyl Alcohol (TBA), Isopropyl Ether (DIPE), Ethyl tertiary Butyl Ether (ETBE), and Methyl tertiary Amyl Ether (TAME).

These activities were performed in accordance with the general guidelines of the California Regional Water Quality Control Board (CRWQCB).

1.1 Previous Activities

On May 20, 1999, in order to comply with underground storage tank (UST) upgrade regulations, three 10,000-gallon single walled USTs were removed and replaced with new double-walled fuel tanks. Geo-Logic oversaw the removal of the USTs, approximately 250 feet of product piping and six dispensers at the Site. Paradiso Mechanical, Inc. removed the old USTs and installed the new USTs. The on-site participating agency was Alameda County Health Care Services (ACHCS). During the upgrade of the USTs, petroleum chemicals were detected in subsurface soils beneath the old USTs. As a result, an over-excavation of the UST cavity was performed.

After excavation and removal, the product piping and the three USTs were transported to the Ecology Control Industries facility in Richmond, California for proper disposal. On May 20 and May 21, 1999, Geo-Logic collected soil samples from beneath the USTs, product piping, and dispensers. On May 20, 1999, seven soil samples were collected from the west and east sides of the tank excavation pit (T1W, T2W, T3W, T1E, T2E, T3E, and an additional soil sample at T1W). The depths at which the samples were taken ranged from 12 to 14 feet below ground surface (bgs). In addition, six soil samples were collected from beneath the dispensers (P1, P2, P4, P5, P6, and P7). The depths at which the samples were taken ranged from 2.5 to 3 feet bgs. One soil sample was collected beneath the product lines (P3) at a depth of 2.5 feet bgs. On May 21, 1999, eight additional soil samples (P8, P9, P10, P11, P12, P13, P14, and P15) were collected beneath the product piping and in the area of the dispensers at depths ranging from 3 to 3.5 feet bgs. A stockpile soil sample was also collected at this time.

On June 2, 1999, additional soil samples were collected during over-excavation activities from beneath the product piping and the base of the tank excavation cavity. An additional soil sample (P12) was collected beneath the product piping at a depth of 5 feet bgs. In order to define the vertical extent of hydrocarbon contamination, three additional soil samples were collected in the western portion of the tank cavity at depths ranging from 16.5 to 24.5 feet bgs.

The soil samples collected during the removal and over-excavation activities were submitted to Calcoast Analytical in Emeryville, California. Soil samples were analyzed for TPH-g using EPA Method 8015, BTEX compounds and MtBE using EPA Method 8020B and total lead using EPA Method 6010A. EPA Method 8260 was used to confirm the presence of MtBE. The concentration of TPH-g in soil samples ranged between 0.76 mg/Kg (in P3, at a depth of 2.5 feet bgs) and 4,000 mg/Kg (in T1W, at a depth of 24.5 feet bgs). Benzene concentrations ranged between 28 mg/Kg (in T1W, at a depth of 13.5 feet bgs) and non-detectable levels (in P2 through P6, and P14, at depths ranging from 2.5 to 3 feet bgs). MtBE concentrations ranged from below the laboratory reporting limit to 0.93 mg/Kg.

On July 7, 1999, a 20,000-gallon gasoline UST, an 8,000-gallon gasoline UST, and a 6,000-gallon diesel UST were installed in the tank cavity by Paradiso Mechanical, Inc.

In July 2001, CCS Environmental Services of San Rafael, California (CCS), at the request of the ACHCS, conducted additional soil and groundwater investigations to further examine potential petroleum hydrocarbon contamination discovered during the removal and upgrade of the USTs at the Site. During this investigation, CCS drilled five soil borings (SB-1 through SB-5) using the direct-push method. The soil boring locations are shown in Figure 2. The soil borings were advanced to a maximum depth of 31 feet. Due to the semi-confined nature of the saturated sediments directly beneath the Site, the groundwater stabilized

at depths of 17 to 20 feet bgs, shortly after drilling. The results of this investigation indicated that petroleum-impacted soils are generally encountered below a depth of 19 feet and are predominantly present within the capillary fringe, just above the saturated zone. The maximum concentrations of TPH-g and BTEX in soil samples collected between 19 and 25.5 feet bgs were 470, 2.6, 16, 12, and 73 mg/Kg, respectively. MtBE was below the laboratory reporting limit of 0.005 mg/Kg in all soil samples. The maximum concentrations of TPH-g and BTEX in the groundwater samples collected from the soil borings were 83, 19, 1.8, 1.5, and 73 mg/L, respectively. MtBE was detected in the groundwater at each of the borings except SB-4. The maximum reported concentration was 87 mg/L at soil boring SB-2.

On April 22 and 23, 2002, SOMA installed 5 (4-inch diameter) on-site groundwater monitoring wells (MW-1 to MW-5) to evaluate the groundwater flow gradient, and the extent of petroleum hydrocarbons and MtBE contamination beneath the Site. The wells were developed and sampled following installation. Figure 2 displays the locations of the monitoring wells.

2.0 FIELD ACTIVITIES

On November 8, 2002, SOMA's field crew conducted a groundwater monitoring event in accordance with the procedures and guidelines of the CRWQCB. During this groundwater monitoring event, a total of five monitoring wells (MW-1 to MW-5) were monitored. Figure 2 displays the locations of the monitoring wells.

The depth to groundwater at each well was measured from the top of the casings to the nearest 0.01 foot using an electric sounder. To calculate the groundwater elevation at each monitoring well, the top of the casing elevation and depth to groundwater were used. There was no detection of free product in any of the wells.

Prior to collecting samples, each well was purged using a battery operated 2-inch diameter pump (Model ES-60 DC).

In order to ensure that the final samples were in equilibrium with and representative of the surrounding groundwater, several samples were taken during the purging for field measurements of pH, temperature and EC. These parameters were measured using a Hanna pH, conductivity, and temperature meter. The equipment was calibrated at the Site using standard solutions and procedures provided by the manufacturer. Appendix A details the field measurements taken during the monitoring event.

The purging continued until these parameters stabilized or three casing volumes were purged. For sampling purposes, after purging, a disposable polyethylene bailer was used to collect sufficient samples from each monitoring well for laboratory analyses. The groundwater samples collected from each monitoring well were transferred to four 40-mL VOA vials, which had been prepared with a hydrochloric acid preservative. The vials were sealed to prevent the development of air bubbles within the headspace area. These groundwater samples were analyzed for TPH-g, BTEX, MtBE and gasoline oxygenates. After the groundwater samples were collected, they were placed in an ice chest and maintained at 4 °C. A chain of custody (COC) form was completed for all of the samples and was submitted along with the samples to the laboratory. On that same day, November 8, 2002, SOMA's field crew delivered the groundwater samples to Curtis & Tompkins, Ltd. laboratory in Berkeley, California.

3.0 LABORATORY ANALYSIS

Curtis & Tompkins, Ltd., a state certified laboratory, analyzed the groundwater samples for TPH-g, BTEX, MtBE, and gasoline oxygenates. Samples for TPH-g measurement were prepared using EPA Method 5030B and analyzed using Method 8015B(M). Samples for BTEX measurements were prepared using EPA

Method 5030B and analyzed using EPA Method 8021B. MtBE and gasoline oxygenates measurements were prepared using EPA Method 5030B and analyzed using EPA Method 8260B.

4.0 RESULTS

The following sections provide the results of field measurements and laboratory analyses for the November 8, 2002 groundwater monitoring event.

4.1 Field Measurements

Table 1 presents the calculated groundwater elevations at each groundwater monitoring well. No free product was detected in any of the wells. As Table 1 shows, depths to groundwater ranged from 20.14 feet in monitoring well MW-5 to 23.58 feet in monitoring well MW-1. The corresponding groundwater elevations ranged from 27.65 feet in monitoring well MW-5 to 28.13 feet in monitoring well MW-1.

Table 2 presents the historical groundwater elevations at different groundwater monitoring wells. SOMA conducted the first monitoring event on the newly installed wells during the Second Quarter 2002. Since the previous monitoring event, all groundwater elevations have decreased. The groundwater elevation in monitoring well MW-2, as recorded for the June 2002, was erroneous and the low groundwater elevation was probably the result of the initial well development. The groundwater elevations for monitoring well MW-2, since the initial monitoring in June 2002, closely matches the other on-site existing wells.

The groundwater elevation contour map in feet is displayed in Figure 3. As shown in Figure 3, groundwater flows southward. The approximate average groundwater gradient on-site is 0.003 feet/feet. The groundwater flow and gradient are similar to the previous (Third Quarter 2002) monitoring event.

Table 3 summarizes the field measurements of the physical and chemical properties of groundwater collected from the monitoring wells at the time of sampling. The pH measurements ranged from 6.96 in monitoring wells MW-1 and MW-5 to 9.01 in monitoring well MW-2. The temperature measurements ranged from 19.61°C in monitoring well MW-3 to 20.88 °C in monitoring well MW-5. EC ranged from 1,130 µS/cm in monitoring well MW-3 to 1,487 µS/cm in monitoring well MW-4.

4.2 Laboratory Analysis

Table 4 presents the results of the laboratory analyses on the groundwater samples. In general, the analytical results indicate that groundwater samples collected from monitoring wells MW-3 and MW-5 were the most impacted, with the exception of MtBE, which seems to peak in monitoring well MW-4. High concentrations of TPH-g and BTEX in monitoring wells MW-3 and MW-5 can be attributed to leaks from the old USTs prior to their upgrade in 1999.

TPH-g concentrations were detected in all of the monitoring wells. TPH-g concentrations ranged from 3,400 µg/L in monitoring well MW-2 to 47,000 µg/L in monitoring well MW-3. Figure 4 displays the contour map of TPH-g concentrations in the groundwater on November 8, 2002. The highest reported TPH-g concentration was in monitoring well MW-3, which is near the dispenser islands and former USTs. Also, a TPH-g concentration of 16,000 µg/L was detected in monitoring well MW-5.

The following trends were observed for BTEX analytes during the Fourth Quarter 2002 monitoring event. All BTEX analytes were detected in all of the monitoring wells with the exception of toluene, which was below laboratory reporting limit in monitoring well MW-2. The monitoring wells least impacted by BTEX were MW-2 and MW-4. The benzene, ethylbenzene and total xylenes concentrations in

monitoring well MW-2 were 4.6 µg/L, 310 µg/L, and 160 µg/L, respectively. The highest BTEX concentrations were detected in monitoring well MW-3 at 5,300 µg/L, 1,200 µg/L, 2,200 µg/L, and 8,600 µg/L, respectively. Figure 5 displays the contour map of benzene concentrations in the groundwater on November 8, 2002. Similar to the results for TPH-g, the highest benzene concentration was detected in monitoring well MW-3, near the dispenser islands. Also, benzene was detected in monitoring well MW-5 at a high concentration of 1,300 µg/L.

Table 4 shows the results of the MtBE analysis by confirmation method 8260B. MtBE concentrations were detected in monitoring wells MW-3, MW-4 and MW-5. MtBE concentrations for monitoring wells MW-3, MW-4, and MW-5 were 1,000 µg/L, 2,400 µg/L, and 1,200 µg/L, respectively. Figure 6 displays the contour map of MtBE concentrations in the groundwater on November 8, 2002. As shown in Figure 6, the highest MtBE concentration was detected in the vicinity of the dispenser islands, in monitoring well MW-4. This can be attributed to the southerly groundwater gradient and location of the product piping from the existing USTs to the dispenser islands.

Table 5 presents the historical groundwater analytical data. The following concentration trends were observed for TPH-g, BTEX, and MtBE since the previous monitoring event. TPH-g concentrations decreased in monitoring wells MW-1 and MW-5 and increased in monitoring wells MW-2, MW-3, and MW-4. Benzene decreased in monitoring wells MW-1 and MW-3, and increased in monitoring wells MW-4 and MW-5. Toluene decreased in monitoring well MW-5 only, and remained below the laboratory reporting limit in monitoring well MW-2. Ethylbenzene decreased in both monitoring wells MW-1 and MW-5, and increased in monitoring wells MW-3 and MW-4. Total xylenes increased in all monitoring wells, with the exception of monitoring well MW-5. MtBE concentrations decreased in all monitoring wells. MtBE has remained below the laboratory reporting limit for both monitoring wells MW-1 and MW-2. MtBE has

significantly decreased in monitoring well MW-4, since the initial monitoring event in May 2002. Total lead was not analyzed during this monitoring event.

Table 6 shows the results of gasoline oxygenates analytical results. TBA was detected in all monitoring wells, and ranged in concentration from 15 µg/L in monitoring well MW-2 to 580 µg/L in monitoring well MW-4. Figure 7 displays the contour map of TBA concentrations in the groundwater on November 8, 2002. As shown in Figure 7, the highest TBA concentration was detected near the dispenser islands in monitoring well MW-4. DIPE and ETBE were below the laboratory reporting limits in all wells, with the exception of a slight detection of ETBE in monitoring well MW-4, at 6 µg/L. TAME was below laboratory reporting limit in monitoring wells MW-1 and MW-2 and peaked in monitoring well MW-5 at 560 µg/L. Figure 8 displays the contour map of TAME concentrations in the groundwater on November 8, 2002. As shown in Figure 8, the highest TAME concentration was detected in monitoring well MW-5, southeast of the dispenser islands. Also, a high TAME concentration was detected in monitoring well MW-3.

Table 7 displays the historical analytical results of gasoline oxygenates in the groundwater sampled at the Site. In compliance with a request from the ACEHS, dated July 2, 2002, SOMA had the groundwater samples analyzed for gasoline oxygenates for the first time during the Third Quarter 2002 monitoring event. TBA decreased in monitoring wells MW-1, MW-2, and MW-4. A significant decrease in TBA concentration was observed in monitoring well MW-4. TBA increased in both monitoring wells MW-3 and MW-5 from below the laboratory reporting limit to 85 µg/L and 66 µg/L, respectively. DIPE and ETBE remained below the laboratory reporting limit in all monitoring wells, with the exception of a slight increase in ETBE for monitoring well MW-4. The only increase in TAME concentrations was detected in monitoring well MW-5. TAME remained below the laboratory reporting limit in both monitoring wells MW-1 and MW-2.

Appendix B includes the laboratory report and COC form for the Fourth Quarter 2002 monitoring event.

5.0 CONCLUSION AND RECOMMENDATIONS

The results of the November 8, 2002 groundwater monitoring event can be summarized as follows:

1. In general, the groundwater flows towards the south. The highest groundwater elevation was found in monitoring well MW-1 at 28.13 feet. The average groundwater gradient on-site is 0.003 feet/feet. The groundwater flow and gradient is consistent with the previous monitoring event.

2. The highest TPH-g and benzene concentrations were detected in monitoring well MW-3. The high TPH-g and benzene concentrations detected in monitoring well MW-3 can be attributed to a possible earlier release in the vicinity of the former USTs. During the upgrade of the USTs in May 1999, petroleum chemicals were detected in subsurface soils beneath the old USTs.

3. The highest concentration of MtBE was detected in monitoring well MW-4. This can be attributed to the proximity of the well to the dispenser islands. Monitoring well MW-4 is located west of the dispenser islands that were remodeled in May 1999. Also, high concentrations in this well can be attributed to the southerly flow direction and the high solubility of MtBE in the groundwater. Monitoring well MW-4 is slightly southwest of monitoring well MW-3 and the former fuel islands where high concentrations of MtBE were detected. However, MtBE has significantly decreased from the initial monitoring event in May 2002, where MtBE was detected at 12,000 µg/L.

4. In compliance with a request from the ACEHS, gasoline oxygenates were analyzed for the first time during the Third Quarter 2002. During this monitoring event TBA was found to be present in all monitoring wells. DIPE and ETBE were below the laboratory limit in all monitoring wells for the second consecutive quarter, with the exception of a slight increase in ETBE in monitoring well MW-4. TAME was only detected in monitoring wells MW-3, MW-4, and MW-5. TAME decreased in both monitoring wells MW-3 and MW-4 since the previous quarter.

5. SOMA recommends a further site investigation to determine the extent of the chemical concentrations south of monitoring well MW-5 and along Fairmont Avenue, east of the Site. High TPH-g and benzene concentrations were detected in monitoring well MW-3, as well as the highest concentration of MtBE being detected in monitoring well MW-4. Therefore, a further investigation is warranted based on the groundwater flow direction and the residential areas surrounding the Site.

6.0 REPORT LIMITATIONS

This report is the summary of work done by SOMA, including observations and descriptions of the Site's conditions. It includes the analytical results produced by Curtis & Tompkins Laboratories for the current groundwater monitoring event. The number and location of the wells were selected to provide the required information, but may not be completely representative of the entire Site's conditions. All conclusions and recommendations are based on the results of the laboratory analysis. Conclusions beyond those specifically stated in this document should not be inferred from this report.

SOMA warrants that the services provided were done in accordance with the generally accepted practices in the environmental engineering and consulting field at the time of this sampling.

7.0 REFERENCES

SOMA Environmental Engineering Inc., September 26, 2002. "Third Quarter 2002 Groundwater Monitoring Report, Texaco Gasoline Service Station, 15101 Freedom Avenue, San Leandro, California".

SOMA Environmental Engineering Inc., June 19, 2002. "Second Quarter 2002 Groundwater Monitoring Report, Texaco Gasoline Service Station, 15101 Freedom Avenue, San Leandro, California".

Alameda County Health Care Services, August 23, 2001. A Letter in Connection with a Request for Conducting a Subsurface Investigation.

CSS Environmental Services, Inc., August 15, 2001. "Preliminary Site Assessment for the Property Located at 15101 Freedom Avenue, San Leandro, California".

Geo-logic, Geotechnical and Environmental Consulting Services, June 11, 1999. "Report of Soil Sampling During Tank Removal and Station Upgrade".

Figures

Figure 1: Site vicinity map.

SOMA
ENVIRONMENTAL ENGINEERING, INC.

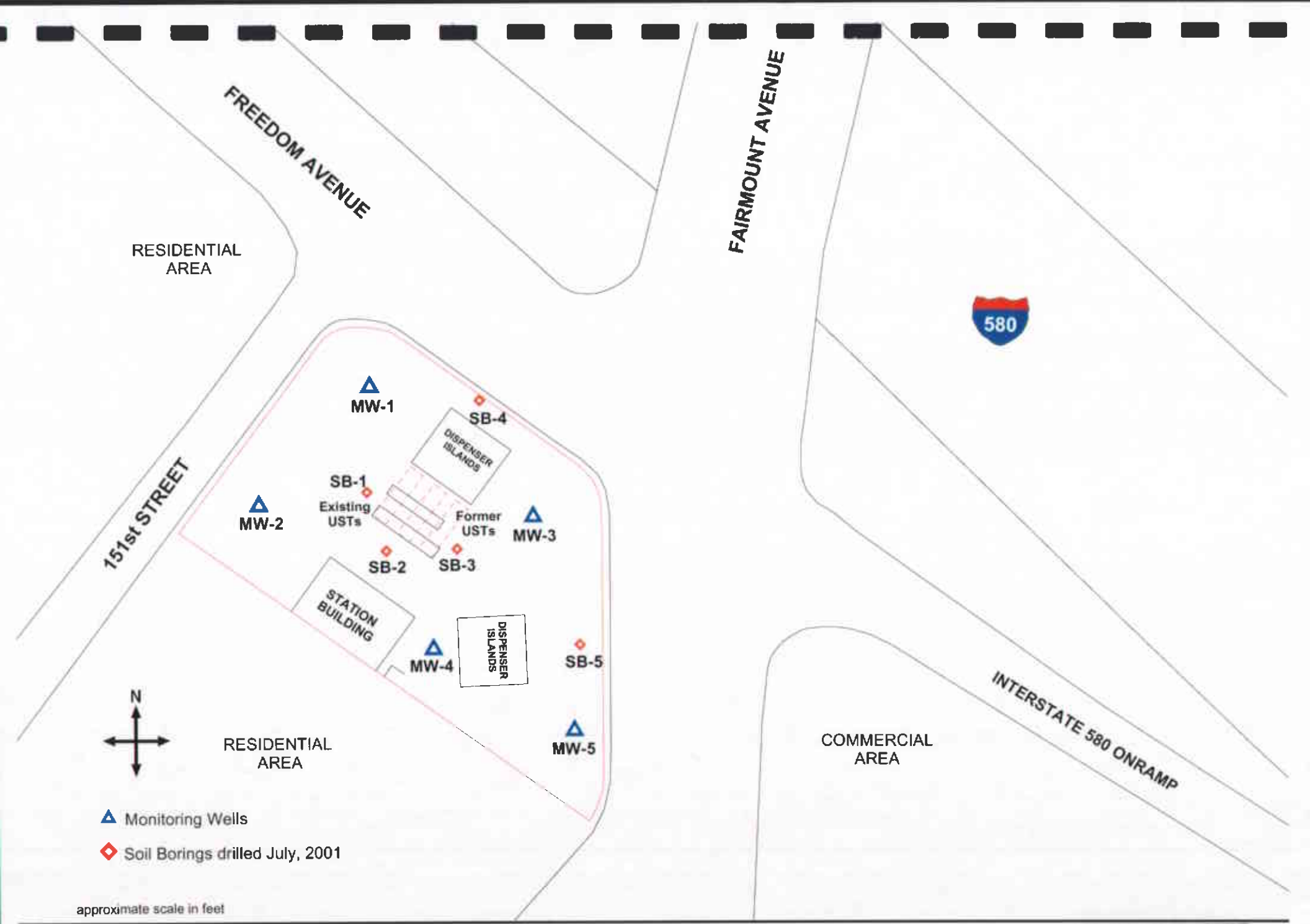

Figure 2: Site map showing locations of groundwater monitoring wells and soil borings.

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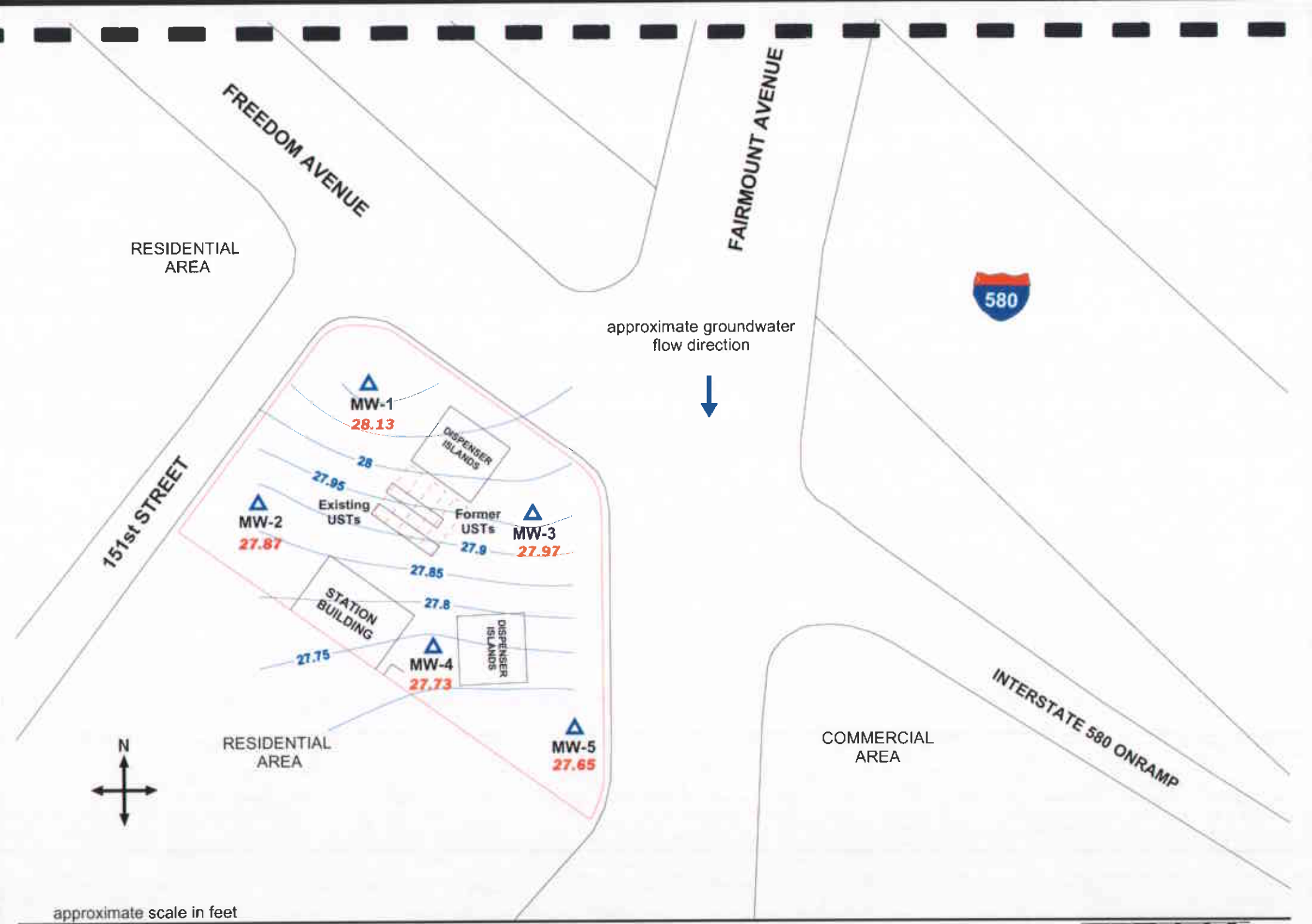

Figure 3: Groundwater elevation contour map in feet.
November 8, 2002.

SOMA ENVIRONMENTAL ENGINEERING, INC.

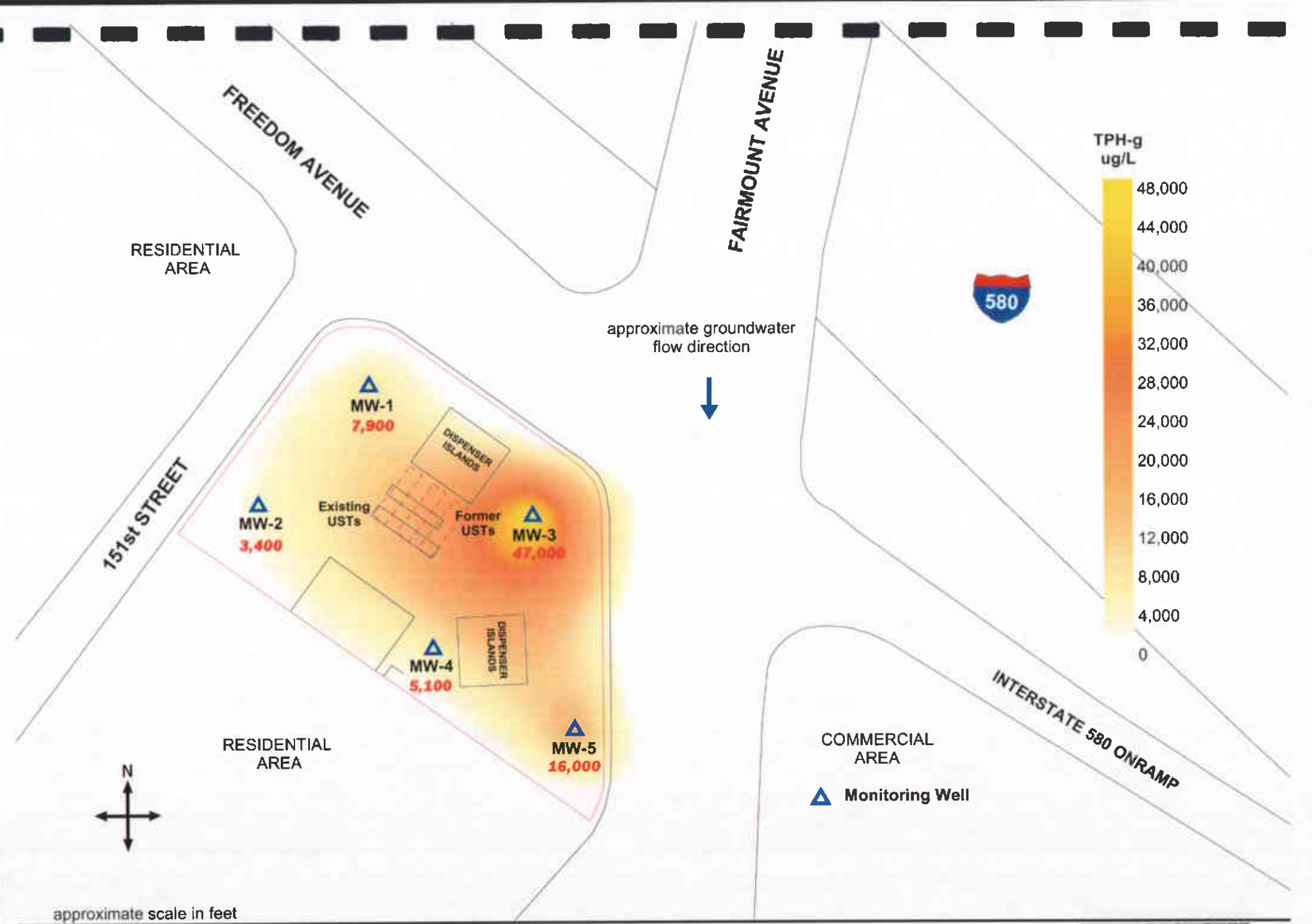

Figure 4: Contour map of TPH-g concentrations in groundwater.
November 8, 2002.

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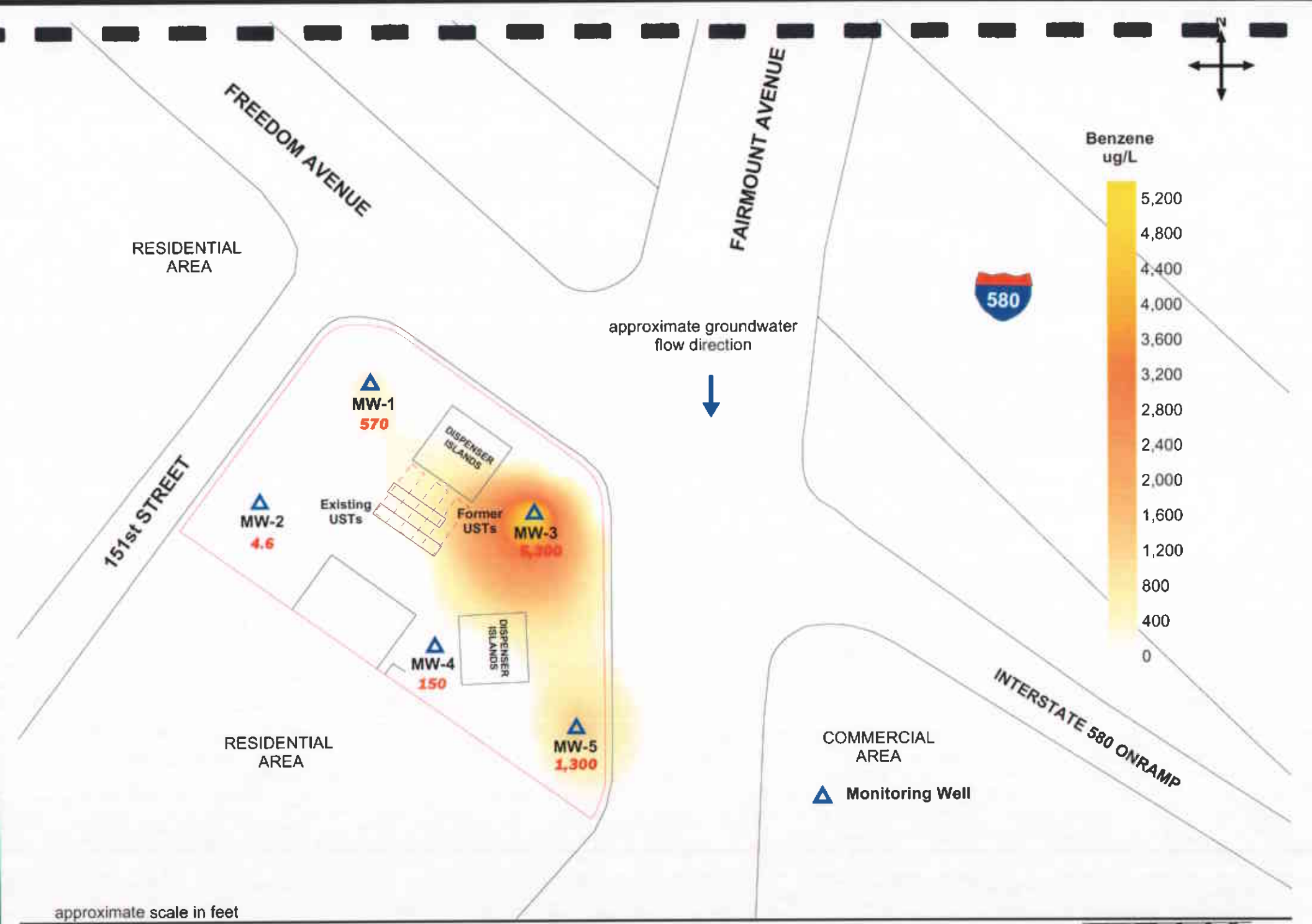

Figure 5: Contour map of Benzene concentrations in groundwater.
November 8, 2002.

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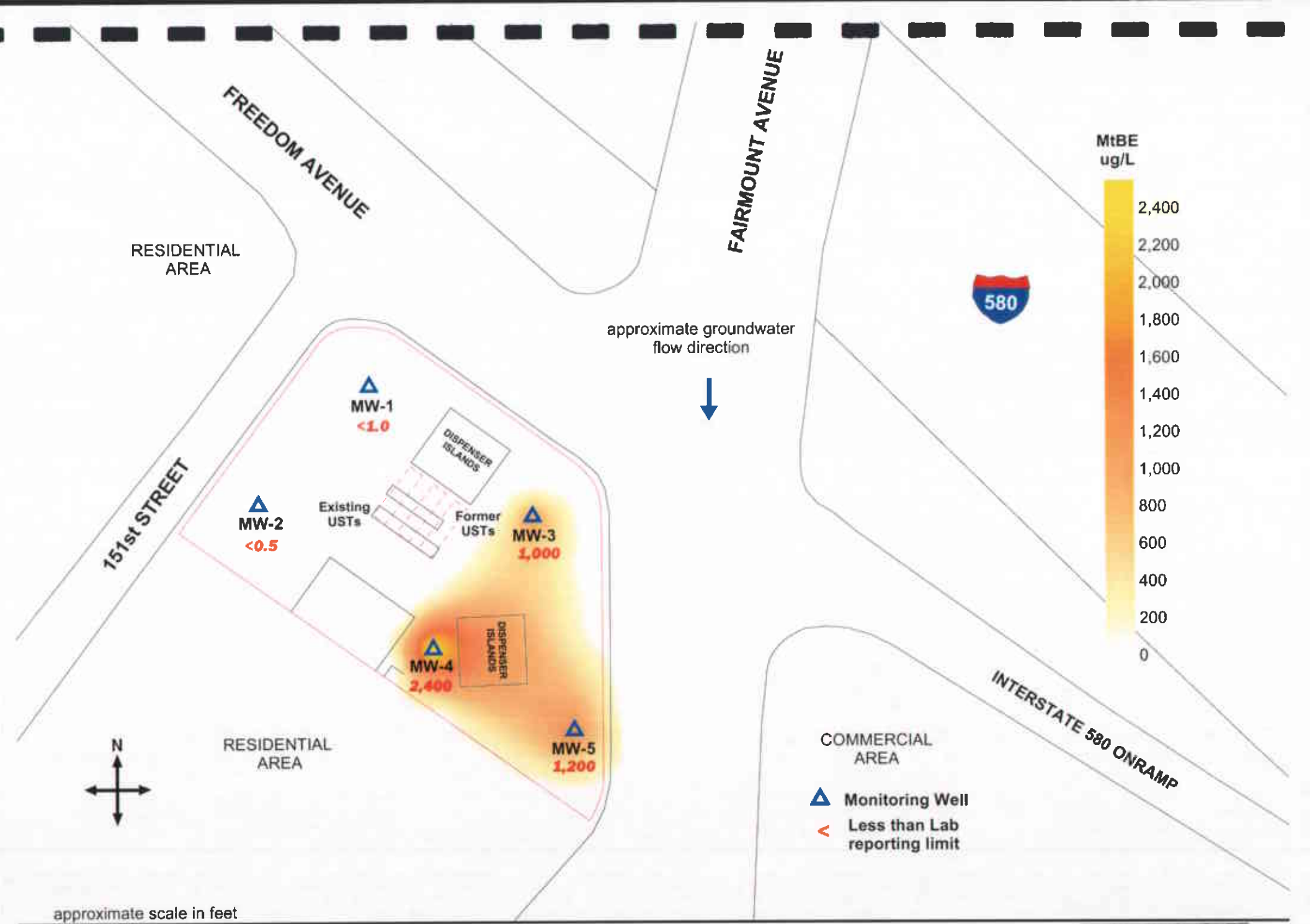


Figure 6: Contour map of MtBE concentrations in groundwater as confirmed by EPA Method 8260B. November 8, 2002.

SOMA ENVIRONMENTAL ENGINEERING, INC.

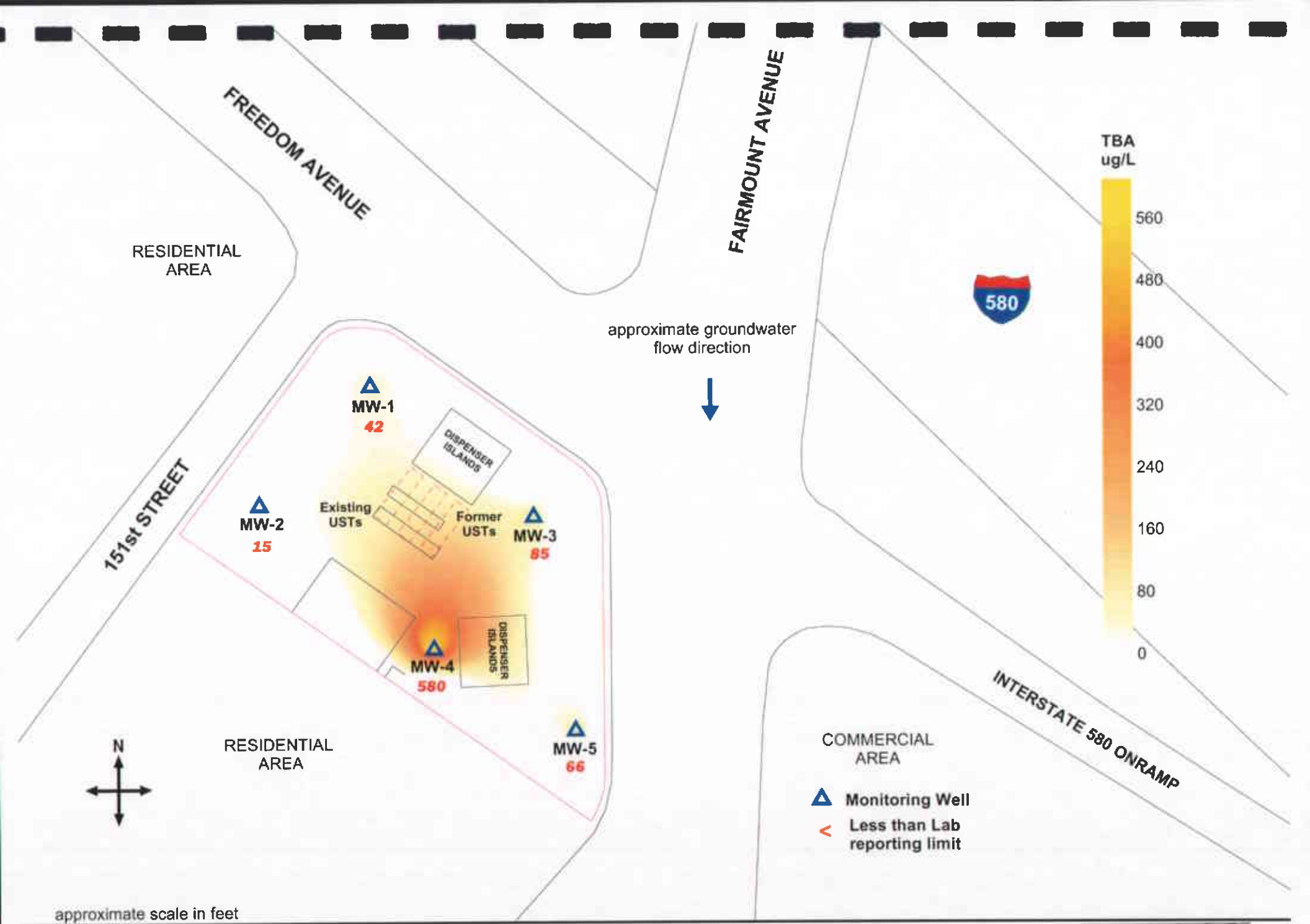


Figure 7: Contour map of TBA concentrations in groundwater.
November 8, 2002.

SOMA ENVIRONMENTAL ENGINEERING, INC.

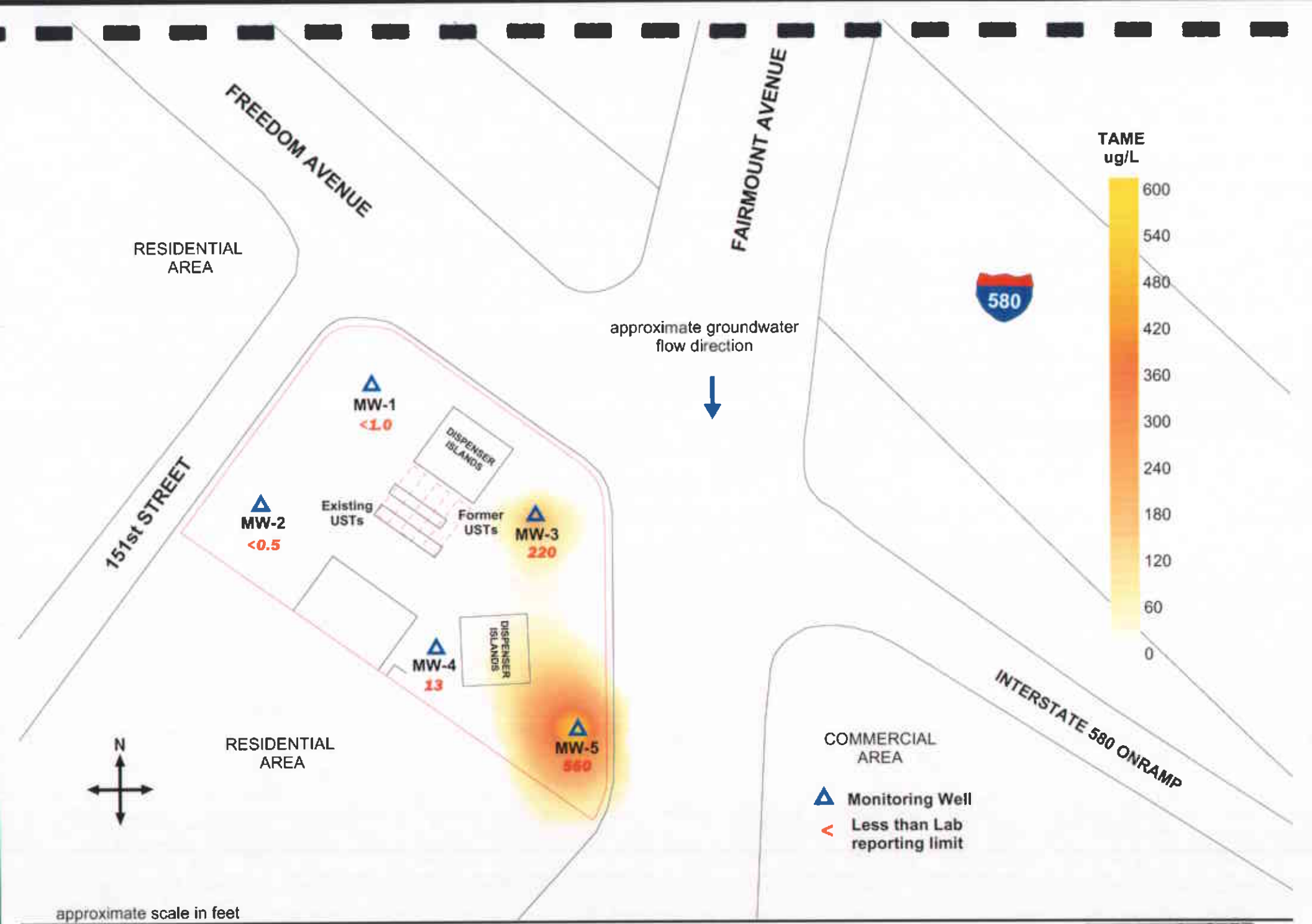


Figure 8: Contour map of TAME concentrations in groundwater.
November 8, 2002.

SOMA ENVIRONMENTAL ENGINEERING, INC.

Tables

Table 1
Groundwater Elevation Data
November 8, 2002
15101 Freedom Avenue, San Leandro, CA

Monitoring Well	Top of Casing Elevation [1] (feet)	Depth to Water (feet)	Groundwater Elevation (feet)
MW-1	51.71	23.58	28.13
MW-2	49.66	21.79	27.87
MW-3	51.16	23.19	27.97
MW-4	50.54	22.81	27.73
MW-5	47.79	20.14	27.65

Notes:
Monitoring wells were surveyed by Kier and Wright Civil Engineer & Land Surveyors.
Surveying was conducted on May 7, 2002.
[1]: Top of casing elevations were surveyed to an assumed datum of 67.07 M.S.L

Table 2
Historical Groundwater Elevation Data
15101 Freedom Avenue, San Leandro, CA

Date	MW-1	MW-2	MW-3	MW-4	MW-5
Nov 2002	**28.13**	**27.87**	**27.97**	**27.73**	**27.65**
Aug 2002	28.40	28.25	28.28	28.04	27.99
Jun 2002	28.86	26.83 *	28.88	28.76	28.77

Notes:
The first time SOMA monitored this Site was in May 2002.
*: The groundwater elevation recorded during the Second Quarter 2002 for monitoring well MW-2 was erronous.
This was probably due the initial development of the well. Since the initial monitoring of MW-2
the elevations recorded for MW-2 have closely matched the other existing wells.

Table 3

Field Measurements at the Time of Sampling, November 8, 2002

15101 Freedom Avenue, San Leandro, CA

Monitoring Well	pH	Temp (°C)	E.C. (uS/cm)
MW-1	6.96	20.33	1176
MW-2	9.01	20.16	1309
MW-3	7.14	19.61	1130
MW-4	8.60	19.77	1487
MW-5	6.96	20.88	1144

Table 4

Groundwater Analytical Data, November 8, 2002

15101 Freedom Avenue, San Leandro, CA

Monitoring Well	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MtBE 8260B [1] (µg/L)	Total Lead (µg/L)
MW-1	7,900	570	3.1	680	392	< 1.0	NA
MW-2	3,400	4.6	< 0.5	310	160	< 0.5	NA
MW-3	47,000	5,300	1,200	2,200	8,600	1,000	NA
MW-4	5,100	150	10	460	258	2,400	NA
MW-5	16,000	1,300	380	930	1,550	1,200	NA

Notes:

< : Not detected above laboratory reporting limits.

[c] Presence confirmed, but confirmation concentration differed by more than a factor of two.

[1] MtBE analyzed by EPA Method 8260B.

NA Not Analyzed

Table 5

Historical Groundwater Analytical Data: TPH-g, MtBE, BTEX, & Lead

15101 Freedom Avenue, San Leandro, CA

Monitoring Well	Date	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MtBE[1] (µg/L) 8260B	Total Lead (µg/L)
MW-1	**Nov 2002**	**7,900**	**570**	**3.1**	**680**	**392**	**< 1.0**	**NA**
	Aug 2002	9,100	590	2.6	830	362	<1.3	<3.0
	May 2002	5,700	360	4.5	340	450	2	<3
MW-2	**Nov 2002**	**3,400**	**4.6**	**< 0.5**	**310**	**160**	**< 0.5**	**NA**
	Aug 2002	2,700	4.6	<0.5	310	140	<0.5	<3.0
	May 2002	3,100	67	8	250	215	56	<3
MW-3	**Nov 2002**	**47,000**	**5,300**	**1,200**	**2,200**	**8,600**	**1,000**	**NA**
	Aug 2002	40,000	5,800	1,100	1,600	6,500	1,300	12
	May 2002	44,000	6,000	900	1,500	6,200	2,400	15
MW-4	**Nov 2002**	**5,100**	**150**	**10**	**460**	**258**	**2,400**	**NA**
	Aug 2002	3,800	70	<5.0	300	115	4,800	3.9
	May 2002	880	25	1.0[C]	110	52	12,000	<3
MW-5	**Nov 2002**	**16,000**	**1,300**	**380**	**930**	**1,550**	**1,200**	**NA**
	Aug 2002	18,000	1,000	660	950	1,720	1,500	4.8
	May 2002	25,000	1,000	1,200	1,100	3,060	1,800	3.5

Notes:

<: Not detected above the laboratory reporting limit.

[C] Presence confirmed, but confirmation concentration differed by more than a factor of two.

[1] MtBE analyzed by EPA Method 8021B, and confirmed by EPA Method 8260B.

NA: Not Analyzed

The first time SOMA monitored this Site was in May 2002.

Table 6
Gasoline Oxygenates, November 8, 2002
15101 Freedom Avenue, San Leandro, CA

Monitoring Well	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)
MW-1	42	< 1.0	< 1.0	< 1.0
MW-2	15	<0.5	<0.5	<0.5
MW-3	85	< 1.3	<1.3	220
MW-4	580	< 5.0	6	13
MW-5	66	< 2.0	< 2.0	560

Notes:
<: Not detected above the laboratory reporting limit.

Table 7
Historical Gasoline Oxygenates Results
15101 Freedom Avenue, San Leandro, CA

Monitoring Well	Date	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)
MW-1	**Nov 2002**	**42**	**< 1.0**	**< 1.0**	**< 1.0**
	Aug 2002	78	<1.3	<1.3	<1.3
MW-2	**Nov 2002**	**15**	**<0.5**	**<0.5**	**<0.5**
	Aug 2002	21	<0.5	<0.5	<0.5
MW-3	**Nov 2002**	**85**	**< 1.3**	**<1.3**	**220**
	Aug 2002	<330	<8.3	<8.3	330
MW-4	**Nov 2002**	**580**	**< 5.0**	**6**	**13**
	Aug 2002	1500	<17	<17	18
MW-5	**Nov 2002**	**66**	**< 2.0**	**< 2.0**	**560**
	Aug 2002	<250	<6.3	<6.3	510

Notes:
August 8, 2002 was the first time that samples were analyzed for Gasoline Oxygenates
<: Not detected above the laboratory reporting limit.
TBA: tert-Butyl Alcohol
DIPE: Isopropyl Ether
ETBE: Ethyl tert-Butyl Ether
TAME: Methyl tert-Amyl Ether

Appendix A

Field Notes

ENVIRONMENTAL ENGINEERING, INC

Well No.:	MW-1	**Project No.:**	2551
Casing Diameter:	4 inches	**Address:**	15101 Freedom Ave.
Depth of Well:	30.10 feet		San Leandro, CA
Top of Casing Elevation:	51.71 feet	**Date:**	8-Nov-02
Depth to Groundwater:	23.58 feet	**Sampler:**	Tony Perini
Groundwater Elevation:	28.13 feet		
Water Column Height:	6.52 feet		
Purged Volume:	12 gallons		

Purging Method:	**Bailer**	☐		**Pump**	■
Sampling Method:	**Bailer**	■		**Pump**	☐
Color:	**Yes**	☐	**No** ☑	**Describe:**	
Sheen:	**Yes**	☐	**No** ☑	**Describe:**	
Odor:	**Yes**	☑	**No** ☐	**Describe:**	slight petro.

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
10:33 AM	1.0	9.05	19.77	1198
10:38 AM	4.0	8.83	20.22	1130
10:42 AM	8.0	6.96	20.38	1141
10:46 AM	12	6.96	20.33	1176
11 AM	Sampled			

ENVIRONMENTAL ENGINEERING, INC

Well No.:	MW-2	**Project No.:**	2551
Casing Diameter:	4 inches	**Address:**	15101 Freedom Ave.
Depth of Well:	30 feet		San Leandro, CA
Top of Casing Elevation:	49.66 feet	**Date:**	8-Nov-02
Depth to Groundwater:	21.79 feet	**Sampler:**	Tony Perini
Groundwater Elevation:	27.87 feet		
Water Column Height:	8.21 feet		
Purged Volume:	11 gallons		

Purging Method: Bailer ☐ Pump ■

Sampling Method: Bailer ■ Pump ☐

Color: Yes ☐ No ☑ **Describe:** _____

Sheen: Yes ☐ No ☑ **Describe:** _____

Odor: Yes ☐ No ☑ **Describe:** _____

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
10:05 AM	1.0	9.27	19.38	1322
10:08 AM	4.0	9.05	19.94	1294
10:13 AM	8.0	9.02	20.22	1299
10:18 AM	11	9.01	20.16	1309
11:15 AM	sampled			

ENVIRONMENTAL ENGINEERING, INC

Well No.:	MW-3	**Project No.:**	2551
Casing Diameter:	4 inches	**Address:**	15101 Freedom Ave.
Depth of Well:	29.90 feet		San Leandro, CA
Top of Casing Elevation:	51.16 feet	**Date:**	8-Nov-02
Depth to Groundwater:	23.19 feet	**Sampler:**	Tony Perini
Groundwater Elevation:	27.97 feet		
Water Column Height:	6.71 feet		
Purged Volume:	10 gallons		

Purging Method:	**Bailer**	☐	**Pump**	■
Sampling Method:	**Bailer**	■	**Pump**	☐

Color:	**Yes**	☑	**No** ☐	**Describe:**	Blackish
Sheen:	**Yes**	☑	**No** ☐	**Describe:**	Rainbow
Odor:	**Yes**	☑	**No** ☐	**Describe:**	slight petro

Field Measurements:

Time	Vol (gallons)	pH	Temp (° C)	E.C. (µs/cm)
2:15 PM	1.0	7.16	20.05	1160
2:19 PM	4.0	7.15	19.88	1120
2:24 PM	8.0	7.16	19.66	1130
2:27 PM	10	7.14	19.61	1130
2:30 PM	samples			

ENVIRONMENTAL ENGINEERING, INC

Well No.:	MW-4	**Project No.:**	2551
Casing Diameter:	4 inches	**Address:**	15101 Freedom Ave.
Depth of Well:	30.10 feet		San Leandro, CA
Top of Casing Elevation:	50.54 feet	**Date:**	8-Nov-02
Depth to Groundwater:	22.81 feet	**Sampler:**	Tony Perini
Groundwater Elevation:	27.73 feet		
Water Column Height:	7.29 feet		
Purged Volume:	12 gallons		

Purging Method:	**Bailer**	☐		**Pump**	■
Sampling Method:	**Bailer**	■		**Pump**	☐
Color:	**Yes**	☑	**No** ☐	**Describe:**	slight blackish
Sheen:	**Yes**	☐	**No** ☑	**Describe:**	
Odor:	**Yes**	☐	**No** ☑	**Describe:**	

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
12:02 PM	1.0	8.73	18.77	1438
12:05 PM	4.0	8.53	19.55	1463
12:10 PM	8.0	8.60	19.66	1481
12:14 PM	12	8.60	19.77	1487
1:30 PM	Sampled			

ENVIRONMENTAL ENGINEERING, INC

Well No.:	MW-5	**Project No.:**	2551
Casing Diameter:	4 inches	**Address:**	15101 Freedom Ave.
Depth of Well:	29.70 feet		San Leandro, CA
Top of Casing Elevation:	47.79 feet	**Date:**	8-Nov-02
Depth to Groundwater:	20.14 feet	**Sampler:**	Tony Perini
Groundwater Elevation:	27.65 feet		
Water Column Height:	9.56 feet		
Purged Volume:	16 gallons		

Purging Method:	**Bailer**	☐		**Pump**	■
Sampling Method:	**Bailer**	■		**Pump**	☐
Color:	**Yes**	☑	**No** ☐	**Describe:**	cloudy
Sheen:	**Yes**	☐	**No** ☑	**Describe:**	
Odor:	**Yes**	☐	**No** ☑	**Describe:**	

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
12:32 PM	1.0	8.84	20.11	1147
12:36 PM	4.0	8.61	20.66	1135
12:41 PM	8.0	6.96	20.88	1145
12:45 PM	13	6.96	20.88	1148
12:48 PM	16	6.96	20.88	1144

1 PM Sampled

Appendix B

Laboratory Reports and Chain of Custody Form

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

SOMA Environmental Engineering Inc.
2680 Bishop Dr.
Suite 203
San Ramon, CA 94583

Date: 20-NOV-02
Lab Job Number: 161837
Project ID: 2551
Location: 15101 Freedom Avenue

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis.

Reviewed by: _____
Project Manager

Reviewed by: _____
Operations Manager

Curtis & Tompkins, Ltd.

Laboratory Number:	**161837**
Client:	**SOMA Environmental Engineering Inc.**
Project Name:	**15101 Freedom Ave., San Leandro**
Project #:	**2551**
Receipt Date:	**11/8/02**

CASE NARRATIVE

This hardcopy data package contains sample results and batch QC results for five water samples received from the above referenced project on November 8th, 2002. The samples were received cold and intact.

Total Volatile Hydrocarbons (EPA 8015(M)):

A high recovery of the surrogate trifluorotoluene was observed for samples MW-2 and MW-4 due to coelution with these samples' matrices.

A high recovery of the surrogate trifluorotoluene was observed for the laboratory control sample due to coelution with the gasoline standard.

A low recovery of o-xylene was observed for the matrix spike in batch 76762 (client ID MW-1) due to matrix interference. In addition, high recoveries of the surrogates trifluorotoluene and bromofluorobenzene were observed for this same matrix spike and its duplicate due to matrix interference. The concentrations of benzene, toluene, and m,p-xylenes present in this same matrix spike and its duplicate were such that they rendered the spike amount insignificant.

No other analytical problems were encountered.

Gasoline Oxygenates by GC/MS (EPA 8260B):

No analytical problems were encountered.

CHAIN OF CUSTODY

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510)486-0900 Phone
(510)486-0532 Fax

C&T LOGIN # 16197

Sampler: Tony Perini

Report To: Tony Perini/Mansour Sepehr

Company : SOMA Environmental

Telephone: 925-244-6600

Fax: 925-244-6601

Project No: 2551

Project Name: 15101 Freedom Ave.,San Leandro

Turnaround Time: Standard

Analyses

Lab No.	Sample ID.	Sampling Date Time	Matrix: Soil	Matrix: Water	Matrix: Waste	# of Containers	Preservative: HCL	Preservative: H_2SO_4	Preservative: HNO_3	Preservative: ICE	TPHg 8015	BTEX + MtBE 8021 GC	MtBE Confirmation 8260 GCMS	Gasoline Oxygenates	~~Total Lead~~ Cancel per Tony Perini JHD 11/12
-1	MW-1	11/8/02 11 AM		✓		4-VOAs	✓			✓	✓	✓	✓	✓	
-2	MW-2	11:15 AM		✓			✓			✓	✓	✓	✓	✓	
-3	MW-3	2:30 PM		✓			✓			✓	✓	✓	✓	✓	
-4	MW-4	1:30 PM		✓			✓			✓	✓	✓	✓	✓	
-5	MW-5	1 PM		✓			✓			✓	✓	✓	✓	✓	
										✓					
-1	MW-1	11/8/02 11 AM		✓		500ml poly			✓	✓					✓
-2	MW-2	11:15 AM		✓					✓	✓					✓
-3	MW-3	2:30 PM		✓					✓	✓					✓
-4	MW-4	1:30 PM		✓					✓	✓					✓
-5	MW-5	1 PM		✓					✓	✓					✓

Notes:

Please provide EDF files of results

Received ☑ On Ice
☑ Cold ☐ Ambient ☐ Intact

RELINQUISHED BY:

Tony Perini 11/8/02
Tony Perini 3:30 PM DATE/TIME

DATE/TIME

Preservation Correct?
☑ Yes ☐ No ☐ N/A
DATE/TIME

RECEIVED BY:

DATE/TIME

DATE/TIME

DATE/TIME

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551		
Matrix:	Water	Sampled:	11/08/02
Units:	ug/L	Received:	11/08/02

ield ID:	MW-1	Diln Fac:	5.000
ype:	SAMPLE	Batch#:	76815
Lab ID:	161837-001	Analyzed:	11/13/02

Analyte	Result	RL	Analysis
Gasoline C7-C12	7,900	250	8015B(M)
Benzene	570	2.5	EPA 8021B
Toluene	3.1	2.5	EPA 8021B
Ethylbenzene	680	2.5	EPA 8021B
m,p-Xylenes	310	2.5	EPA 8021B
o-Xylene	82	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	111	68-145	8015B(M)
Bromofluorobenzene (FID)	96	66-143	8015B(M)
Trifluorotoluene (PID)	135	53-143	EPA 8021B
Bromofluorobenzene (PID)	113	52-142	EPA 8021B

Field ID:	MW-2	Diln Fac:	1.000
Type:	SAMPLE	Batch#:	76762
ab ID:	161837-002	Analyzed:	11/12/02

Analyte	Result	RL	Analysis
Gasoline C7-C12	3,400	50	8015B(M)
Benzene	4.6	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	310	0.50	EPA 8021B
m,p-Xylenes	160	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	152 *	68-145	8015B(M)
Bromofluorobenzene (FID)	136	66-143	8015B(M)
Trifluorotoluene (PID)	150 *	53-143	EPA 8021B
Bromofluorobenzene (PID)	132	52-142	EPA 8021B

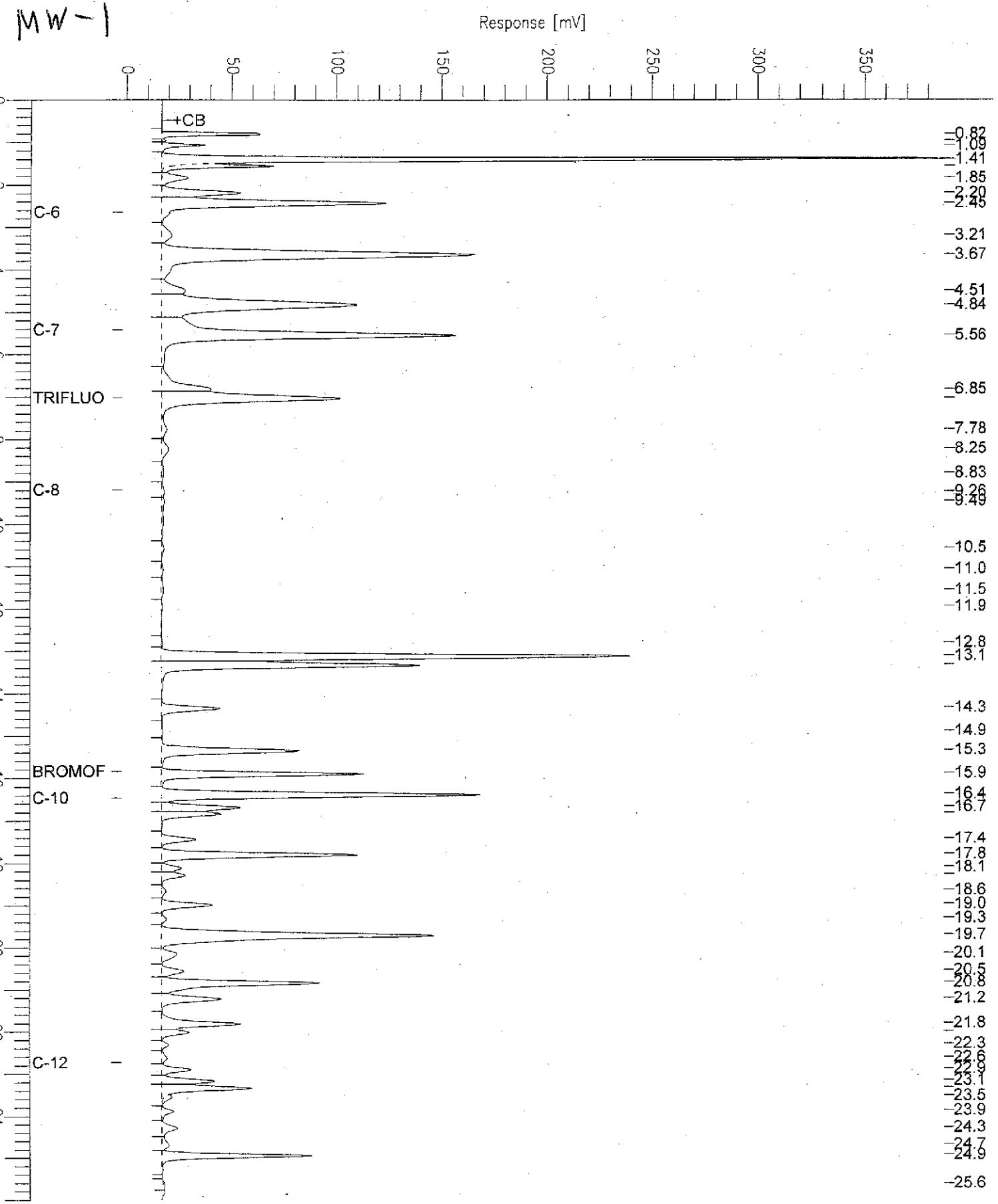
*= Value outside of QC limits; see narrative
D= Not Detected
L= Reporting Limit

GC07 TVH 'A' Data File RTX 502

Sample Name : 161837-001,76815
FileName : G:\GC07\DATA\317A010.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: -2 mV

Sample #: b1hs
Date : 11/13/02 10:49 PM
Time of Injection: 11/13/02 10:23 PM
Low Point : -1.84 mV High Point : 387.77 mV
Plot Scale: 389.6 mV

MW-1

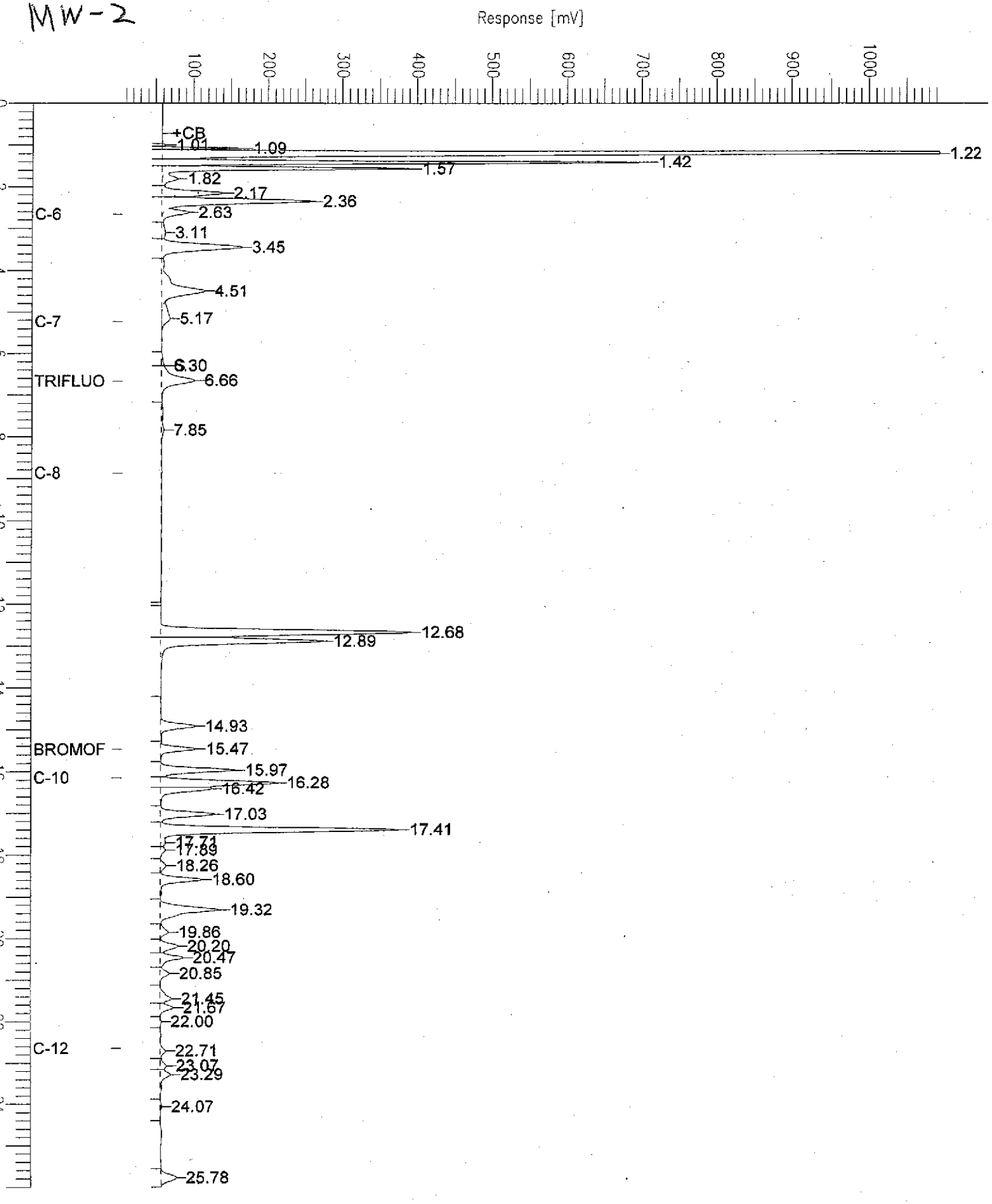


GC04 TVH 'J' Data File FID

Sample Name : 161837-002,76762
FileName : G:\GC04\DATA\316J008.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: 6 mV

Sample #: a1 Page 1 of 1
Date : 11/13/02 09:07 AM
Time of Injection: 11/12/02 07:09 PM
Low Point : 6.24 mV High Point : 1094.35 mV
Plot Scale: 1088.1 mV

MW-2



Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551		
Matrix:	Water	Sampled:	11/08/02
Units:	ug/L	Received:	11/08/02

ield ID:	MW-3	Diln Fac:	25.00
ype:	SAMPLE	Batch#:	76762
Lab ID:	161837-003	Analyzed:	11/13/02

Analyte	Result	RL	Analysis
Gasoline C7-C12	47,000	1,300	8015B(M)
Benzene	5,300	13	EPA 8021B
Toluene	1,200	13	EPA 8021B
Ethylbenzene	2,200	13	EPA 8021B
m,p-Xylenes	5,900	13	EPA 8021B
o-Xylene	2,700	13	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	142	68-145	8015B(M)
Bromofluorobenzene (FID)	129	66-143	8015B(M)
Trifluorotoluene (PID)	136	53-143	EPA 8021B
Bromofluorobenzene (PID)	128	52-142	EPA 8021B

Field ID:	MW-4	Lab ID:	161837-004
Type:	SAMPLE		

Analyte	Result	RL	Diln Fac	Batch#	Analyzed	Analysis
Gasoline C7-C12	5,100	50	1.000	76762	11/12/02	8015B(M)
Benzene	150	0.50	1.000	76762	11/12/02	EPA 8021B
Toluene	10	0.50	1.000	76762	11/12/02	EPA 8021B
Ethylbenzene	460	1.0	2.000	76815	11/13/02	EPA 8021B
m,p-Xylenes	220	0.50	1.000	76762	11/12/02	EPA 8021B
o-Xylene	38	0.50	1.000	76762	11/12/02	EPA 8021B

Surrogate	%REC	Limits	Diln Fac	Batch#	Analyzed	Analysis
Trifluorotoluene (FID)	174 *	68-145	1.000	76762	11/12/02	8015B(M)
Bromofluorobenzene (FID)	140	66-143	1.000	76762	11/12/02	8015B(M)
Trifluorotoluene (PID)	141	53-143	1.000	76762	11/12/02	EPA 8021B
Bromofluorobenzene (PID)	137	52-142	1.000	76762	11/12/02	EPA 8021B

Field ID:	MW-5	Diln Fac:	5.000
ype:	SAMPLE	Batch#:	76815
ab ID:	161837-005	Analyzed:	11/13/02

Analyte	Result	RL	Analysis
Gasoline C7-C12	16,000	250	8015B(M)
Benzene	1,300	2.5	EPA 8021B
Toluene	380	2.5	EPA 8021B
Ethylbenzene	930	2.5	EPA 8021B
m,p-Xylenes	1,200	2.5	EPA 8021B
o-Xylene	350	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	145	68-145	8015B(M)
Bromofluorobenzene (FID)	98	66-143	8015B(M)
Trifluorotoluene (PID)	134	53-143	EPA 8021B
Bromofluorobenzene (PID)	113	52-142	EPA 8021B

*= Value outside of QC limits; see narrative
D= Not Detected
L= Reporting Limit

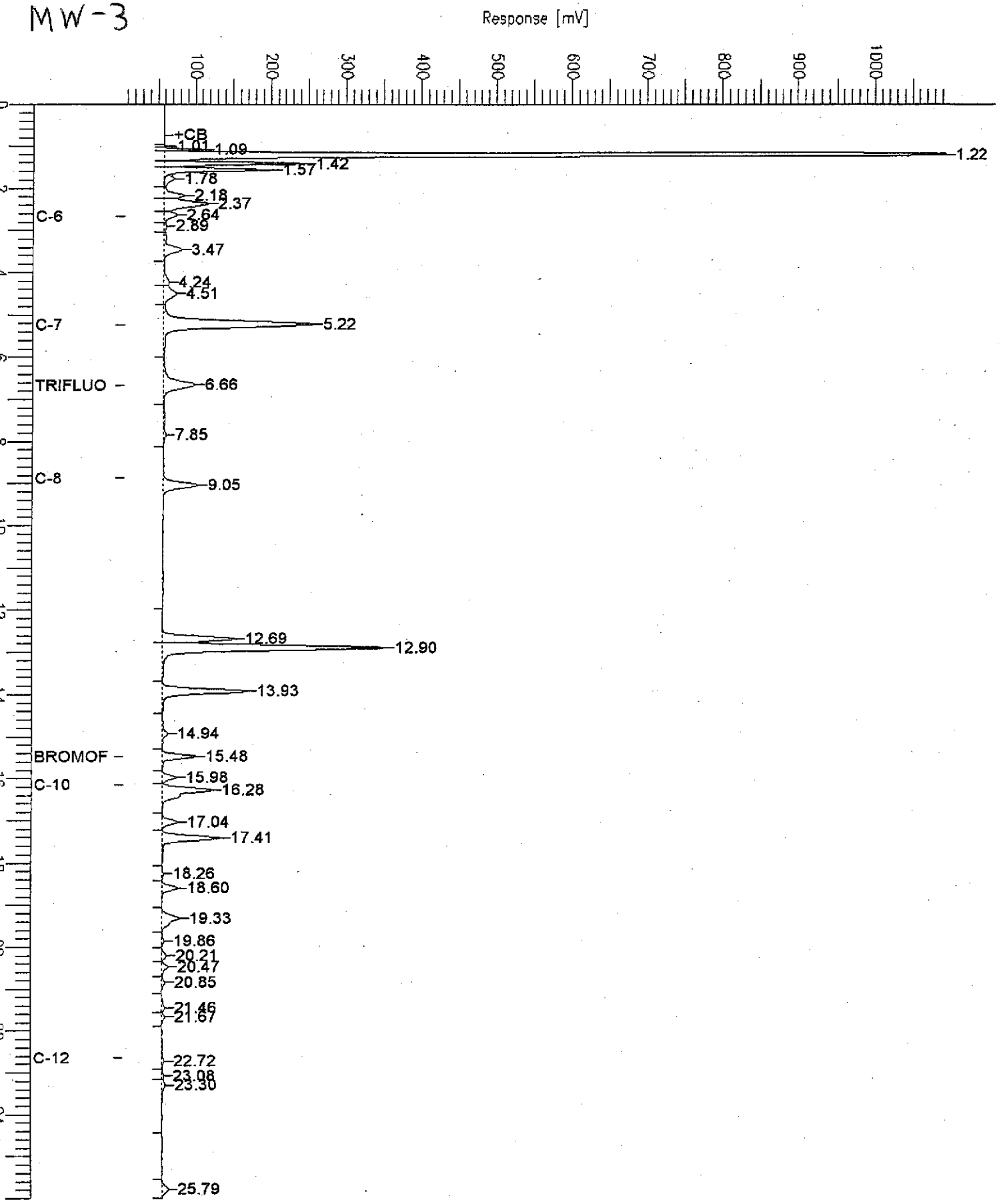
1.0

GC04 TVH 'J' Data File FID

Sample Name : 161837-003,76762
FileName : g:\gc04\data\316j024.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: 6 mV

Sample #: a1 Page 1 of 1
Date : 11/13/02 08:46 AM
Time of Injection: 11/13/02 05:29 AM
Low Point : 6.49 mV High Point : 1094.34 mV
Plot Scale: 1087.9 mV

MW-3

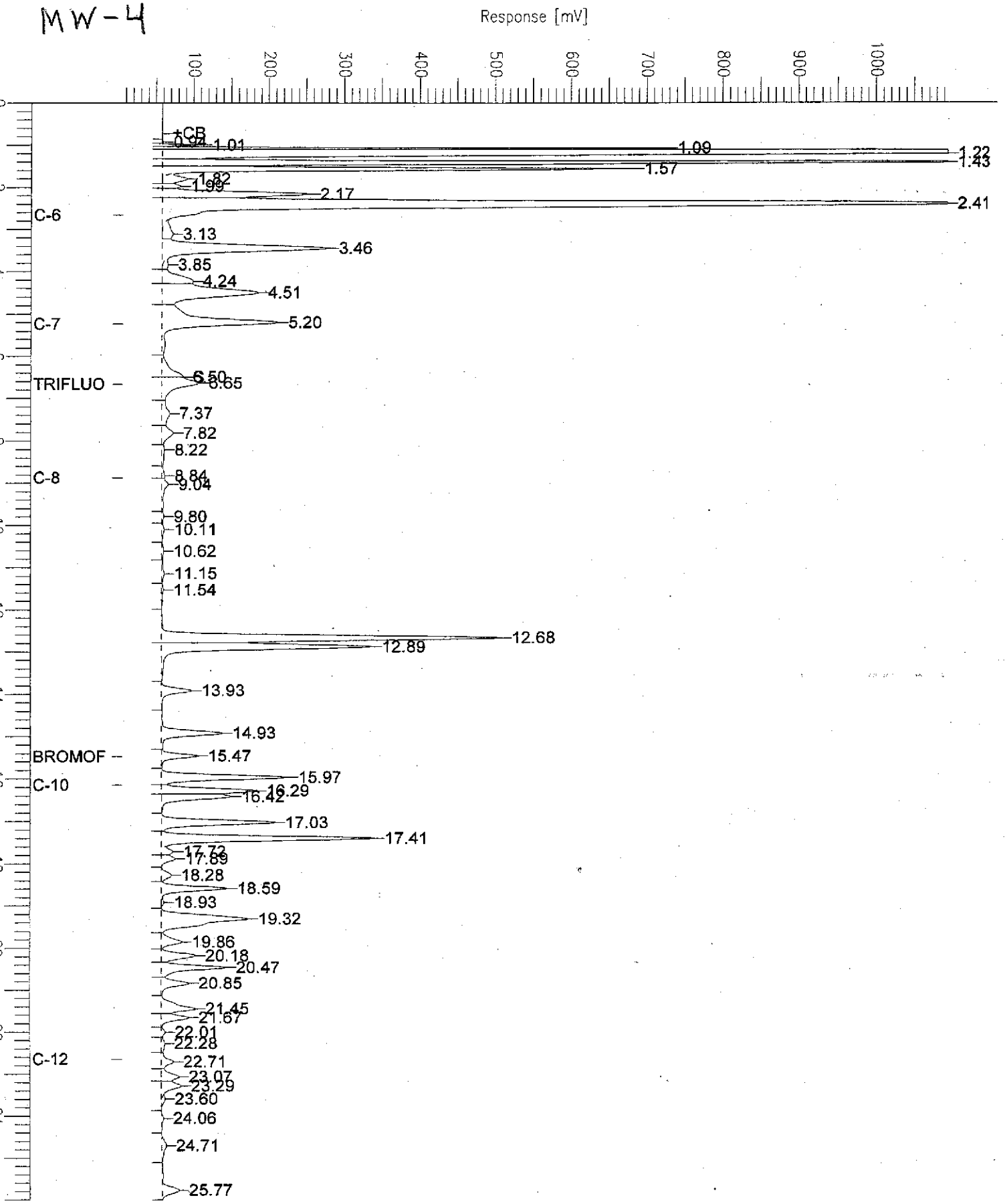


GC04 TVH 'J' Data File FID

Sample Name : 161837-004,76762
FileName : G:\GC04\DATA\316J009.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: 6 mV

Sample #: a1 Page 1 of 1
Date : 11/13/02 09:07 AM
Time of Injection: 11/12/02 07:48 PM
Low Point : 6.48 mV High Point : 1094.42 mV
Plot Scale: 1087.9 mV

MW-4

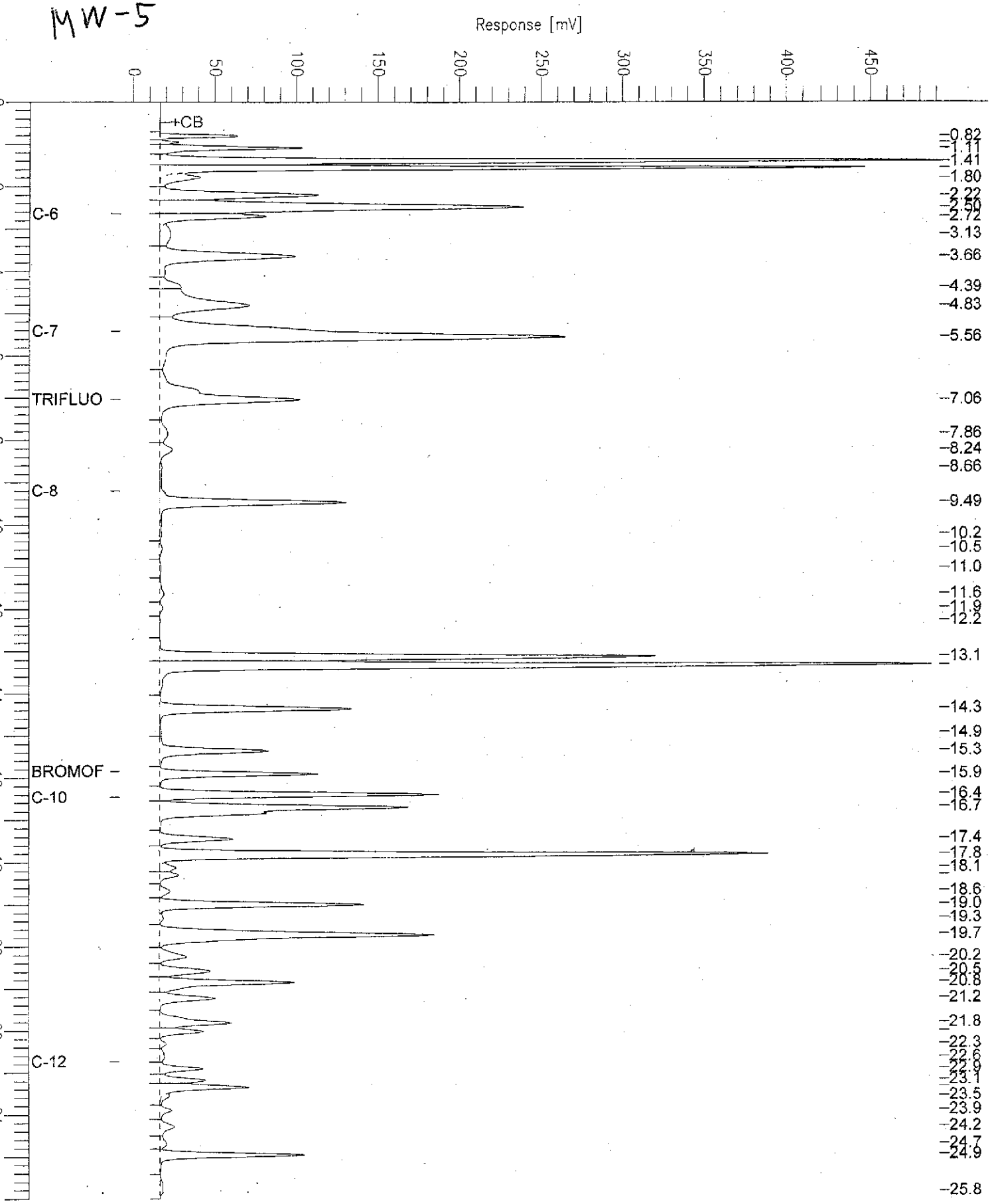


GC07 TVH 'A' Data File RTX 502

Sample Name : 161837-005,76815
FileName : G:\GC07\DATA\317A009.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: -8 mV

Sample #: b1hs Page 1 of 1
Date : 11/13/02 10:15 PM
Time of Injection: 11/13/02 09:49 PM
Low Point : -7.52 mV High Point : 492.25 mV
Plot Scale: 499.8 mV

MW-5

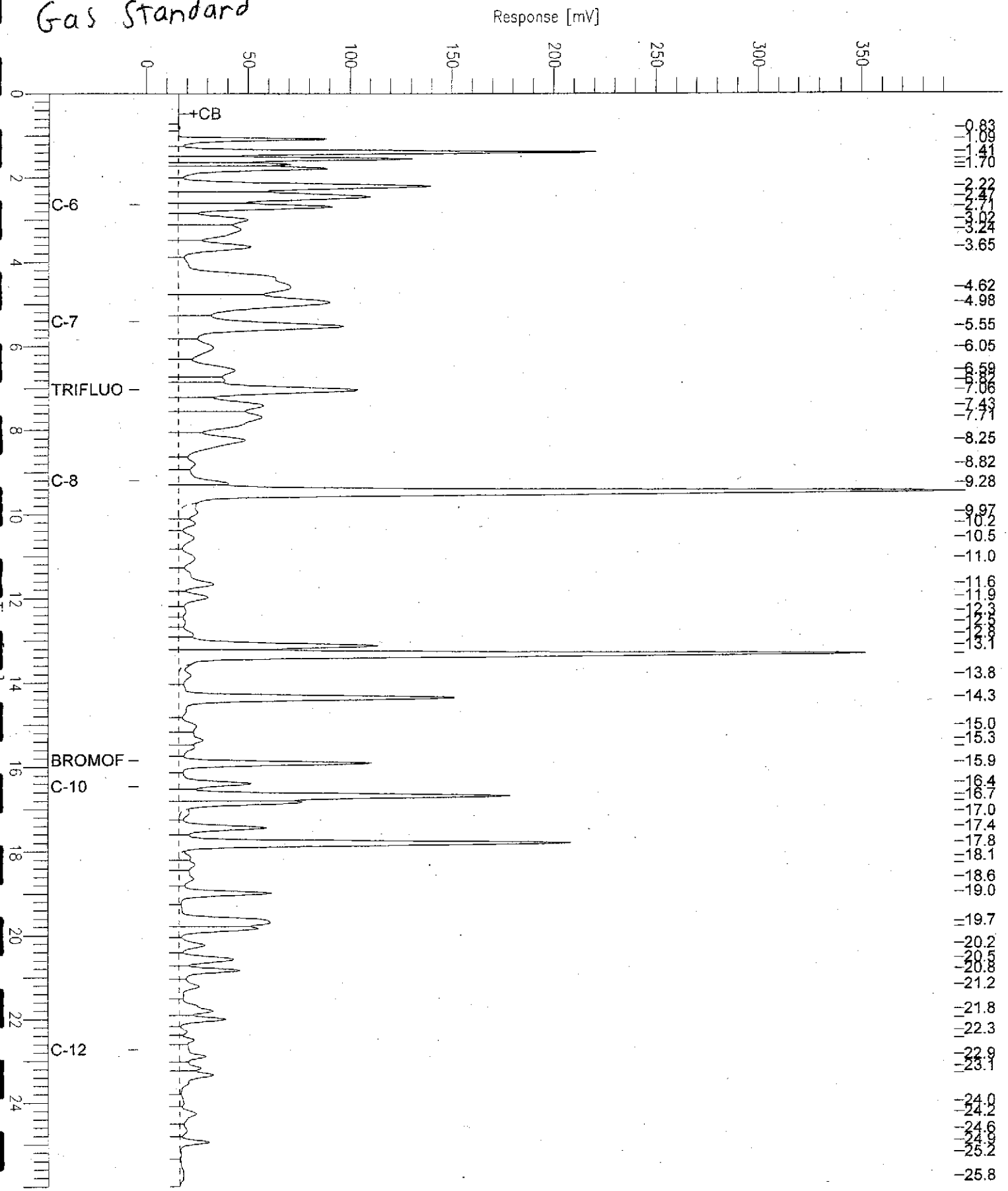


GC07 TVH 'A' Data File RTX 502

Sample Name : ccv/ics,qc195737,76815,02ws1751,7.5/5000
FileName : G:\GC07\DATA\317A002.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: -3 mV

Sample #: Page 1 of 1
Date : 11/13/02 06:04 PM
Time of Injection: 11/13/02 05:38 PM
Low Point : -3.17 mV High Point : 395.47 mV
Plot Scale: 398.6 mV

Gas Standard



Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551		
Matrix:	Water	Sampled:	11/08/02
Units:	ug/L	Received:	11/08/02

Type:	BLANK	Batch#:	76762
Lab ID:	QC195542	Analyzed:	11/12/02
Diln Fac:	1.000		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	8015B(M)
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	116	68-145	8015B(M)
Bromofluorobenzene (FID)	116	66-143	8015B(M)
Trifluorotoluene (PID)	125	53-143	EPA 8021B
Bromofluorobenzene (PID)	120	52-142	EPA 8021B

Type:	BLANK	Batch#:	76815
Lab ID:	QC195736	Analyzed:	11/13/02
Diln Fac:	1.000		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	8015B(M)
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	95	68-145	8015B(M)
Bromofluorobenzene (FID)	95	66-143	8015B(M)
Trifluorotoluene (PID)	103	53-143	EPA 8021B
Bromofluorobenzene (PID)	104	52-142	EPA 8021B

*= Value outside of QC limits; see narrative
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	8015B(M)
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC195543	Batch#:	76762
Matrix:	Water	Analyzed:	11/12/02
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2,000	2,161	108	79-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	156 *	68-145
Bromofluorobenzene (FID)	134	66-143

* Value outside of QC limits; see narrative

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Benzene, Toluene, Ethylbenzene, Xylenes

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC195544	Batch#:	76762
Matrix:	Water	Analyzed:	11/12/02
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Benzene	20.00	19.19	96	65-122
Toluene	20.00	20.49	102	67-121
Ethylbenzene	20.00	19.63	98	70-121
m,p-Xylenes	40.00	34.02	85	72-125
o-Xylene	20.00	19.90	99	73-122

Surrogate	%REC	Limits
Trifluorotoluene (PID)	124	53-143
Bromofluorobenzene (PID)	119	52-142

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	8015B(M)
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC195737	Batch#:	76815
Matrix:	Water	Analyzed:	11/13/02
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	3,000	2,892	96	79-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	116	68-145
Bromofluorobenzene (FID)	99	66-143

Curtis & Tompkins, Ltd.

Benzene, Toluene, Ethylbenzene, Xylenes

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC195738	Batch#:	76815
Matrix:	Water	Analyzed:	11/13/02
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Benzene	30.00	31.52	105	65-122
Toluene	30.00	31.73	106	67-121
Ethylbenzene	30.00	30.76	103	70-121
m,p-Xylenes	60.00	54.48	91	72-125
o-Xylene	30.00	32.20	107	73-122

Surrogate	%REC	Limits
Trifluorotoluene (PID)	106	53-143
Bromofluorobenzene (PID)	108	52-142

Curtis & Tompkins, Ltd.

Benzene, Toluene, Ethylbenzene, Xylenes

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8021B
Field ID:	MW-1	Batch#:	76762
MSS Lab ID:	161837-001	Sampled:	11/08/02
Matrix:	Water	Received:	11/08/02
Units:	ug/L	Analyzed:	11/12/02
Diln Fac:	1.000		

Type: MS Lab ID: QC195545

Analyte	MSS Result	Spiked	Result	%REC	Limits
Benzene	517.8 >LR	20.00	479.6 >LR	-191 NM	52-149
Toluene	3.770	20.00	25.26	107	69-130
Ethylbenzene	663.0 >LR	20.00	609.2 >LR	-269 NM	70-131
m,p-Xylenes	287.6	40.00	300.5	32 NM	68-137
o-Xylene	77.87	20.00	91.84	70 *	73-133

Surrogate	%REC	Limits
Trifluorotoluene (PID)	169 *	53-143
Bromofluorobenzene (PID)	143 *	52-142

Type: MSD Lab ID: QC195546

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Benzene	20.00	494.1 >LR	-118 NM	52-149	NC	30
Toluene	20.00	27.92	121	69-130	10	30
Ethylbenzene	20.00	620.9 >LR	-210 NM	70-131	NC	30
m,p-Xylenes	40.00	304.0	41 NM	68-137	1	30
o-Xylene	20.00	93.63	79	73-133	2	30

Surrogate	%REC	Limits
Trifluorotoluene (PID)	186 *	53-143
Bromofluorobenzene (PID)	148 *	52-142

*= Value outside of QC limits; see narrative
NC= Not Calculated
NM= Not Meaningful
LR= Response exceeds instrument's linear range
RPD= Relative Percent Difference

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Curtis & Tompkins, Ltd.

Benzene, Toluene, Ethylbenzene, Xylenes

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8021B
Field ID:	ZZZZZZZZZZ	Batch#:	76815
MSS Lab ID:	161813-002	Sampled:	11/08/02
Matrix:	Water	Received:	11/08/02
Units:	ug/L	Analyzed:	11/13/02
Diln Fac:	1.000		

Type: MS Lab ID: QC195764

Analyte	MSS Result	Spiked	Result	%REC	Limits
Benzene	<0.04100	20.00	21.55	108	52-149
Toluene	<0.03400	20.00	21.82	109	69-130
Ethylbenzene	<0.04800	20.00	21.64	108	70-131
m,p-Xylenes	<0.04800	40.00	39.00	98	68-137
o-Xylene	<0.02100	20.00	22.57	113	73-133

Surrogate	%REC	Limits
Trifluorotoluene (PID)	110	53-143
Bromofluorobenzene (PID)	113	52-142

Type: MSD Lab ID: QC195765

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Benzene	20.00	21.70	109	52-149	1	30
Toluene	20.00	21.95	110	69-130	1	30
Ethylbenzene	20.00	21.80	109	70-131	1	30
m,p-Xylenes	40.00	39.13	98	68-137	0	30
o-Xylene	20.00	22.75	114	73-133	1	30

Surrogate	%REC	Limits
Trifluorotoluene (PID)	109	53-143
Bromofluorobenzene (PID)	111	52-142

RPD= Relative Percent Difference

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Gasoline Oxygenates by GC/MS

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8260B
Matrix:	Water	Sampled:	11/08/02
Units:	ug/L	Received:	11/08/02

Field ID:	MW-1	Diln Fac:	2.000
Type:	SAMPLE	Batch#:	76833
Lab ID:	161837-001	Analyzed:	11/14/02

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	42	20
MTBE	ND	1.0
Isopropyl Ether (DIPE)	ND	1.0
Ethyl tert-Butyl Ether (ETBE)	ND	1.0
Methyl tert-Amyl Ether (TAME)	ND	1.0
1,2-Dibromoethane	ND	1.0

Surrogate	%REC	Limits
Dibromofluoromethane	99	80-121
1,2-Dichloroethane-d4	113	77-130
Toluene-d8	99	80-120
Bromofluorobenzene	89	80-120

Field ID:	MW-2	Diln Fac:	1.000
Type:	SAMPLE	Batch#:	76833
Lab ID:	161837-002	Analyzed:	11/14/02

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	15	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
1,2-Dibromoethane	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	97	80-121
1,2-Dichloroethane-d4	107	77-130
Toluene-d8	98	80-120
Bromofluorobenzene	89	80-120

Field ID:	MW-3	Lab ID:	161837-003
Type:	SAMPLE		

Analyte	Result	RL	Diln Fac	Batch#	Analyzed
tert-Butyl Alcohol (TBA)	85	25	2.500	76785	11/13/02
MTBE	1,000	3.6	7.143	76833	11/14/02
Isopropyl Ether (DIPE)	ND	1.3	2.500	76785	11/13/02
Ethyl tert-Butyl Ether (ETBE)	ND	1.3	2.500	76785	11/13/02
Methyl tert-Amyl Ether (TAME)	220	1.3	2.500	76785	11/13/02
1,2-Dibromoethane	ND	1.3	2.500	76785	11/13/02

Surrogate	%REC	Limits	Diln Fac	Batch#	Analyzed
Dibromofluoromethane	92	80-121	2.500	76785	11/13/02
1,2-Dichloroethane-d4	93	77-130	2.500	76785	11/13/02
Toluene-d8	93	80-120	2.500	76785	11/13/02
Bromofluorobenzene	95	80-120	2.500	76785	11/13/02

NA= Not Analyzed
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8260B
Matrix:	Water	Sampled:	11/08/02
Units:	ug/L	Received:	11/08/02

Field ID: MW-4 Lab ID: 161837-004
Type: SAMPLE

Analyte	Result	RL	Dil'n Fac	Batch#	Analyzed
tert-Butyl Alcohol (TBA)	580	100	10.00	76785	11/13/02
MTBE	2,400	10	20.00	76833	11/15/02
Isopropyl Ether (DIPE)	ND	5.0	10.00	76785	11/13/02
Ethyl tert-Butyl Ether (ETBE)	6.0	5.0	10.00	76785	11/13/02
Methyl tert-Amyl Ether (TAME)	13	5.0	10.00	76785	11/13/02
1,2-Dibromoethane	ND	5.0	10.00	76785	11/13/02

Surrogate	%REC	Limits	Dil'n Fac	Batch#	Analyzed
Dibromofluoromethane	92	80-121	10.00	76785	11/13/02
1,2-Dichloroethane-d4	95	77-130	10.00	76785	11/13/02
Toluene-d8	97	80-120	10.00	76785	11/13/02
Bromofluorobenzene	95	80-120	10.00	76785	11/13/02

Field ID: MW-5 Lab ID: 161837-005
Type: SAMPLE

Analyte	Result	RL	Dil'n Fac	Batch#	Analyzed
tert-Butyl Alcohol (TBA)	66	40	4.000	76785	11/14/02
MTBE	1,200	5.0	10.00	76833	11/15/02
Isopropyl Ether (DIPE)	ND	2.0	4.000	76785	11/14/02
Ethyl tert-Butyl Ether (ETBE)	ND	2.0	4.000	76785	11/14/02
Methyl tert-Amyl Ether (TAME)	560	2.0	4.000	76785	11/14/02
1,2-Dibromoethane	ND	2.0	4.000	76785	11/14/02

Surrogate	%REC	Limits	Dil'n Fac	Batch#	Analyzed
Dibromofluoromethane	92	80-121	4.000	76785	11/14/02
1,2-Dichloroethane-d4	98	77-130	4.000	76785	11/14/02
Toluene-d8	95	80-120	4.000	76785	11/14/02
Bromofluorobenzene	89	80-120	4.000	76785	11/14/02

Type: BLANK Batch#: 76785
Lab ID: QC195629 Analyzed: 11/13/02
Dil'n Fac: 1.000

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	NA	
MTBE	ND	0.5
Isopropyl Ether (DIPE)	NA	
Ethyl tert-Butyl Ether (ETBE)	NA	
Methyl tert-Amyl Ether (TAME)	NA	
1,2-Dibromoethane	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	105	80-121
1,2-Dichloroethane-d4	108	77-130
Toluene-d8	99	80-120
Bromofluorobenzene	113	80-120

NA= Not Analyzed
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8260B
Matrix:	Water	Sampled:	11/08/02
Units:	ug/L	Received:	11/08/02

Type:	BLANK	Batch#:	76785
Lab ID:	QC195630	Analyzed:	11/13/02
Diln Fac:	1.000		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
1,2-Dibromoethane	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	107	80-121
1,2-Dichloroethane-d4	109	77-130
Toluene-d8	99	80-120
Bromofluorobenzene	112	80-120

Type:	BLANK	Batch#:	76833
Lab ID:	QC195806	Analyzed:	11/14/02
Diln Fac:	1.000		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
1,2-Dibromoethane	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	103	80-121
1,2-Dichloroethane-d4	107	77-130
Toluene-d8	98	80-120
Bromofluorobenzene	111	80-120

NA= Not Analyzed
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8260B
Matrix:	Water	Sampled:	11/08/02
Units:	ug/L	Received:	11/08/02

Type:	BLANK	Batch#:	76833
Lab ID:	QC195807	Analyzed:	11/14/02
Diln Fac:	1.000		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
1,2-Dibromoethane	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	106	80-121
1,2-Dichloroethane-d4	109	77-130
Toluene-d8	98	80-120
Bromofluorobenzene	112	80-120

NA= Not Analyzed
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	76785
Units:	ug/L	Analyzed:	11/13/02
Diln Fac:	1.000		

ype: BS Lab ID: QC195627

Analyte	Spiked	Result	%REC	Limits
MTBE	50.00	51.10	102	49-144

Surrogate	%REC	Limits
Dibromofluoromethane	97	80-121
1,2-Dichloroethane-d4	104	77-130
Toluene-d8	100	80-120
Bromofluorobenzene	90	80-120

ype: BSD Lab ID: QC195628

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	50.00	53.19	106	49-144	4	21

Surrogate	%REC	Limits
Dibromofluoromethane	96	80-121
1,2-Dichloroethane-d4	102	77-130
Toluene-d8	98	80-120
Bromofluorobenzene	91	80-120

PD= Relative Percent Difference

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Gasoline Oxygenates by GC/MS

Lab #:	161837	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	76833
Units:	ug/L	Analyzed:	11/14/02
Diln Fac:	1.000		

Type: BS Lab ID: QC195804

Analyte	Spiked	Result	%REC	Limits
MTBE	50.00	53.03	106	49-144

Surrogate	%REC	Limits
Dibromofluoromethane	96	80-121
1,2-Dichloroethane-d4	104	77-130
Toluene-d8	99	80-120
Bromofluorobenzene	90	80-120

Type: BSD Lab ID: QC195805

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	50.00	52.68	105	49-144	1	21

Surrogate	%REC	Limits
Dibromofluoromethane	93	80-121
1,2-Dichloroethane-d4	100	77-130
Toluene-d8	98	80-120
Bromofluorobenzene	90	80-120

RPD= Relative Percent Difference