RO-473

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Third Quarter 2003

GROUNDWATER MONITORING REPORT

TEXACO GASOLINE SERVICE STATION

15101 FREEDOM AVENUE

SAN LEANDRO, CALIFORNIA

September 4, 2003

Project 2551

Prepared for

Mr. Mohammad Pazdel
35840 Alcazar Court
Fremont, California

Prepared by

SOMA Environmental Engineering, Inc.
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SOLID MEDICAL WASTE MANAGEMENT
COUNTY OF ALAMEDA

September 4, 2003

Ms. Eva Chu
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 Ms. Chu:

Enclosed for your review is a copy of SOMA's "Third Quarter 2003 Groundwater Monitoring Report" for the subject property.

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.,PE
Principal Hydrogeologist

Enclosure

cc: Mr. Mohammad Pazdel 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' requirements for the Third Quarter 2003 groundwater monitoring event.

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 Third Quarter 2003 groundwater monitoring event conducted at the Site on August 12, 2003. This report includes the results of on-site measurements of the physical and chemical properties of the groundwater, which include 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 Health Care Services (ACHCS):

- 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 from the Site, which consisted of approximately 250 feet of product piping and six dispensers. Paradiso Mechanical, Inc. removed the old USTs and installed the new USTs. The on-site participating agency was the 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 excavating and removing the product piping and three USTs, they 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 from beneath the product piping at a depth of 5 feet bgs. In order to define the vertical extent of the 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 8260B 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 the July 2001 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 groundwater analytical results from the July 2001 investigation showed that 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 MtBE 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, the extent of petroleum hydrocarbons, and MtBE contamination beneath the Site. After installing the wells, they were developed and sampled. Figure 2 displays the locations of the monitoring wells. Appendix A shows the table of elevations and coordinates, as surveyed by Kier & Wright Civil Engineer & Land Surveyors in May 2002.

2.0 FIELD ACTIVITIES

On August 12, 2003, 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.

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.

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.

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. 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, August 12, 2003, 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. 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 August 12, 2003 groundwater monitoring event.

4.1 Field Measurements

Table 1 presents the calculated groundwater elevations at each groundwater monitoring well. As Table 1 shows, depths to groundwater ranged from 19.54 feet in monitoring well MW-5 to 23.18 feet in monitoring well MW-2. The corresponding groundwater elevations ranged from 26.48 feet in monitoring well MW-2 to 30.41 feet in monitoring well MW-1.

Table 2 presents the historical groundwater elevations at different groundwater monitoring wells. Table 2 also presents the deviations in groundwater elevations on a quarterly and annually basis. The groundwater elevations have decreased in all of the wells, with the exception of MW-1. Based on shallow groundwater depths depicted in monitoring well MW-2 during this quarter, as well as, during the initial monitoring event in June 2002, the local recharge rate at this well is

minimal. Variations in seasonal fluctuations, as well as, local recharge rates at each well determine the deviations in groundwater elevations.

The groundwater elevation contour map in feet is displayed in Figure 3. In general, as shown in Figure 3, the groundwater flows southeasterly. The approximate average groundwater gradient on-site is 0.017 feet/feet. The groundwater flow is consistent with the previous quarter, however, the groundwater gradient has increased. Due to the ineffectiveness of the local recharge in well MW-2, the groundwater elevation for this well was not contoured.

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 6.58 in monitoring well MW-2 to 6.65 in both monitoring wells MW-3 and MW-5. In general, the pH measurements remained consistent throughout the Site. The temperature measurements ranged from 19.66 °C in monitoring well MW-4 to 21.05 °C in both monitoring wells MW-3 and MW-5. The slight variation in temperature may reflect the changes in the ambient temperature during the sampling event. EC ranged from 1,380 µS/cm in monitoring well MW-5 to 1,740 µS/cm in monitoring well MW-4.

The field measurements taken during the Third Quarter 2003 monitoring event are shown in Appendix A.

4.2 Laboratory Analysis

Table 4 presents the results of the laboratory analyses on the groundwater samples. In general, the analytical results indicate that the groundwater samples collected from monitoring well MW-3 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 well MW-3 can be attributed to leaks from the former USTs prior to their upgrade in 1999.

TPH-g concentrations were detected in all of the monitoring wells. TPH-g concentrations ranged from 2,600 µg/L in monitoring well MW-1 to 31,000 µg/L in monitoring well MW-3. Figure 4 displays the contour map of TPH-g concentrations in the groundwater on August 12, 2003. The highest reported TPH-g concentration was in monitoring well MW-3, which is near the dispenser islands and former USTs. Also, a high TPH-g concentration of 12,000 µg/L was detected in monitoring well MW-5. The TPH-g concentration detected in well MW-5, can be attributed to the groundwater flow direction towards the southeastern corner of the Site.

In general, as shown in Table 4, the least impacted BTEX analyte location during this monitoring event was in the vicinity of MW-1. BTEX concentrations in MW-1 were 2.5 µg/L, non-detectable, 190 µg/L, and 130 µg/L, respectively. Toluene was also below the laboratory reporting limit in MW-2. The highest BTEX concentrations were detected in MW-3 at 6,100 µg/L, 860 µg/L, 1,500 µg/L, and 6,900 µg/L, respectively.

Figure 5 displays the contour map of benzene concentrations in the groundwater on August 12, 2003. Similar to the results for TPH-g, the highest benzene concentration was detected in monitoring well MW-3, near the dispenser islands. Benzene was detected in MW-2 at 640 µg/L, which is near the existing USTs, however, the concentration in this well is several orders of magnitudes below the concentration detected in well MW-3.

Table 4 shows the results of the MtBE analysis using EPA Method 8260B. MtBE concentrations were below the laboratory reporting limit in wells MW-1 and MW-2. The highest MtBE concentration was detected in monitoring well MW-4 at 1,900 µg/L.

Figure 6 displays the contour map of MtBE concentrations in the groundwater on August 12, 2003. 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 location of the product piping from the existing USTs to the dispenser islands and the solubility of MtBE in groundwater.

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 increased in all of the monitoring wells, with the exception of MW-3. TPH-g significantly increased in well MW-2. TPH-g significantly decreased in well MW-3.
- In MW-1, benzene decreased, toluene remained below the laboratory reporting limit, and ethylbenzene and total xylenes increased. In MW-2, benzene significantly increased, toluene remained below the laboratory reporting limit, and ethylbenzene and total xylenes increased. All BTEX analytes decreased significantly in MW-3. All BTEX analytes increased slightly in MW-4 and MW-5.
- MtBE decreased to below the laboratory reporting limit in wells MW-1 and MW-2. MtBE also decreased in wells MW-3 and MW-4. MtBE slightly increased in MW-5.

Table 6 shows the results of the gasoline oxygenates analytical results from the groundwater samples collected during the Third Quarter 2003. TBA was detected in all of the monitoring wells, with the exception of MW-1, which was below the laboratory reporting limit. Detectable TBA concentrations ranged from 69 µg/L in monitoring well MW-2 to 550 µg/L in monitoring well MW-4. Figure 7 displays the contour map of TBA concentrations in the groundwater on August 12, 2003. As shown in Figure 7, the highest TBA concentration was detected near the dispenser islands in monitoring well MW-4.

As shown in Table 6, DIPE and ETBE were below the laboratory reporting limit in all groundwater samples collected this quarter, with the exception of a trace ETBE concentration in MW-4. TAME was below the laboratory reporting limit in monitoring wells MW-1 and MW-2. Detectable TAME concentrations ranged from 18 µg/L in monitoring well MW-4 to 270 µg/L in both monitoring wells MW-3 and MW-5. Figure 8 displays the contour map of TAME concentrations in the groundwater on August 12, 2003. As shown in Figure 8, the highest TAME concentrations were detected in monitoring well MW-3, near the USTs and MW-5.

Table 7 displays the historical analytical results of gasoline oxygenates in the groundwater sampled at the Site. In compliance with a request from the ACHCS, dated July 2, 2002, SOMA had the groundwater samples analyzed for gasoline oxygenates for the first time during the Third Quarter 2002 monitoring event.

The following concentration trends were observed for gasoline oxygenates since the previous monitoring event.

- TBA decreased in monitoring well MW-1 to below the laboratory reporting limit. TBA increased slightly in MW-2 and increased to above the laboratory limit in MW-5. TBA decreased in wells MW-3 and MW-4.
- DIPE has remained below the laboratory reporting limit in all monitoring wells. ETBE remained below the laboratory reporting limit in all monitoring wells, with the exception of MW-4. ETBE increased to above the laboratory reporting limit in well MW-4 during the Third Quarter 2003.
- TAME has historically remained below the laboratory reporting limit in monitoring wells MW-1 and MW-2. TAME decreased in monitoring well MW-3. TAME slightly increased in wells MW-4 and MW-5.

Appendix B includes the laboratory report and COC form for the Third Quarter 2003.

5.0 CONCLUSION AND RECOMMENDATIONS

The results of the August 12, 2003 groundwater monitoring event can be summarized as follows:

1. The groundwater flow direction is southeasterly with an average gradient of 0.017 feet/feet. The groundwater flow is consistent with the previous quarter, however, the groundwater gradient has increased. Local recharge rates can affect the groundwater gradient from well to well. The recharge rates are affected by sedimentation on the well screening. The large deviation in groundwater elevations between well MW-2 and the remaining wells is attributable to the ineffectiveness of the local recharge rate in MW-2. SOMA recommends that a further well development be conducted on all wells, especially well MW-2, prior to the next monitoring event.

2. The highest TPH-g and BTEX 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 the 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. However, MtBE is still significantly lower in MW-4 than the concentration detected during the initial monitoring event in May 2002, where MtBE was detected at 12,000 µg/L.

4. TPH-g and all BTEX analytes, with the exception of toluene, increased significantly in well MW-2. However, the concentrations detected in this well are still several orders of magnitude below the concentrations detected in well MW-3. All TPH-g, BTEX, and MtBE constituents decreased significantly in well MW-3 during this quarter. MtBE decreased in well MW-4 during this quarter.

5. In compliance with a request from the ACHCS, gasoline oxygenates were analyzed for the first time during the Third Quarter 2002 monitoring event. During the Third Quarter 2003 monitoring event, TBA was found to be present in all monitoring wells with the exception of MW-1. Historically, DIPE and ETBE have remained below the laboratory limit in all monitoring wells, with the exception of monitoring well MW-4. ETBE increased to above the laboratory reporting limit in MW-4 during this quarter. Historically, TAME has remained below the laboratory reporting limit in wells MW-1 and MW-2. TAME has decreased in well MW-3 and increased slightly in wells MW-4 and MW-5.

6. Based on the following factors 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.

   - Residential housing is located near the Site.
   - The groundwater flow direction is southeasterly towards well MW-5, which is near the residential housing.
   - TPHg, BTEX, MtBE, TBA, and TAME constituents have all increased in MW-5.
   - A further investigation east of the Site is recommended due to the high concentrations detected in MW-3, however, concentrations have decreased this quarter at this location.

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., June 18, 2003. "Second Quarter 2003 Groundwater Monitoring Report, Texaco Gasoline Service Station, 15101 Freedom Avenue, San Leandro, California".

SOMA Environmental Engineering Inc., March 21, 2003. "First Quarter 2003 Groundwater Monitoring Report, Texaco Gasoline Service Station, 15101 Freedom Avenue, San Leandro, California".

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

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.

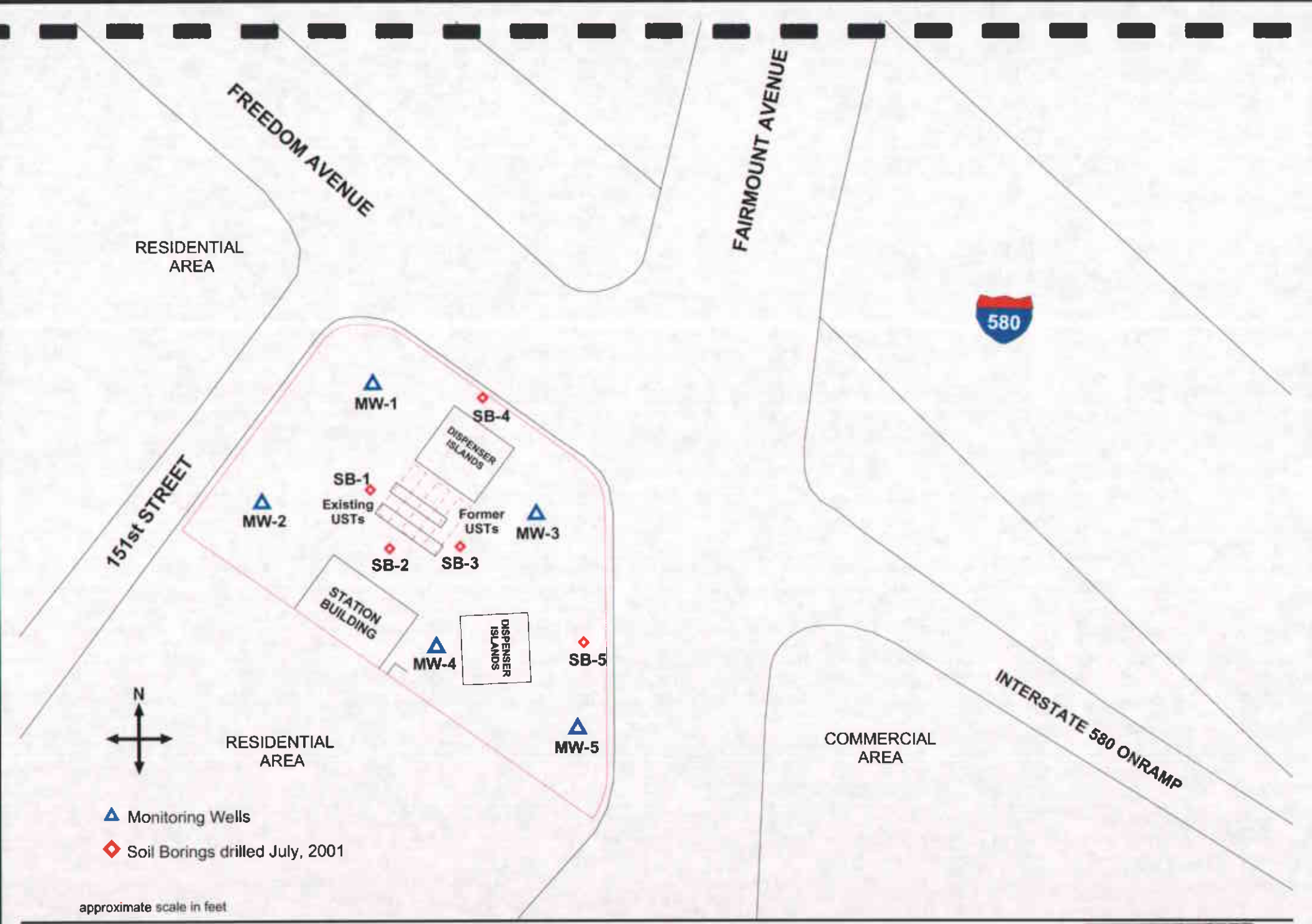

Figure 2: Site map showing locations of groundwater monitoring wells and soil borings.

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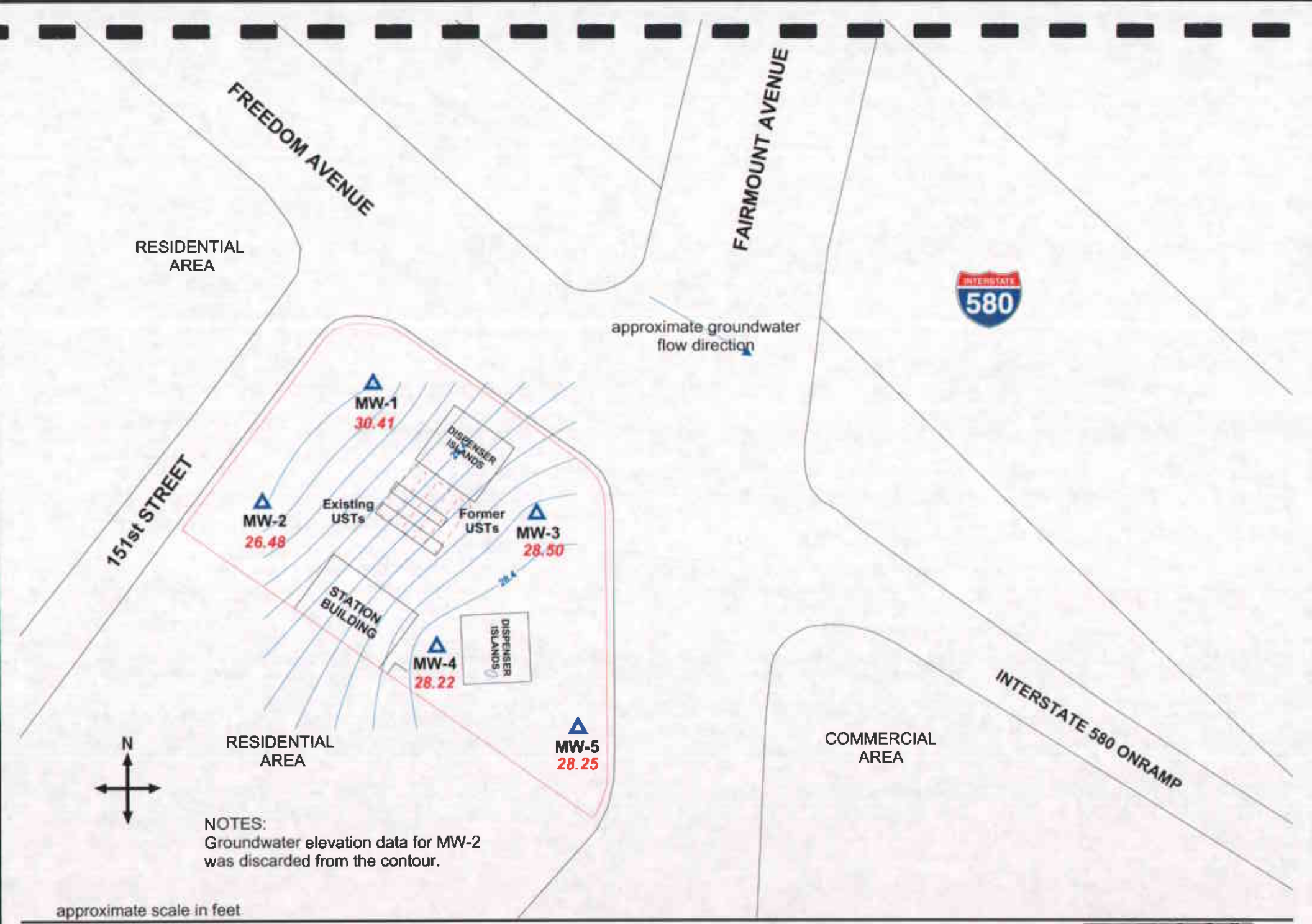

Figure 3: Groundwater elevation contour map in feet.
August 12, 2003.

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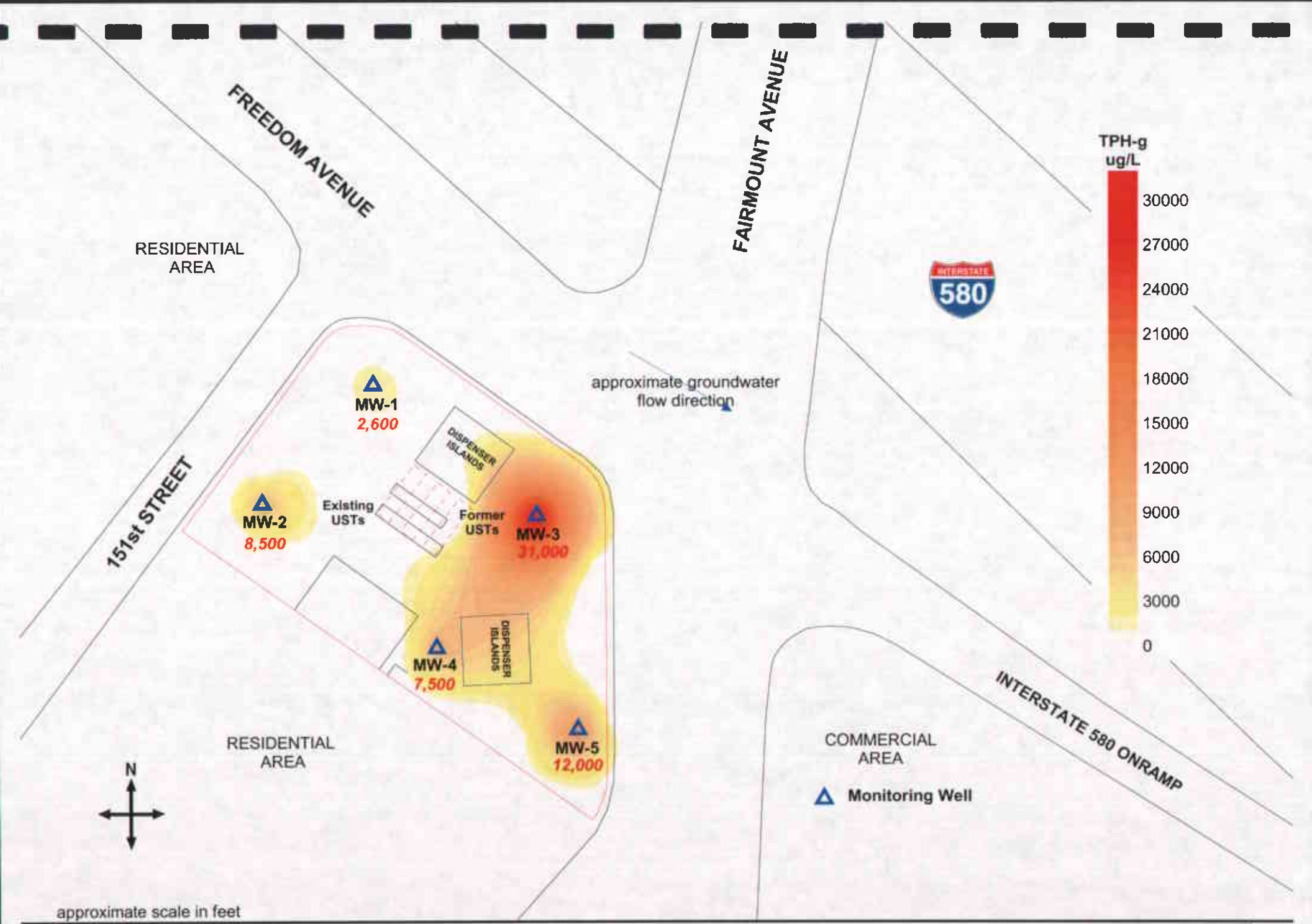


Figure 4: Contour map of TPH-g concentrations in groundwater.
August 12, 2003.

SOMA ENVIRONMENTAL ENGINEERING, INC.

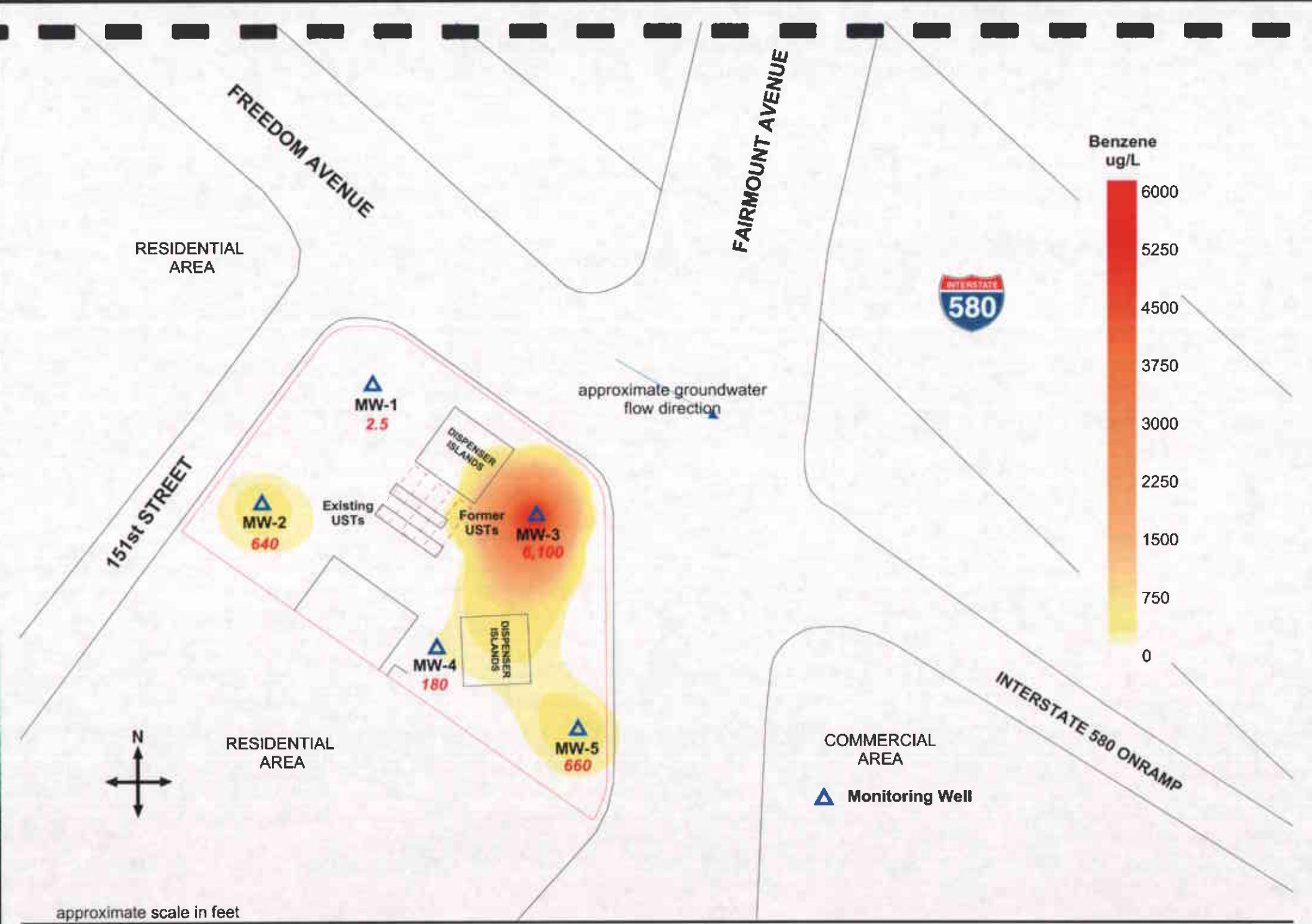


Figure 5: Contour map of Benzene concentrations in groundwater.
August 12, 2003.

SOMA ENVIRONMENTAL ENGINEERING, INC.

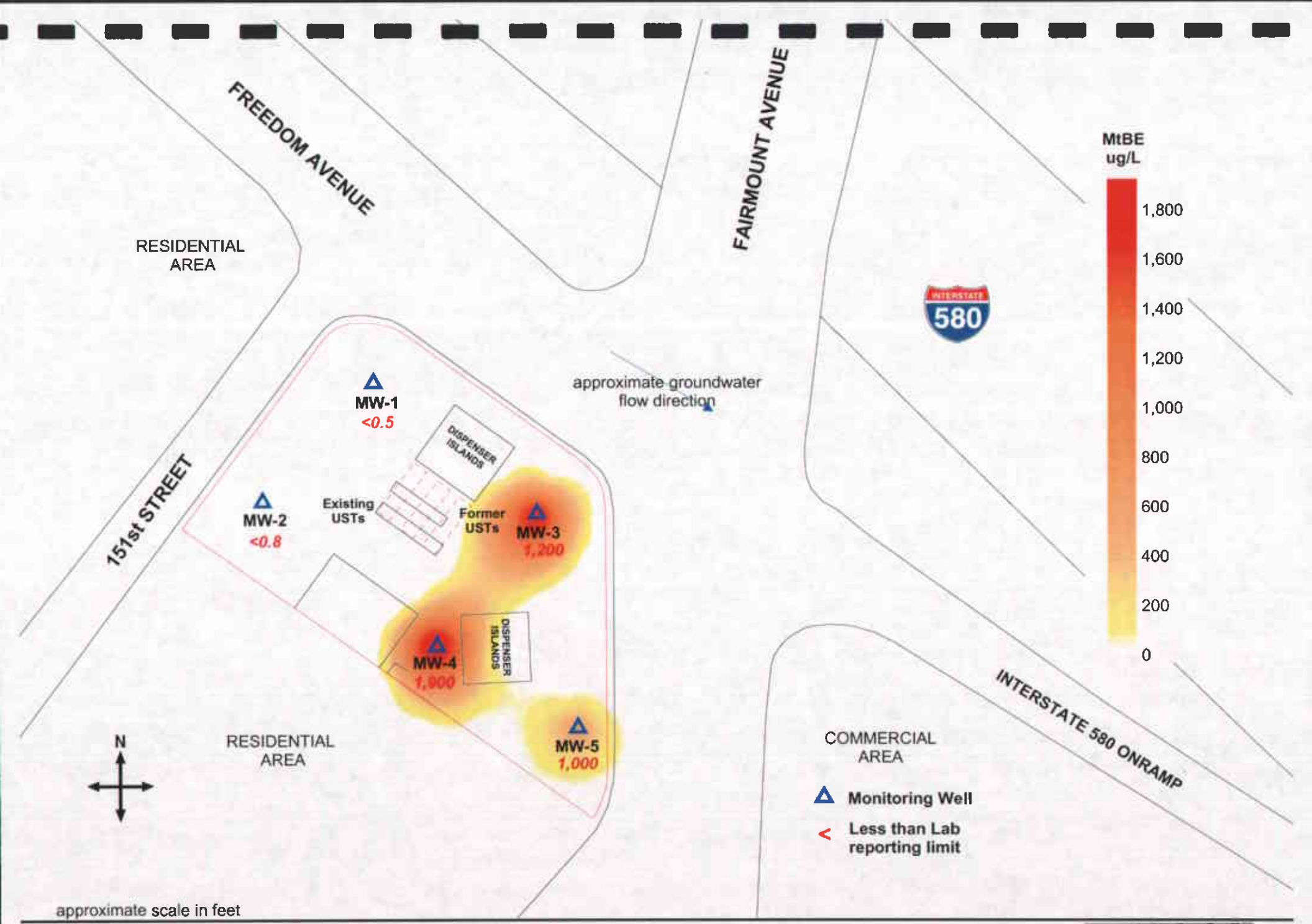


Figure 6: Contour map of MtBE concentrations in groundwater (EPA Method 8260B).
August 12, 2003.

SOMA ENVIRONMENTAL ENGINEERING, INC.

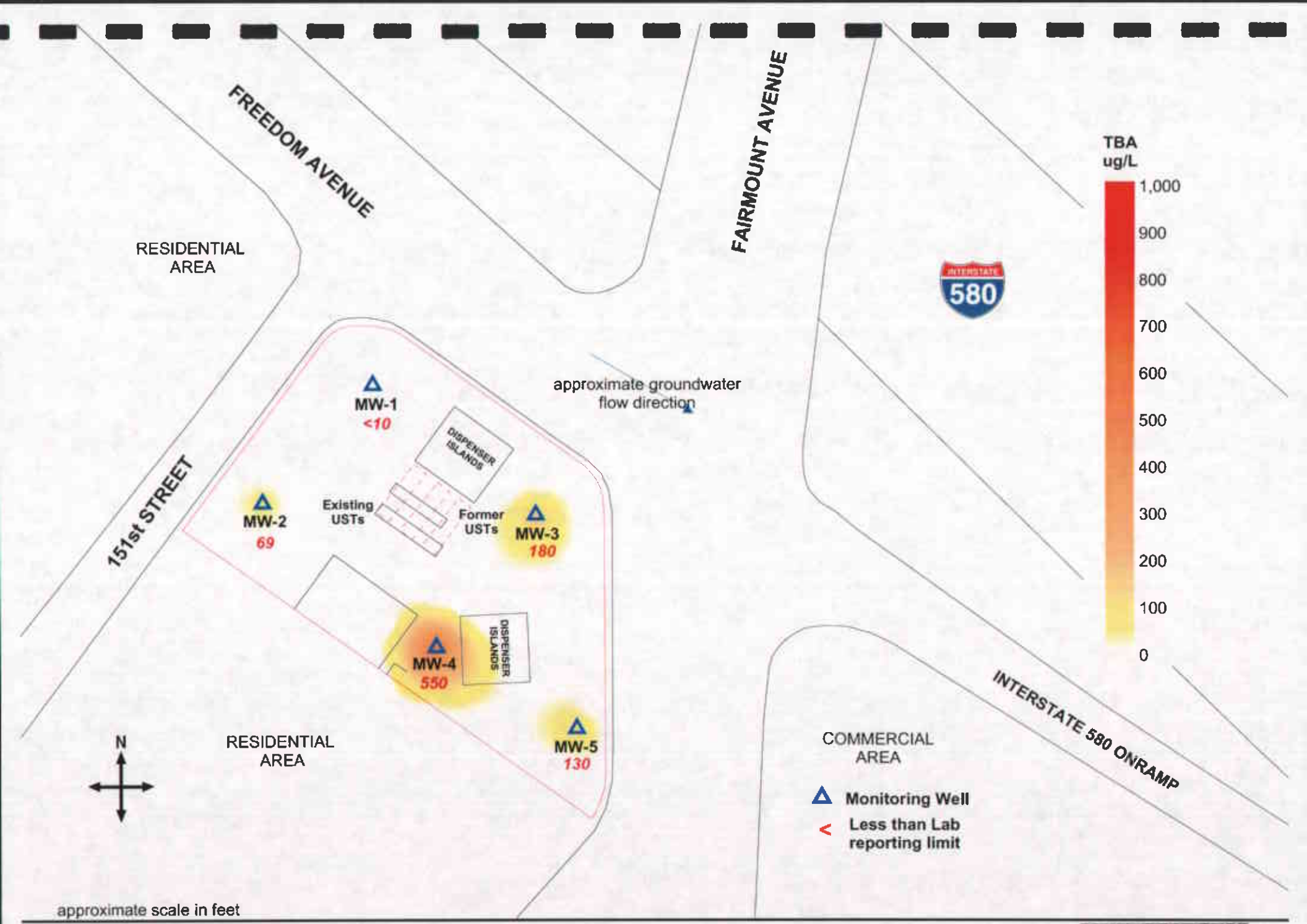


Figure 7: Contour map of TBA concentrations in groundwater.
August 12, 2003.

SOMA ENVIRONMENTAL ENGINEERING, INC.

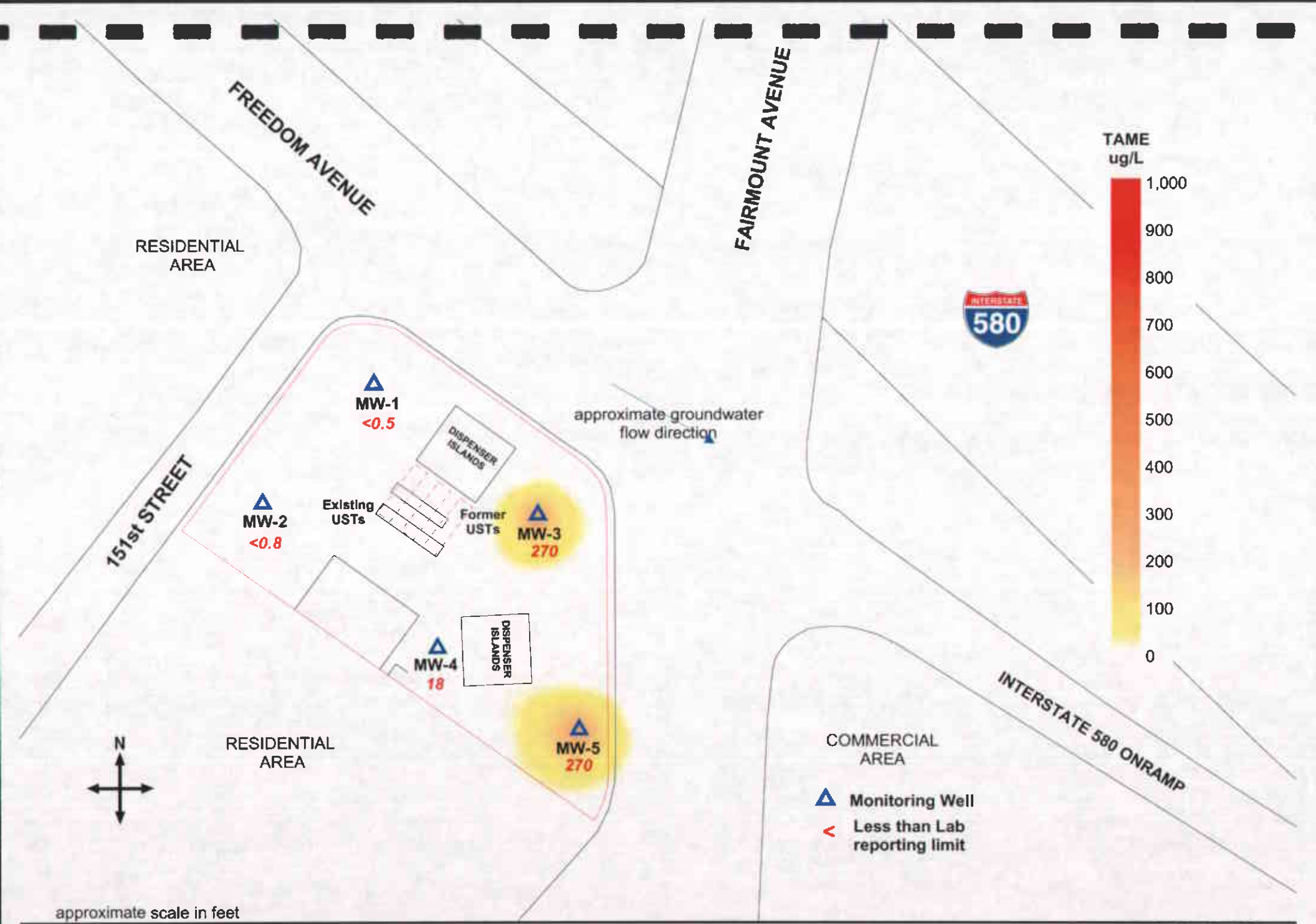


Figure 8: Contour map of TAME concentrations in groundwater.
August 12, 2003.

SOMA ENVIRONMENTAL ENGINEERING, INC.

Tables

Table 1
Groundwater Elevation Data
August 12, 2003
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	21.30	30.41
MW-2	49.66	23.18	26.48
MW-3	51.16	22.66	28.50
MW-4	50.54	22.32	28.22
MW-5	47.79	19.54	28.25

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
Aug 2003	**30.41**	**26.48**	**28.50**	**28.22**	**28.25**
May 2003	29.28	29.33	29.27	29.30	29.27
Feb 2003	29.09	29.15	29.14	29.06	29.09
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.

Annual change	1.32	-2.67	-0.64	-0.84	-0.84
Quarterly change	1.13	-2.85	-0.77	-1.08	-1.02

Table 3
Field Measurements at the Time of Sampling
August 12, 2003
15101 Freedom Avenue, San Leandro, CA

Monitoring Well	pH	Temp (°C)	E.C. (uS/cm)
MW-1	6.62	19.77	1560
MW-2	6.58	20.66	1450
MW-3	6.65	21.05	1430
MW-4	6.59	19.66	1740
MW-5	6.65	21.05	1380

Table 4
Groundwater Analytical Data
August 12, 2003
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)
MW-1	2,600	2.5	<0.5	190	130	<0.5
MW-2	8,500	640.0	<2.5	560	659	<0.8
MW-3	31,000	6100.0	860	1,500	6,900	1,200
MW-4	7,500	180.0	57	220	1,450	1,900
MW-5	12,000	660.0	75	660	1,110	1,000

Notes:
< : Not detected above laboratory reporting limits.
[1] MtBE analyzed by EPA Method 8260B.

Table 5
Historical Groundwater Analytical Data:
TPH-g, BTEX, MtBE, & Total 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	**Aug 2003**	**2,600**	**2.5**	**<0.5**	**190**	**130**	**<0.5**	**NA**
	May 2003	1,700	55	<0.5	90	115	2	NA
	Feb 2003	2,900	160	1.6 C	170	211	<0.5	NA
	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	**Aug 2003**	**8,500**	**640**	**<2.5**	**560**	**659**	**<0.8**	**NA**
	May 2003	2,700	5.2 C	<0.5	120	140	1.2	NA
	Feb 2003	890	1.7 C	0.80 C	68	38.92 C	<0.5	NA
	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	**Aug 2003**	**31,000**	**6,100**	**860**	**1,500**	**6,900**	**1,200**	**NA**
	May 2003	52,000	7,300	3,000	2,800	12,700	2,100	NA
	Feb 2003	39,000	5,500	1,500	2,000	8,600	1,300	NA
	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	**Aug 2003**	**7,500**	**180**	**57**	**220**	**1,450**	**1,900**	**NA**
	May 2003	6,200	140	46	200	790	2,300	NA
	Feb 2003	3,200	98	66	220	360	6,600	NA
	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	**Aug 2003**	**12,000**	**660**	**75**	**660**	**1,110**	**1,000**	**NA**
	May 2003	9,100	210	31	560	790	600	NA
	Feb 2003	12,000	390	71	770	1,100	860	NA
	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.

Appendix A

Table of Elevations & Coordinates on Monitoring Wells Measured by Kier Wright Civil Engineers Surveyors, Inc., and Field Measurements of Physical and Chemical Parameters of Groundwater Samples

Survey Date 05/07/02
Job No. A02545

Table of Elevations & Coordinates

On Monitoring Wells
Texaco Service Station
15101 Freedom Avenue
San Leandro, California

Well No.	Northing	Easting	Elevation
MW-1	5106.89	4812.60	51.71 -Top of PVC casing, North side @ Punch Mark 52.08 – Top North Rim of Box
MW-2	5056.82	4766.17	49.66 – Top of PVC Casing, North Side @ Punch Mark 50.19 - Top North Rim of Box
MW-3	5051.97	4881.26	51.16 - Top of PVC Casing, North side @ Punch Mark 51.60 - Top North Rim of Box
MW-4	4996.14	4839.06	50.54 – Top of PVC Casing, North side @ Punch Mark 50.98 - Top North Rim of Box
MW-5	4961.75	4898.20	47.79 – Top of PVC Casing, North side @Punch Mark 48.25 - Top North Rim of Box
Building Corner	5035.26	4796.09	
Building Corner	5009.72	4831.30	
Building Corner	4979.40	4808.97	
Building Corner	5005.06	4773.92	

Benchmark: Alameda County Benchmark "Fair-580"
Alameda County disc stamped "Fair-580 – 1976" set in the top of the Northwesterly concrete walk at the Northwest corner of the Fairmont Drive over-crossing of I-580, 1' southeast of the northwesterly concrete bridge rail, 1.9' southwesterly of the northeasterly end of the northwest concrete walk for the bridge.
Elevation = 67.07 M.S.L. Datum

Kier & Wright Civil Engineer & Land Surveyors, Inc.
1233 Quarry Lane, Suite 145 ♦ PLEASANTON, CALIFORNIA 94566 ♦ (925) 249-6555 ♦ (925) 249-6563

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:**	12-Aug-03
Depth to Groundwater:	21.30 feet	**Sampler:**	Tony Perini
Groundwater Elevation:	30.41 feet		
Water Column Height:	8.80 feet		
Purged Volume:	14 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)
10:38 AM	1	6.45	22.66	1420
10:40 AM	5	6.50	20.38	1550
10:42 AM	8	6.56	19.88	1520
10:47 AM	11	6.62	19.77	1540
10:49 AM	14	6.62	19.77	1560

10:50 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:**	12-Aug-03
Depth to Groundwater:	23.18 feet	**Sampler:**	Tony Perini
Groundwater Elevation:	26.48 feet		
Water Column Height:	6.82 feet		
Purged Volume:	13 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)
11:09 AM	1.0	6.71	22.27	1350
11:12 AM	3.0	6.56	20.94	1250
11:16 AM	8.0	6.58	20.61	1410
11:21 AM	13	6.58	20.66	1450
11:25 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:**	12-Aug-03
Depth to Groundwater:	22.66 feet	**Sampler:**	Tony Perini
Groundwater Elevation:	28.50 feet		
Water Column Height:	7.24 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:** _____

Field Measurements:

Time	Vol (gallons)	pH	Temp (° C)	E.C. (µs/cm)
1:50 PM	1.0	6.69	24.44	1.480
1:52 PM	4.0	6.67	22.05	1.450
1:57 PM	8.0	6.65	21.22	1.440
2:01 PM	12	6.65	21.05	1.430
2:05 PM	sampled			

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:**	12-Aug-03
Depth to Groundwater:	22.32 feet	**Sampler:**	Tony Perini
Groundwater Elevation:	28.22 feet		
Water Column Height:	7.78 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)
11:40 AM	1.0	6.56	21.38	1,610
11:42 AM	4.0	6.62	20.11	1,710
11:47 AM	8.0	6.54	19.77	1,730
11:50 AM	11	6.59	19.66	1,740
11:55 AM	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:**	12-Aug-03
Depth to Groundwater:	19.54 feet	**Sampler:**	Tony Perini
Groundwater Elevation:	28.25 feet		
Water Column Height:	10.16 feet		
Purged Volume:	13 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)
1:22 PM	1.0	6.65	23.05	1170
1:25 PM	5.0	6.61	21.27	1350
1:27 PM	9.0	6.61	21.05	1230
1:30 PM	13	6.65	21.05	1380
1:35 PM	sampled			

Appendix B

Laboratory Report and

Chain of Custody Form

for the

Third Quarter 2003 Monitoring Event

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: 21-AUG-03
Lab Job Number: 166897
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: _____ for LD
Project Manager

Reviewed by: _____
Operations Manager

This package may be reproduced only in its entirety.

CHAIN OF CUSTODY

Page _____ of _____

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

C&T LOGIN # 166897

Sampler: Tony Perini

Project No: 2551

Report To: Tony Perini

Project Name: 15101 Freedom Ave.,San Leandro

Company : SOMA Environmental

Turnaround Time: Standard

Telephone: 925-244-6600

Fax: 925-244-6601

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
-1	MW-1	8/12/03 *10:15A		✓		4-VOAs	✓			✓	✓	✓	✓	✓
-2	MW-2	11:25A		✓										
-3	MW-3	2:05P		✓										
-4	MW-4	11:55A		✓										
-5	MW-5	1:35P		✓										

Preservation Correct? ☐ Yes ☐ No ☐ N/A

Received ☐ On ice ☐ Cold ☐ Ambient ☐ Intact

Notes: EDF OUTPUT REQUIRED
Grab sample
* Labels = 10:50 JAW 8-12-03

RELINQUISHED BY:

Tony Perini	8/12/03	
Tony Perini	3PM	DATE/TIME
		DATE/TIME
		DATE/TIME

RECEIVED BY:

8-12-03	3:pm
	DATE/TIME
	DATE/TIME
	DATE/TIME

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551		
Matrix:	Water	Sampled:	08/12/03
Units:	ug/L	Received:	08/12/03

Field ID:	MW-1	Diln Fac:	1.000
Type:	SAMPLE	Batch#:	83608
Lab ID:	166897-001	Analyzed:	08/12/03

Analyte	Result	RL	Analysis
Gasoline C7-C12	2,600	50	8015B
Benzene	2.5	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	190	0.50	EPA 8021B
m,p-Xylenes	130	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	122	57-150	8015B
Bromofluorobenzene (FID)	115	65-144	8015B
Trifluorotoluene (PID)	111	54-149	EPA 8021B
Bromofluorobenzene (PID)	114	58-143	EPA 8021B

Field ID:	MW-2	Diln Fac:	5.000
Type:	SAMPLE	Batch#:	83608
Lab ID:	166897-002	Analyzed:	08/12/03

Analyte	Result	RL	Analysis
Gasoline C7-C12	8,500	250	8015B
Benzene	640	2.5	EPA 8021B
Toluene	ND	2.5	EPA 8021B
Ethylbenzene	560	2.5	EPA 8021B
m,p-Xylenes	600	2.5	EPA 8021B
o-Xylene	59	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	124	57-150	8015B
Bromofluorobenzene (FID)	104	65-144	8015B
Trifluorotoluene (PID)	107	54-149	EPA 8021B
Bromofluorobenzene (PID)	102	58-143	EPA 8021B

Field ID:	MW-3	Lab ID:	166897-003
Type:	SAMPLE		

Analyte	Result	RL	Diln Fac	Batch#	Analyzed	Analysis
Gasoline C7-C12	31,000	500	10.00	83608	08/12/03	8015B
Benzene	6,100	10	20.00	83669	08/13/03	EPA 8021B
Toluene	860	5.0	10.00	83608	08/12/03	EPA 8021B
Ethylbenzene	1,500	5.0	10.00	83608	08/12/03	EPA 8021B
m,p-Xylenes	5,000	10	20.00	83669	08/13/03	EPA 8021B
o-Xylene	1,900	5.0	10.00	83608	08/12/03	EPA 8021B

Surrogate	%REC	Limits	Diln Fac	Batch#	Analyzed	Analysis
Trifluorotoluene (FID)	115	57-150	10.00	83608	08/12/03	8015B
Bromofluorobenzene (FID)	105	65-144	10.00	83608	08/12/03	8015B
Trifluorotoluene (PID)	101	54-149	10.00	83608	08/12/03	EPA 8021B
Bromofluorobenzene (PID)	102	58-143	10.00	83608	08/12/03	EPA 8021B

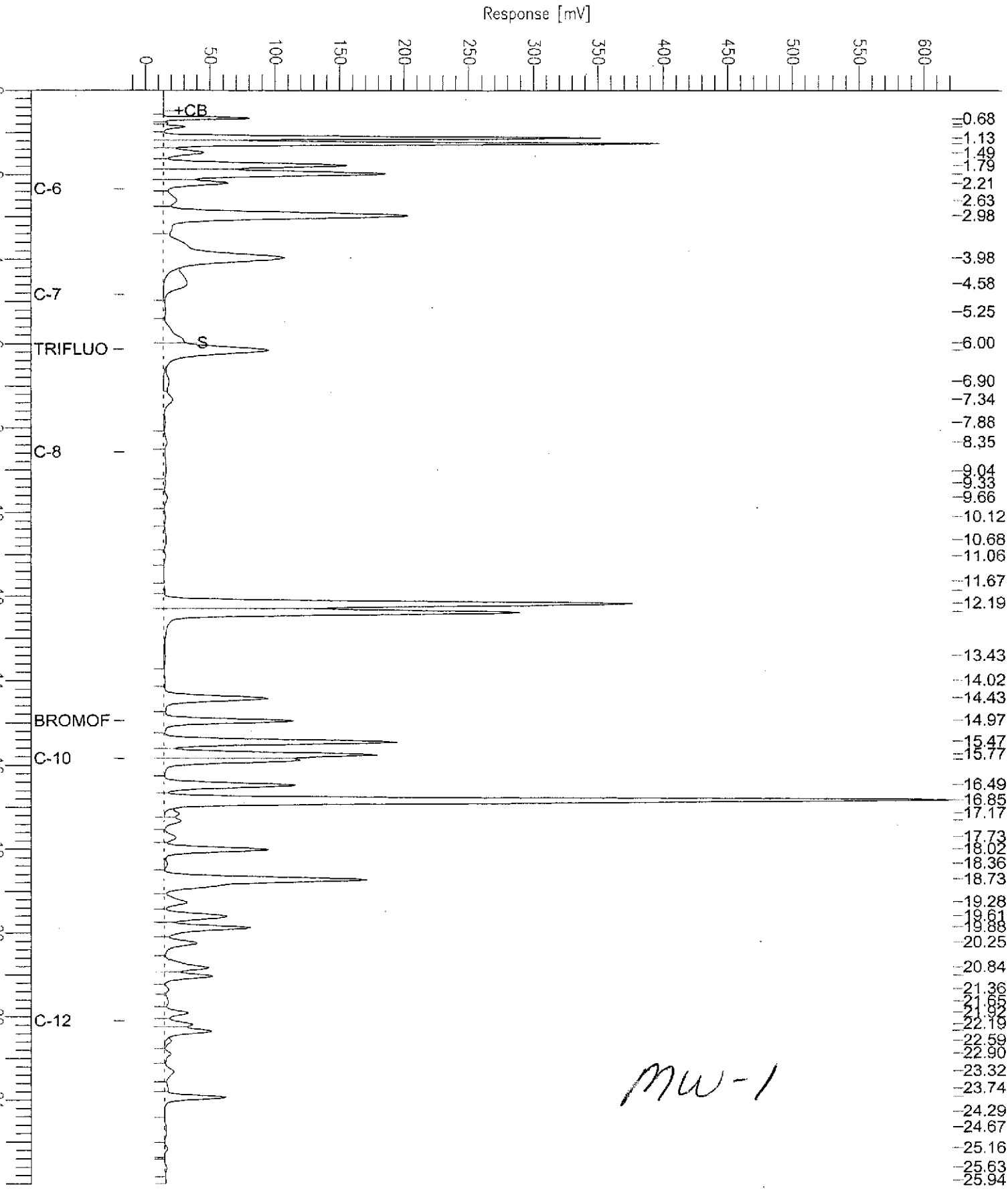
ND= Not Detected
RL= Reporting Limit

1.0

GC07 TVH 'A' Data File RTX 502

Sample Name : 166897-001,83608
leName : G:\GC07\DATA\224A019.raw
thod : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: -16 mV

Sample #: b1.3 Page 1 of 1
Date : 8/13/03 10:50 AM
Time of Injection: 8/12/03 08:07 PM
Low Point : -16.19 mV High Point : 622.02 mV
Plot Scale: 638.2 mV

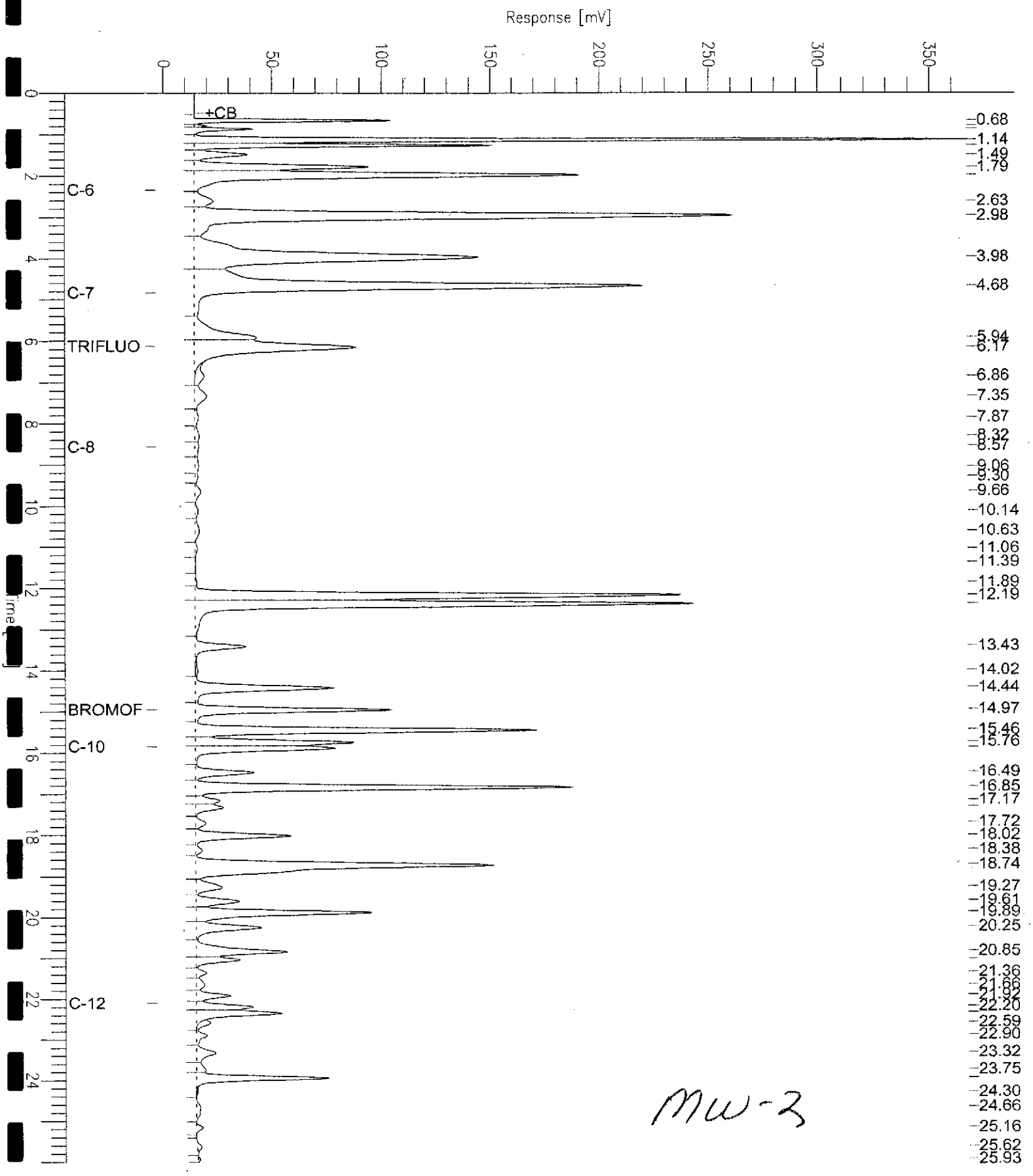


MW-1

GC07 TVH 'A' Data File RTX 502

Sample Name : 166897-002,83608
FileName : G:\GC07\DATA\224A023.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: -3 mV

Sample #: b1.3 Page 1 of 1
Date : 8/12/03 10:54 PM
Time of Injection: 8/12/03 10:28 PM
Low Point : -3.24 mV High Point : 367.12 mV
Plot Scale: 370.4 mV

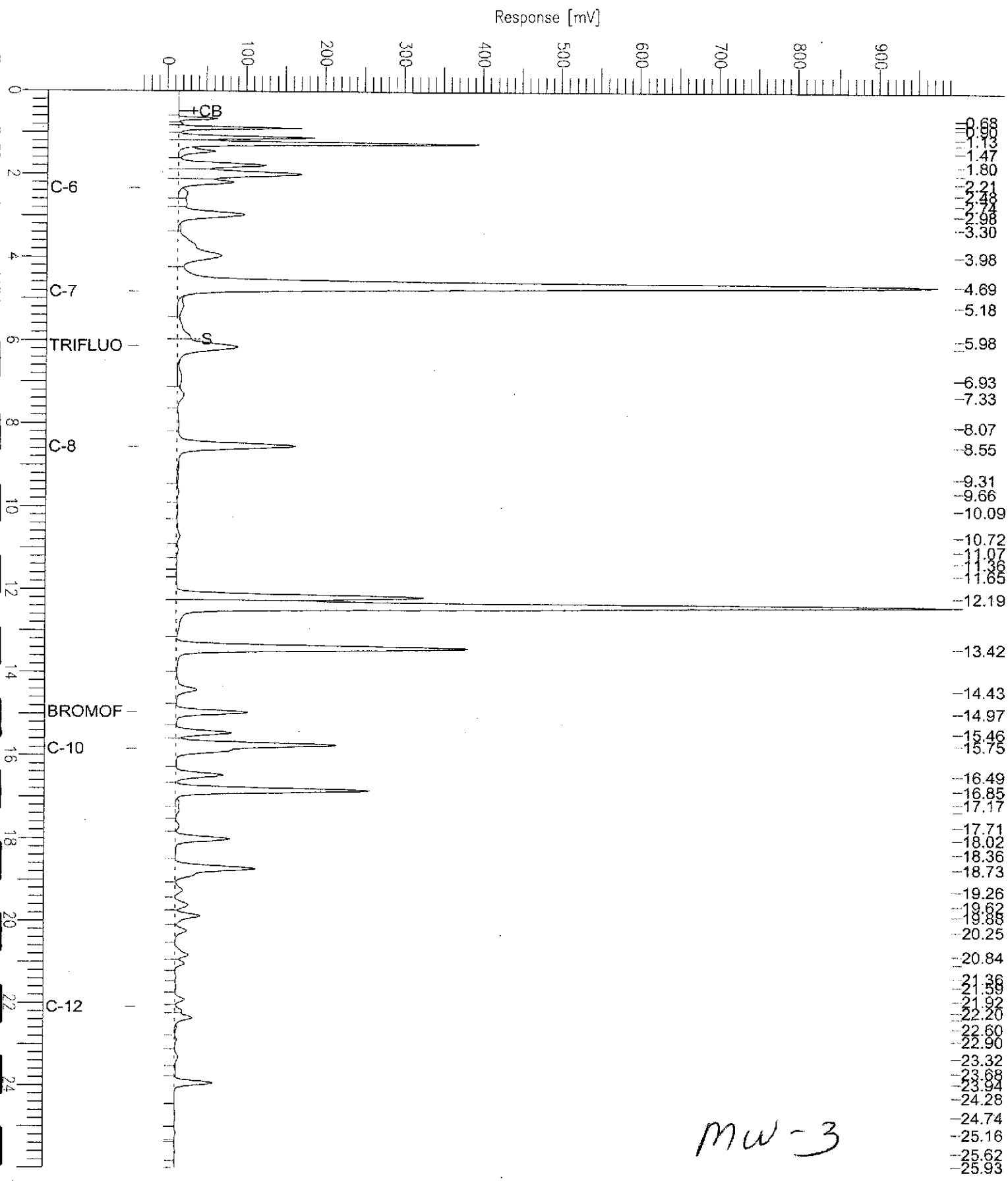


MW-2

GC07 TVH 'A' Data File RTX 502

Sample Name : 166897-003,83608
FileName : G:\GC07\DATA\224A021.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: -35 mV

Sample #: b1.3 Page 1 of 1
Date : 8/13/03 10:50 AM
Time of Injection: 8/12/03 09:18 PM
Low Point : -34.51 mV High Point : 996.00 mV
Plot Scale: 1030.5 mV



MW-3

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551		
Matrix:	Water	Sampled:	08/12/03
Units:	ug/L	Received:	08/12/03

Field ID: MW-4 Lab ID: 166897-004
Type: SAMPLE

Analyte	Result	RL	Diln Fac	Batch#	Analyzed	Analysis
Gasoline C7-C12	7,500	250	5.000	83669	08/13/03	8015B
Benzene	180	0.50	1.000	83608	08/12/03	EPA 8021B
Toluene	57	0.50	1.000	83608	08/12/03	EPA 8021B
Ethylbenzene	220	0.50	1.000	83608	08/12/03	EPA 8021B
m,p-Xylenes	840	2.5	5.000	83669	08/13/03	EPA 8021B
o-Xylene	610	2.5	5.000	83669	08/13/03	EPA 8021B

Surrogate	%REC	Limits	Diln Fac	Batch#	Analyzed	Analysis
Trifluorotoluene (FID)	121	57-150	5.000	83669	08/13/03	8015B
Bromofluorobenzene (FID)	109	65-144	5.000	83669	08/13/03	8015B
Trifluorotoluene (PID)	107	54-149	1.000	83608	08/12/03	EPA 8021B
Bromofluorobenzene (PID)	102	58-143	1.000	83608	08/12/03	EPA 8021B

Field ID: MW-5 Diln Fac: 5.000
Type: SAMPLE Batch#: 83608
Lab ID: 166897-005 Analyzed: 08/12/03

Analyte	Result	RL	Analysis
Gasoline C7-C12	12,000	250	8015B
Benzene	660	2.5	EPA 8021B
Toluene	75	2.5	EPA 8021B
Ethylbenzene	660	2.5	EPA 8021B
m,p-Xylenes	930	2.5	EPA 8021B
o-Xylene	180	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	122	57-150	8015B
Bromofluorobenzene (FID)	105	65-144	8015B
Trifluorotoluene (PID)	108	54-149	EPA 8021B
Bromofluorobenzene (PID)	104	58-143	EPA 8021B

Type: BLANK Batch#: 83608
Lab ID: QC222013 Analyzed: 08/12/03
Diln Fac: 1.000

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	8015B
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

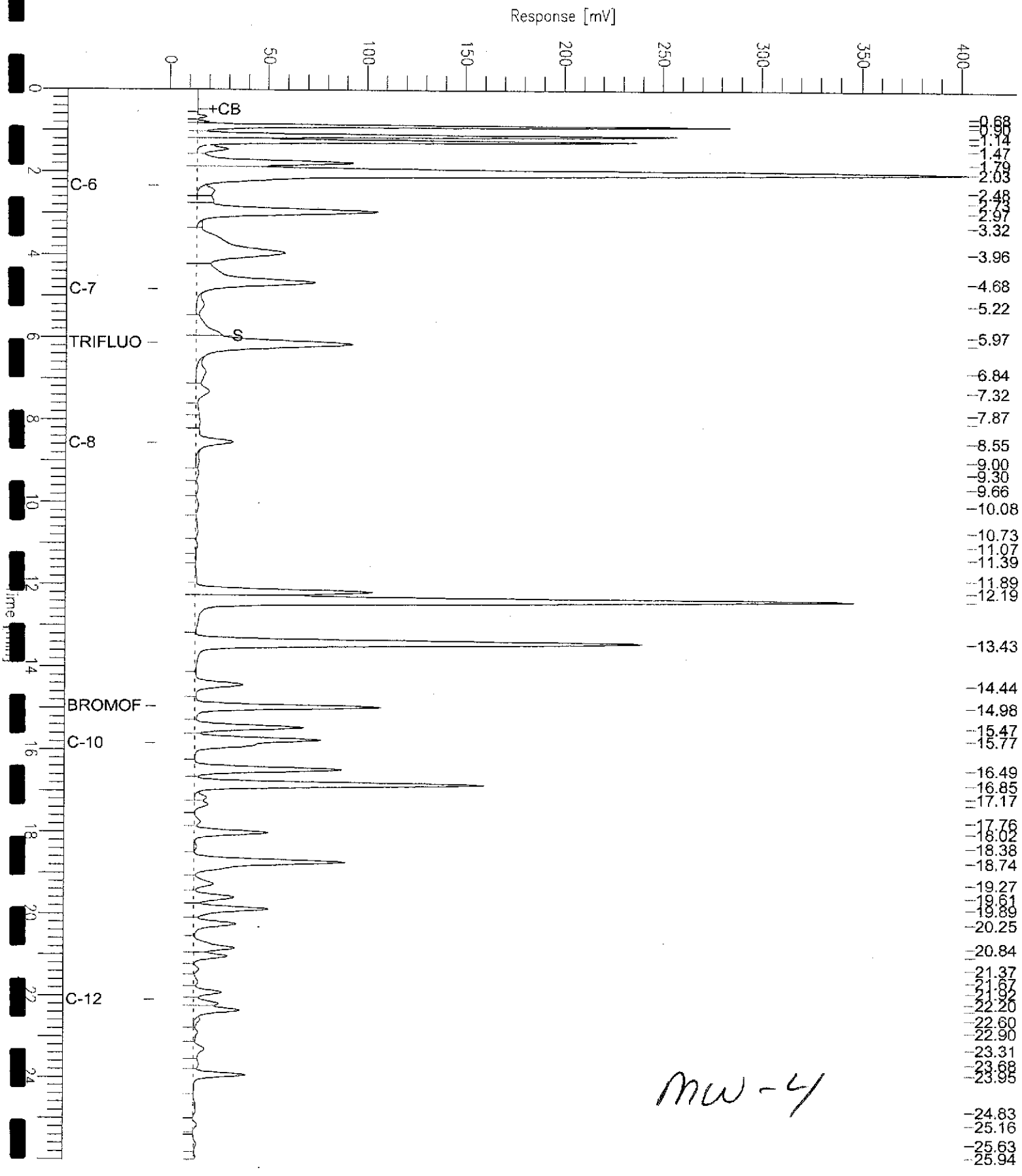
Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	99	57-150	8015B
Bromofluorobenzene (FID)	96	65-144	8015B
Trifluorotoluene (PID)	95	54-149	EPA 8021B
Bromofluorobenzene (PID)	96	58-143	EPA 8021B

ND= Not Detected
RL= Reporting Limit

GC07 TVH 'A' Data File RTX 502

Sample Name : 166897-004,83669,tvh & oxyo & mpxyl
FileName : G:\GC07\DATA\225A009.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: -6 mV

Sample #: c1.3 Page 1 of 1
Date : 8/14/03 01:41 PM
Time of Injection: 8/13/03 07:19 PM
Low Point : -5.52 mV High Point : 403.65 mV
Plot Scale: 409.2 mV

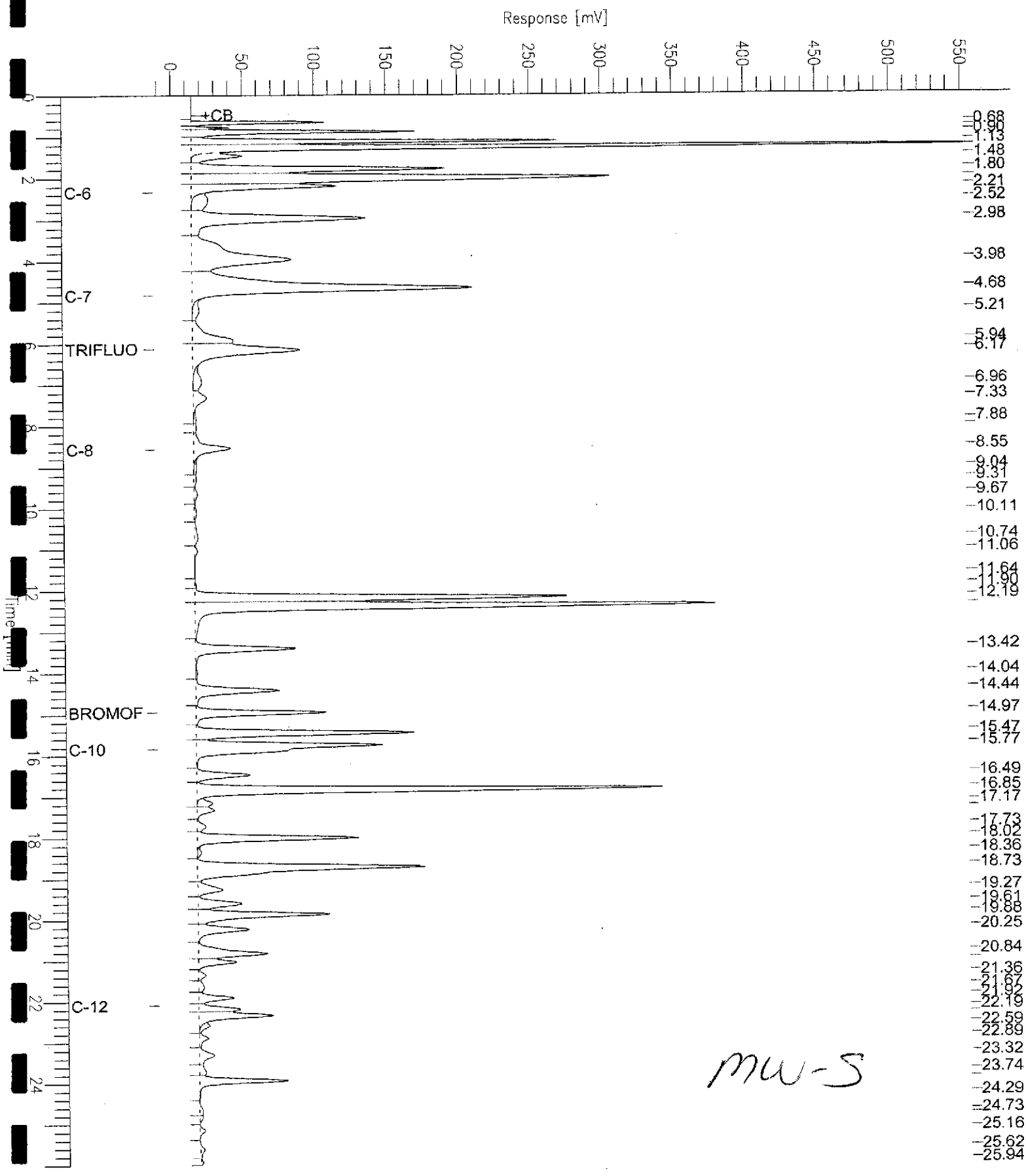


MW-4

GC07 TVH 'A' Data File RTX 502

Sample Name : 166897-005,83608
File Name : G:\GC07\DATA\224A025.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: -12 mV

Sample #: b1.3
Date : 8/13/03 12:05 AM
Time of Injection: 8/12/03 11:38 PM
Low Point : -12.47 mV High Point : 552.46 mV
Plot Scale: 564.9 mV

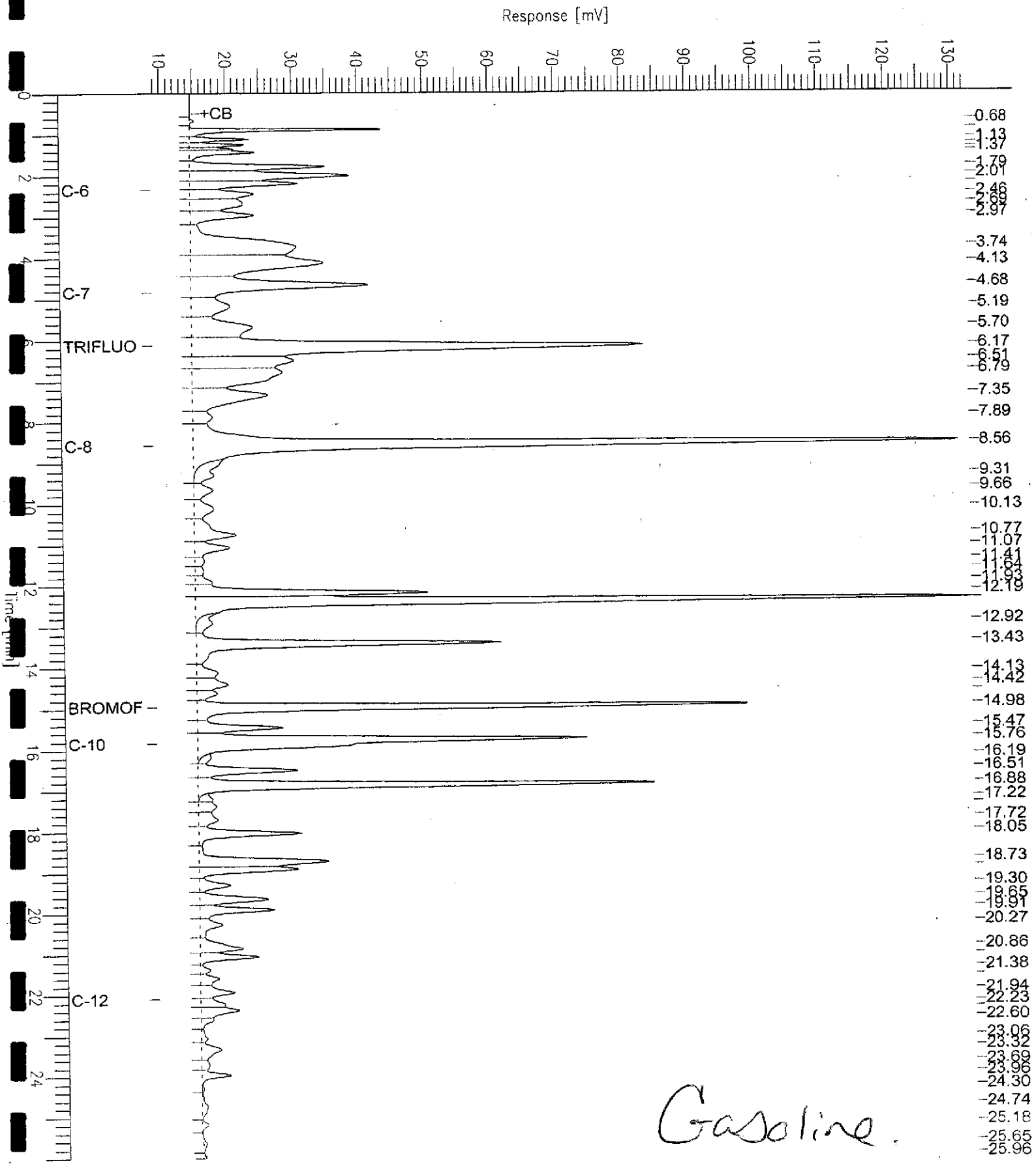


MW-5

GC07 TVH 'A' Data File RTX 502

Sample Name : ccv/lcs,qc222015,83608,03wsl192,2.5/5000
File Name : G:\GC07\DATA\224A003.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor: 1.0 Plot Offset: 9 mV

Sample #:
Date : 8/12/03 09:59 AM
Time of Injection: 8/12/03 09:33 AM
Low Point : 8.73 mV High Point : 132.64 mV
Plot Scale: 123.9 mV



Gasoline.

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551		
Matrix:	Water	Sampled:	08/12/03
Units:	ug/L	Received:	08/12/03

Type:	BLANK	Batch#:	83669
Lab ID:	QC222262	Analyzed:	08/13/03
Diln Fac:	1.000		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	8015B
Benzene	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)	100	57-150	8015B
Bromofluorobenzene (FID)	100	65-144	8015B
Trifluorotoluene (PID)	96	54-149	EPA 8021B
Bromofluorobenzene (PID)	99	58-143	EPA 8021B

ND = Not Detected
RL = Reporting Limit

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Total Volatile Hydrocarbons

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC222015	Batch#:	83608
Matrix:	Water	Analyzed:	08/12/03
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	937.0	94	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	105	57-150
Bromofluorobenzene (FID)	100	65-144

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Benzene, Toluene, Ethylbenzene, Xylenes

Lab #:	166897	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:	QC222014	Batch#:	83608
Matrix:	Water	Analyzed:	08/12/03
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Benzene	10.00	10.06	101	78-123
Toluene	10.00	9.593	96	79-120
Ethylbenzene	10.00	9.094	91	80-120
m,p-Xylenes	20.00	18.77	94	76-120
o-Xylene	10.00	9.158	92	80-121

Surrogate	%REC	Limits
Trifluorotoluene (PID)	96	54-149
Bromofluorobenzene (PID)	96	58-143

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Total Volatile Hydrocarbons

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC222263	Batch#:	83669
Matrix:	Water	Analyzed:	08/13/03
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	968.6	97	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	111	57-150
Bromofluorobenzene (FID)	103	65-144

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Benzene, Toluene, Ethylbenzene, Xylenes

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8021B
Type:	BS	Diln Fac:	1.000
Lab ID:	QC222264	Batch#:	83669
Matrix:	Water	Analyzed:	08/13/03
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Benzene	10.00	10.75	108	78-123
m,p-Xylenes	20.00	20.85	104	76-120
o-Xylene	10.00	10.30	103	80-121

Surrogate	%REC	Limits
Trifluorotoluene (PID)	98	54-149
Bromofluorobenzene (PID)	101	58-143

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Benzene, Toluene, Ethylbenzene, Xylenes

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8021B
Type:	BSD	Diln Fac:	1.000
Lab ID:	QC222276	Batch#:	83669
Matrix:	Water	Analyzed:	08/13/03
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Benzene	20.00	21.68	108	78-123	1	20
m,p-Xylenes	40.00	41.27	103	76-120	1	20
o-Xylene	20.00	20.51	103	80-121	0	20

Surrogate	%REC	Limits
Trifluorotoluene (PID)	101	54-149
Bromofluorobenzene (PID)	104	58-143

RPD= Relative Percent Difference

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Total Volatile Hydrocarbons

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	8015B
Field ID:	ZZZZZZZZZZ	Batch#:	83608
MSS Lab ID:	166853-001	Sampled:	08/11/03
Matrix:	Water	Received:	08/11/03
Units:	ug/L	Analyzed:	08/12/03
Diln Fac:	1.000		

ype: MS Lab ID: QC222081

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	<18.00	2,000	1,962	98	76-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	114	57-150
Bromofluorobenzene (FID)	109	65-144

ype: MSD Lab ID: QC222082

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,905	95	76-120	3	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	121	57-150
Bromofluorobenzene (FID)	116	65-144

PD= Relative Percent Difference

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Total Volatile Hydrocarbons

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	8015B
Field ID:	ZZZZZZZZZZ	Batch#:	83669
MSS Lab ID:	166916-017	Sampled:	08/12/03
Matrix:	Water	Received:	08/13/03
Units:	ug/L	Analyzed:	08/14/03
Diln Fac:	1.000		

Type: MS Lab ID: QC222274

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	<18.00	2,000	1,850	92	76-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	115	57-150
Bromofluorobenzene (FID)	107	65-144

Type: MSD Lab ID: QC222275

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,871	94	76-120	1	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	116	57-150
Bromofluorobenzene (FID)	109	65-144

RPD= Relative Percent Difference

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Gasoline Oxygenates by GC/MS

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8260B
Matrix:	Water	Sampled:	08/12/03
Units:	ug/L	Received:	08/12/03
Batch#:	83777	Analyzed:	08/18/03

Field ID: MW-1 Lab ID: 166897-001
Type: SAMPLE 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

Surrogate	%REC	Limits
Dibromofluoromethane	96	80-121
1,2-Dichloroethane-d4	99	77-129
Toluene-d8	100	80-120
Bromofluorobenzene	101	80-123

Field ID: MW-2 Lab ID: 166897-002
Type: SAMPLE Diln Fac: 1.667

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	69	17
MTBE	ND	0.8
Isopropyl Ether (DIPE)	ND	0.8
Ethyl tert-Butyl Ether (ETBE)	ND	0.8
Methyl tert-Amyl Ether (TAME)	ND	0.8

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-121
1,2-Dichloroethane-d4	97	77-129
Toluene-d8	99	80-120
Bromofluorobenzene	102	80-123

Field ID: MW-3 Lab ID: 166897-003
Type: SAMPLE Diln Fac: 8.333

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	180	83
MTBE	1,200	4.2
Isopropyl Ether (DIPE)	ND	4.2
Ethyl tert-Butyl Ether (ETBE)	ND	4.2
Methyl tert-Amyl Ether (TAME)	270	4.2

Surrogate	%REC	Limits
Dibromofluoromethane	93	80-121
1,2-Dichloroethane-d4	93	77-129
Toluene-d8	100	80-120
Bromofluorobenzene	103	80-123

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

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8260B
Matrix:	Water	Sampled:	08/12/03
Units:	ug/L	Received:	08/12/03
Batch#:	83777	Analyzed:	08/18/03

Field ID: MW-4 Lab ID: 166897-004
Type: SAMPLE Diln Fac: 14.29

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	550	140
MTBE	1,900	7.1
Isopropyl Ether (DIPE)	ND	7.1
Ethyl tert-Butyl Ether (ETBE)	7.3	7.1
Methyl tert-Amyl Ether (TAME)	18	7.1

Surrogate	%REC	Limits
Dibromofluoromethane	92	80-121
1,2-Dichloroethane-d4	92	77-129
Toluene-d8	102	80-120
Bromofluorobenzene	101	80-123

Field ID: MW-5 Lab ID: 166897-005
Type: SAMPLE Diln Fac: 7.143

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	130	71
MTBE	1,000	3.6
Isopropyl Ether (DIPE)	ND	3.6
Ethyl tert-Butyl Ether (ETBE)	ND	3.6
Methyl tert-Amyl Ether (TAME)	270	3.6

Surrogate	%REC	Limits
Dibromofluoromethane	90	80-121
1,2-Dichloroethane-d4	92	77-129
Toluene-d8	99	80-120
Bromofluorobenzene	102	80-123

Type: BLANK Diln Fac: 1.000
Lab ID: QC222693

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

Surrogate	%REC	Limits
Dibromofluoromethane	93	80-121
1,2-Dichloroethane-d4	96	77-129
Toluene-d8	97	80-120
Bromofluorobenzene	105	80-123

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

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	83777
Units:	ug/L	Analyzed:	08/18/03
Diln Fac:	1.000		

Type: BS Lab ID: QC222691

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)		NA		
MTBE	50.00	50.01	100	69-124
Isopropyl Ether (DIPE)		NA		
Ethyl tert-Butyl Ether (ETBE)		NA		
Methyl tert-Amyl Ether (TAME)		NA		

Surrogate	%REC	Limits
Dibromofluoromethane	95	80-121
1,2-Dichloroethane-d4	100	77-129
Toluene-d8	99	80-120
Bromofluorobenzene	99	80-123

Type: BSD Lab ID: QC222692

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)		NA				
MTBE	50.00	49.73	99	69-124	1	20
Isopropyl Ether (DIPE)		NA				
Ethyl tert-Butyl Ether (ETBE)		NA				
Methyl tert-Amyl Ether (TAME)		NA				

Surrogate	%REC	Limits
Dibromofluoromethane	93	80-121
1,2-Dichloroethane-d4	98	77-129
Toluene-d8	98	80-120
Bromofluorobenzene	99	80-123

NA= Not Analyzed
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Gasoline Oxygenates by GC/MS

Lab #:	166897	Location:	15101 Freedom Avenue
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	2551	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	83777
Units:	ug/L	Analyzed:	08/18/03
Dil'n Fac:	1.000		

Type: BS Lab ID: QC222695

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	250.0	244.2	98	70-130
MTBE		NA		
Isopropyl Ether (DIPE)	50.00	50.28	101	70-130
Ethyl tert-Butyl Ether (ETBE)	50.00	49.06	98	70-130
Methyl tert-Amyl Ether (TAME)	50.00	46.26	93	70-130

Surrogate	%REC	Limits
Dibromofluoromethane	89	80-121
1,2-Dichloroethane-d4	95	77-129
Toluene-d8	99	80-120
Bromofluorobenzene	103	80-123

Type: BSD Lab ID: QC222696

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	250.0	259.8	104	70-130	6	20
MTBE		NA				
Isopropyl Ether (DIPE)	50.00	50.56	101	70-130	1	20
Ethyl tert-Butyl Ether (ETBE)	50.00	48.86	98	70-130	0	20
Methyl tert-Amyl Ether (TAME)	50.00	44.91	90	70-130	3	20

Surrogate	%REC	Limits
Dibromofluoromethane	90	80-121
1,2-Dichloroethane-d4	96	77-129
Toluene-d8	100	80-120
Bromofluorobenzene	102	80-123

NA= Not Analyzed
RPD= Relative Percent Difference