

ENVIRONMENTAL ENGINEERING, INC.
6620 Owens Drive, Suite A • Pleasanton, CA 94588
TEL (925)734-6400 • FAX (925)734-6401
www.somaenv.com

December 19, 2016

Mr. Martin Musonge
Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

RECEIVED

By Alameda County Environmental Health 11:24 am, Jan 09, 2017

Subject: **File No. 01-0098 (MYM)**

Site Located at 2844 Mountain Boulevard, Oakland, California

Dear Mr. Musonge:

Enclosed for your review is a copy of SOMA's "Fourth Quarter 2016 Groundwater Monitoring Report" for the subject property. It has been uploaded to the State's GeoTracker database and Alameda County's FTP site.

Thank you for your time in reviewing our report. Please do not hesitate to call me at (925) 734-6400, if you have any questions or comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Mansour Sepehr", written over a horizontal line.

Mansour Sepehr, Ph.D., PE
Principal Hydrogeologist



cc: Mr. Tejindar Singh w/enclosure
Ms. Dilan Roe – Alameda County Env. Health

**Fourth Quarter 2016
Groundwater Monitoring Report**

**2844 Mountain Boulevard
Oakland, California
Regional Board File Number 01-0098**

December 19, 2016

Project 5081

Prepared for

**Tejindar Singh
6400 Dublin Blvd.
Dublin, California, 94568**



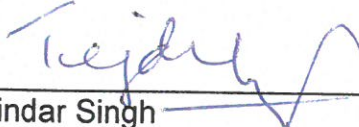
ENVIRONMENTAL ENGINEERING, INC.

6620 Owens Drive Suite A Pleasanton CA 94588 Ph: 925.734.6400 F: 925.734-6401 www.somaenv.com

PERJURY STATEMENT

Site Location: 2844 Mountain Boulevard, Oakland, California

"I declare under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge".



Tejinder Singh
6400 Dublin Boulevard
Dublin, California 94568
Responsible Party

CERTIFICATION

SOMA Environmental Engineering, Inc. has prepared this report on behalf of Tejindar Singh, property owner of 2844 Mountain Blvd., Oakland, California, to comply with requirements of the San Francisco Bay Regional Water Quality Control Board for the Fourth Quarter 2016 groundwater monitoring event.



Mansour Sepehr, PhD, PE
Principal Hydrogeologist



TABLE OF CONTENTS

CERTIFICATION	i
TABLE OF CONTENTS.....	ii
LIST OF FIGURES	iii
LIST OF TABLES.....	iii
LIST OF APPENDICES	iii
1. INTRODUCTION	1
1.1 Previous Activities	1
1.2 Summary of Field Activities and Laboratory Analysis	3
1.2.1 Field Activities	3
1.2.2 Laboratory Analysis	3
2. RESULTS	3
2.1 Field Measurements	3
2.2 Laboratory Analysis	4
3. CONCLUSIONS AND RECOMMENDATIONS.....	5
4. REPORT LIMITATIONS	6

LIST OF FIGURES

- Figure 1 Site Vicinity Map
- Figure 2 Site Map Showing Locations of Former USTs, Soil Borings, and Groundwater Monitoring Wells
- Figure 3 Groundwater Elevation Contour Map in feet, November 18, 2016
- Figure 4 Map Showing TPH-g and Benzene Concentrations in Groundwater, November 18, 2016
- Figure 5 Contour Map Showing TPH-d Concentrations in Groundwater, November 18, 2016
- Figure 6 Contour Map Showing Current MtBE Concentrations in Groundwater
- Figure 7 Contour Map Showing Current TBA Concentrations in Groundwater
- Figure 8 Contour Map Showing Current TAME Concentrations in Groundwater

LIST OF TABLES

- Table 1 Historical Groundwater Analytical Results

LIST OF APPENDICES

- Appendix A Standard Operating Procedures for Conducting Groundwater Monitoring Activities
- Appendix B Tables of Elevations and Coordinates on Wells, Field Measurements of Physical and Chemical Parameters of the Groundwater Samples and Groundwater Gradient Calculations
- Appendix C Laboratory Report and Chain of Custody Form

1. INTRODUCTION

SOMA Environmental Engineering, Inc. (SOMA) has prepared this report on behalf of Mr. Tejindar Singh, property owner of 2844 Mountain Blvd., Oakland, California. The site is located east of Highway 13 and west of Joaquin Miller Park (Figure 1). Former underground storage tank (UST) locations and site features are shown in Figure 2.

This report summarizes results of the Fourth Quarter 2016 groundwater monitoring event conducted at the site on November 18, 2016. It includes physical and chemical properties measured in the field for each groundwater sample and laboratory analytical results for groundwater samples. This monitoring event was conducted based on an email directive from the San Francisco Regional Water Quality Control Board (SFRWQCB) dated November 16, 2016 requesting quarterly groundwater monitoring events through the end of 2016.

1.1 Previous Activities

In March 1989 soil contamination was identified during replacement of product lines. Analytical results for a soil sample collected from the southern edge of a premium unleaded tank reported total petroleum hydrocarbons (TPHs) as gasoline (TPH-g) concentration of 8,400 mg/kg. Samples from beneath the lines near the pump islands reported TPH concentrations of less than 100 mg/kg.

In July 1989, contaminated soil was excavated and from the area of the southern end of the premium unleaded UST disposed of. Analysis of 12 soil samples collected from the sides of the excavation reported TPH concentrations ranging between ND to 3,300 mg/kg.

In May 1990, further site investigation including installation of four monitoring wells (RS-1 through RS-4) was conducted. Analysis of soil samples collected above the water table reported TPH concentrations ranging from 1 to 240 mg/kg. Hydrocarbons were detected in groundwater samples collected from all the wells; the highest concentration was found in a sample monitoring well RS-2.

In June 1991 soil vapor extraction began in June 1991. Groundwater remediation began in October 1992. Remediation was suspended in 1992, apparently due to responsible party financial issues.

In April 1994, one 280-gallon waste oil UST was removed with approximately 280 gallons of fluid and rinsate. The site operated as a retail gasoline station. Three USTs, two pump islands and an office/garage building were among the site features. The USTs contained various grades of unleaded gasoline and diesel with storage capacities of 3,000, 4,000, and 10,000 gallons.

In 1996 free product was reported in RS-1.

In July 1998, one 4,000-gallon gasoline UST was excavated and disposed of off-site.

Between July 29 and August 18, 2011, two USTs, one 10,000 gallon and one 3,000 gallon capacity, were excavated and disposed of off-site. The site is currently fenced in, which limits public access to the property.

Further soil and groundwater investigation was conducted at the site in March 2012. In October 2012, two wells (RS-1 and RS-2) were decommissioned in anticipation of excavation activities onsite. Excavation activities commenced on October 3, 2012, and an area of approximately 1,200 square feet was excavated to a depth of 15 feet. A total of 788.65 tons of waste soil was removed and replaced with clean fill material.

On May 9 and 10, 2013, two groundwater monitoring wells (MW-1 and MW-2) and soil and groundwater borings (DPT-5/5W) were installed as approved and requested by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB). All site wells were surveyed by a licensed surveyor on May 28, 2013.

Based on the success of a multi-phase extraction (MPE) pilot test conducted at the site in December 2013, SFRWQCB approved an extended MPE event. This event was conducted at the site from September 17, 2014 to November 5, 2014. Details and results of this event are documented in SOMA's report dated December 12, 2014.

Based on SFRWQCB's approval, SOMA installed an additional MPE well (MW-3) on May 1, 2015, in the vicinity of historical groundwater sample T-1, where high contaminant concentrations were observed during UST removal of August 2011. An extended MPE event was conducted utilizing this well and other site wells during May and June 2015.

SOMA submitted a workplan on December 4, 2015 for delineation of horizontal and vertical extent of soil and groundwater contamination of MtBE and TBA. This workplan was approved on February 11, 2016. Therefore, in March 2016, SOMA advanced four soil borings (DPT-6 through DPT-9) for collection of soil and groundwater samples. Results and recommendations are documented in SOMA's 'Additional Site Investigation Report' report dated April 14, 2016.

1.2 Summary of Field Activities and Laboratory Analysis

1.2.1 Field Activities

On November 18, 2016, five monitoring wells (RS-3, RS-4, MW-1, MW-2, and MW-3) were measured for depth to groundwater. Additional field measurements and groundwater samples were collected from all five wells. Properties measured in the field were pH, temperature, and electrical conductivity (EC). This monitoring event was conducted in accordance with procedures and guidelines of SFBRWQCB.

Figure 2 shows well locations. Appendix A details groundwater monitoring procedures followed during this event.

Purged groundwater was temporarily stored and secured on-site in 55-gallon drums pending transport to an appropriate disposal facility.

1.2.2 Laboratory Analysis

Groundwater samples were submitted to a California state-certified laboratory Curtis and Tompkins Laboratories, for the following analysis:

- TPH-g (gasoline by EPA Method 8260), and TPH-d (diesel by EPA Method 8015);
- BTEX (benzene, toluene, ethylbenzene, and total xylenes), MtBE, gasoline oxygenates (by EPA Method 8260).

2. RESULTS

Results of field measurements and laboratory analyses for the groundwater monitoring event conducted on November 18, 2016 follow below.

2.1 Field Measurements

Monitoring wells MW-1, MW-2, MW-3, RS-3 and RS-4 were measured for depth to groundwater (Table 1). Depths to groundwater ranged from 5.71 feet in MW-3 to 8.80 feet in RS-4. Groundwater elevations ranged from 666.47 feet in RS-4 to 669.90 feet in RS-3.

Figure 3 displays the groundwater elevation map. The groundwater flows southeasterly at a gradient of 0.07 ft/ft. Since the previous monitoring event (August 2016), the groundwater flow direction gradient have remained the same. Groundwater gradient calculations are included in Appendix B.

2.2 Laboratory Analysis

Groundwater analytical data for this monitoring event is shown in Table 1. Appendix C includes the laboratory report and chain of custody form. No measurable floating product was observed during this monitoring event.

TPH-g was detected in MW-1 at 340 µg/L and was below laboratory-reporting limit in other groundwater samples. Since the previous monitoring event (August 2016), TPH-g concentrations decreased in RS-4 and MW-1 and remained below laboratory-reporting limits in RS-3, MW-2, and MW-3. Figure 4 shows a map of TPH-g concentrations in groundwater. The TPH-g plume appears to be centered in the vicinity of the pump islands around MW-1.

TPH-d was detected in concentrations ranging from 62 µg/L in RS-3 to 3,900 µg/L in MW-1. Since the previous monitoring event (August 2016), TPH-d has decreased in RS-3, RS-4, MW-1, and MW-3 and remained same in MW-2. Figure 5 shows a contour map of TPH-d concentrations in groundwater. TPH-d plume appears to be centered southwest of the pump islands in the vicinity of MW-1.

During the analysis of TPH-d, some groundwater samples exhibited chromatographic pattern that did not resemble the standard pattern for diesel. Refer to the laboratory analytical report attached in Appendix C for further clarification of diesel testing and analysis.

The following BTEX concentrations were observed during this monitoring event:

- All BTEX analytes were below laboratory-reporting limits in RS-3, RS-4, MW-1, and MW-3.
- Benzene was detected in MW-2 at 9.80 µg/L. Other BTEX analytes were below laboratory-reporting limits in this sample.
- Since the previous monitoring event (August 2016) benzene has decreased in MW-2. Figure 4 shows a map of benzene concentrations in groundwater. The benzene plume appears to be centered to the south of the pump islands in the vicinity of MW-2.

Methyl tertiary-butyl ether (MtBE) concentrations ranged from 2.10 µg/L in MW-3 to 190 µg/L in RS-4. Since the previous monitoring event (August 2016), MtBE has increased in RS-4 and decreased in other groundwater samples.

Figure 6 shows a contour map of current MtBE concentrations in groundwater. This figure includes the results of Fourth Quarter 2016 groundwater monitoring event as well as the results of recent site investigations. As illustrated, although MtBE concentrations observed in monitoring wells were low, high MtBE concentrations were detected in on-site and off-site borings during recent site investigations. The MtBE plume appears to be centered in the southwestern corner of the site.

Tertiary-butyl alcohol (TBA) was below laboratory-reporting limit in RS-3 and MW-3. Detectable TBA concentrations ranged from 1,800 µg/L in MW-1 to 6,400 µg/L in MW-2. Since the previous monitoring event (August 2016), TBA decreased in RS-4, MW-1, MW-2 and MW-3.

Figure 7 shows a contour map of current TBA concentrations in groundwater. Similar to MtBE, this figure includes the results of Fourth Quarter 2016 groundwater monitoring event as well as the results of recent site investigations. As illustrated, high TBA concentrations were detected in on-site and off-site borings during recent site investigations. The TBA plume appears to be centered in the southwestern corner of the site.

Tertiary amyl methyl ether (TAME) was detected only in RS-4 at 13 µg/L and was below laboratory-reporting limit in other wells. Since the previous monitoring event (August 2016), TAME has increased in RS-4 and decreased in MW-2 and MW-3. Figure 8 shows a contour map of current TAME concentrations in groundwater. This figure includes the results of Fourth Quarter 2016 groundwater monitoring event as well as the results of recent site investigations.

3. CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations based on results of Fourth Quarter 2016 groundwater monitoring are summarized below.

- The groundwater flows southeasterly across the site.
- No free/floating product was observed in any monitoring wells during this monitoring event.
- The highest TPH-g and TPH-d concentrations were detected to the southwest of the pump islands around MW-1. The highest benzene, MtBE, TBA, and TAME concentrations were detected in the vicinity of pump islands around MW-2 and RS-4.
- During the recent site investigations, significantly high concentrations of MtBE, TBA, and TAME were observed in on and off-site borings, as illustrated in Figures 6 through 8. MtBE and TBA plume appear to be centered in the southwestern corner of the site in the vicinity of DPT-2.
- Since the previous monitoring event in August 2016, TPH-g decreased in RS-4 and MW-1 and remained below laboratory-reporting limits in RS-3, MW-2, and MW-3; TPH-d decreased in RS-3, RS-4, MW-1, and MW-3 and remained same in MW-2; benzene decreased in MW-2; MtBE increased in RS-4 and decreased in other groundwater samples; TBA decreased in RS-4, MW-1, MW-2 and MW-3; and increased in RS-4 and decreased in MW-2 and MW-3.

Based on SFRWQCB's request, SOMA conducted an LTCP review for the site which was submitted on November 10, 2016. SOMA recommended to conduct a soil gas survey at the site in order to accurately evaluate the site for 'Petroleum Vapor Intrusion to Indoor Air' media criteria and to collect shallow soil samples for analysis of PAH in order to complete the evaluation of 'Direct Contact and Out Air Exposure'.

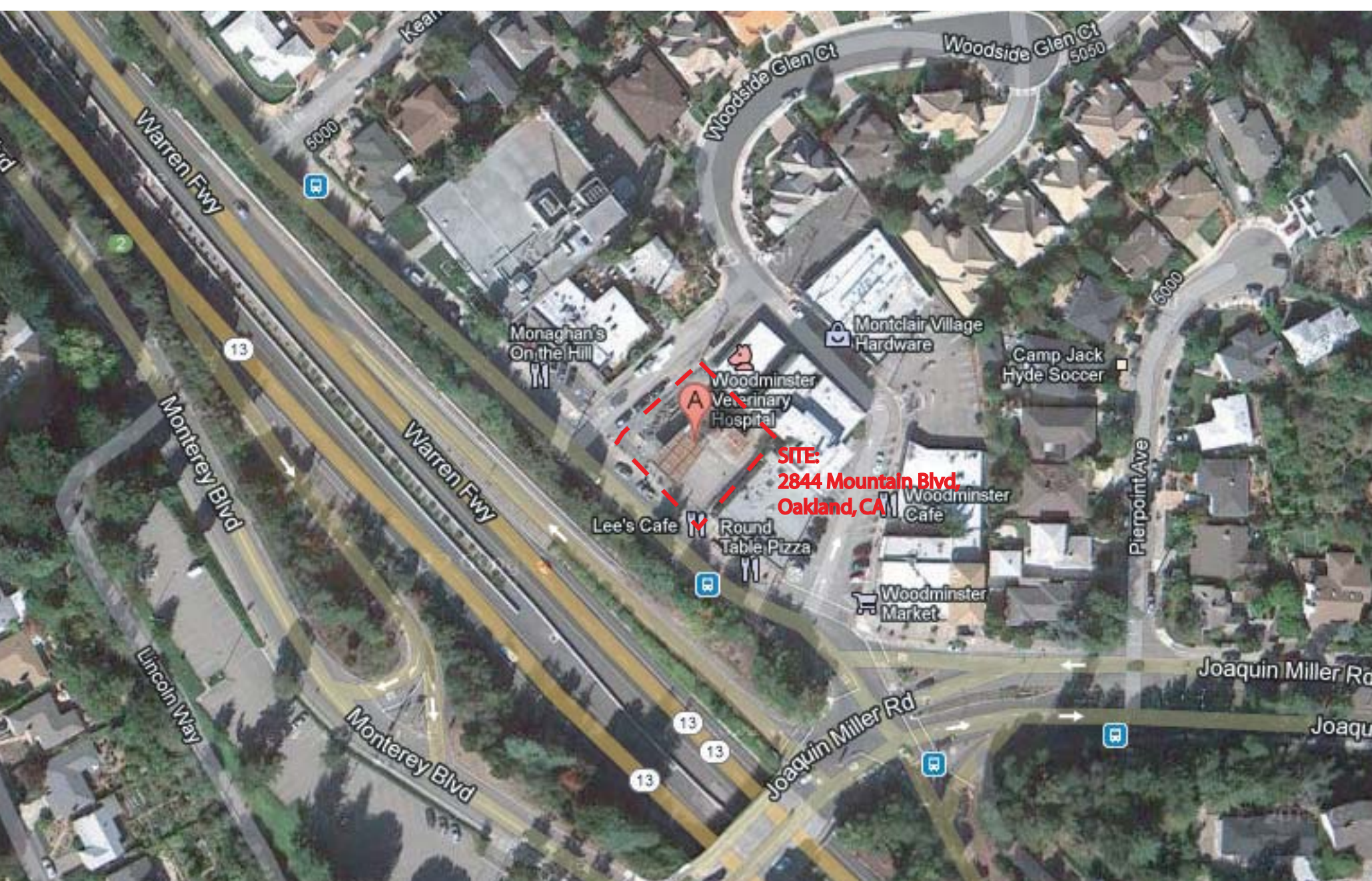
Due to elevated levels of MtBE (30,000 µg/L), TBA (40,000 µg/L), and TAME (2,200 µg/L) detected in groundwater during the most recent site investigation of 2016, SOMA has also recommended to prepare a corrective action plan (CAP) in order to address removal of MtBE, TBA, and TAME from the shallow perched water bearing zone. The CAP will be prepared upon receipt of a written authorization from the SFRWQCB.

4. REPORT LIMITATIONS

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

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

Figures



Source: Google (R) 2012

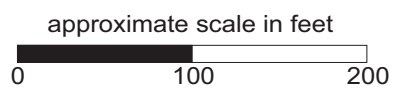
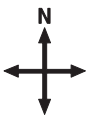
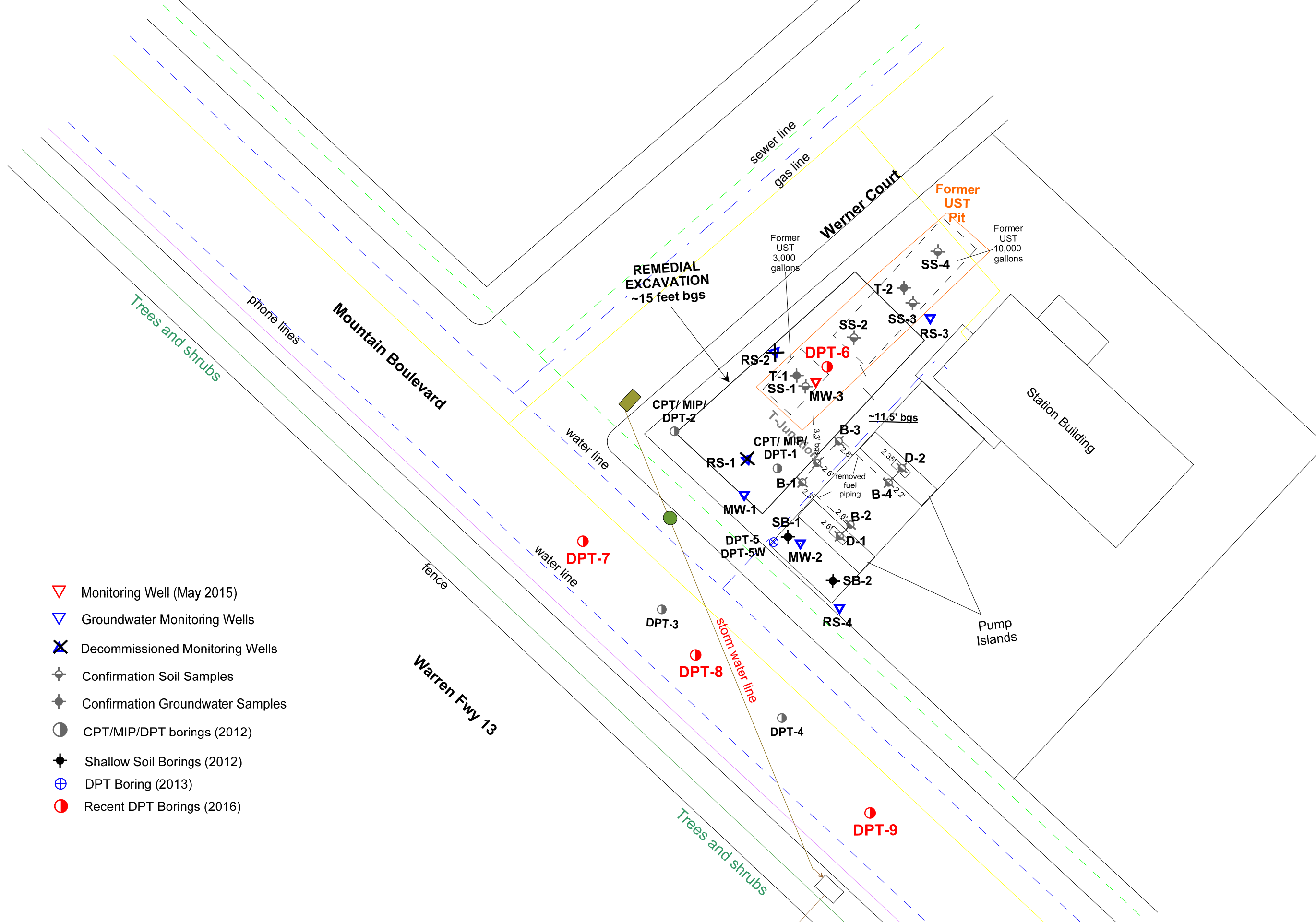
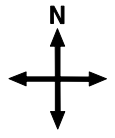











Figure 1: Site Vicinity Map





-  Monitoring Well (May 2015)
-  Groundwater Monitoring Wells
-  Decommissioned Monitoring Wells
-  Confirmation Soil Samples
-  Confirmation Groundwater Samples
-  CPT/MIP/DPT borings (2012)
-  Shallow Soil Borings (2012)
-  DPT Boring (2013)
-  Recent DPT Borings (2016)

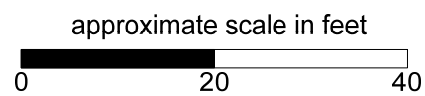
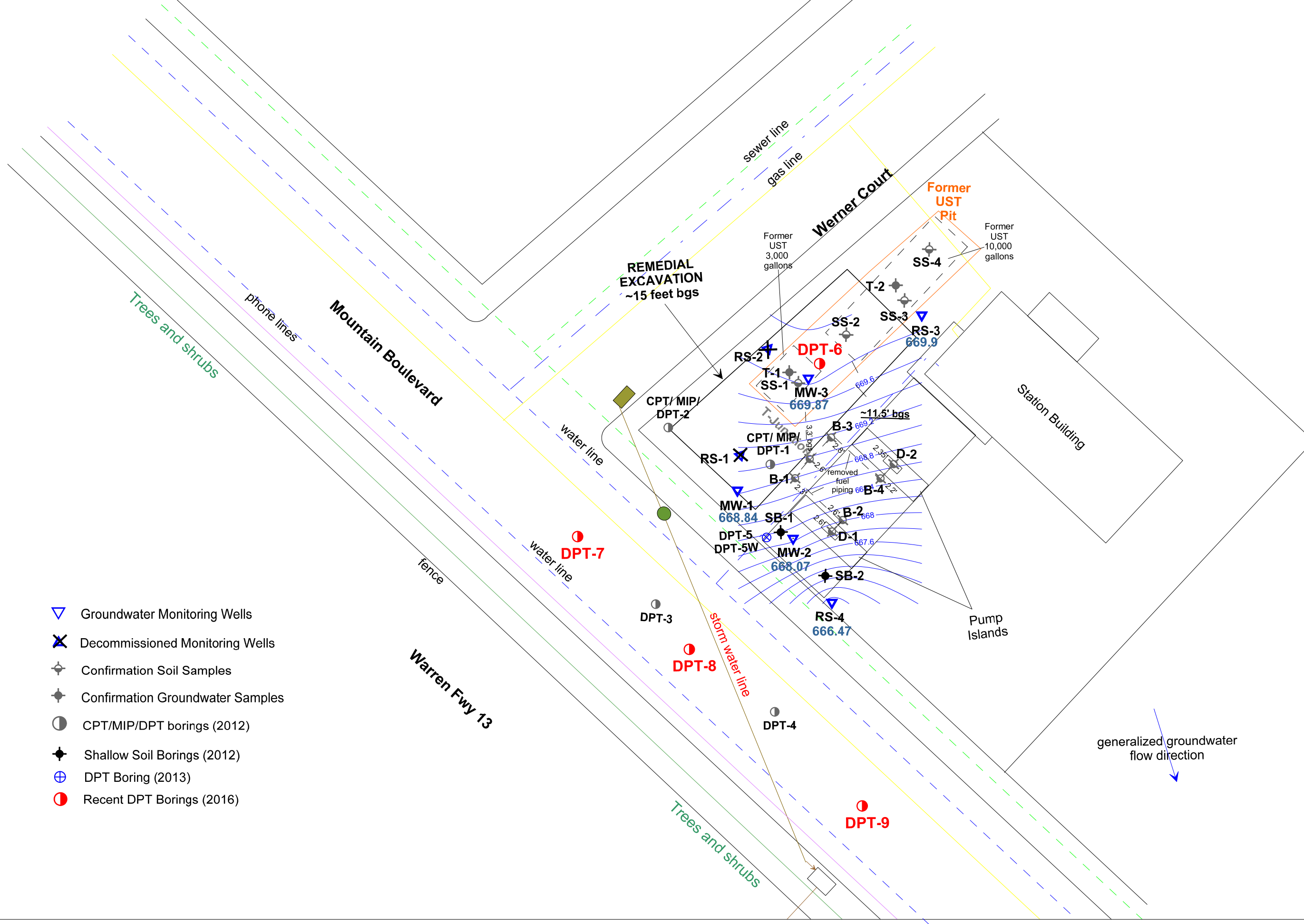
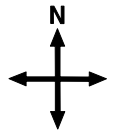


Figure 2: Site Map Showing Locations of Former USTs, Soil Borings, and Groundwater Monitoring Wells





- Groundwater Monitoring Wells
- Decommissioned Monitoring Wells
- Confirmation Soil Samples
- Confirmation Groundwater Samples
- CPT/MIP/DPT borings (2012)
- Shallow Soil Borings (2012)
- DPT Boring (2013)
- Recent DPT Borings (2016)

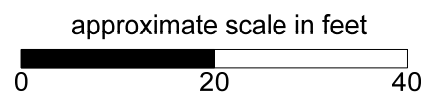
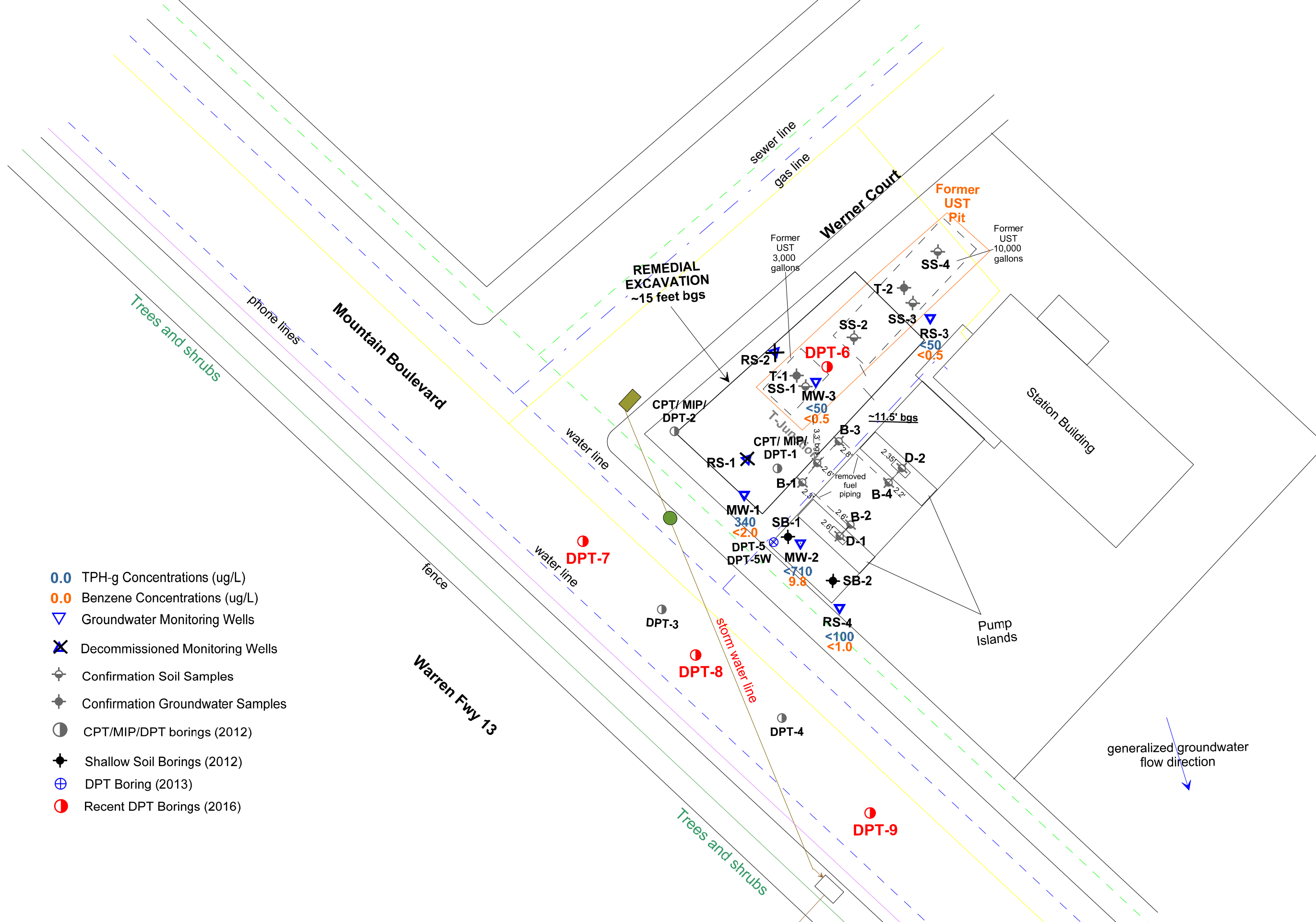
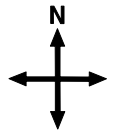


Figure 3: Groundwater Elevation Contour Map in Feet, November 18, 2016



- 0.0 TPH-g Concentrations (ug/L)
- 0.0 Benzene Concentrations (ug/L)
- ▽ Groundwater Monitoring Wells
- ✕ Decommissioned Monitoring Wells
- ⊕ Confirmation Soil Samples
- ⊕ Confirmation Groundwater Samples
- CPT/MIP/DPT borings (2012)
- ◆ Shallow Soil Borings (2012)
- ⊕ DPT Boring (2013)
- Recent DPT Borings (2016)

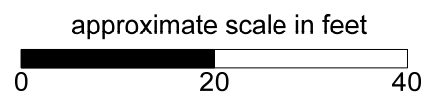


Figure 4: Map Showing TPH-g and Benzene Concentrations in Groundwater, November 18, 2016



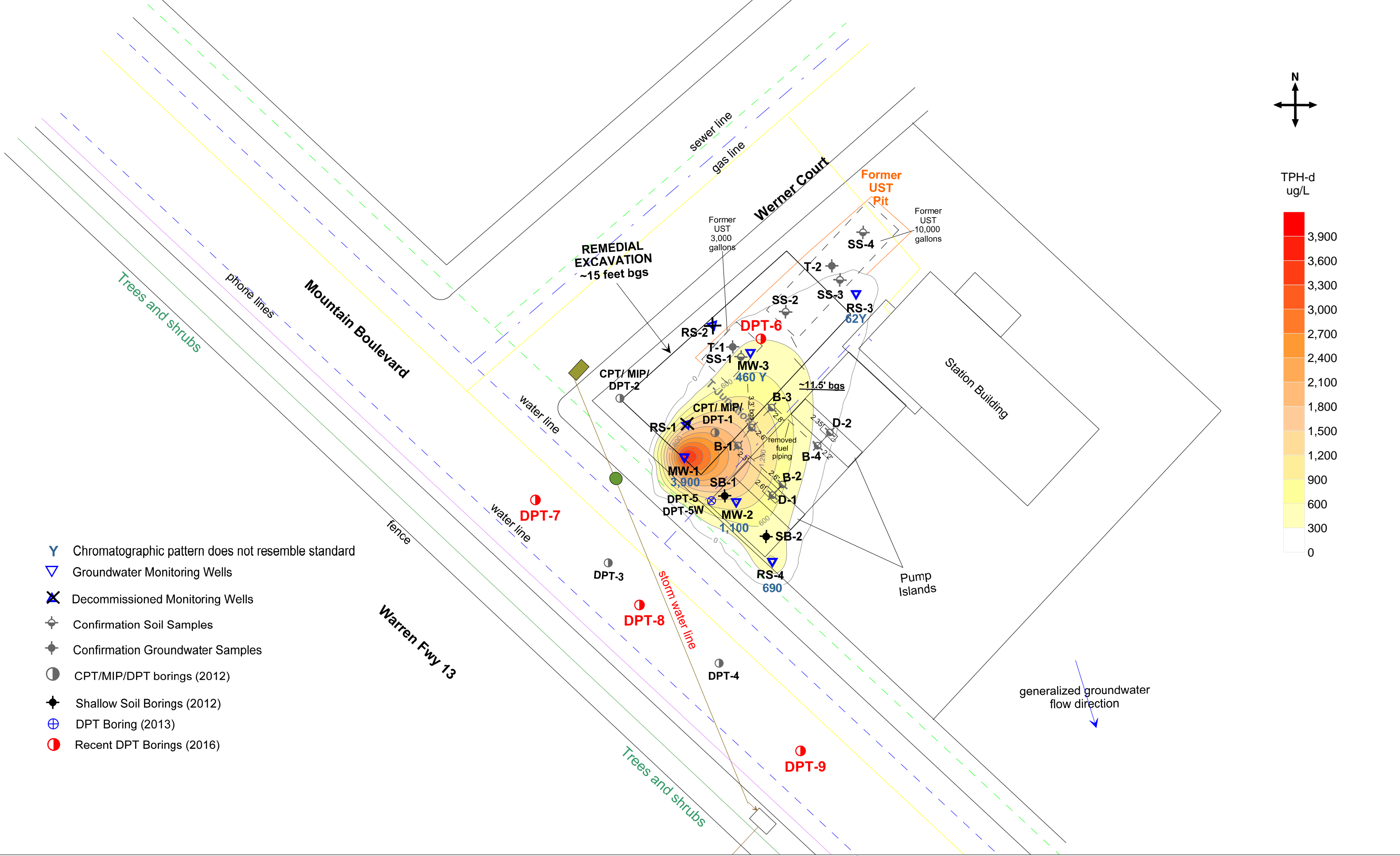


Figure 5: Contour Map Showing TPH-d Concentrations in Groundwater, November 18, 2016

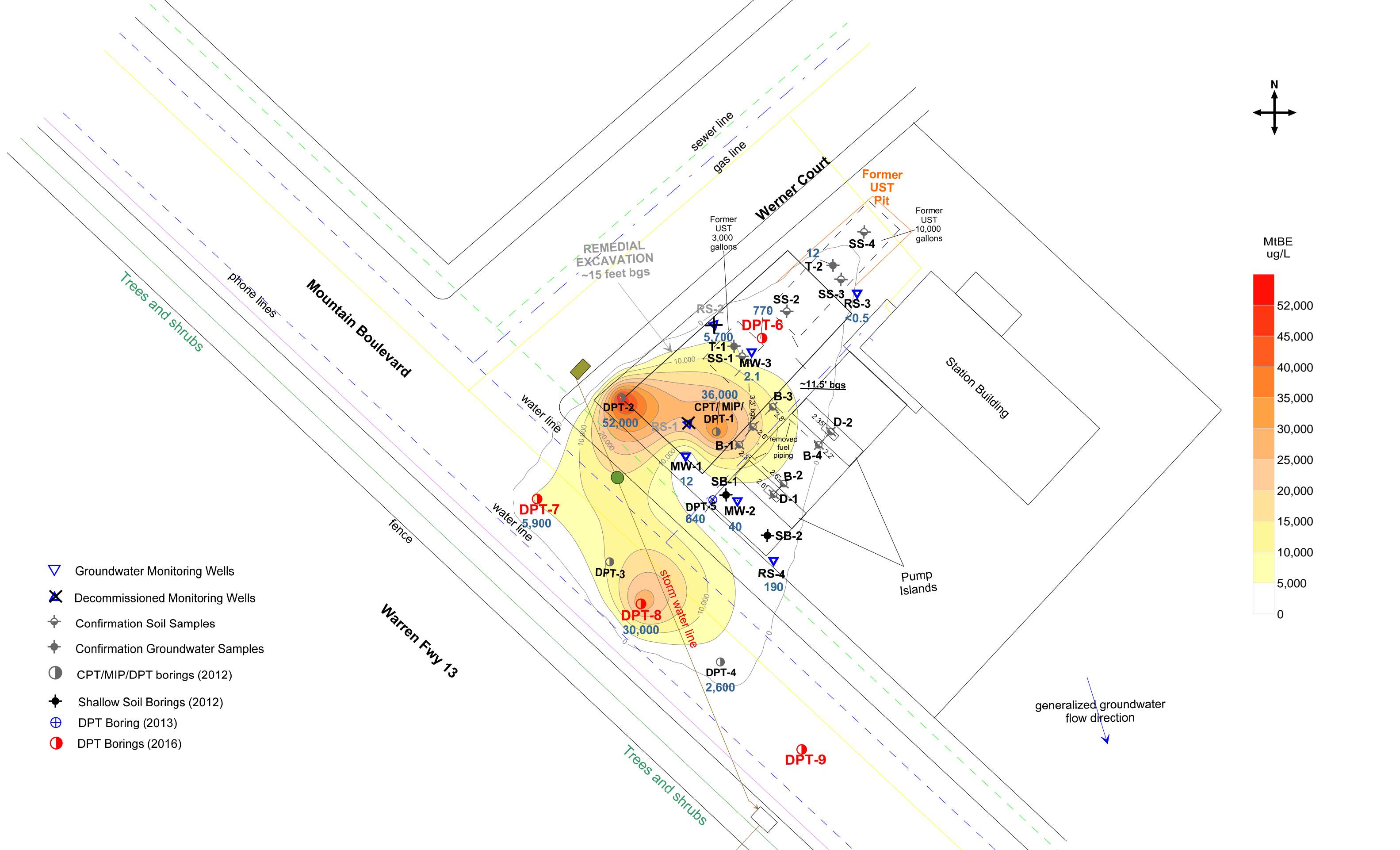
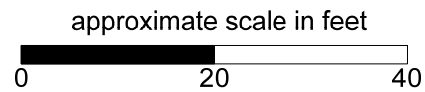


Figure 6: Contour Map Showing Current MtBE Concentrations in Groundwater



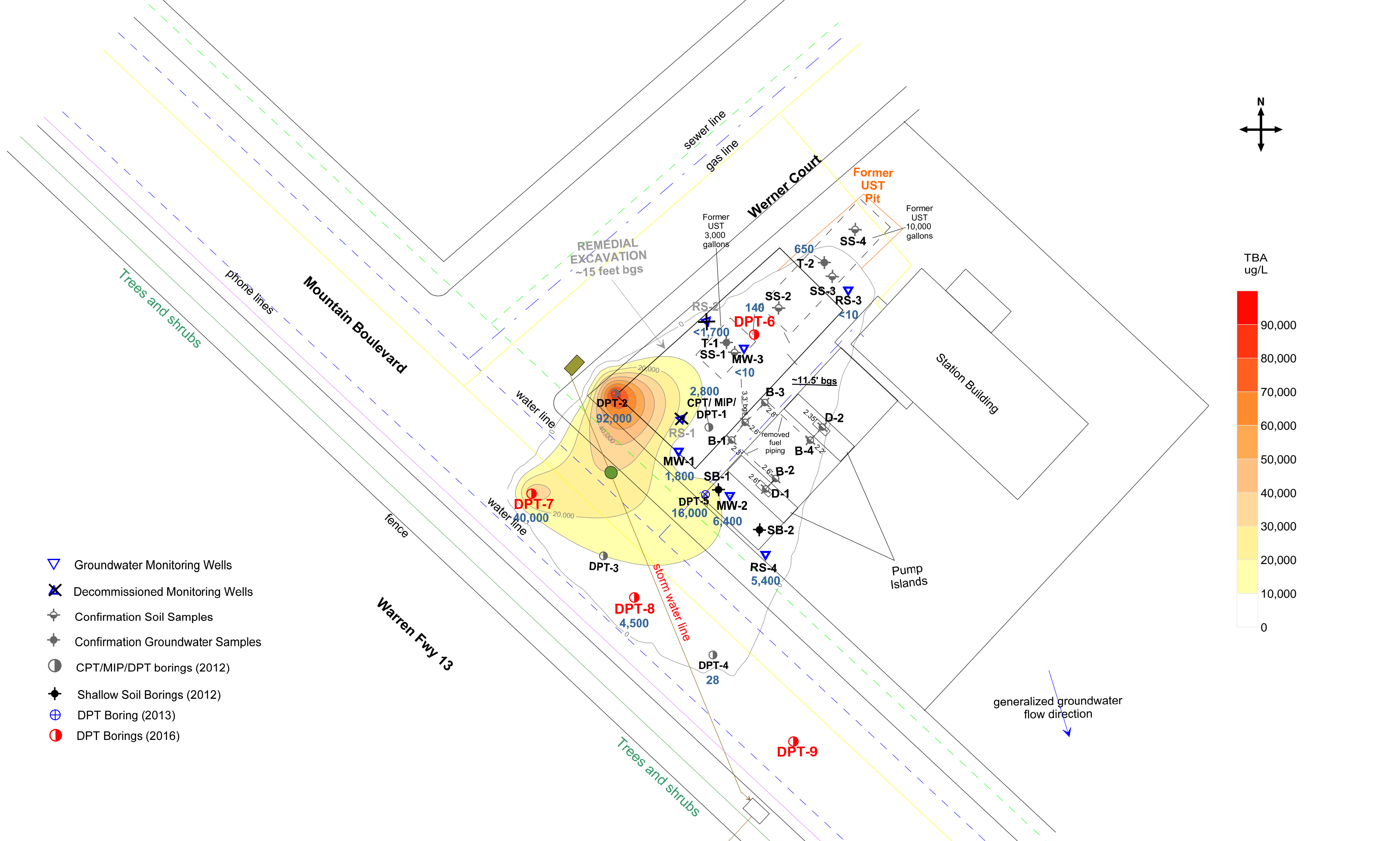


Figure 7: Contour Map Showing Current TBA Concentrations in Groundwater

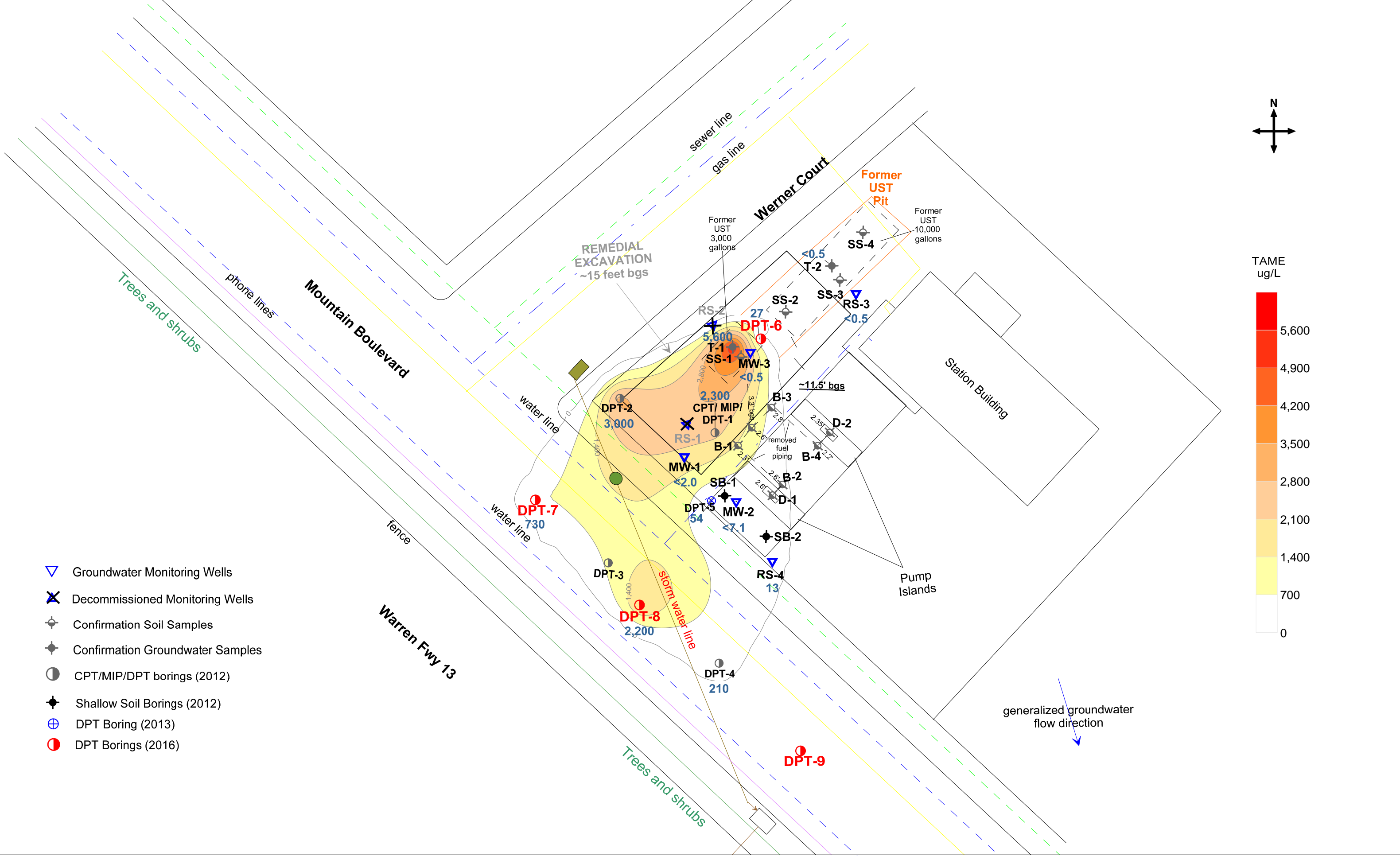
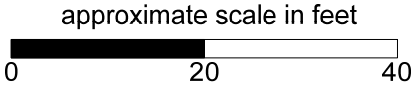


Figure 8: Contour Map Showing Current TAME Concentrations in Groundwater



Tables

Table 1
Historical Groundwater Analytical Results
2844 Mountain Boulevard, Oakland, CA

Monitoring Well	Date	Casing Elevation (Ft.)	Depth to Top Fluid (Ft.)	Depth to Groundwater (Ft.)	Free-Product Thickness	Groundwater Elevation	TPH-g µg/L	TPH-d µg/L	TPH-mo µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L	MtBE µg/L	TBA µg/L	TAME µg/L	
RS-1	5/1/90	675.63	7.20	7.20	0.00	668.43	2,700	-	-	370	420	40	320	-	-	-	
	5/1/91	675.63	8.35	8.35	0.00	667.28	1,300	-	-	580	130	62	240	-	-	-	
	10/1/91	675.63	10.22	10.22	0.00	665.41	1,100	-	-	140	100	45	210	-	-	-	
	1/1/92	675.63	8.06	8.06	0.00	667.57	1,700	-	-	9.9	31	9.7	170	-	-	-	
	1/1/93	675.63	5.30	5.30	0.00	670.33	3,700	-	-	650	9.2	51	170	-	-	-	
	8/1/93	675.63	8.56	8.56	0.00	667.07	900	-	-	14	0.6	2.1	8	-	-	-	
	11/1/93	675.63	8.44	8.44	0.00	667.19	1,400	-	-	9.6	ND	0.9	5	-	-	-	
	1/1/94	675.63	6.88	6.88	0.00	668.75	4,200	-	-	95	3.1	58	130	-	-	-	
	5/1/94	675.63	7.87	7.87	0.00	667.76	7,500	-	-	270	11	37	96	-	-	-	
	8/1/94	675.63	16.28	16.28	0.00	659.35	130	-	-	12	0.5	2.6	5	-	-	-	
	11/1/94	675.63	8.02	8.02	0.00	667.61	270	-	-	4.7	0.7	0.6	15	-	-	-	
	2/1/95	675.63	6.51	6.51	0.00	669.12	12,000	-	-	81	2.3	1	12	-	-	-	
	6/1/95	675.63	7.34	7.34	0.00	668.29	37,000	-	-	460	ND	ND	ND	63,000	-	-	
	11/1/95	675.63	8.71	8.71	0.00	666.92	ND	-	-	660	16	140	330	31,000	-	-	
	2/1/96	675.63	6.95	6.95	0.00	668.68	66,000	-	-	110	ND	12	21	84,000	-	-	
	9/18/96	675.63	8.44	8.52	0.08	667.17	1 INCH FLOATING PRODUCT			-	-	-	-	-	-	-	-
	12/11/96	675.63	6.42	6.62	0.20	669.17	79,000	-	-	4,000	37,000	8,000	45,000	220,000	-	-	
	2/21/97	675.63	6.88	6.92	0.04	668.74	1/2 INCH FLOATING PRODUCT			-	-	-	-	-	-	-	-
	5/28/97	675.63	7.88	7.96	0.08	667.73	156,000	-	-	9,400	51,000	7,000	45,000	112,000	-	-	
	9/2/97	675.63	8.34	8.38	0.04	667.28	1/2 INCH FLOATING PRODUCT			-	-	-	-	-	-	-	-
	11/24/97	675.63	6.98	7.00	0.02	668.65	1/4 INCH FLOATING PRODUCT			-	-	-	-	-	-	-	-
	2/25/98	675.63	3.51	3.52	0.01	672.12	1/8 INCH FLOATING PRODUCT			-	-	-	-	-	-	-	-
	5/27/98	675.63	7.31	7.31	0.00	668.32	40,000	-	-	2,200	4,000	2,300	19,000	350,000	-	-	
	9/16/98	675.63	8.10	8.10	0.00	667.53	62,000	-	-	2,400	2,300	2,100	14,000	250,000	-	-	
	11/23/98	675.63	7.10	7.10	0.00	668.53	99,000	-	-	2,600	5,800	2,500	18,000	130,000	-	-	
	2/23/99	675.67	4.82	4.87	0.05	670.84	5/8 INCH FLOATING PRODUCT			-	-	-	-	-	-	-	-
	5/5/99	675.67	6.86	6.90	0.04	668.80	FLOATING PRODUCT			-	-	-	-	-	-	-	-
	8/24/99	675.67	7.87	7.90	0.03	667.80	FLOATING PRODUCT			-	-	-	-	-	-	-	-
	2/8/12	675.67	6.80	6.80	0.00	668.87	60,000 x	8,200 x	<936	790	<6.4	2,000	430	65,000	41,000	5,100	
	5/4/12	675.67	6.57	6.57	0.00	669.10	18,000	10,000	NA	600	<36	2,000	870	22,000	11,000	1,800	
	8/6/12	675.67	7.61	7.61	0.00	668.06	16,000	12,000	NA	940	<130	2,000	560	42,000	35,000	3,400	
	Well Destroyed October 1, 2012																
RS-2	5/1/90	689.00	7.06	7.06	0.00	681.94	23,000	-	-	7,200	4,800	300	3,300	-	-	-	
	5/1/91	689.00	7.14	7.14	0.00	681.86	26,000	-	-	14,000	1,800	750	2,900	-	-	-	
	10/1/91	688.89	8.84	8.84	0.00	680.05	13,000	-	-	4,300	910	300	2,300	-	-	-	
	1/1/92	688.89	7.34	7.34	0.00	681.55	8,300	-	-	1,800	920	140	1,700	-	-	-	
	1/1/93	688.89	4.10	4.10	0.00	684.79	41,000	-	-	7,000	210	1,200	4,200	-	-	-	
	8/1/93	688.89	7.32	7.32	0.00	681.57	19,000	-	-	5,300	62	810	1,600	-	-	-	
	11/1/93	688.89	7.34	7.34	0.00	681.55	9,300	-	-	2,400	3.90	46	800	-	-	-	
	1/1/94	688.89	5.52	5.52	0.00	683.37	30,000	-	-	4,900	ND	880	2,600	-	-	-	
	5/1/94	675.25	6.40	6.40	0.00	668.85	120,000	-	-	3,300	330	ND	2,200	-	-	-	
	8/1/94	675.25	6.40	6.40	0.00	675.25	510	-	-	7.30	3.80	3.50	32	-	-	-	
	11/1/94	675.25	9.82	9.82	0.00	665.43	620	-	-	6.60	3.90	1.10	47	-	-	-	

Table 1
Historical Groundwater Analytical Results
2844 Mountain Boulevard, Oakland, CA

Monitoring Well	Date	Casing Elevation (Ft.)	Depth to Top Fluid (Ft.)	Depth to Groundwater (Ft.)	Free-Product Thickness	Groundwater Elevation	TPH-g µg/L	TPH-d µg/L	TPH-mo µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L	MtBE µg/L	TBA µg/L	TAME µg/L
RS-2 cont.	2/1/95	675.25	4.81	4.81	0.00	670.44	22,000	-	-	228	80	2	463	-	-	-
	6/1/95	675.25	5.80	5.80	0.00	669.45	49,000	-	-	1,300	160	200	1,600	71,000	-	-
	11/1/95	675.25	7.64	7.64	0.00	667.61	ND	-	-	670	25	150	360	65,000	-	-
	2/1/96	675.25	4.69	4.69	0.00	670.56	75,000	-	-	1,400	170	59	460	71,000	-	-
	9/18/96	675.25	7.34	7.34	0.00	667.91	6,300	-	-	2,000	48	350	570	160,000	-	-
	12/11/96	675.25	5.08	5.08	0.00	670.17	16,000	-	-	2,000	840	200	3,200	180,000	-	-
	2/21/97	675.25	5.42	5.42	0.00	669.83	22,000	-	-	2,100	1,300	600	5,100	56,000	-	-
	5/28/97	675.25	6.40	6.40	0.00	668.85	156,000	-	-	4,200	89	1,000	6,900	390,000	-	-
	9/2/97	675.25	6.93	6.93	0.00	668.32	<50	-	-	1,300	25	360	1,400	180,000	-	-
	11/24/97	675.25	5.93	5.93	0.00	669.32	<50	-	-	600	ND	ND	ND	610,000	-	-
	2/25/98	675.25	4.59	4.59	0.00	670.66	11,000	-	-	1,100	<50	320	2,400	330,000	-	-
	5/27/98	675.25	5.61	5.61	0.00	669.64	13,000	-	-	2,000	150	600	2,700	380,000	-	-
	9/16/98	675.25	6.84	6.84	0.00	668.41	11,000	-	-	1,600	20	1,600	1,600	280,000	-	-
	11/23/98	675.25	6.24	6.24	0.00	669.01	12,000	-	-	1,200	84	<5	960	140,000	-	-
	2/23/99	675.28	4.62	4.62	0.00	670.66	8,800	-	-	1,500	650	640	1,500	450,000	-	-
	5/5/99	675.28	7.55	7.55	0.00	667.73	29,000	-	-	2,000	1,300	500	3,700	270,000	-	-
	8/24/99	675.28	6.62	6.62	0.00	668.66	12,000	-	-	1,900	20	370	980	340,000	-	-
2/8/12	675.28	5.52	5.52	0.00	669.76	18,000 x	6,800 x	<378	540	<6.4	120	710	2,800	64,000	420	
5/4/12	675.28	5.18	5.18	0.00	670.10	16,000	13,000	NA	690	23	460	1,140	6,800	21,000	960	
8/6/12	675.28	6.33	6.33	0.00	668.95	11,000	10,000	NA	810	<25	210	473	3,300	18,000	580	
Well Destroyed October 1, 2012																
RS-3	5/1/90	670.00	6.00	6.00	0.00	664.00	330	-	-	2	1	1	150	-	-	-
	5/1/91	670.00	6.76	6.76	0.00	663.24	ND	-	-	0.40	ND	0.80	8	-	-	-
	10/1/91	670.00	8.98	8.98	0.00	661.02	ND	-	-	ND	ND	ND	ND	-	-	-
	1/1/92	670.00	6.81	6.81	0.00	663.19	ND	-	-	2.20	7.20	0.60	4	-	-	-
	1/1/93	670.00	4.05	4.05	0.00	665.95	ND	-	-	ND	ND	ND	ND	-	-	-
	8/1/93	670.00	7.19	7.19	0.00	662.81	ND	-	-	30	6	2.40	5	-	-	-
	11/1/93	670.00	7.12	7.12	0.00	662.88	ND	-	-	4.80	0.40	0.60	2	-	-	-
	1/1/94	670.00	5.42	5.42	0.00	664.58	330	-	-	25	3.20	3.90	12	-	-	-
	5/1/94	676.20	5.78	5.78	0.00	670.42	670	-	-	34	4	28	70	-	-	-
	8/1/94	676.20	5.86	5.86	0.00	670.34	ND	-	-	ND	ND	ND	ND	-	-	-
	11/1/94	676.20	5.08	5.08	0.00	671.12	69	-	-	2.50	3.10	1	4	-	-	-
	2/1/95	676.20	4.51	4.51	0.00	671.69	ND	-	-	0.30	0.40	ND	1	-	-	-
	6/1/95	676.20	5.29	5.29	0.00	670.91	ND	-	-	ND	ND	ND	ND	66	-	-
	11/1/95	676.20	7.10	7.10	0.00	669.10	ND	-	-	ND	ND	ND	ND	44	-	-
	2/1/96	676.20	4.48	4.48	0.00	671.72	120	-	-	ND	ND	ND	ND	110	-	-
	9/18/96	676.20	6.92	6.92	0.00	669.28	1,000	-	-	13	8.60	10	17	33	-	-
	12/11/96	676.20	4.90	4.90	0.00	671.30	85	-	-	20	2	<0.5	14	4,700	-	-
	2/21/97	676.20	4.94	4.94	0.00	671.26	120	-	-	5	2	2	6	850	-	-
	5/28/97	676.20	7.92	7.92	0.00	668.28	<50	-	-	6	<0.5	<0.5	<2	2,400	-	-
	9/2/97	676.20	6.60	6.60	0.00	669.60	<50	-	-	0.90	<0.5	<0.5	<2	8,600	-	-
11/24/97	676.20	5.89	5.89	0.00	670.31	140	-	-	13	2	1	12	3,600	-	-	
2/25/98	676.20	4.29	4.29	0.00	671.91	<50	-	-	<0.5	<0.5	<0.5	4	850	-	-	
5/27/98	676.20	5.01	5.01	0.00	671.19	<50	-	-	7	<0.5	<0.5	11	940	-	-	

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Historical Groundwater Analytical Results
2844 Mountain Boulevard, Oakland, CA

Monitoring Well	Date	Casing Elevation (Ft.)	Depth to Top Fluid (Ft.)	Depth to Groundwater (Ft.)	Free-Product Thickness	Groundwater Elevation	TPH-g µg/L	TPH-d µg/L	TPH-mo µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L	MtBE µg/L	TBA µg/L	TAME µg/L
RS-3 cont.	9/16/98	676.20	6.21	6.21	0.00	669.99	<50	-	-	2	2	2	10	670	-	-
	11/24/98	676.20	5.58	5.58	0.00	670.62	85	-	-	9	23	<0.5	19	180	-	-
	2/24/99	676.23	4.30	4.30	0.00	671.93	<50	-	-	<0.5	0.90	<0.5	<1.0	150	-	-
	5/5/99	676.23	4.92	4.92	0.00	671.31	<50	-	-	1	2	1	6	130	-	-
	8/24/99	676.23	6.64	6.64	0.00	669.59	80	-	-	0.80	<0.5	0.60	<1	300	-	-
	2/8/12	676.23	5.72	5.72	0.00	670.51	130 x	<42	<94	<0.13	0.59	2.90	18.1	7.9	<1.5	<0.17
	5/4/12	676.23	5.25	5.25	0.00	670.98	<50	330 Y	NA	<0.5	<0.5	<0.5	<0.5	10	18	2.4
	8/6/12	676.23	6.65	6.65	0.00	669.58	<50	390 Y	NA	<0.5	<0.5	<0.5	<0.5	13	<10	3.2
	3/29/13	676.23	6.01	6.01	0.00	670.22	<50	90 ^Y	NA	<0.5	<0.5	<0.5	<0.5	3.6	<10	<0.5
	6/6/13	676.08	6.45	6.45	0.00	669.63	<50	66 ^Y	NA	<0.5	<0.5	<0.5	<0.5	1.5	<10	<0.5
	9/4/13	676.08	6.91	6.91	0.00	669.17	<50	170 ^Y	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5
	12/30/13	676.08	7.21	7.21	0.00	668.87	<50	61 ^Y	NA	<0.5	<0.5	<0.5	<0.5	21	680	0.64
	3/10/14	676.08	5.68	5.68	0.00	670.40	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	14	320	0.61
	6/3/14	676.08	6.72	6.72	0.00	669.36	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	41	490	1.70
	8/27/14	676.08	7.10	7.10	0.00	668.98	<50	120 ^Y	NA	<0.5	<0.5	<0.5	<0.5	27	<10	1.20
11/13/14	676.08	6.53	6.53	0.00	669.55	<50*	58 ^Y	NA	<0.5	<0.5	<0.5	<0.5	19	<10	0.60	
post-MPE	2/12/15	676.08	5.95	5.95	0.00	670.13	<50	56 ^Y	NA	<0.5	<0.5	<0.5	<0.5	19	<10	<0.5
	5/13/15	676.08	6.93	6.93	0.00	669.15	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	4.6	<10	<0.5
	6/22/15	676.08	8.87	8.87	0.00	667.21	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5
	8/12/15	676.08	7.79	7.79	0.00	668.29	<50	<52	NA	<0.5	<0.5	<0.5	<0.5	0.57	<10	<0.5
	11/12/15	676.08	7.85	7.85	0.00	668.23	<50	<49	NA	<0.5	<0.5	<0.5	<0.5	1.10	<10	<0.5
	2/15/16	676.08	5.88	5.88	0.00	670.20	<50	<49	NA	<0.5	<0.5	<0.5	<0.5	5.40	<10	<0.5
	5/6/16	676.08	5.93	5.93	0.00	670.15	<50	<50	NA	<0.5	<0.5	<0.5	<0.5	4.80	<10	<0.5
	8/17/16	676.08	6.70	6.70	0.00	669.38	<50	81Y	NA	<0.5	<0.5	<0.5	<0.5	0.51	<10	<0.5
	11/18/16	676.08	6.18	6.18	0.00	669.90	<50	62Y	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5
	RS-4	5/1/90	675.38	8.34	8.34	0.00	667.04	440	-	-	9	11	9	49	-	-
5/1/91		675.38	9.50	9.50	0.00	665.88	ND	-	-	8	4	3	5	-	-	-
10/1/91		675.38	10.82	10.82	0.00	664.56	830	-	-	280	120	24	170	-	-	-
1/1/92		675.38	9.31	9.31	0.00	666.07	620	-	-	34	8.30	2.10	21	-	-	-
1/1/93		675.38	6.89	6.89	0.00	668.49	150	-	-	32	1.70	5.80	13	-	-	-
8/1/93		675.38	9.68	9.68	0.00	665.70	ND	-	-	0.90	0.70	ND	0	-	-	-
11/1/93		675.38	9.83	9.83	0.00	665.55	ND	-	-	ND	ND	ND	ND	-	-	-
1/1/94		675.38	8.17	8.17	0.00	667.21	ND	-	-	1.70	ND	0.81	2	-	-	-
5/1/94		675.38	8.69	8.69	0.00	666.69	ND	-	-	ND	ND	ND	1	-	-	-
8/1/94		675.38	9.04	9.04	0.00	666.34	420	-	-	6.50	4.10	1.90	40	-	-	-
11/1/94		675.38	8.00	8.00	0.00	667.38	130	-	-	4.10	0.70	1.70	8	-	-	-
2/1/95		675.38	7.93	7.93	0.00	667.45	ND	-	-	6	1.20	3.50	13	-	-	-
6/1/95		675.38	8.61	8.61	0.00	666.77	ND	-	-	ND	ND	ND	ND	69	-	-
11/1/95		675.38	10.43	10.43	0.00	664.95	ND	-	-	ND	ND	ND	ND	47	-	-
2/1/96		675.38	7.44	7.44	0.00	667.94	960	-	-	ND	ND	0.60	ND	80	-	-
9/18/96		675.38	9.58	9.58	0.00	665.80	<50	-	-	<0.5	<0.5	<0.5	<2	200	-	-
12/11/96	675.38	7.50	7.50	0.00	667.88	75	-	-	<0.5	0.60	<0.5	<0.5	104	-	-	

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Historical Groundwater Analytical Results
2844 Mountain Boulevard, Oakland, CA

Monitoring Well	Date	Casing Elevation (Ft.)	Depth to Top Fluid (Ft.)	Depth to Groundwater (Ft.)	Free-Product Thickness	Groundwater Elevation	TPH-g µg/L	TPH-d µg/L	TPH-mo µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L	MtBE µg/L	TBA µg/L	TAME µg/L
RS-4 cont.	2/21/97	675.38	8.26	8.26	0.00	667.12	<50	-	-	1	1	<0.5	1	190	-	-
	5/28/97	675.38	8.92	8.92	0.00	666.46	<50	-	-	6	<0.5	<0.5	<2	110	-	-
	9/2/97	675.38	9.39	9.39	0.00	665.99	100	-	-	3	<0.5	<0.5	<2	39	-	-
	11/24/97	675.38	8.22	8.22	0.00	667.16	41	-	-	<0.5	2	<0.5	<2	210	-	-
	2/25/98	675.38	7.19	7.19	0.00	668.19	<50	-	-	3	<0.5	<0.5	<1	5,600	-	-
	5/27/98	675.38	8.40	8.40	0.00	666.98	<50	-	-	<0.5	<0.5	<0.5	<1	2,400	-	-
	9/16/98	675.38	9.26	9.26	0.00	666.12	<50	-	-	<0.5	<0.5	<0.5	<1	230	-	-
	11/24/98	675.38	8.50	8.50	0.00	666.88	<50	-	-	2	<0.5	<0.5	<1	100	-	-
	2/24/99	675.42	7.20	7.20	0.00	668.22	<50	-	-	2	3	0.80	5	670	-	-
	5/5/99	675.42	8.37	8.37	0.00	667.05	100	-	-	<0.5	<0.5	<0.5	<1	440	-	-
	8/24/99	675.42	8.36	8.36	0.00	667.06	<50	-	-	<0.5	<0.5	<0.5	<1	<500	-	-
	2/8/12	675.42	8.11	8.11	0.00	667.31	140,000	130,000 X	<9,360	120	2,600	4,700	28,200	28,000	100,000	1,800
	5/4/12	675.42	8.31	8.31	0.00	667.11	67,000	12,000 Y	NA	61	900	2,100	9,700	32,000	69,000	1,700
	8/6/12	675.42	9.01	9.01	0.00	666.41	49,000	8,900	NA	<130	350	1,700	8,100	19,000	90,000	1,300
Post-MPE	3/29/13	675.42	8.49	8.49	0.00	666.93	14,000	14,000	NA	<100	<100	440	1,340	14,000	110,000	590
	6/6/13	675.27	8.48	8.48	0.00	666.79	12,000	7,200	NA	11	<3.6	420	886	16,000	66,000	970
	9/4/13	675.27	9.39	9.39	0.00	665.88	20,000	5,100	NA	<100	<100	660	2,830	18,000	75,000	1,200
	12/30/13	675.27	9.57	9.57	0.00	665.70	<13,000	9,900	NA	<130	<130	<130	150	16,000	37,000	1,100
	3/10/14	675.27	7.65	7.65	0.00	667.62	<10,000	3,700	NA	<100	<100	<100	<100	11,000	38,000	640
	6/3/14	675.27	9.27	9.27	0.00	666.00	<3,600	4,400	NA	<36	<36	40	<36	3,700	27,000	260
	8/27/14	675.27	9.43	9.43	0.00	665.84	2,500	4,700	NA	<20	<20	40	<20	2,100	28,000	150
	11/13/14	675.27	9.56	9.56	0.00	665.71	2,200*	3,500	NA	<20	<20	<20	36	11,000	15,000	910
	2/12/15	675.27	8.03	8.03	0.00	667.24	<1,300	1,900	NA	<13	<13	<13	<13	500	14,000	25
	5/13/15	675.27	9.05	9.05	0.00	666.22	<1,300	1,100	NA	<13	<13	<13	<13	460	25,000	21
	6/22/15	675.27	10.62	10.62	0.00	664.65	<1,300	770	NA	<13	<13	<13	<13	5,900	7,900	500
	8/12/15	675.27	9.93	9.93	0.00	665.34	320	1,300	NA	<1.3	<1.3	1.3	1.7	230	6,400	18
	11/12/15	675.27	9.58	9.58	0.00	665.69	170	440	NA	<0.5	<0.5	1.4	0.55	12	1,400	0.66
	2/15/16	675.27	8.43	8.43	0.00	666.84	<100	350 Y	NA	<1.0	<1.0	<1.0	<1.0	8.80	270	<1.0
5/6/16	675.27	6.47	6.47	0.00	668.80	<50	850 Y	NA	<0.5	<0.5	<0.5	<0.5	160	21	5.60	
8/17/16	675.27	9.38	9.38	0.00	665.89	100	710 Y	NA	<0.5	<0.5	<0.5	<0.5	47	8,100	2.80	
11/18/16	675.27	8.80	8.80	0.00	666.47	<100	690	NA	<1.0	<1.0	<1.0	<1.0	190	5,400	13	
MW-1	6/6/13	674.92	6.03	6.03	0.00	668.89	<17,000	13,000	NA	930	370	470	1,760	55,000	32,000	7,200
	9/4/13	674.92	7.10	7.10	0.00	667.82	<50,000	13,000	NA	2,000	<500	1,400	4,200	70,000	48,000	7,700
	12/30/13	674.92	7.27	7.27	0.00	667.65	34,000	13,000	NA	920	1,000	1,300	4,900	43,000	43,000	4,500
	3/10/14	674.92	5.51	5.51	0.00	669.41	<20,000	11,000	NA	720	<200	890	1,970	25,000	30,000	2,600
	6/3/14	674.92	6.74	6.74	0.00	668.18	8,900	7,400	NA	350	<83	550	1,420	11,000	28,000	1,300
	8/27/14	674.92	7.23	7.23	0.00	667.69	8,100	12,000	NA	640	<63	610	720	8,400	23,000	1,500
	11/13/14	674.92	7.36	7.36	0.00	667.56	7,400*	7,900	NA	270	<63	360	880	6,100	12,000	910
	2/12/15	674.92	5.80	5.80	0.00	669.12	4,300	11,000	NA	200	<25	200	350	3,400	18,000	500
	5/13/15	674.92	7.00	7.00	0.00	667.92	2,700	7,100	NA	150	<8.3	170	76	1,000	12,000	150
	6/22/15	674.92	12.11	12.11	0.00	662.81	<1,300	2,600	NA	<13	<13	<13	<13	4,800	17,000	450
Post-MPE	8/12/15	674.92	8.25	8.25	0.00	666.67	2,000	8,100	NA	31	<8.3	27	46	530	10,000	57
	11/12/15	674.92	7.79	7.79	0.00	667.13	2,500	5,100	NA	16	<5.0	34	6.9	120	6,200	13

Table 1
Historical Groundwater Analytical Results
2844 Mountain Boulevard, Oakland, CA

Monitoring Well	Date	Casing Elevation (Ft.)	Depth to Top Fluid (Ft.)	Depth to Groundwater (Ft.)	Free-Product Thickness	Groundwater Elevation	TPH-g µg/L	TPH-d µg/L	TPH-mo µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L	MtBE µg/L	TBA µg/L	TAME µg/L
MW-1 cont.	2/15/16	674.92	5.94	5.94	0.00	668.98	970	3,700	NA	3.20	<2.5	27	11	75	4,100	7.40
	5/6/16	674.92	5.92	5.92	0.00	669.00	690	2,900	NA	1.80	<1.7	<1.7	<1.7	26	2,900	2.50
	8/17/16	674.92	6.62	6.62	0.00	668.30	940	5,000 Y	NA	<1.7	<1.7	<1.7	<1.7	17	2,300	<1.7
	11/18/16	674.92	6.08	6.08	0.00	668.84	340	3,900	NA	<2.0	<2.0	<2.0	<2.0	12	1,800	<2.0
MW-2	6/6/13	675.02	6.70	6.70	0.00	668.32	16,000	5,400	NA	910	<130	610	2,290	59,000	64,000	7,700
	9/4/13	675.02	7.79	7.79	0.00	667.23	<25,000	3,900	NA	860	<250	710	1,580	32,000	31,000	4,600
	12/30/13	675.02	8.05	8.05	0.00	666.97	<13,000	6,300	NA	180	<130	<130	330	18,000	53,000	1,800
	3/10/14	675.02	6.08	6.08	0.00	668.94	14,000	11,000	NA	210	<130	360	700	15,000	40,000	1,800
	6/3/14	675.02	7.54	7.54	0.00	667.48	<7,100	6,200	NA	170	<71	310	150	8,000	29,000	920
	8/27/14	675.02	7.90	7.90	0.00	667.12	3,400	5,000	NA	100	<8.3	120	88	2,300	25,000	310
	11/13/14	675.02	8.12	8.12	0.00	666.90	1,000*	4,700	NA	120	<8.3	11	<8.3	4,000	22,000	460
	2/12/15	675.02	6.33	6.33	0.00	668.69	<4,200	5,400	NA	98	<42	58	<42	6,300	42,000	610
	5/13/15	675.02	7.72	7.72	0.00	667.30	<2,000	4,900	NA	86	<20	45	<20	870	34,000	96
	6/22/15	675.02	11.30	11.30	0.00	663.72	<2,000	3,300	NA	<20	<20	<20	<20	3,400	18,000	460
	8/12/15	675.02	8.86	8.86	0.00	666.16	<2,000	2,800 Y	NA	<20	<20	<20	<20	470	23,000	31
	11/12/15	675.02	8.30	8.30	0.00	666.72	<2,000	1,800	NA	<20	<20	<20	<20	340	37,000	25
	2/15/16	675.02	6.67	6.67	0.00	668.35	620	1,900	NA	32	<2.0	8.2	<2.0	180	26,000	15
5/6/16	675.02	5.72	5.72	0.00	669.30	1,200	1,700	NA	43	<2.5	14	<2.5	220	19,000	20	
8/17/16	675.02	7.67	7.67	0.00	667.35	<710	1,100	NA	20	<7.1	<7.1	<7.1	140	10,000	10	
11/18/16	675.02	6.95	6.95	0.00	668.07	<710	1,100	NA	9.80	<7.1	<7.1	<7.1	40	6,400	<7.1	
MW-3 Post-MPE	5/13/15	675.58	6.60	6.60	0.00	668.98	<50	7,000	NA	<0.5	<0.5	<0.5	0.75	160	380	8.4
	6/22/15	675.58	14.31	14.31	0.00	661.27	<100	650 Y	NA	<1.0	<1.0	<1.0	<1.0	190	17	6.3
	8/12/15	675.58	7.80	7.80	0.00	667.78	<170	410 Y	NA	<1.7	<1.7	<1.7	<1.7	590	41	20
	11/12/15	675.58	7.78	7.78	0.00	667.80	<50	220 Y	NA	<0.5	<0.5	<0.5	<0.5	67	<10	1.70
	2/15/16	675.58	5.40	5.40	0.00	670.18	<50	370 Y	NA	<0.5	<0.5	<0.5	<0.5	140	<10	3.20
	5/6/16	675.58	5.68	5.68	0.00	669.90	140	490 Y	NA	<0.5	<0.5	<0.5	<0.5	190	9,000	10
	8/17/16	675.58	6.37	6.37	0.00	669.21	<50	870 Y	NA	<0.5	<0.5	<0.5	<0.5	30	19	1.30
11/18/16	675.58	5.71	5.71	0.00	669.87	<50	460 Y	NA	<0.5	<0.5	<0.5	<0.5	2.10	<10	<0.5	
ESLs (µg/L)	Ground-water						100	100	NA	1.00	40	13	20	5.00	12	NL
	Vapor Intrusion						NV	NV	NV	1.10	3,600	13	1,300	1,200	NV	NL

Note:

< : Below Laboratory Reporting Limit (Method Detection Limit)

x : Does not match pattern of reference Gasoline standard/ Not typical of diesel standard pattern (possibly fuel lighter than diesel)

* : Laboratory instruments for EPA8260 were down. Therefore, TPH-g was analyzed by EPA8015B instead of EPA8260 for samples collected on 11/13/2014

ESL: Environmental Screening Level by California Regional Water Quality Control Board San Francisco Bay Region, February 2016

NL: Not Listed

NV: No Value

Appendix A

Standard Operating Procedures for Conducting Groundwater Monitoring Activities

Standard Operating Procedures for Conducting Groundwater Monitoring Activities

Water Level Measurements

Prior to measurement of groundwater depth at each monitoring well, equalization with the surrounding aquifer must be achieved. Initially, the well cap is removed and the pressure is allowed to dissipate, creating a more stable water table level within the well. After about 10-15 minutes, once the water level in the well stabilizes, the depth to groundwater in each monitoring well is measured from the top of the casing to the nearest 0.01 foot using an electric sounder.

Purging and Field Measurements

Prior to sample collection, each monitoring well is purged using a battery-operated, 2-inch-diameter pump (Model ES-60 DC). To ensure that final samples are in equilibrium with, and representative of, the surrounding groundwater, during purging several samples are taken for field measurements of pH, temperature and electrical conductivity (EC). These parameters are measured with a Hanna pH, conductivity, and temperature meter. Equipment is calibrated on-site using standard solutions and procedures provided by the manufacturer.

The pH of groundwater has an effect on the activity of microbial populations in the groundwater. The groundwater temperature affects the metabolic activity of bacteria. The groundwater EC is directly related to the concentration of total dissolved solids (TDS) in solution.

Purging continues until these parameters stabilize or three casing volumes are purged.

Sampling

For sampling purposes, after purging a disposable polyethylene bailer is used to collect sufficient samples from each monitoring well for laboratory analyses. Groundwater samples are transferred to 40-mL VOA vials and preserved with hydrochloric acid. The vials are sealed to prevent air bubbles from forming within the headspace. For TPH-d and TPH-mo analysis, groundwater samples are collected using 1-L, amber, nonpreserved glass containers. Samples are placed in an ice-filled cooler and maintained at 4°C. A chain of custody form for all samples is prepared to accompany the samples, which are promptly delivered to a California state-certified analytical laboratory.

Appendix B

Tables of Elevations and Coordinates on Wells,
Field Measurements of Physical and Chemical
Parameters of the Groundwater Samples
and Groundwater Gradient Calculations

DATE: 5/28/2013
JOB# 13004

**TABLE OF ELEVATIONS & COORDINATES
ON MONITORING WELLS**
SOMA ENVIRONMENTAL ENGINEERING
2844 MOUNTAIN BLVD
OAKLAND, CA 94602

WELL ID #	NORTHING (FT.) / LATITUDE (D.DEG.)	EASTING (FT.) / LONGITUDE (D.DEG.)	ELEVATION (FT.)	DESCRIPTION
MW-1	2122404.169	6071174.709	674.92	SET NOTCH N. SIDE 4" PVC
	N37.81151896	W122.1980061	675.50	SET PUNCH N. SIDE
			675.49	NORTH SIDE AC
MW-2	2122393.627	6071186.912	675.02	SET NOTCH N. SIDE 4" PVC
	N37.81149062	W122.1979632	675.53	SET PUNCH N. SIDE
			675.51	
RS-3	2122442.569	6071215.114	676.08	SET NOTCH N. SIDE 4" PVC
	N37.81162641	W122.1978687	676.47	SET PUNCH N. SIDE
			676.38	NORTH SIDE AC
RS-4	2122379.611	6071195.421	675.27	TOP 4" PVC
	N37.81145256	W122.1979329	675.70	SET PUNCH N. SIDE
			675.59	NORTH SIDE AC

HORIZONTAL CONTROL: CALIFORNIA COORDINATE SYSTEM ZONE 3, NAD83.
ELLIPSOID: WGS 1984
EPOCH: NAD_83 (2011) 2010.0000
GEOID MODEL: GEOID12A

VERTICAL CONTROL: BENCH MARK: CITY OF OAKLAND BM 2806
CINCH NAIL IN SOUTHWESTERLY CURB OF MOUNTAIN BLVD, 150' SOUTHEASTERLY FROM THE CENTERLINE OF KEARNEY AVE EXTENDED. NORTHING 2,122,547.687', EASTING 6,070,956.301' ELEVATION= 674.892' NAVD 88 DATUM



EQUIPMENT USED: TRIMBLE GPS-R8 & TS S6, TOPCON AT-G2 LEVEL

E. Espinoza
6/03/13

EDGIS LAND SURVEYING
LAND SURVEYING AND MAPPING
1374 Garland Avenue, Clovis, CA 93612
Phone (559) 803-2679
email: edgis@aol.com



ENVIRONMENTAL ENGINEERING, INC

Well No.: RS-3
 Casing Diameter: 4 inches
 Depth of Well: 23.35 feet
 Top of Casing Elevation: 676.08 feet
 Depth to Groundwater: 6.18 feet
 Groundwater Elevation: 669.90 feet
 Water Column Height: 17.17 feet
 Purged Volume: 10 gallons

Project No.: 5081
 Address: 2844 Mountain Blvd.
 Oakland, CA
 Date: November 18, 2016
 Sampler: Davoud Bazrpash

Purging Method: Bailer Pump

Sampling Method: Bailer Pump

Color: Yes No Describe: Clear

Sheen: Yes No Describe: _____

Odor: Yes No Describe: _____

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
11/18/16 START 9:40				704
9:50	2	7.51	20.0	704
9:55	5	7.39	19.7	677
10:00	7	7.07	19.2	655
10:07	10	7.02	19.6	639
START SAMPLING 10:20				

Notes:



ENVIRONMENTAL ENGINEERING, INC

Well No.: RS-4
 Casing Diameter: 4 inches
 Depth of Well: 25.50 feet
 Top of Casing Elevation: 675.27 feet
 Depth to Groundwater: 8.80 feet
 Groundwater Elevation: 666.47 feet
 Water Column Height: 16.7 feet
 Purged Volume: 10 gallons

Project No.: 5081
 Address: 2844 Mountain Blvd.
 Oakland, CA
 Date: November 18, 2016
 Sampler: Davoud Bazrpash

Purging Method: Bailer Pump

Sampling Method: Bailer Pump

Color: Yes No Describe: Clear

Sheen: Yes No Describe: _____

Odor: Yes No Describe: petroleum

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
START 11/18/16				
12:30	2	6.73	20.3	992
12:35	5	6.87	20.1	962
12:40	7	6.88	20.2	947
12:45	10	6.87	20.4	902
STOP SAMPLING	15.05			

Notes:



ENVIRONMENTAL ENGINEERING, INC

Well No.: MW-1
 Casing Diameter: 4 inches
 Depth of Well: 19.70 feet
 Top of Casing Elevation: 674.92 feet
 Depth to Groundwater: 6.08 feet
 Groundwater Elevation: 668.84 feet
 Water Column Height: 13.62 feet
 Purged Volume: 10 gallons

Project No.: 5081
 Address: 2844 Mountain Blvd.
 Oakland, CA
 Date: November 18, 2016
 Sampler: Davoud Bazrpash

Purging Method: Bailer Pump

Sampling Method: Bailer Pump

Color: Yes No Describe: cloudy

Sheen: Yes No Describe: _____

Odor: Yes No Describe: petroleum

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
11/18/16 11:10				
11:15	2	6.68	20.3	710
11:20	5	6.72	20.6	691
11:25	7	6.78	20.7	676
11:30	10	6.82	20.6	656
START SAMPLING	11:40			

Notes:



ENVIRONMENTAL ENGINEERING, INC

Well No.: MW-2 Project No.: 5081
Casing Diameter: 4 inches Address: 2844 Mountain Blvd.
Depth of Well: 19.75 feet Oakland, CA
Top of Casing Elevation: 675.02 feet Date: November 18, 2016
Depth to Groundwater: 6.95 feet Sampler: Davoud Bazrpash
Groundwater Elevation: 668.07 feet
Water Column Height: 12.8 feet
Purged Volume: 10 gallons

Purging Method: Bailer Pump
Sampling Method: Bailer Pump

Color: Yes No Describe: cloudy clear
Sheen: Yes No Describe: _____
Odor: Yes No Describe: Petroleum

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
Start 11:18:16				
11:45	2	6.70	20.3	727
11:50	5	6.76	20.4	685
11:55	7	6.77	20.4	681
12:00	10	6.86	20.3	674
Start Sampling 12:15				

Notes:



ENVIRONMENTAL ENGINEERING, INC

Well No.:	<u>MW-3</u>	Project No.:	5081
Casing Diameter:	<u>4</u> inches	Address:	2844 Mountain Blvd.
Depth of Well:	<u>24.60</u> feet		Oakland, CA
Top of Casing Elevation:	<u>675.58</u> feet	Date:	November 18, 2016
Depth to Groundwater:	<u>5.71</u> feet	Sampler:	Davoud Bazrpash
Groundwater Elevation:	<u>669.87</u> feet		
Water Column Height:	<u>18.89</u> feet		
Purged Volume:	<u>10</u> gallons		

Purging Method: Bailer Pump

Sampling Method: Bailer Pump

Color: Yes No Describe: clear

Sheen: Yes No Describe: _____

Odor: Yes No Describe: _____

Field Measurements:

Time	Vol (gallons)	pH	Temp (°C)	E.C. (µs/cm)
START 11/18/11 10:30				
10:35	2	7.09	19.8	612
10:40	5	7.08	20.4	616
10:45	7	7.12	20.4	615
10:50	10	7.17	20.2	616
START SAMPLING	11:00			

Notes:



EPA On-line Tools for Site Assessment Calculation

Hydraulic Gradient -- Magnitude and Direction

Gradient Calculation from fitting a plane to as many as thirty points

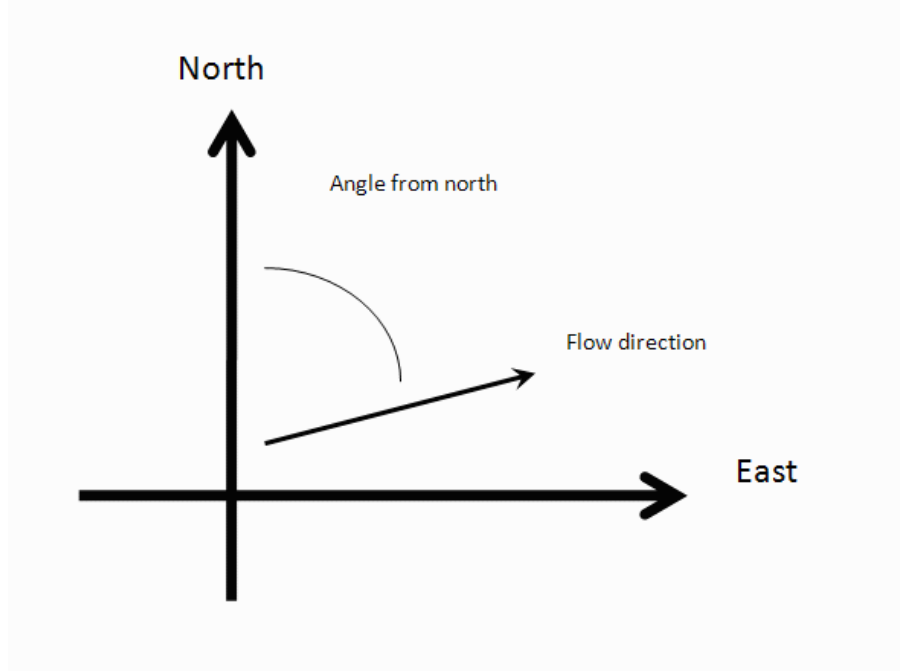
$$\begin{aligned}
 a x_1 + b y_1 + c &= h_1 \\
 a x_2 + b y_2 + c &= h_2 \\
 a x_3 + b y_3 + c &= h_3 \\
 &\dots \\
 a x_{30} + b y_{30} + c &= h_{30}
 \end{aligned}$$

where (x_i, y_i) are the coordinates of the well and h_i is the head

$i = 1, 2, 3, \dots, 30$

The coefficients a , b , and c are calculated by a least-squares fitting of the the data to a plane

The gradient is calculated from the square root of $(a^2 + b^2)$ and the angle from the arctangent of a/b or b/a depending on the quadrant



Inputs

Example Data Set 1	Example Data Set 2	Calculate	Clear
Save Data	Recall Data	Go Back	
Site Name	2844 Mountain Blvd., Oakl		
Date	November 18, 2016	Current Date	
Calculation basis	Head		
Coordinates	ft		
I.D.	x-coordinate	y-coordinate	head ft
1) RS-3	6071215.111	2122442.671	669.90
2) RS-4	6071195.458	2122379.324	666.47
3) MW-1	6071174.931	2122404.178	668.84
4) MW-2	6071186.39	2122393.492	668.07
5) MW-3	6071190.453	2122428.874	669.87
6)			
7)			
8)			
9)			
10)			
11)			
12)			
13)			
14)			
15)			
16)			

17)				
18)				
19)				
20)				
21)				
22)				
23)				
24)				
25)				
26)				
27)				
28)				
29)				
30)				

Results

Number of Points Used in Calculation	5
Max. Difference Between Head Values	1.045
Gradient Magnitude (i)	0.07310
Flow direction as degrees from North (positive y axis)	149.9
Coefficient of Determination (R^2)	0.990

WCMS

Last updated on 2/23/2016

Appendix C

Laboratory Report and Chain of Custody Form



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

**Laboratory Job Number 283551
ANALYTICAL REPORT**

SOMA Environmental Engineering Inc. Project : 5081	Location : 2844 Mountain Blvd., Oakland
6620 Owens Dr.	Level : II
Pleasanton, CA 94588	

<u>Sample ID</u>	<u>Lab ID</u>
RS-3	283551-001
RS-4	283551-002
MW-1	283551-003
MW-2	283551-004
MW-3	283551-005

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 signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____

Tracy Babjar
Project Manager
tracy.babjar@ctberk.com
(510) 204-2226

Date: 12/01/2016

CASE NARRATIVE

Laboratory number: 283551
Client: SOMA Environmental Engineering Inc.
Project: 5081
Location: 2844 Mountain Blvd., Oakland
Request Date: 11/18/16
Samples Received: 11/18/16

This data package contains sample and QC results for five water samples, requested for the above referenced project on 11/18/16. The samples were received cold and intact.

TPH-Extractables by GC (EPA 8015B):

No analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B):

Low recovery was observed for 1,2-dibromoethane in the BSD for batch 241820; the associated RPD was within limits, and the low recovery was not associated with any reported results. No other analytical problems were encountered.

COOLER RECEIPT CHECKLIST



Login # 283551 Date Received 11/18/16 Number of coolers 1
Client SOMA Project 5081

Date Opened 11/18 By (print) CB (sign) [Signature]
Date Logged in [Signature] By (print) DTN (sign) [Signature]
Date Labeled [Signature] By (print) CB (sign) [Signature]

1. Did cooler come with a shipping slip (airbill, etc) YES NO
Shipping info

2A. Were custody seals present? ... YES (circle) on cooler on samples NO
How many Name Date

2B. Were custody seals intact upon arrival? YES NO N/A

3. Were custody papers dry and intact when received? YES NO

4. Were custody papers filled out properly (ink, signed, etc)? YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO

6. Indicate the packing in cooler: (if other, describe)
Bubble Wrap, Foam blocks, Bags, None, Cloth material, Cardboard, Styrofoam, Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: Wet, Blue/Gel, None, Temp(°C)

Temperature blank(s) included? Thermometer# IR Gun#

Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES NO
If YES, what time were they transferred to freezer?

9. Did all bottles arrive unbroken/unopened? YES NO

10. Are there any missing / extra samples? YES NO

11. Are samples in the appropriate containers for indicated tests? YES NO

12. Are sample labels present, in good condition and complete? YES NO

13. Do the sample labels agree with custody papers? YES NO

14. Was sufficient amount of sample sent for tests requested? YES NO

15. Are the samples appropriately preserved? YES NO N/A

16. Did you check preservatives for all bottles for each sample? YES NO N/A

17. Did you document your preservative check? (pH strip lot#) YES NO N/A

18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO N/A

19. Did you change the hold time in LIMS for preserved terracores? YES NO N/A

20. Are bubbles > 6mm absent in VOA samples? YES NO N/A

21. Was the client contacted concerning this sample delivery? YES NO
If YES, Who was called? By Date:

COMMENTS

[Blank lines for comments]

Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	283551	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3520C
Project#:	5081	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	241699
Units:	ug/L	Prepared:	11/22/16
Diln Fac:	1.000		

Type: BS Analyzed: 11/23/16
 Lab ID: QC861804

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,967	119	60-121

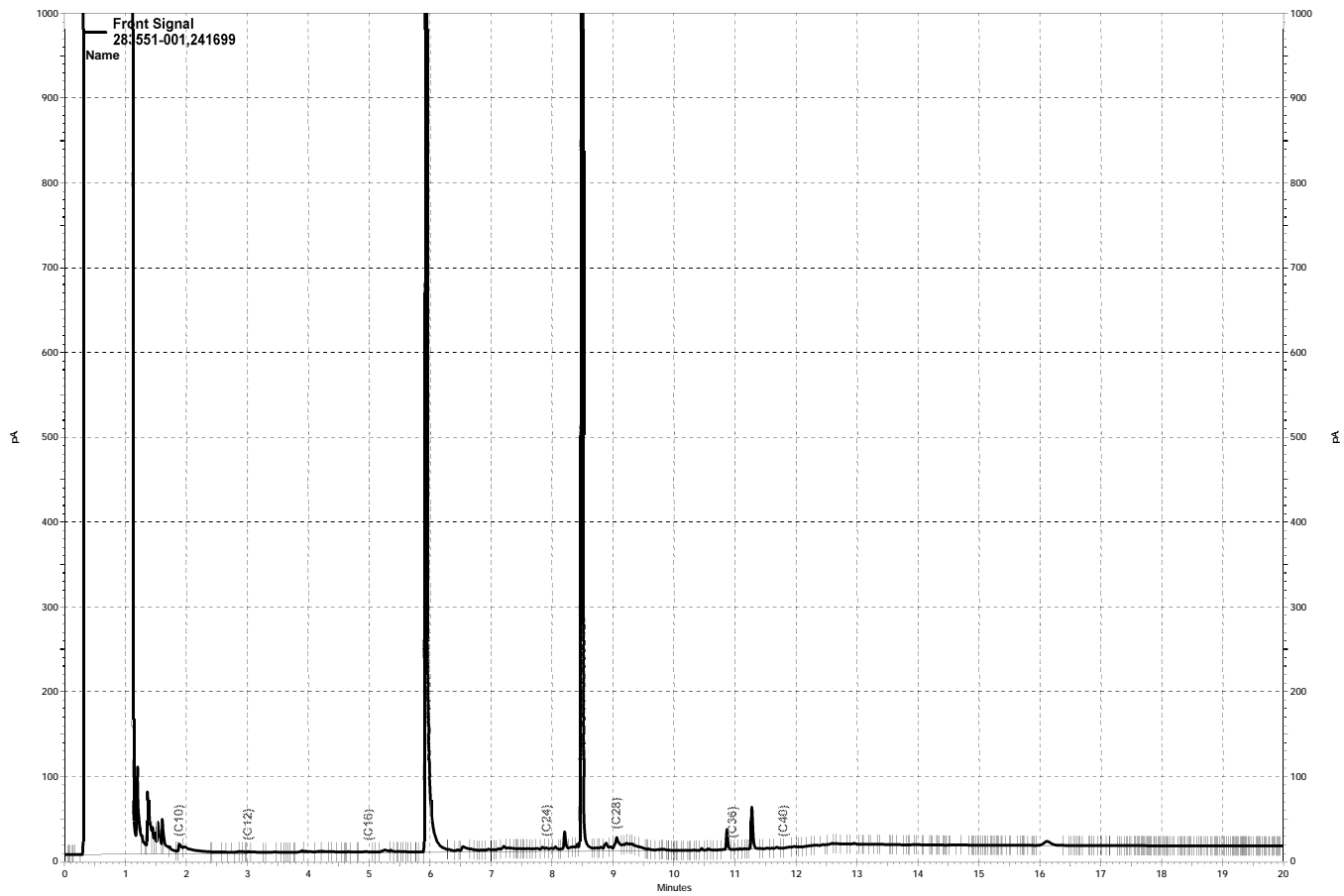
Surrogate	%REC	Limits
o-Terphenyl	94	67-136

Type: BSD Analyzed: 11/24/16
 Lab ID: QC861805

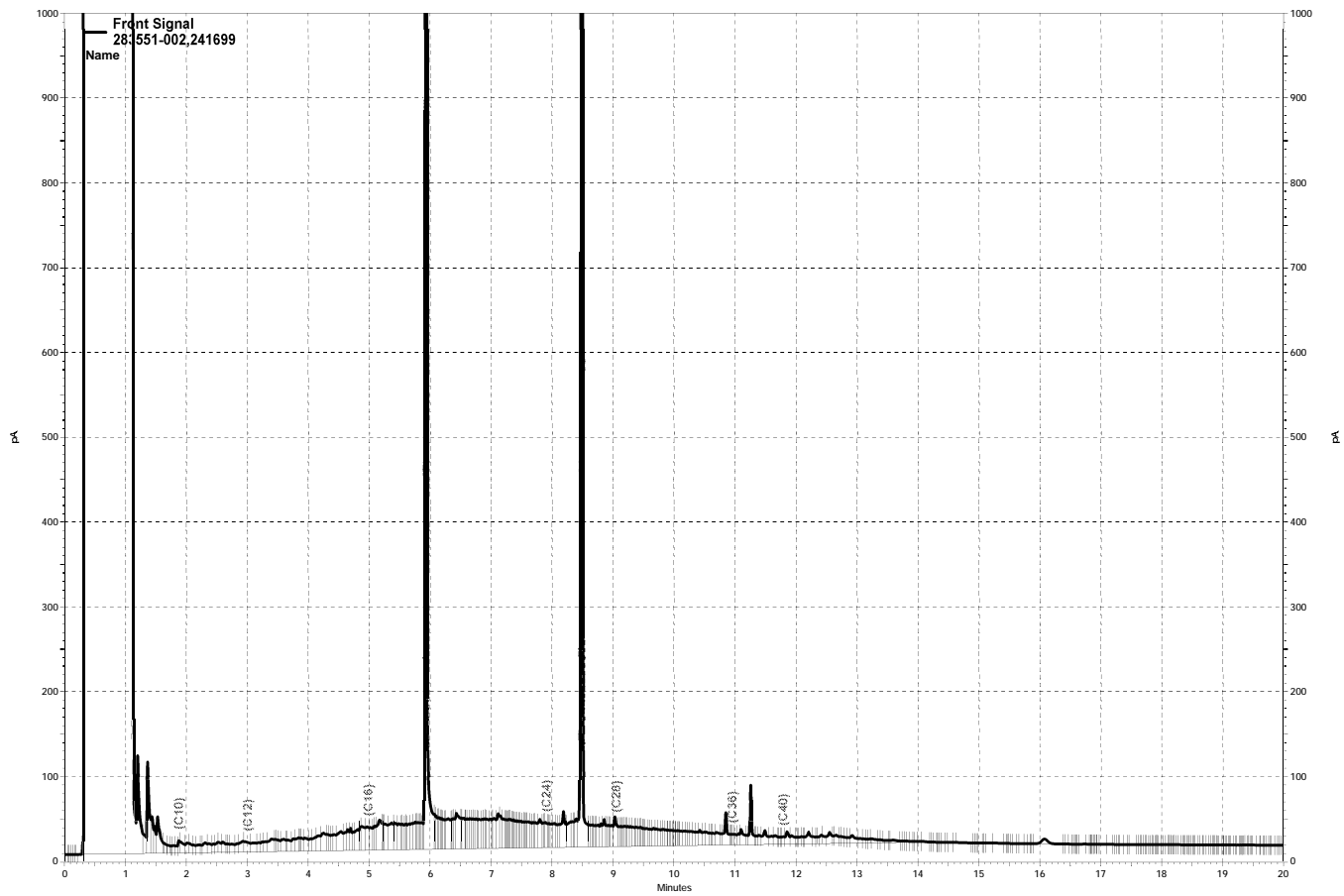
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,822	113	60-121	5	32

Surrogate	%REC	Limits
o-Terphenyl	89	67-136

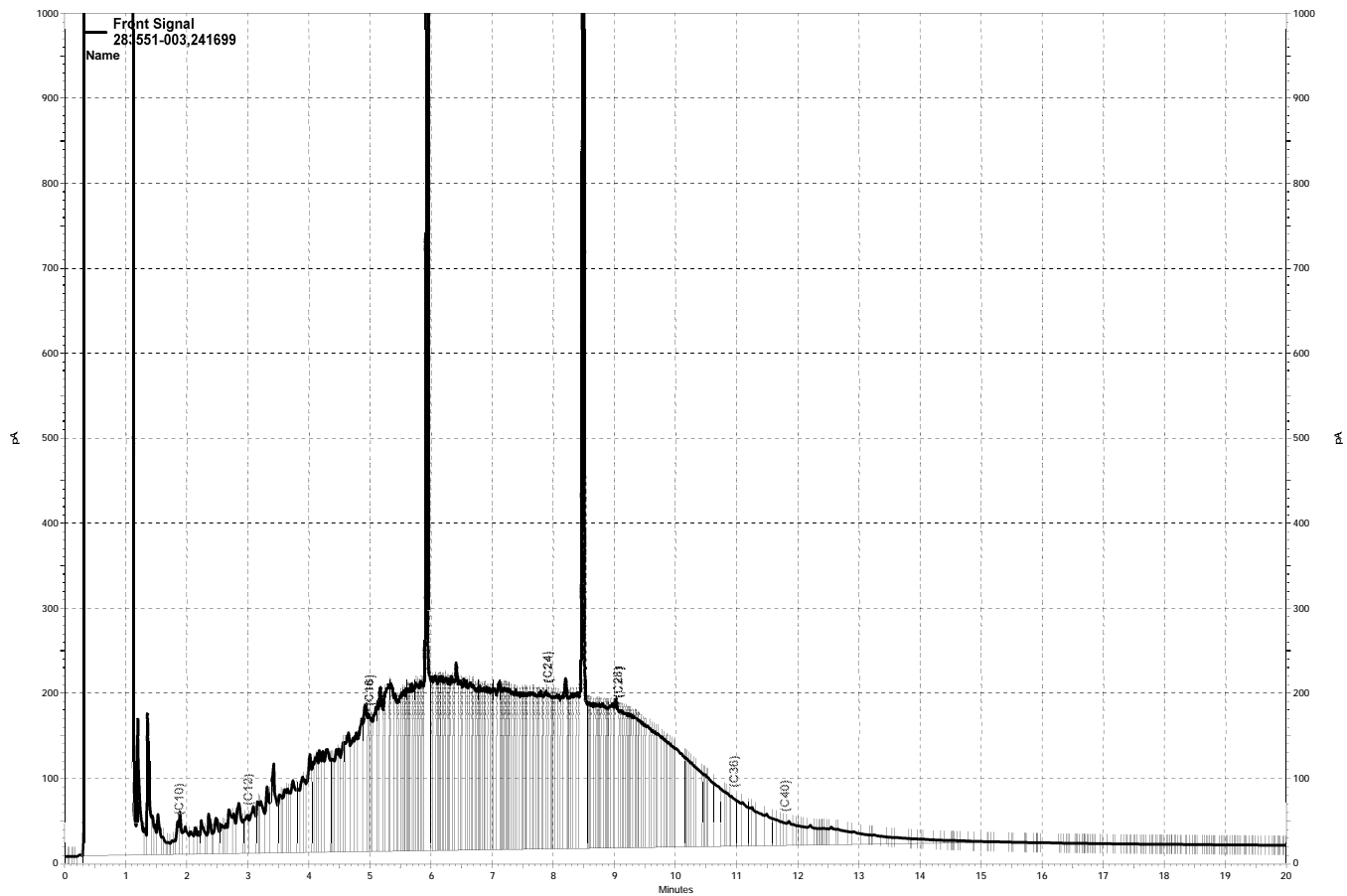
RPD= Relative Percent Difference



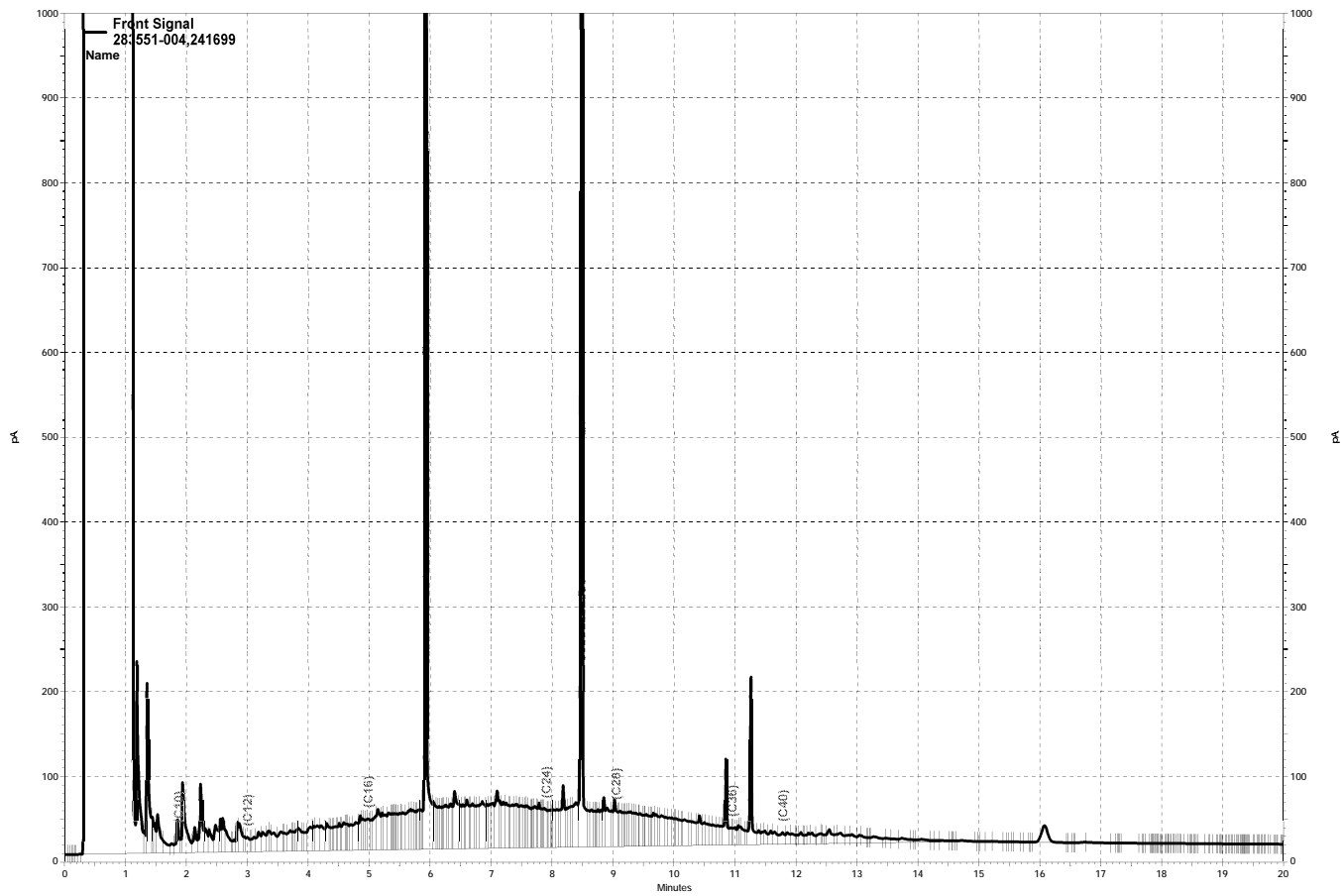
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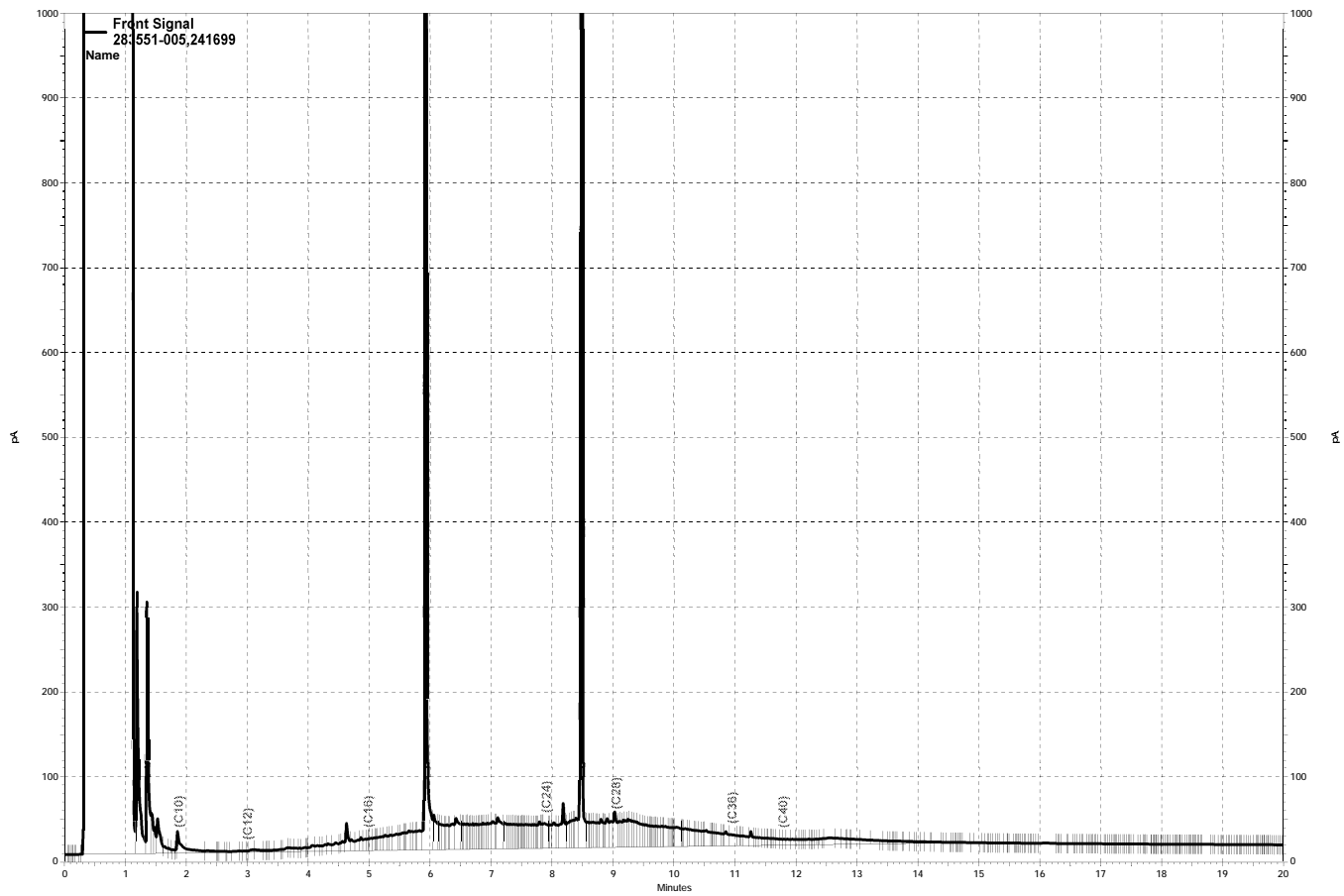
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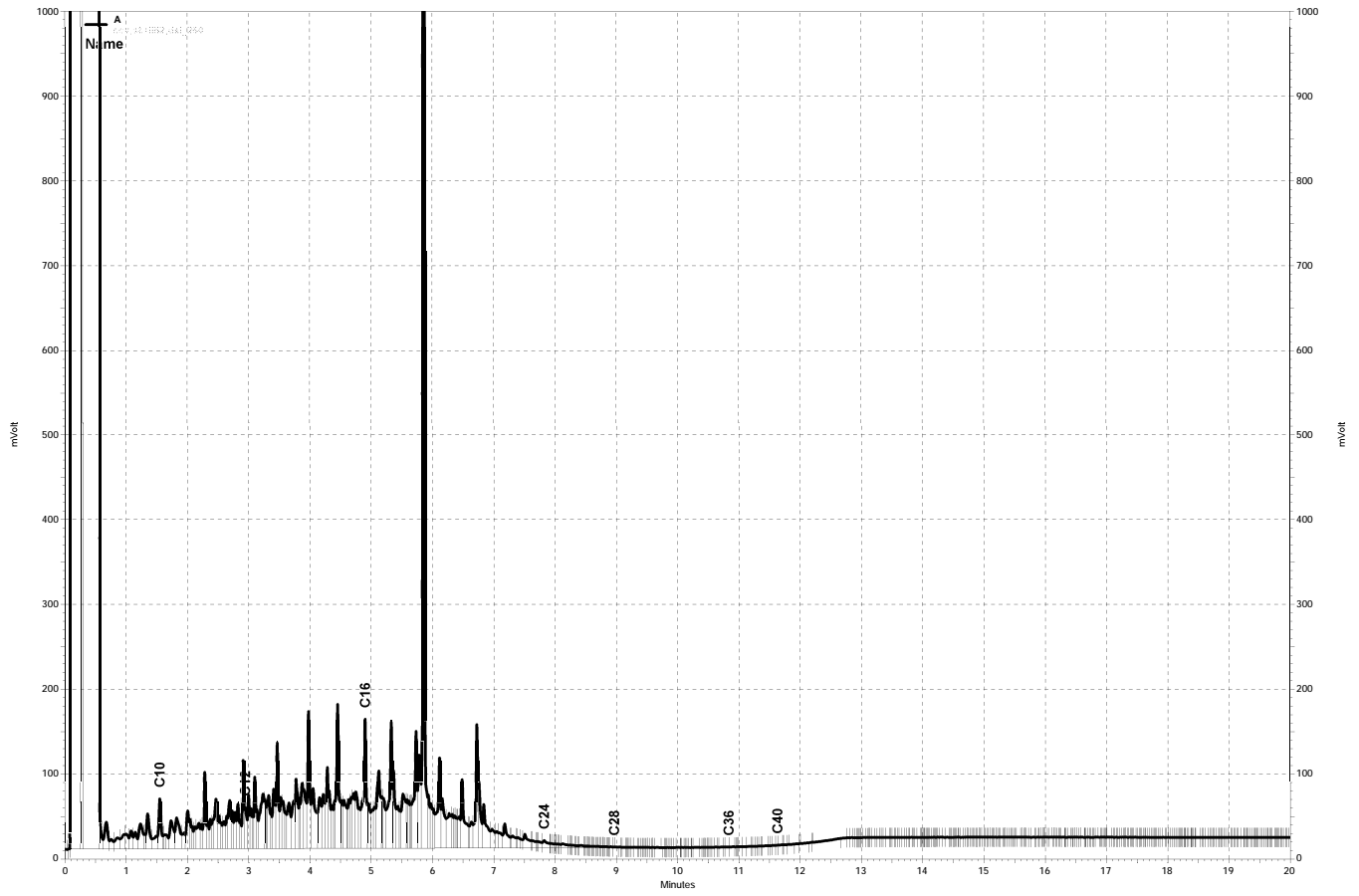
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Purgeable Organics by GC/MS

Lab #: 283551	Location: 2844 Mountain Blvd., Oakland
Client: SOMA Environmental Engineering Inc.	Prep: EPA 5030B
Project#: 5081	Analysis: EPA 8260B
Field ID: RS-3	Batch#: 241756
Lab ID: 283551-001	Sampled: 11/18/16
Matrix: Water	Received: 11/18/16
Units: ug/L	Analyzed: 11/27/16
Diln Fac: 1.000	

Analyte	Result	RL
Gasoline C7-C12	ND	50
tert-Butyl Alcohol (TBA)	ND	10
Isopropyl Ether (DIPE)	ND	0.50
Ethyl tert-Butyl Ether (ETBE)	ND	0.50
Methyl tert-Amyl Ether (TAME)	ND	0.50
Ethanol	ND	1,000
MTBE	ND	0.50
1,2-Dichloroethane	ND	0.50
Benzene	ND	0.50
Toluene	ND	0.50
1,2-Dibromoethane	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	96	80-128
1,2-Dichloroethane-d4	82	75-139
Toluene-d8	96	80-120
Bromofluorobenzene	91	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Organics by GC/MS

Lab #: 283551	Location: 2844 Mountain Blvd., Oakland
Client: SOMA Environmental Engineering Inc.	Prep: EPA 5030B
Project#: 5081	Analysis: EPA 8260B
Field ID: RS-4	Units: ug/L
Lab ID: 283551-002	Sampled: 11/18/16
Matrix: Water	Received: 11/18/16

Analyte	Result	RL	Diln Fac	Batch#	Analyzed
Gasoline C7-C12	ND	100	2.000	241756	11/28/16
tert-Butyl Alcohol (TBA)	5,400	140	14.29	241820	11/29/16
Isopropyl Ether (DIPE)	ND	1.0	2.000	241756	11/28/16
Ethyl tert-Butyl Ether (ETBE)	ND	1.0	2.000	241756	11/28/16
Methyl tert-Amyl Ether (TAME)	13	1.0	2.000	241756	11/28/16
Ethanol	ND	2,000	2.000	241756	11/28/16
MTBE	190	7.1	14.29	241820	11/29/16
1,2-Dichloroethane	ND	1.0	2.000	241756	11/28/16
Benzene	ND	1.0	2.000	241756	11/28/16
Toluene	ND	1.0	2.000	241756	11/28/16
1,2-Dibromoethane	ND	1.0	2.000	241756	11/28/16
Ethylbenzene	ND	1.0	2.000	241756	11/28/16
m,p-Xylenes	ND	1.0	2.000	241756	11/28/16
o-Xylene	ND	1.0	2.000	241756	11/28/16

Surrogate	%REC	Limits	Diln Fac	Batch#	Analyzed
Dibromofluoromethane	97	80-128	2.000	241756	11/28/16
1,2-Dichloroethane-d4	87	75-139	2.000	241756	11/28/16
Toluene-d8	98	80-120	2.000	241756	11/28/16
Bromofluorobenzene	94	80-120	2.000	241756	11/28/16

ND= Not Detected
 RL= Reporting Limit

Purgeable Organics by GC/MS

Lab #: 283551	Location: 2844 Mountain Blvd., Oakland
Client: SOMA Environmental Engineering Inc.	Prep: EPA 5030B
Project#: 5081	Analysis: EPA 8260B
Field ID: MW-1	Batch#: 241826
Lab ID: 283551-003	Sampled: 11/18/16
Matrix: Water	Received: 11/18/16
Units: ug/L	Analyzed: 11/29/16
Diln Fac: 4.000	

Analyte	Result	RL
Gasoline C7-C12	340	200
tert-Butyl Alcohol (TBA)	1,800	40
Isopropyl Ether (DIPE)	ND	2.0
Ethyl tert-Butyl Ether (ETBE)	ND	2.0
Methyl tert-Amyl Ether (TAME)	ND	2.0
Ethanol	ND	4,000
MTBE	12	2.0
1,2-Dichloroethane	ND	2.0
Benzene	ND	2.0
Toluene	ND	2.0
1,2-Dibromoethane	ND	2.0
Ethylbenzene	ND	2.0
m,p-Xylenes	ND	2.0
o-Xylene	ND	2.0

Surrogate	%REC	Limits
Dibromofluoromethane	99	80-128
1,2-Dichloroethane-d4	100	75-139
Toluene-d8	100	80-120
Bromofluorobenzene	102	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Organics by GC/MS

Lab #: 283551	Location: 2844 Mountain Blvd., Oakland
Client: SOMA Environmental Engineering Inc.	Prep: EPA 5030B
Project#: 5081	Analysis: EPA 8260B
Field ID: MW-2	Batch#: 241826
Lab ID: 283551-004	Sampled: 11/18/16
Matrix: Water	Received: 11/18/16
Units: ug/L	Analyzed: 11/29/16
Diln Fac: 14.29	

Analyte	Result	RL
Gasoline C7-C12	ND	710
tert-Butyl Alcohol (TBA)	6,400	140
Isopropyl Ether (DIPE)	ND	7.1
Ethyl tert-Butyl Ether (ETBE)	ND	7.1
Methyl tert-Amyl Ether (TAME)	ND	7.1
Ethanol	ND	14,000
MTBE	40	7.1
1,2-Dichloroethane	ND	7.1
Benzene	9.8	7.1
Toluene	ND	7.1
1,2-Dibromoethane	ND	7.1
Ethylbenzene	ND	7.1
m,p-Xylenes	ND	7.1
o-Xylene	ND	7.1

Surrogate	%REC	Limits
Dibromofluoromethane	101	80-128
1,2-Dichloroethane-d4	96	75-139
Toluene-d8	100	80-120
Bromofluorobenzene	105	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Organics by GC/MS

Lab #: 283551	Location: 2844 Mountain Blvd., Oakland
Client: SOMA Environmental Engineering Inc.	Prep: EPA 5030B
Project#: 5081	Analysis: EPA 8260B
Field ID: MW-3	Batch#: 241756
Lab ID: 283551-005	Sampled: 11/18/16
Matrix: Water	Received: 11/18/16
Units: ug/L	Analyzed: 11/27/16
Diln Fac: 1.000	

Analyte	Result	RL
Gasoline C7-C12	ND	50
tert-Butyl Alcohol (TBA)	ND	10
Isopropyl Ether (DIPE)	ND	0.50
Ethyl tert-Butyl Ether (ETBE)	ND	0.50
Methyl tert-Amyl Ether (TAME)	ND	0.50
Ethanol	ND	1,000
MTBE	2.1	0.50
1,2-Dichloroethane	ND	0.50
Benzene	ND	0.50
Toluene	ND	0.50
1,2-Dibromoethane	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-128
1,2-Dichloroethane-d4	83	75-139
Toluene-d8	96	80-120
Bromofluorobenzene	91	80-120

ND= Not Detected
 RL= Reporting Limit

Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	283551	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	241756
Units:	ug/L	Analyzed:	11/27/16
Diln Fac:	1.000		

Type: BS Lab ID: QC862038

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	62.50	57.74	92	32-155
Isopropyl Ether (DIPE)	12.50	11.83	95	57-128
Ethyl tert-Butyl Ether (ETBE)	12.50	11.60	93	62-120
Methyl tert-Amyl Ether (TAME)	12.50	11.74	94	69-120
MTBE	12.50	10.87	87	65-120
1,2-Dichloroethane	12.50	10.22	82	74-133
Benzene	12.50	13.53	108	80-123
Toluene	12.50	13.03	104	80-121
1,2-Dibromoethane	12.50	10.97	88	80-120
Ethylbenzene	12.50	12.81	103	80-123
m,p-Xylenes	25.00	25.53	102	80-126
o-Xylene	12.50	12.39	99	80-126

Surrogate	%REC	Limits
Dibromofluoromethane	97	80-128
1,2-Dichloroethane-d4	80	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	93	80-120

Type: BSD Lab ID: QC862039

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	62.50	57.59	92	32-155	0	33
Isopropyl Ether (DIPE)	12.50	11.64	93	57-128	2	20
Ethyl tert-Butyl Ether (ETBE)	12.50	11.53	92	62-120	1	20
Methyl tert-Amyl Ether (TAME)	12.50	11.60	93	69-120	1	20
MTBE	12.50	10.83	87	65-120	0	22
1,2-Dichloroethane	12.50	9.780	78	74-133	4	20
Benzene	12.50	13.17	105	80-123	3	20
Toluene	12.50	12.42	99	80-121	5	20
1,2-Dibromoethane	12.50	10.76	86	80-120	2	20
Ethylbenzene	12.50	12.15	97	80-123	5	21
m,p-Xylenes	25.00	24.99	100	80-126	2	21
o-Xylene	12.50	11.81	95	80-126	5	20

Surrogate	%REC	Limits
Dibromofluoromethane	95	80-128
1,2-Dichloroethane-d4	81	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	91	80-120

RPD= Relative Percent Difference

Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	283551	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC862040	Batch#:	241756
Matrix:	Water	Analyzed:	11/27/16
Units:	ug/L		

Analyte	Result	RL
Gasoline C7-C12	ND	50
tert-Butyl Alcohol (TBA)	ND	10
Isopropyl Ether (DIPE)	ND	0.50
Ethyl tert-Butyl Ether (ETBE)	ND	0.50
Methyl tert-Amyl Ether (TAME)	ND	0.50
Ethanol	ND	1,000
MTBE	ND	0.50
1,2-Dichloroethane	ND	0.50
Benzene	ND	0.50
Toluene	ND	0.50
1,2-Dibromoethane	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	93	80-128
1,2-Dichloroethane-d4	82	75-139
Toluene-d8	95	80-120
Bromofluorobenzene	90	80-120

ND= Not Detected
 RL= Reporting Limit

Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	283551	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	241756
Units:	ug/L	Analyzed:	11/27/16
Diln Fac:	1.000		

Type: BS Lab ID: QC862041

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,098	110	76-120

Surrogate	%REC	Limits
Dibromofluoromethane	95	80-128
1,2-Dichloroethane-d4	82	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	93	80-120

Type: BSD Lab ID: QC862042

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	1,000	1,128	113	76-120	3	20

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-128
1,2-Dichloroethane-d4	81	75-139
Toluene-d8	96	80-120
Bromofluorobenzene	91	80-120

RPD= Relative Percent Difference

Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	283551	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	241820
Units:	ug/L	Analyzed:	11/29/16
Diln Fac:	1.000		

Type: BS Lab ID: QC862309

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	62.50	48.03	77	32-155
Isopropyl Ether (DIPE)	12.50	12.00	96	57-128
Ethyl tert-Butyl Ether (ETBE)	12.50	11.45	92	62-120
Methyl tert-Amyl Ether (TAME)	12.50	11.23	90	69-120
MTBE	12.50	10.27	82	65-120
1,2-Dichloroethane	12.50	9.530	76	74-133
Benzene	12.50	13.06	104	80-123
Toluene	12.50	12.15	97	80-121
1,2-Dibromoethane	12.50	10.00	80	80-120
Ethylbenzene	12.50	11.96	96	80-123
m,p-Xylenes	25.00	24.28	97	80-126
o-Xylene	12.50	11.91	95	80-126

Surrogate	%REC	Limits
Dibromofluoromethane	96	80-128
1,2-Dichloroethane-d4	79	75-139
Toluene-d8	98	80-120
Bromofluorobenzene	92	80-120

Type: BSD Lab ID: QC862310

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	62.50	44.75	72	32-155	7	33
Isopropyl Ether (DIPE)	12.50	11.76	94	57-128	2	20
Ethyl tert-Butyl Ether (ETBE)	12.50	11.20	90	62-120	2	20
Methyl tert-Amyl Ether (TAME)	12.50	10.77	86	69-120	4	20
MTBE	12.50	10.04	80	65-120	2	22
1,2-Dichloroethane	12.50	9.354	75	74-133	2	20
Benzene	12.50	12.65	101	80-123	3	20
Toluene	12.50	11.67	93	80-121	4	20
1,2-Dibromoethane	12.50	9.743	78 *	80-120	3	20
Ethylbenzene	12.50	11.64	93	80-123	3	21
m,p-Xylenes	25.00	23.13	93	80-126	5	21
o-Xylene	12.50	11.25	90	80-126	6	20

Surrogate	%REC	Limits
Dibromofluoromethane	97	80-128
1,2-Dichloroethane-d4	79	75-139
Toluene-d8	99	80-120
Bromofluorobenzene	96	80-120

*= Value outside of QC limits; see narrative

RPD= Relative Percent Difference

Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	283551	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC862311	Batch#:	241820
Matrix:	Water	Analyzed:	11/29/16
Units:	ug/L		

Analyte	Result	RL
Gasoline C7-C12	NA	
tert-Butyl Alcohol (TBA)	ND	10
Isopropyl Ether (DIPE)	ND	0.50
Ethyl tert-Butyl Ether (ETBE)	ND	0.50
Methyl tert-Amyl Ether (TAME)	ND	0.50
Ethanol	ND	1,000
MTBE	ND	0.50
1,2-Dichloroethane	ND	0.50
Benzene	ND	0.50
Toluene	ND	0.50
1,2-Dibromoethane	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	98	80-128
1,2-Dichloroethane-d4	78	75-139
Toluene-d8	99	80-120
Bromofluorobenzene	99	80-120

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

Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	283551	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	241826
Units:	ug/L	Analyzed:	11/29/16
Diln Fac:	1.000		

Type: BS Lab ID: QC862340

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	62.50	55.48	89	32-155
Isopropyl Ether (DIPE)	12.50	12.29	98	57-128
Ethyl tert-Butyl Ether (ETBE)	12.50	12.82	103	62-120
Methyl tert-Amyl Ether (TAME)	12.50	12.13	97	69-120
MTBE	12.50	11.87	95	65-120
1,2-Dichloroethane	12.50	12.41	99	74-133
Benzene	12.50	12.93	103	80-123
Toluene	12.50	13.12	105	80-121
1,2-Dibromoethane	12.50	12.16	97	80-120
Ethylbenzene	12.50	12.99	104	80-123
m,p-Xylenes	25.00	26.16	105	80-126
o-Xylene	12.50	12.33	99	80-126

Surrogate	%REC	Limits
Dibromofluoromethane	103	80-128
1,2-Dichloroethane-d4	102	75-139
Toluene-d8	100	80-120
Bromofluorobenzene	104	80-120

Type: BSD Lab ID: QC862341

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	62.50	53.63	86	32-155	3	33
Isopropyl Ether (DIPE)	12.50	12.02	96	57-128	2	20
Ethyl tert-Butyl Ether (ETBE)	12.50	12.75	102	62-120	1	20
Methyl tert-Amyl Ether (TAME)	12.50	11.96	96	69-120	1	20
MTBE	12.50	11.98	96	65-120	1	22
1,2-Dichloroethane	12.50	12.06	97	74-133	3	20
Benzene	12.50	12.00	96	80-123	7	20
Toluene	12.50	12.40	99	80-121	6	20
1,2-Dibromoethane	12.50	12.06	97	80-120	1	20
Ethylbenzene	12.50	12.04	96	80-123	8	21
m,p-Xylenes	25.00	24.20	97	80-126	8	21
o-Xylene	12.50	12.02	96	80-126	3	20

Surrogate	%REC	Limits
Dibromofluoromethane	104	80-128
1,2-Dichloroethane-d4	104	75-139
Toluene-d8	100	80-120
Bromofluorobenzene	105	80-120

RPD= Relative Percent Difference

Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	283551	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC862342	Batch#:	241826
Matrix:	Water	Analyzed:	11/29/16
Units:	ug/L		

Analyte	Result	RL
Gasoline C7-C12	ND	50
tert-Butyl Alcohol (TBA)	ND	10
Isopropyl Ether (DIPE)	ND	0.50
Ethyl tert-Butyl Ether (ETBE)	ND	0.50
Methyl tert-Amyl Ether (TAME)	ND	0.50
Ethanol	ND	1,000
MTBE	ND	0.50
1,2-Dichloroethane	ND	0.50
Benzene	ND	0.50
Toluene	ND	0.50
1,2-Dibromoethane	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	107	80-128
1,2-Dichloroethane-d4	108	75-139
Toluene-d8	101	80-120
Bromofluorobenzene	108	80-120

ND= Not Detected
 RL= Reporting Limit

