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**FIRST SEMIANNUAL 2017  
GROUNDWATER MONITORING AND  
PRODUCT EXTRACTION REPORT**

**BRIDGEWATER APARTMENTS PHASE I PARKING GARAGE  
6400 CHRISTIE AVENUE  
EMERYVILLE, CALIFORNIA**

*Prepared for:*

**EMERYBAY COMMERCIAL ASSOCIATION  
EMERYVILLE, CA 94608**

**May 2017**

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GROUNDWATER MONITORING AND  
PRODUCT EXTRACTION REPORT**

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6400 CHRISTIE AVENUE  
EMERYVILLE, CALIFORNIA**

*Prepared for:*

**EMERYBAY COMMERCIAL ASSOCIATION  
6475 CHRISTIE AVENUE, SUITE 550  
EMERYVILLE, CA 94608**

*Prepared by:*

**STELLAR ENVIRONMENTAL SOLUTIONS, INC.  
2198 SIXTH STREET  
BERKELEY, CALIFORNIA 94710**

**May 30, 2017**

Project No. 2007-65

May 30, 2017

Mr. Mark Detterman  
Hazardous Materials Specialist  
Alameda County Department of Environmental Health  
Local Oversight Program  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

Subject: First Semiannual 2017 Groundwater Monitoring & Product Extraction Report  
EmeryBay Commercial Association Phase I Condo Parking Garage  
6400 Christie Avenue, Emeryville, California.

Dear Mr. Detterman:

Enclosed is the Stellar Environmental Solutions, Inc. report summarizing the site activities conducted in March 2017 at the referenced site. This report is being submitted on behalf of the owner and Responsible Party, Emerybay Commercial Association. Subject site activities since the second semiannual monitoring event of 2016 include collecting and analyzing groundwater samples from the three trench well arrays to evaluate the viability of previous 2016 Nutrisulfate<sup>®</sup> injections, one (partial) product extraction event and the first semiannual 2017 groundwater monitoring event.

This report summarizes the 27<sup>th</sup> sampling event conducted at the site since 1988. The bulk of the residual contamination beneath the site remains concentrated around wells MW-8, MW-10, MW-12, MW-13, MW-14, MW-15, MW-E, RW-1, and the plume underlying the parking garage. In accordance with regulatory requirements, an electronic copy of this report has been uploaded to ACEH and to the State Water Resources Control Board's GeoTracker system.

We declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report are true and correct to the best of our knowledge. If you have any questions regarding this report, please contact us at (510) 644-3123.

Sincerely,



Richard S. Makdisi, P.G.  
Principal Geochemist & President



Ms. Katherine Collins  
Emerybay Commercial Assoc.



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# **1.0 INTRODUCTION**

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## **PROJECT BACKGROUND**

The subject property, located at 6400 Christie Avenue in Emeryville, California, is owned by the Emerybay Commercial Association, for which Stellar Environmental Solutions, Inc. (Stellar Environmental) provides environmental consulting services. The site has undergone fuel tank-related investigations and remediation since 1988 (by Stellar Environmental since 2007). All known environmental documents for the subject property are listed in the References and Bibliography section (Section 7.0) of this report. Previous remediation and investigation activities are outlined in the final subsection of this chapter.

## **SITE AND VICINITY DESCRIPTION**

The project site is located at 6400 Christie Avenue in Emeryville, California (see Figure 1). The project site, which slopes to the south, is wholly developed with an open ground-floor parking area and apartment complex known as the Bridgewater Phase I Condos and parking garage. The area of monitoring and product extraction is primarily located in the northeastern portion of the parking garage. Figure 2 is a site plan. The site is bordered to the east by the Emery Bay Phase II Condos and parking garage, to the north by 65<sup>th</sup> Street, beyond Christie Avenue and to the west by the Bay Center Offices, and to the south by 64<sup>th</sup> Street. The surrounding area is developed with apartment complexes, offices, and commercial stores.

## **PREVIOUS INVESTIGATIONS**

Historical groundwater well analytical results are presented in Appendix A, and are discussed in detail in Section 5.0 of this report.

The subject property parcel was developed as early as 1958 with the Garrett Motor Freight Station, associated with Delta Lines, Inc. The Delta Lines complex contained an “Oil and Gas” building, located at the site of the present-day Emery Bay Phase I Condo complex and parking garage. The building remained on the property until 1986, when it was demolished to build the present-day structures. Twelve underground fuel storage tanks (UFSTs) containing diesel and gasoline were removed from the Emery Bay Phase I and Phase II Condo complex parcels in 1987, at which time soil and groundwater contamination was discovered.

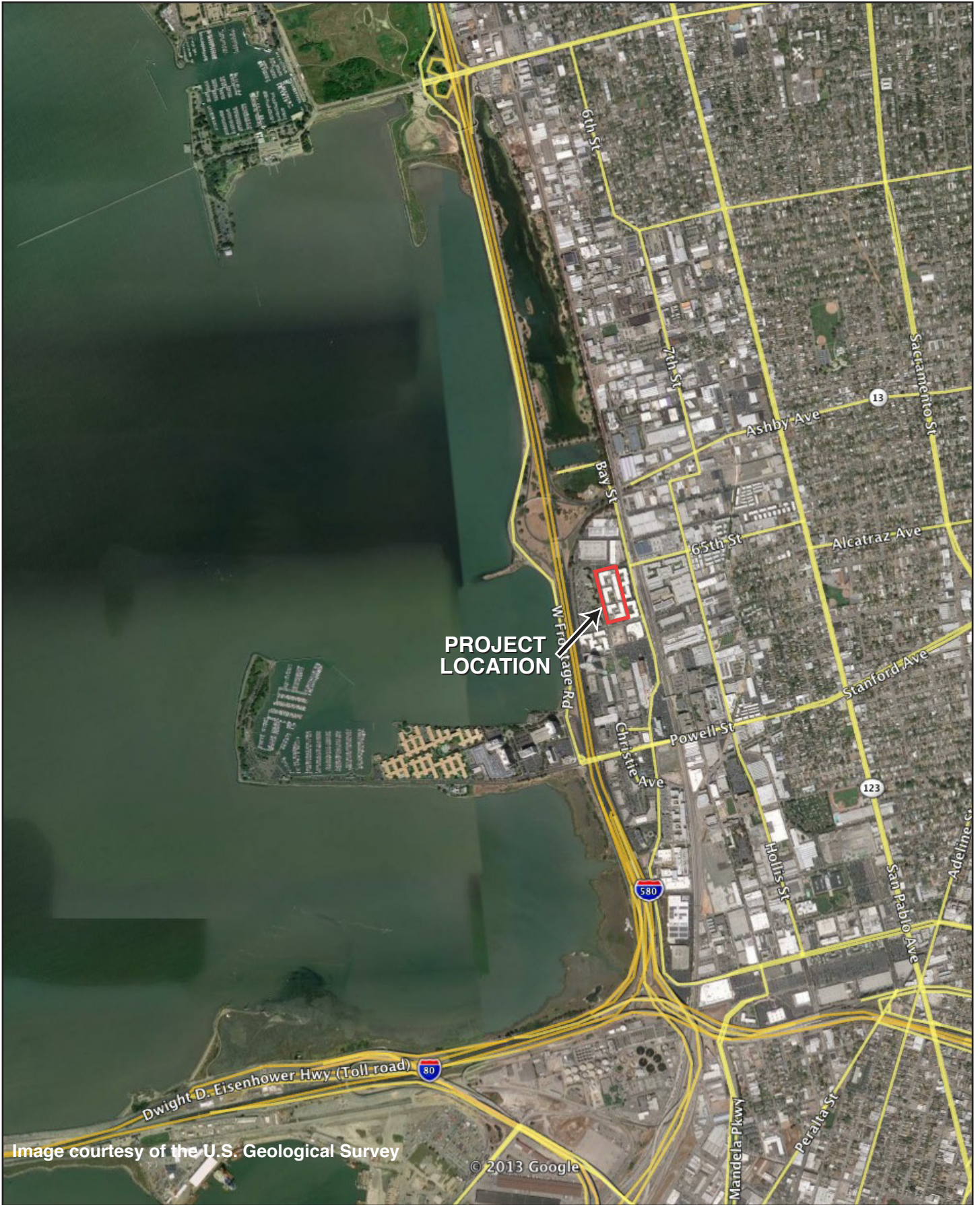


Image courtesy of the U.S. Geological Survey

© 2013 Google



**SITE LOCATION ON AERIAL PHOTO**

6400 Christie Ave.  
Emeryville, CA

By: MJC

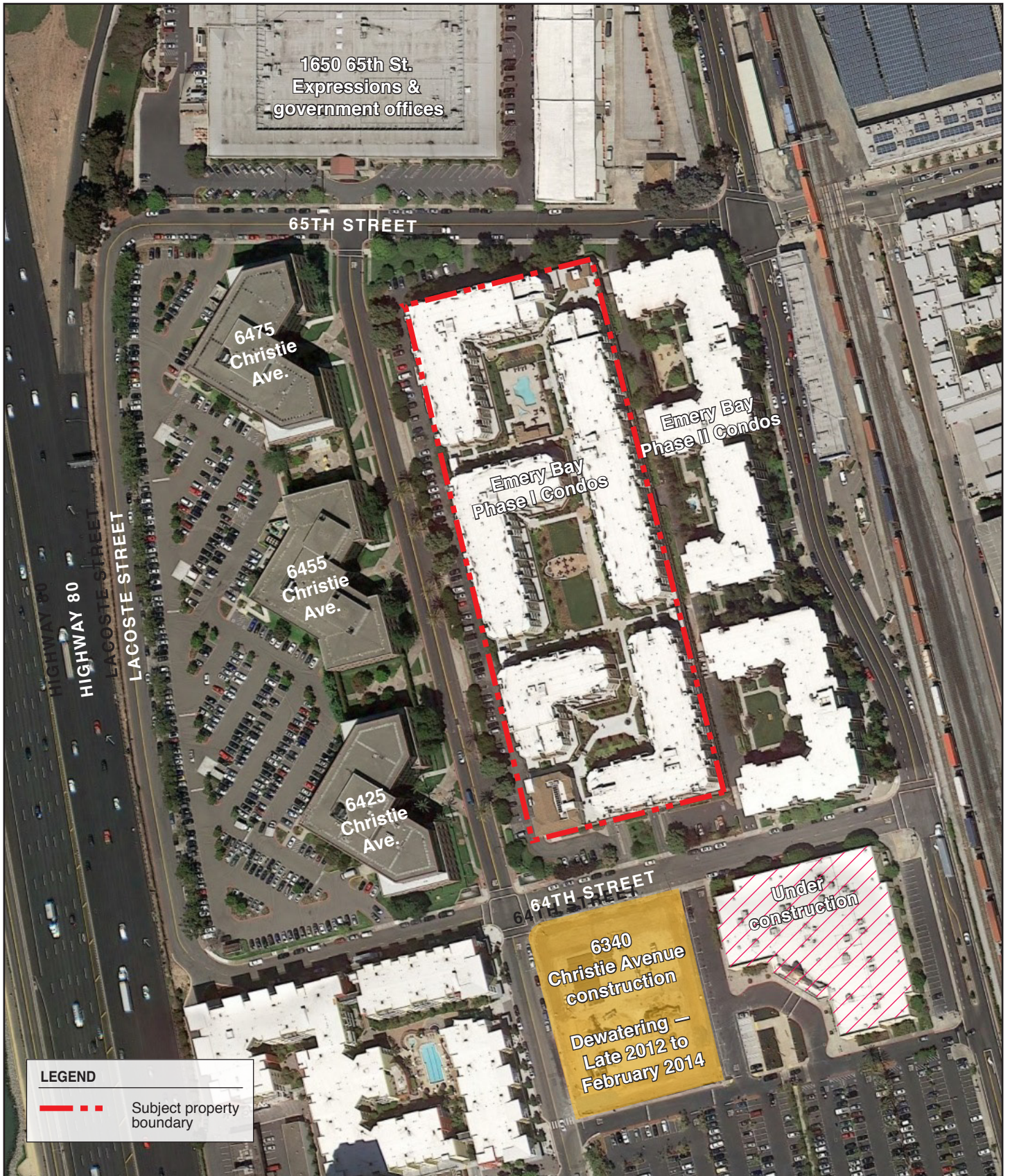
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**Figure 1**




2007-665-01





**LEGEND**

 Subject property boundary



**SITE PLAN AND ADJACENT LAND USE**

6400 Christie Ave.  
Emeryville, CA

By: MJC

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**Figure 2**



2007-65-80

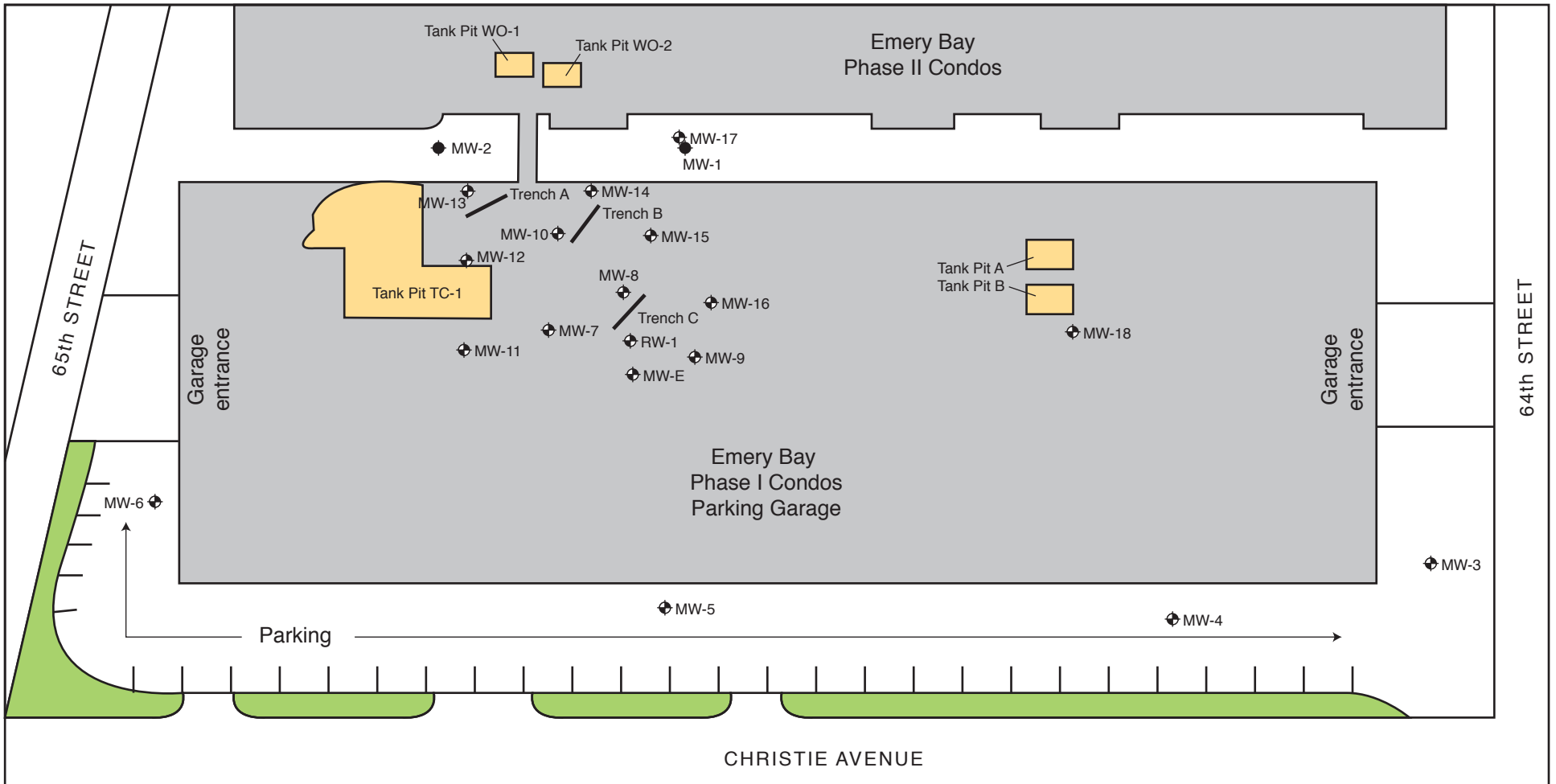


The subsurface contamination originated from the trucking terminal that was operated by the Garrett Freight Line and Delta Lines, and existed at the site of the Bay Center Apartments before its development in the late 1980s. Site investigations identified a total of 12 UFSTs in three areas of the trucking terminal. These UFST areas were referred to as: 1) Tank Pits A and B (each containing one 10,000-gallon diesel tank); 2) Tank Pit TC-1 (four 12,000-gallon diesel tanks, two 10,000-gallon diesel tanks, and one 6,000-gallon gasoline tank); and 3) Tank Pit WO-1 and WO-2 (one 6,000-gallon tank, one 4,000-gallon tank, and one 1,000-gallon tank). Nine UFSTs were located beneath the current footprint of the Emery Bay Phase I Condo complex, while three were beneath the Emery Bay Phase II Condo complex. Figure 2 shows the historical locations where the tanks were removed.

To remediate the hydrocarbon contamination beneath the garage area of the Emery Bay Phase I Condo complex, a light non-aqueous phase liquid (LNAPL) groundwater pump-and-treat system was installed by Groundwater Technology, Inc. (GTI) in 1989. The system extracted approximately one million gallons of groundwater, yielding approximately 100 gallons of LNAPL from recovery well RW-1 from July 1990 to March 1991. Three monitoring wells had previously been installed in 1985. GTI installed (and repaired) several more monitoring wells between 1987 and 1990, for a total of seven monitoring wells and one extraction well by 1990. The system and groundwater monitoring wells were designed and monitored as a condition of discharge permits granted by the East Bay Municipal Utility District (EBMUD) and the Bay Area Air Quality Management District (BAAQMD). The first groundwater monitoring event for MW-1 through MW-6 occurred in December 1988. The second monitoring event, which also included MW-E and RW-1, was conducted in March 1989. Subsequently, the groundwater extraction system operated by GTI was closed in late 1990 when corrosion and other mechanical problems caused the system to fail. Recovery of LNAPL continued manually on RW-1 until 1991, and a third groundwater sampling event occurred in February 1991. In 1994, the GTI system was abandoned. Appendix A contains the historical analytical results. Figure 3 shows the locations of the monitoring wells and trenches.

No groundwater monitoring events had occurred at the site between 1991 and 2004, when PES Environmental, Inc. (PES) was retained to evaluate and implement remediation of the residual contamination at the TC-1 in the Emery Bay Phase I Condo complex area. (Note: Harding Lawson Associates conducted soil and groundwater sampling on the Phase II Apartment complex area during this time, but not for the purpose of product extraction or remediation.) In 2004, PES installed an additional 10 groundwater monitoring wells (monitoring wells MW-1 and MW-2 were either abandoned or paved over with asphalt during construction), bringing the current total to 17 monitoring wells and one extraction well in the Phase I parking garage area.

The first groundwater monitoring event for the current wells was conducted in March 2004 and the second event conducted in December 2006. A previous Stellar Environmental report (Stellar



**LEGEND**

- ⊕ Monitoring well
- Monitoring well (presumed abandoned)
- Trench location
- Historical tank pit area
- Landscaping

0 60  
SCALE: 1/2" = 60 FEET



**MONITORING WELL AND TRENCH LOCATIONS**  
6400 Christie Ave., Emeryville, CA

**Figure 3**

by: MJC

APRIL 2017

Environmental, 2007) discusses previous site remediation and investigations, site geology and hydrogeology, and residual site contamination. Tabular summaries of historical groundwater well water elevations and analytical results are included in Appendices D and A, respectively.

In March 2014, Stellar Environmental Solutions conducted a groundwater investigation that consisted of advancing five soil borings in the areas between wells MW-3 on the southern edge of the site and MW-18 in the garage and downgradient of MW-3, with the goal to locate a suspected source of residual subsurface hydrocarbons. The reason for this additional work was based on the recent uptrend in diesel concentration noted in well MW-3 since the late 2012 initiation of construction de-watering at the 6340 Christie Avenue (ACHCSA Case # RO0000057) property across 64<sup>th</sup> Street, south of the subject property garage area.

The impact the dewatering had on the subject site was apparent in terms of both the changes to the site hydrology—with the change in the groundwater flow regime from west/northwest to having a southern component—as well as a hydrochemical impact. The hydrochemical impact, as documented in the Y2013 and Y2014 site monitoring reports, was to draw the hydrocarbon plume southward, increasing the concentrations of TEHd by orders of magnitude at well MW-3 near the subject property south border, compared to the previous 5 years of monitoring that showed stable results. The TEHd concentration at MW-3 increased from 15,000 µg/L TEHd in April 2013 to 250,000 µg/L TEHd in September 2013. The relatively stable TEHd concentration present in well MW-18 since 2012, suggested a possible undiscovered source between these two wells impacting well MW-3. However, the plume appears to have stabilized since the cessation of construction dewatering at the site across 64<sup>th</sup> Street along with the product recovery efforts in the garage area. The groundwater flow direction and plume geometry has now reverted to the pre-pumping groundwater regime. The TVHg and TEHd concentrations in well MW-3 have substantially decreased with March 2015 through the current September 2016 monitoring events since the highest concentrations of 2013.

## **OBJECTIVES AND SCOPE OF WORK**

This report discusses the following activities conducted/coordinated by Stellar Environmental in the current semiannual monitoring period:

- Collect groundwater samples from the central trench wells (TA-M, TB-M and TC-M) in each of the three arrays on February 8, 2017 and laboratory analyze the samples for dissolved iron, nitrates, sulfates, pH, dissolved oxygen, oxidation reduction potential and for hydrocarbons. The goal of this work is to track the viability of the Nutrisulfate<sup>®</sup> product injected into trench well arrays A and C in 2015 and 2016. Nutrisulfate<sup>®</sup> is a high sulfate metabolic supplement designed to enhance the kinetics and efficiency of microbial systems specifically related to



bioremediation of BTEX, MTBE, and other petroleum hydrocarbons. The wells in trench array B are not receiving the product and act as control wells.

- Active extraction on all groundwater monitoring wells, trench well array C and recovery well RW-1 was planned for March 21 and 22 2017, however equipment failure prevented extraction from all planned wells except for trench wells TC-W, TC-M and TC-E.
- Record water levels in site wells to determine groundwater flow direction.
- Sampling of site monitoring wells for contaminant analysis on March 23 and 24, 2016.
- Evaluation of hydrochemical and groundwater elevation trends in the context of plume stability and case closure assessment.

## **REGULATORY OVERSIGHT**

Alameda Department of Environmental Health (ACEH) is the lead regulatory agency for the case, acting as a Local Oversight Program for the Regional Water Quality Control Board (Water Board). There are currently no ACEH or Water Board cleanup orders for the site; however, all site work has been conducted under the oversight of ACEH. ACEH assigned the site to its fuel leak case system (RO #2799), currently overseen by Mr. Mark Detterman. In a November 2008 meeting with the Responsible Party (represented by Ms. Sarah Irving), Stellar Environmental (represented by Ms. Teal Glass and Mr. Richard Makdisi), and ACEH (represented by Ms. Jakub and Ms. Donna Drogas), it was agreed that quarterly sampling could be reduced to a semiannual schedule with the stipulation that an indoor air and preferential pathway study be completed. Stellar Environmental submitted a letter on November 24, 2008 to ACEH documenting the change in sampling frequency. The Indoor Air Survey and Preferential Pathway Report (Stellar Environmental, 2009b) was submitted to ACEH on April 6, 2009. Stellar Environmental conducted an additional indoor air survey in the ground floor office area on March 22, 2010. The results were presented in a separate report, submitted to ACEH on April 6, 2010 (Stellar Environmental, 2010). The case has been assigned No. SLT2005561 in the Water Board's GeoTracker system. Electronic uploads of required data/reports are submitted to both agencies. The November 2012 and March 2013 monitoring reports warned ACEH of impacts from the adjacent site dewatering at 6340 Christie Avenue and tracked the pull of the hydrocarbon plume to the southern property boundaries. The cessation of dewatering from the adjacent southern development, along with selected well purging at Bay Center, resulted in a re-equilibration of the plume back closer to its former geometry since the 2014 monitoring events.

## **2.0 PHYSICAL SETTING**

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The following evaluation of the physical setting of the site—including topography, drainage, and geologic and hydrogeologic conditions—is based on previous (1986 through 2006) site investigations conducted by others, and site inspections and subsurface data collection by Stellar Environmental in 2007, 2008 and 2014.

### **TOPOGRAPHY AND DRAINAGE**

The mean elevation of the property is about 13 feet above mean sea level, and the general topographic gradient in the vicinity of the property is to the southwest, although the regional gradient is to the west-southwest.

The nearest receiving water body is San Francisco Bay, located approximately 700 feet to the west of the subject property. East of the site lies the Oakland Hills, which rise to an elevation of approximately 1,000 feet and are situated 2.5 miles east of the subject property. The subject property is not listed within a 100- or 500-year flood zone.

Storm drains from the roof collect storm runoff for discharge onto the asphalt-paved parking lots. Drainage collected in storm sewers from the parking lot and from Christie, 64<sup>th</sup>, and 65<sup>th</sup> Streets discharges into San Francisco Bay. Stellar Environmental noted several storm drains, in the parking lot area and on the surrounding streets.

### **GEOLOGY**

The subject property area is underlain with material mapped “Qhbm,” designated early Pleistocene alluvium, that is moderately consolidated, deeply weathered, poorly sorted, irregularly interbedded clay, silt, sand, and gravel. A geotechnical survey conducted in 1985 revealed that the upper 15 to 20 feet of soil consists of a combination of fill and soft bay sediment. The upper 1 to 2 feet of soil is generally pavement and imported fill. This is underlain by approximately 20 feet of firm soil consisting of primarily dense, silty sand with intermittent layers of silty and sandy clay. Stiff to very stiff clay lies a depth of approximately 40 feet and extends to the depth of the borings, approximately 101.5 feet (Geomatrix, 1988).

The closest major fault, the Hayward Fault, is located about 3 miles east of the property. While the site is located in a seismically active area, it is not within an Alquist-Priolo Special Studies active

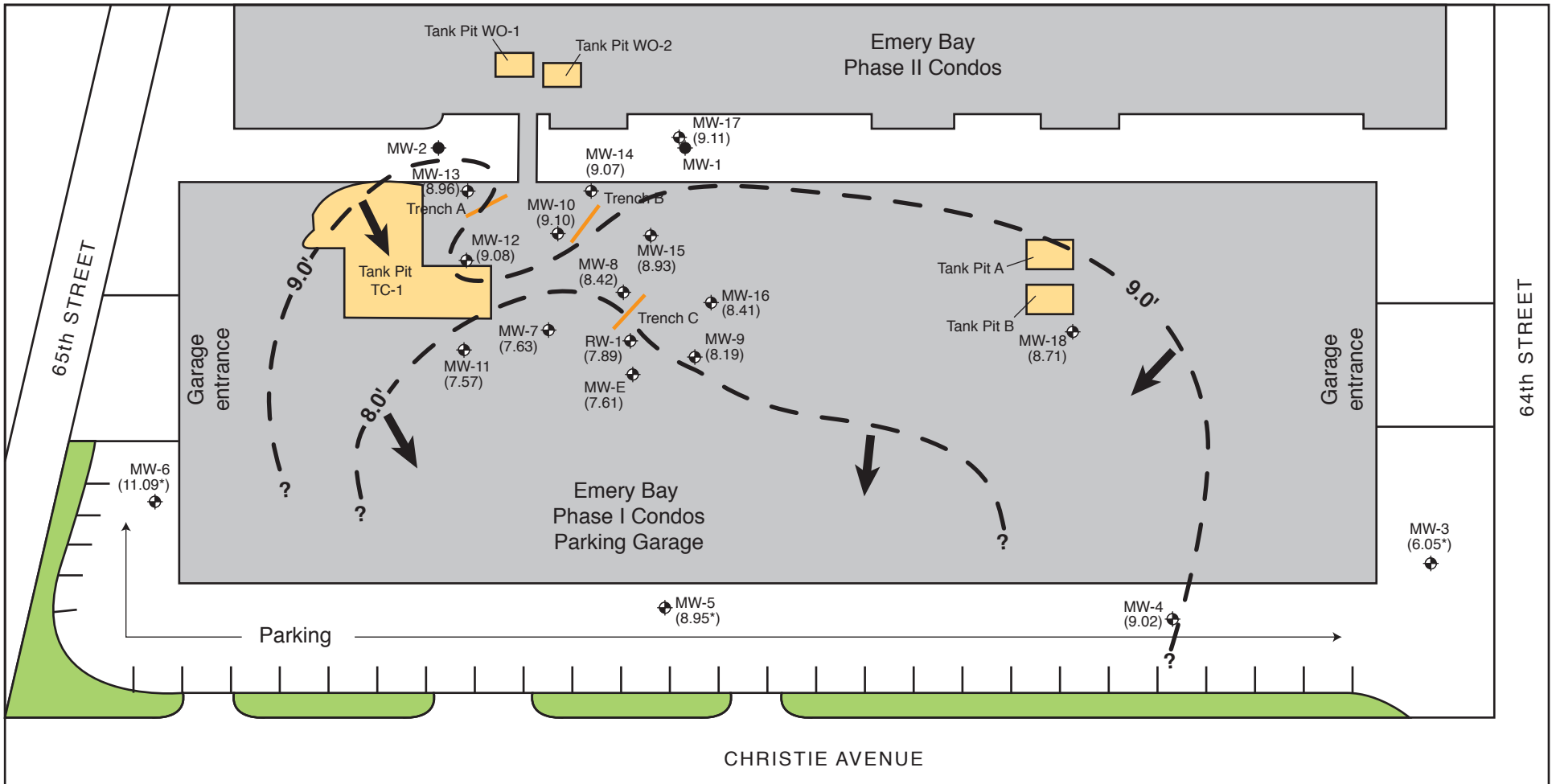
fault zone, the legislatively defined zone of restricted land use 200 feet around an active fault due to the high probability of ground rupture.

## **GROUNDWATER HYDROLOGY**

Regulatory agency records indicate that the direction of shallow groundwater flow in the site vicinity is to the west-northwest, toward San Francisco Bay. However, water levels and flow direction in this area are influenced by tidal patterns, natural topography modifications and the historical LNAPL, resulting in a relatively slow moving and stable plume pattern.

The groundwater flow direction measured during the September 2016 monitoring event was generally towards the west. The localized, approximately southerly direction to groundwater flow in the area of MW-3 noted in the 2013 monitoring events, thought to be the result of construction dewatering that had been occurring during 2013 at the re-development site across 64<sup>th</sup> Street, appears to have dissipated for the current event, since that de-watering has been discontinued since February of 2014. According to current and historical water level data obtained from onsite monitoring wells, depth to groundwater beneath the site ranges from approximately 7.75 to 11.01 feet below ground surface (bgs). Groundwater elevations recorded during the previous Spring monitoring event in March 2016, ranged from 7.22 feet (MW-7) to 10.43 feet (MW-6) above mean sea level. For this Spring monitoring event of March 2017, groundwater elevations ranged from 6.05 feet (MW-3) to 11.09 feet (MW-6) above mean sea level, with the average groundwater gradient for the current monitoring event being 0.007 foot/foot.

Figure 4 is a groundwater elevation map from the recent groundwater-monitoring event (activities discussed in Section 4.0).



**LEGEND**

- ⊕ Monitoring well
  - Monitoring well (presumed abandoned)
  - Trench location
  - Groundwater elevation contour in feet amsl
  - Historical tank pit area
  - Landscaping
  - ← Inferred direction of groundwater flow
  - Extrapolated groundwater elevation contour
  - \* Groundwater elevation not used in determining contour due to the presence of free product, or in areas affected by landscape irrigation
- NM = Depth to groundwater could not be measured due to the presence of tar
- 0 40  
SCALE: 1/2" = 40 FEET



**GROUNDWATER ELEVATION MAP – March 23, 2017**  
**6400 Christie Ave., Emeryville, CA**

**Figure 4**

by: MJC

APRIL 2017

2007-65-52



### **3.0 MARCH 2017 GROUNDWATER MONITORING AND SAMPLING ACTIVITIES**

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This section presents the groundwater sampling and analytical methods for the most recent event. Table 1 summarizes monitoring well construction and groundwater monitoring data. Groundwater analytical results are summarized in Section 4.0.

#### **SAMPLING METHODS AND ACTIVITIES**

Activities for this event include:

- Measuring static water levels in 18 site wells.
- Collecting post-purge groundwater samples from the 18 wells for laboratory analysis of the following contaminants:
  - benzene, toluene, ethyl benzene, and xylenes (BTEX)
  - methyl tertiary-butyl ether (MTBE)
  - total petroleum hydrocarbons as gasoline (TPHg)
  - total petroleum hydrocarbons as diesel (TPHd)

The site monitoring well sampling locations are shown on Figure 3. Well construction information and water level data are summarized in Table 1. Appendix B contains the groundwater monitoring field records.

#### **FEBRUARY 2017 TRENCH WELL SAMPLING**

Stellar Collect groundwater samples from the central trench wells (TAM, TBM and TCM) in each of the three arrays on February 8, 2017 and laboratory analyze the samples for dissolved iron, nitrates, sulfates, pH, dissolved oxygen, oxidation reduction potential and for hydrocarbons. The goal of this work is to track the viability of the Nutrisulfate<sup>®</sup> product injected into trench well arrays A and C in 2015 and 2016. Nutrisulfate<sup>®</sup> is a high sulfate metabolic supplement designed to enhance the kinetics and efficiency of microbial systems specifically related to bioremediation of BTEX, MTBE, and other petroleum hydrocarbons. The wells in trench array B are not receiving the product and act as control wells.

## **CURRENT SEPTEMBER 2016 MONITORING EVENT**

Blaine Tech Services conducted groundwater monitoring well level measurements, purging, sampling, and field analyses on March 23 and 24, 2017 under the supervision of Stellar Environmental personnel. Groundwater sampling was conducted in accordance with State of California guidelines for sampling dissolved analytes in groundwater associated with leaking UFSTs. As the first task of the monitoring event, static water levels and free product levels were measured in the 18 wells using an electric water level indicator. The depth of free product was recorded, and the water level was adjusted to reflect the groundwater elevation. Table 1 summarizes the March 2017 groundwater level data.

Approximately 300 gallons of water and no observable product were removed/purged from trench wells TCW, TCM and TCE during the active product removal on March 21, 2017. Due to equipment failure, no other wells were purged for the current monitoring event. The water generated during the active product and water removal was stored in a 1,100 gallon above ground storage tank located in a fenced compound onsite.

**Table 1**  
**March 23 and 24, 2017**  
**Groundwater Monitoring Well Construction and Groundwater Elevation Data**  
**6400 Christie Avenue, Emeryville, California**

Well	Well Depth (feet bgs)	Screened Interval	Top of Well Casing Elevation <sup>(a)</sup>	Depth to Free Product (TOC)	Thickness of Free Product (feet)	Groundwater Elevation (March 23, 2017)
MW-3	25	5 to 20	16.65	10.59	0.01	6.05
MW-4	25	5 to 20	16.29	NP	NP	9.02
MW-5	25	5 to 20	16.72	NP	NP	9.45
MW-6	25	5 to 20	16.82	NP	NP	11.09
MW-7	20	5 to 20	17.73	NP	NP	7.63
MW-8	16	5 to 16	17.84	9.15	0.27	8.42
MW-9	20	5 to 20	17.84	NP	NP	8.19
MW-10	20	5 to 20	17.83	NP	NP	9.10
MW-11	20	5 to 20	17.76	NP	NP	7.57
MW-12	20	5 to 20	17.83	NP	NP	9.08
MW-13	20	5 to 20	17.66	8.45	0.25	8.96
MW-14	20	5 to 20	17.60	NP	NP	9.07
MW-15	20	5 to 20	17.80	NP	NP	8.83
MW-16	20	5 to 20	17.74	NP	NP	8.41
MW-17	20	5 to 20	18.17	9.05	0.01	9.11
MW-18	20	5 to 20	16.35	NP	NP	8.71
MW-E	47	7 to 40	17.47	NP	NP	7.61
RW-1	30	unknown	16.70	8.80	0.01	7.89
TA-E	11-13	6-8 to 11-13	17.20	NM	NM	NM
TA-M	11-13	6-8 to 11-13	17.21	NM	NM	NM
TA-W	11-13	6-8 to 11-13	17.28	NM	NM	NM
TB-E	11-13	6-8 to 11-13	17.24	NM	NM	NM
TB-M	11-13	6-8 to 11-13	17.30	NM	NM	NM
TB-W	11-13	6-8 to 11-13	17.33	NM	NM	NM
TC-E	11-13	6-8 to 11-13	17.07	NM	NM	NM
TC-M	11-13	6-8 to 11-13	17.37	NM	NM	NM
TC-W	11-13	6-8 to 11-13	17.32	NM	NM	NM

Notes:

- (a) Relative to mean sea level.
- (b) Depth to groundwater and/or of free product could not be determined because free product density would not allow a clear delineation.

bgs = below ground surface

TOC = below top of casing

NP = no free product in well)

NM = depth to groundwater and/or free product could not be determined due to the presence of product

MW-3 through MW-6 and MW-E are 2-inch PVC. MW-7 through MW-18 are ¾-inch PVC. RW-1 is 10-inch steel.

## **4.0 REGULATORY CONSIDERATIONS, ANALYTICAL RESULTS, AND DISCUSSION OF FINDINGS**

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This section presents analytical results of the current monitoring event and summarizes relevant regulatory considerations. Appendix C contains the certified analytical laboratory report.

### **REGULATORY CONSIDERATIONS**

As specified in the East Bay Plain Groundwater beneficial Use Evaluation Report by the San Francisco Bay Region Water Board (Water Board, 1999), all groundwater is considered a potential source of drinking water unless otherwise indicated by the Water Board, and is assumed to ultimately discharge to a surface water body and potentially impact aquatic organisms. The subject property is listed as occurring within Zone B, designated as groundwater that is unlikely to be used as a drinking water resource. This western area of Emeryville is also generally known as a brownfield area where ubiquitous groundwater contamination makes groundwater use problematic. The basin is shallow in this area, with depths of less than 300 feet. Groundwater in this area has been used for backyard irrigation, industrial supply, and commercial irrigation. There is a low likelihood that this water will be used as a public water supply in the near future.

The Water Board publishes Environmental Screening Levels (ESLs) for residential and commercial/industrial properties where groundwater is/is not a likely drinking water resource. As stipulated in the ESL document (Water Board, 2016), ESLs are not cleanup criteria; rather, they are conservative screening-level criteria designed to be protective of both drinking water resources and aquatic environments. The groundwater ESLs are composed of one or more components—including ceiling value, human toxicity, indoor air impacts, and aquatic life protection. Exceedance of ESLs suggests that additional remediation and/or investigation (e.g., monitoring plume stability to demonstrate no risk to sensitive receptors where drinking water is not threatened) may be warranted. Because the subject property is a residential property where groundwater is not a likely drinking water resource, the contaminant levels at the site will be compared to the ESLs for these criteria.

Contaminants detected above the ESLs during this sampling event include gasoline, diesel, benzene, toluene, ethylbenzene, and total xylenes. In general, concentrations of gasoline and diesel have decreased as compared to both the previous quarter and the same quarter last year.



## GROUNDWATER SAMPLE RESULTS

Table 2 and Figure 5 summarize the analytical results for the site monitoring wells for the current sampling event that occurred March 23 and March 24, 2017.

**Table 2**  
**Groundwater Sample Analytical Results – March 23 and 24, 2017**  
**6400 Christie Avenue, Emeryville, California**

Well ID	Analytical Results						
	TPHg	TPHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-3	340	<b>28,000</b>	<b>5.0</b>	< 0.5	< 0.5	0.73	< 2.0
MW-4	76	389	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
MW-5	< 50	<b>2,500</b>	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
MW-6	<50	<b>1,500</b>	0.77	<0.5	<0.5	<0.5	< 2.0
MW-7	<b>1,500</b>	<b>12,000</b>	<b>560</b>	25	10	62	< 50
MW-8	<b>34,000</b>	<b>6,400</b>	<b>9,200</b>	<b>140</b>	<b>950</b>	<b>301</b>	< 170
MW-9	< 250	<b>11,000</b>	14	< 2.5	< 2.5	< 2.5	< 10
MW-10	<b>7,000</b>	<b>2,900</b>	<b>1,400</b>	59	<b>29</b>	42.8	< 10
MW-11	<b>5,000</b>	<b>8,700</b>	<b>360</b>	70	<b>45</b>	<b>116</b>	< 10
MW-12	<b>6,200</b>	<b>2,800</b>	<b>1,200</b>	28	<b>16</b>	< 13	< 50
MW-13	<b>14,000</b>	<b>13,000</b>	<b>3,100</b>	60	<b>350</b>	<b>130</b>	< 100
MW-14	<b>16,000</b>	<b>6,200</b>	<b>4,100</b>	<b>370</b>	<b>360</b>	<b>191</b>	< 100
MW-15	<b>7,100</b>	<b>3,700</b>	<b>1,300</b>	31	<b>72</b>	40	< 100
MW-16	< 250	<b>8,400</b>	<b>27</b>	3.4	< 2.5	< 2.5	< 10
MW-17	<b>27,000</b>	<b>3,700</b>	<b>2,100</b>	< 13	<b>93</b>	<b>167</b>	< 50
MW-18	< 250	<b>11,000</b>	< 2.5	< 2.5	< 2.5	< 2.5	< 10
MW-E	<b>2,200</b>	<b>6,700</b>	<b>580</b>	32	<b>42</b>	57	< 2.0
RW-1	<b>910</b>	<b>2,800</b>	<b>130</b>	6.2	4.9	5.9	< 2.0
ESLs <sup>(a)</sup>	<b>100 / 440</b>	<b>100 / 640</b>	<b>1.0 / 1.1</b>	<b>40 / 130</b>	<b>13 / 13</b>	<b>20 / 100</b>	<b>5.0 / 180</b>

Notes:

<sup>(a)</sup> Water Board Environmental Screening Levels for residential sites where groundwater *is/is not* a drinking water resource (Water Board, 2016).

MTBE = methyl tertiary-butyl ether

TPHd = total petroleum hydrocarbons – diesel range (equivalent to total extractable hydrocarbons – diesel range)

TPHg = total petroleum hydrocarbons – gasoline range (equivalent to total volatile hydrocarbons – gasoline range)

All concentrations are expressed in micrograms per liter (µg/L), equivalent to parts per billion (ppb).

Results listed in **bold-face type** are at or above the ESLs where groundwater *is not* a drinking water resource.

Table 3 below, summarizes the analytical results for TPHg/d and MBTEX for the trench wells. In order to begin tracking the effectiveness of the Nutrisulfate<sup>®</sup> product that was introduced into trench well arrays A and C in 2015 and 2016, sampling of the central wells (TAM, TBM and TCM) in all three trench well arrays was conducted on June 24, 2016, and again on February 8, 2017. Trench well TBM has not received the Nutrisulfate<sup>®</sup> product and is a control well. Although the ratios of TVHg, to TEHd and MBTEX concentrations in the trench wells after the introduction of the Nutrisulfate<sup>®</sup> product have slightly shifted towards TEHd, no clear pattern of reducing hydrocarbon concentration in groundwater was evident in the trench wells over the June 2016 to February 2017 time period. Laboratory analyses of samples collected in February 2017 for dissolved iron, nitrates, sulfates, pH, dissolved oxygen, oxidation reduction potential is discussed in Section 5.

**Table 3**  
**Trench Well Groundwater Samples Hydrocarbon Analytical Results**  
**6400 Christie Avenue, Emeryville, California**

Well ID	Analytical Results						
	TPHg	TPHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
<b>June 24, 2016</b>							
TAM	<b>22,000</b>	<b>23,000</b>	<b>4,400</b>	<b>160</b>	<b>1,000</b>	<b>128</b>	< 20
TBM	<b>3,400</b>	<b>8,100</b>	<b>820</b>	18	<0.50	14.4	< 2.0
TCM	<b>5,200</b>	<b>62,000</b>	<b>830</b>	7.2	<b>14</b>	10.2	< 2.0
<b>February 8, 2017</b>							
TAM	<b>15,000</b>	<b>31,000</b>	<b>3,200</b>	75	<b>410</b>	<b>140</b>	< 10
TBM	<b>5,100</b>	<b>3,400</b>	<b>750</b>	22	<b>48</b>	32	< 2
TCM	<b>5,600</b>	<b>65,000</b>	<b>1,300</b>	< 2.5	<b>23</b>	3.5	< 10
ESLs <sup>(a)</sup>	<b>100 / 440</b>	<b>100 / 640</b>	<b>1.0 / 1.1</b>	<b>40 / 130</b>	<b>13 / 13</b>	<b>20 / 100</b>	<b>5.0 / 180</b>

Notes:

(a) Water Board Environmental Screening Levels for residential sites where groundwater *is/is not* a drinking water resource (Water Board, 2016). MTBE = methyl tertiary-butyl ether; TPHd = total petroleum hydrocarbons – diesel range (equivalent to total extractable hydrocarbons – diesel range); TPHg = total petroleum hydrocarbons – gasoline range (equivalent to total volatile hydrocarbons – gasoline range)

All concentrations are expressed in micrograms per liter (µg/L), equivalent to parts per billion (ppb).

Results listed in **bold-face type** are at or above the ESLs where groundwater *is not* a drinking water resource.

**Distribution of Hydrocarbon Contaminants**

For the current sampling event, several wells have hydrocarbon concentrations significantly above Water Board ESLs. However, hydrocarbon concentrations in wells can be significantly affected by the purging of accumulated hydrocarbons product, so large swings in concentration (both reductions and increases) are possible due to this occurrence. In addition, the introduction of surfactant since 2013 and Nutrisulfate<sup>®</sup> since 2015 (see Section 5) into the trench and/or selected monitoring wells with the aim of reducing accumulated LNAPL and to enhance the kinetics and efficiency of microbial systems in site groundwater is likely to affect dissolved concentrations.

Increases in March 23/24 2017 TVHg concentrations compared to the March 2016 monitoring event were observed at wells MW-7, MW-8, MW-11, MW-14, MW-17, and RW-1. This represents six wells exhibiting an increase in TVHg as compared to eight wells reported in March 2016.

Gasoline was detected above the ESL where groundwater is not a likely drinking water resource (440 micrograms per liter [ $\mu\text{g/L}$ ]) in all wells except wells MW-4, MW-5, MW-6, MW-9, MW-16 and MW-18 where Gasoline was also detected, but at concentrations below the ESL.

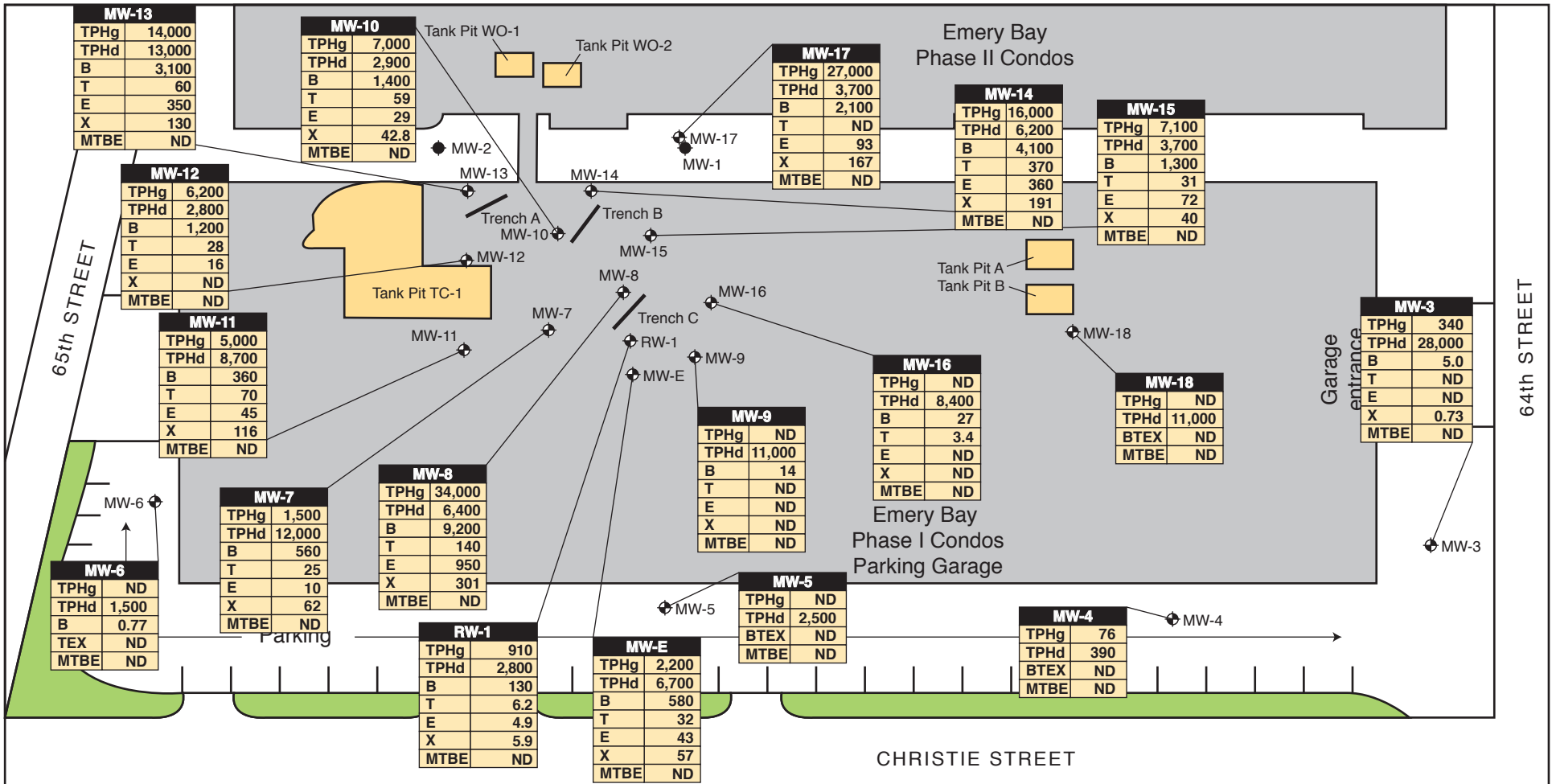
Diesel was detected in all site wells above the ESL of 640  $\mu\text{g/L}$  (where groundwater is not a likely drinking water resource) except for well MW-4, but showed a decrease in concentration in 3 of the 18 wells sampled as compared to 12 of 18 wells in the March 2016 sampling event.

The highest concentrations of TVHg (34,000  $\mu\text{g/L}$  in MW-8) and TEHd (28,000  $\mu\text{g/L}$  in MW-3) for the current event compares to concentrations of 23,000  $\mu\text{g/L}$  TVHg in MW-8 and 11,000  $\mu\text{g/L}$  TEHd in wells MW-13 in March 2016. Concentrations of hydrocarbons in well MW-8 have trended higher since the March 2016 sampling event with TVHg increasing from 23,000  $\mu\text{g/L}$  to 34,000  $\mu\text{g/L}$ , and TEHd increasing from 1,200  $\mu\text{g/L}$  in 2016 to the current 6,400  $\mu\text{g/L}$ . Concentrations of hydrocarbons in well MW-11 also showed an upward change in hydrocarbon concentrations compared to the March 2016 sampling event, with TVHg increasing from 1,900  $\mu\text{g/L}$  in to 5,000  $\mu\text{g/L}$  for the current event, and TEHd increasing from 5,500  $\mu\text{g/L}$  in 2016 to the current 8,700  $\mu\text{g/L}$ .

Multiple applications of surfactant in wells MW-3, MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15 and into all nine trench wells between 2013 and 2016 have had the primary effect of reducing the amount of recoverable oily product during the pumping activities that occur before each semi-annual monitoring event. Due to equipment failure, only the trench wells in Array B were pumped for the current event, and none of the other site wells were pumped as is the usual procedure.

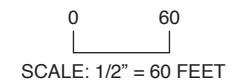
Overall, the total detected concentrations of TVHg in all 18 monitored wells (excluding the trench wells) remained relatively stable with 121,326  $\mu\text{g/L}$  TVHg detected in March 2016 compared to 120,080  $\mu\text{g/L}$  TVHg in March 2017. TEHd concentrations increased significantly from 92,130  $\mu\text{g/L}$  in March 2016 to 131,689  $\mu\text{g/L}$  for the current monitoring event.

Observed fluctuations in hydrocarbon concentrations may be attributed to seasonal groundwater level, reduction of LNAPL and reduced volume of groundwater being pumped from the trench wells. Since the application of the Nutrisulfate<sup>®</sup> into trench well arrays A and C, no pumping of those wells has occurred. In the case of the current 2017 monitoring event, no pre-monitoring pumping was conducted of the monitoring wells either, which likely also had an effect on total concentrations. Figure 5 shows the TVHg MBTEX and TEHd concentrations for the March 2017 monitoring event.



**LEGEND**

- ◆ Monitoring well
  - ◆ Monitoring well (presumed abandoned)
  - Trench location
  - Historical tank pit area
  - Landscaping
- TPHg = Total petroleum hydrocarbons as gasoline  
 TPHd = Total petroleum hydrocarbons as diesel  
 B = Benzene  
 T = Toluene  
 E = Ethylbenzene  
 X = Total xylenes  
 ND = Below the laboratory detection limit  
 MTBE = Methyl Tertiary Butyl Ether
- All concentrations in micrograms per liter (µg/L)



**GROUNDWATER MONITORING WELL ANALYTICAL RESULTS –**  
**MARCH 23, 2017**  
**6400 Christie Ave., Emeryville, CA**

**Figure 5**

by: MJC

APRIL 2017

In monitoring wells MW-3, MW-7, MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-E and RW-1 concentrations of benzene exceeded the ESL of 1.0 µg/L for residential property where groundwater is not a drinking water resource. Comparing March 2016 results to the current results showed a decrease in benzene in 6 of the 18 site wells sampled. An increase in benzene was detected in 9 of the 18 wells. Benzene was detected in well MW-6 but at a concentration below the ESL. Perimeter wells MW-4 and MW-5 remain stable at concentrations below laboratory reporting limits for the current event.

Figures 6 and 7 are isoconcentration maps of TVHg and TEHd concentrations in groundwater based on the March 23/24, 2017 analytical results.

Toluene was detected at or above the ESL of 130 µg/L in monitoring wells MW-8, MW-13 and MW-14. Toluene was also detected in wells MW-7, MW-8, MW-10, MW-11, MW-12, MW-15, MW-16, MW-E and RW-1 but at levels below the ESL but at levels below the ESL.

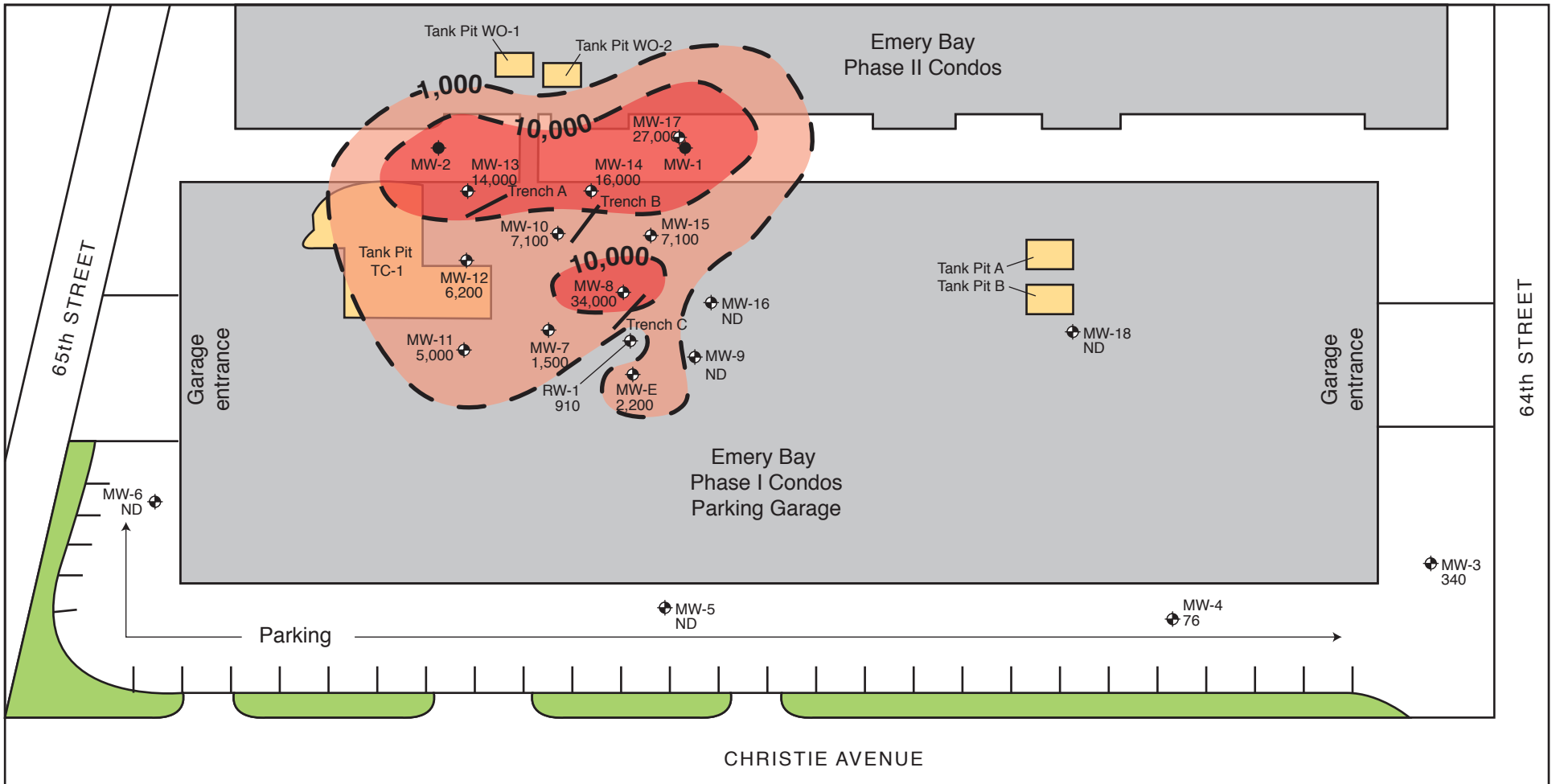
Ethylbenzene was detected above the 43 µg/L ESL in monitoring wells MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-17 and MW-E. Ethylbenzene was also detected in wells MW-7 and RW-1 but at levels below the ESL.

Total xylene concentrations in wells MW-8, MW-11, MW-13, MW-14, and MW-17 were above the 100-µg/L ESL where groundwater is not a likely drinking water resource. Total xylenes were detected in MW-3, MW-7, MW-10, MW-15, MW-E and RW-1 but below the ESL.

MTBE was not detected above the reporting limit in any monitored site well.

Laboratory analytical and quality control (QC) samples (e.g., method blanks, matrix spikes, surrogate spikes, etc.) were analyzed by the in accordance with the requirements of each analytical method. All laboratory QC results and sample holding times were within method limits (Appendix C).

Figure 8 depicts groundwater analytical trends for TPHd in downgradient wells MW-5 and MW-6. Figure 9 depicts groundwater analytical trends for TPHd in source wells MW-11 and MW-12. Figure 10 depicts groundwater analytical trends for TPHd in crossgradient wells MW-3 and MW-18.



**LEGEND**

- ◆ Monitoring well
- ◆ Monitoring well (presumed abandoned)
- Trench location
- Historical tank pit area
- Landscaping
- Gasoline concentration contour

0 60  
SCALE: 1/2" = 60 FEET

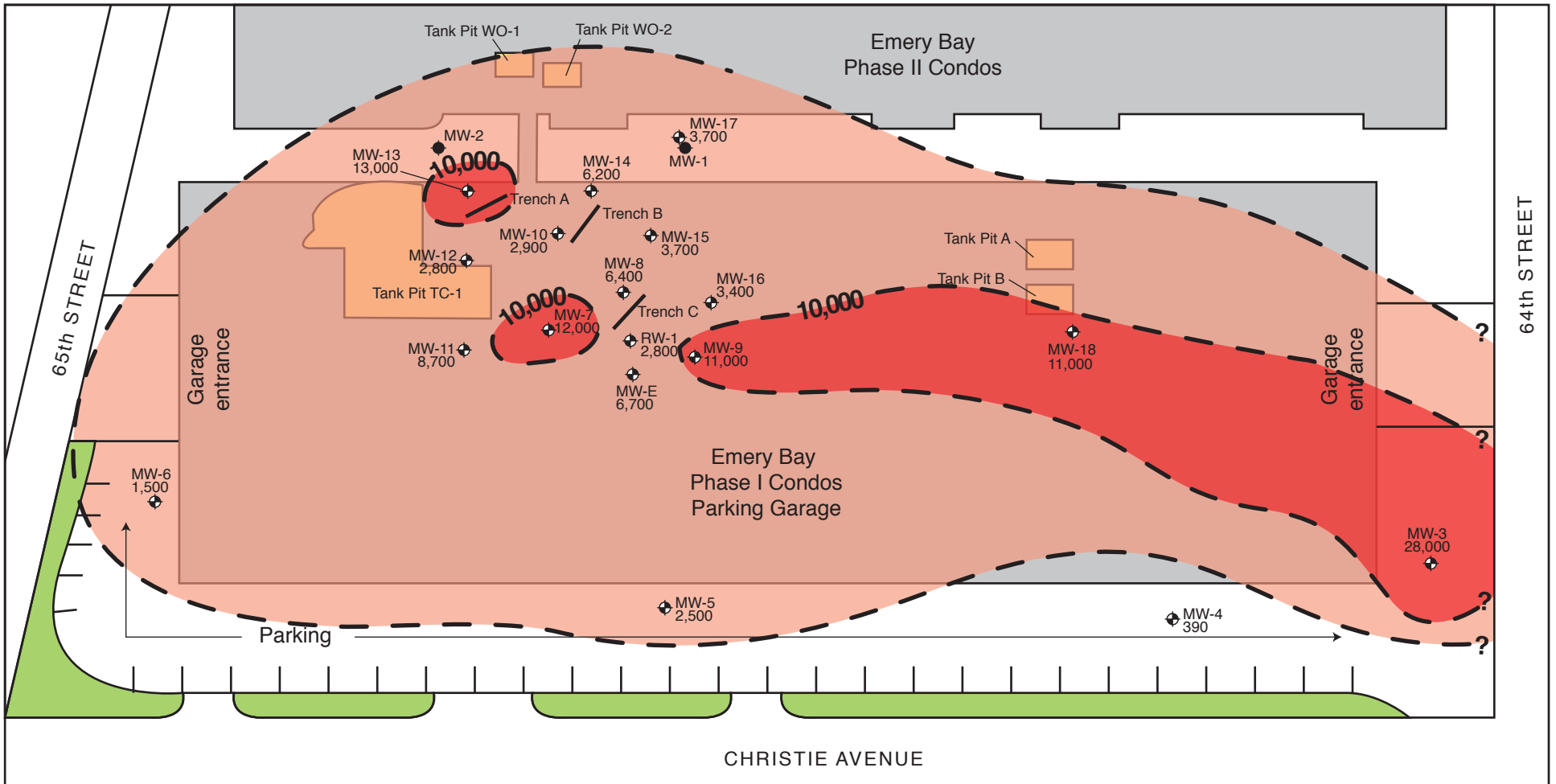


**TOTAL PETROLEUM HYDROCARBONS AS GASOLINE—  
MARCH 23, 2017  
6400 Christie Ave., Emeryville, CA**

**Figure 6**

by: MJC

APRIL 2017



**LEGEND**

- ◆ Monitoring well
- ◆ Monitoring well (presumed abandoned)
- Trench location
- Historical tank pit area
- Landscaping
- Diesel concentration contour

0 60  
SCALE: 1/2" = 60 FEET



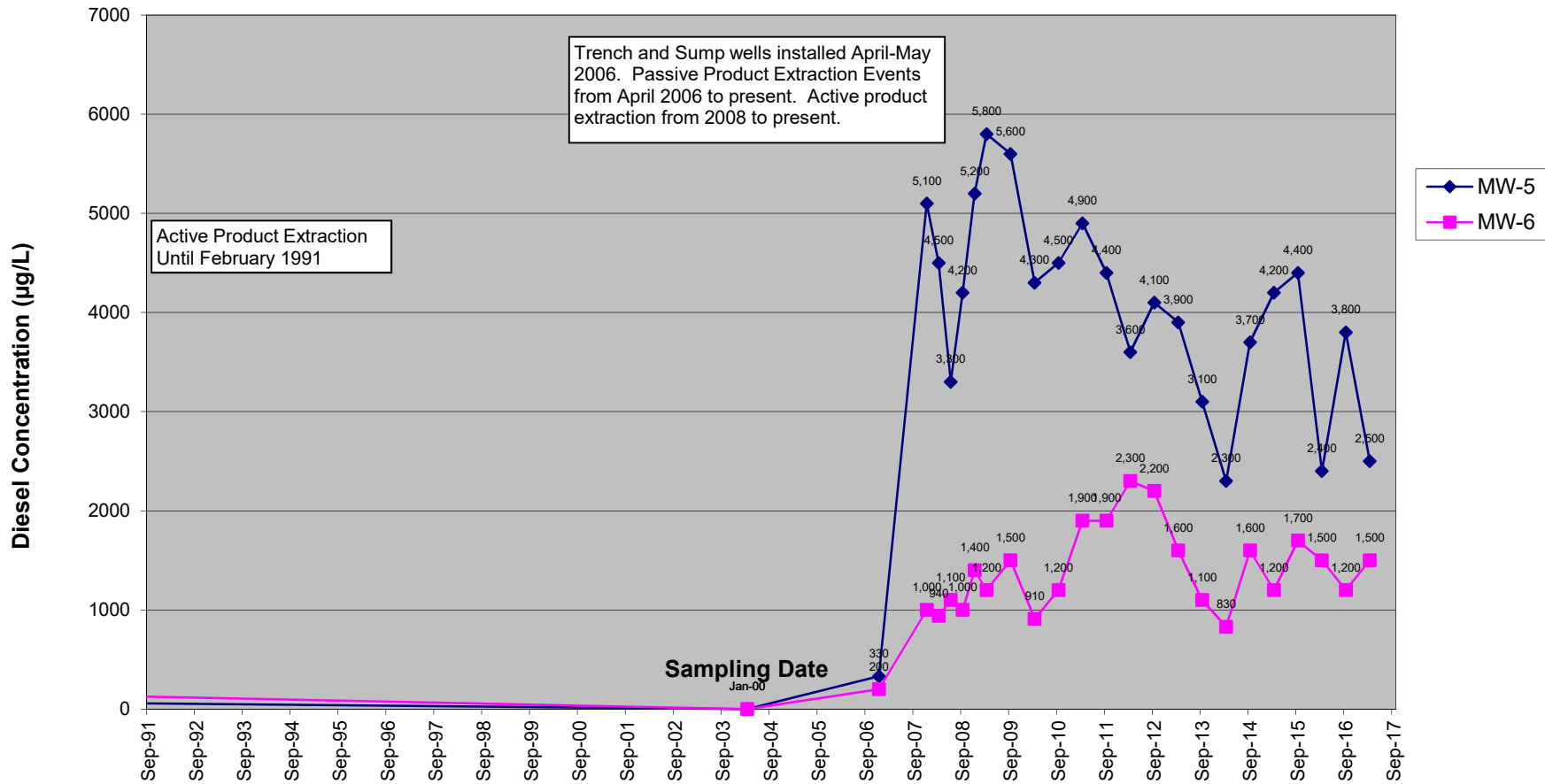
**TOTAL PETROLEUM HYDROCARBONS AS DIESEL—  
MARCH 23, 2017  
6400 Christie Ave., Emeryville, CA**

**Figure 7**

by: MJC

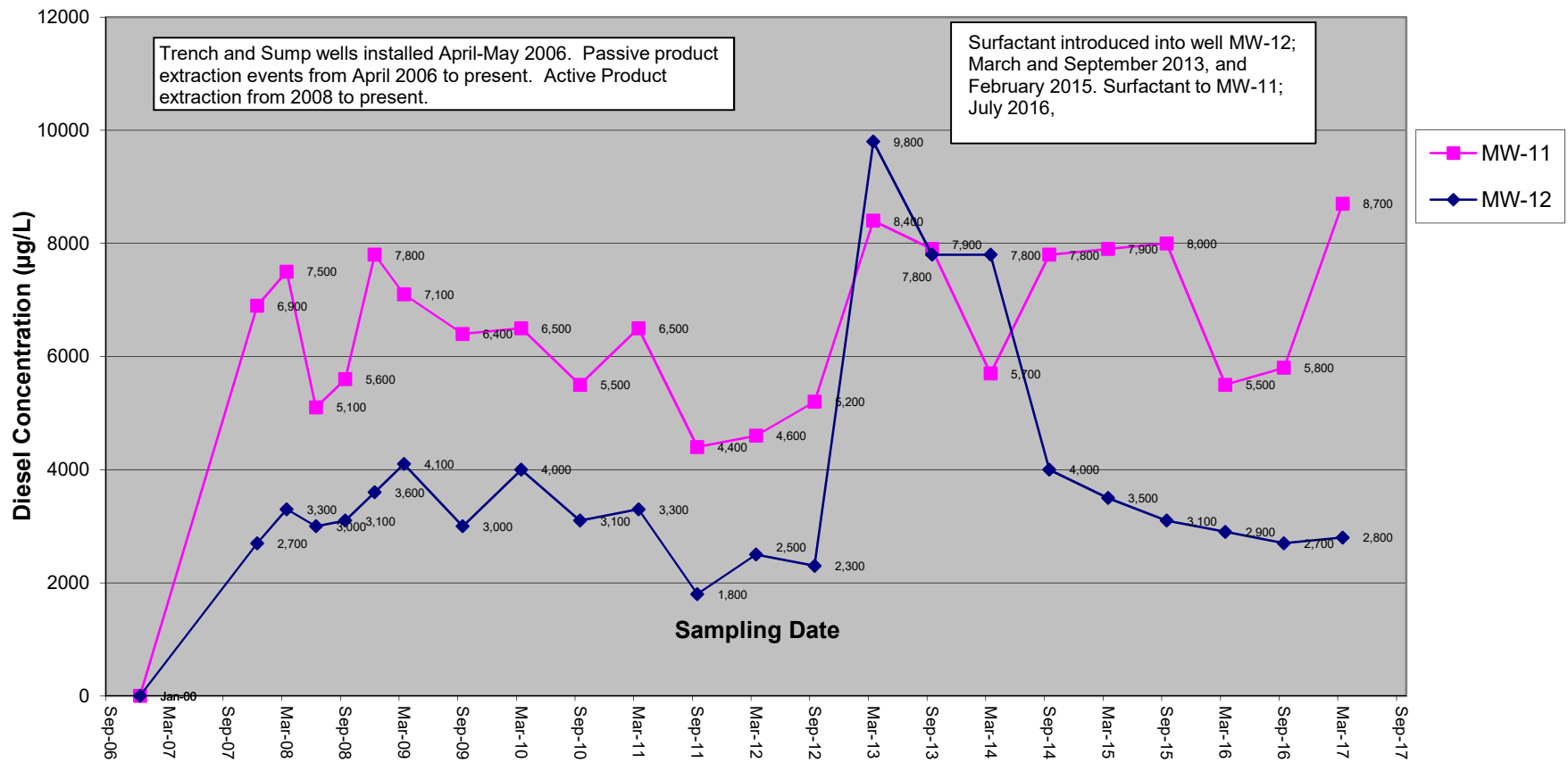
APRIL 2017

**Figure 8**  
**Historical Groundwater Analytical Results**  
**Total Petroleum Hydrocarbons as Diesel (TPHd)**  
**Downgradient Wells MW-5 and MW-6**  
**February 1991 - March 2017**

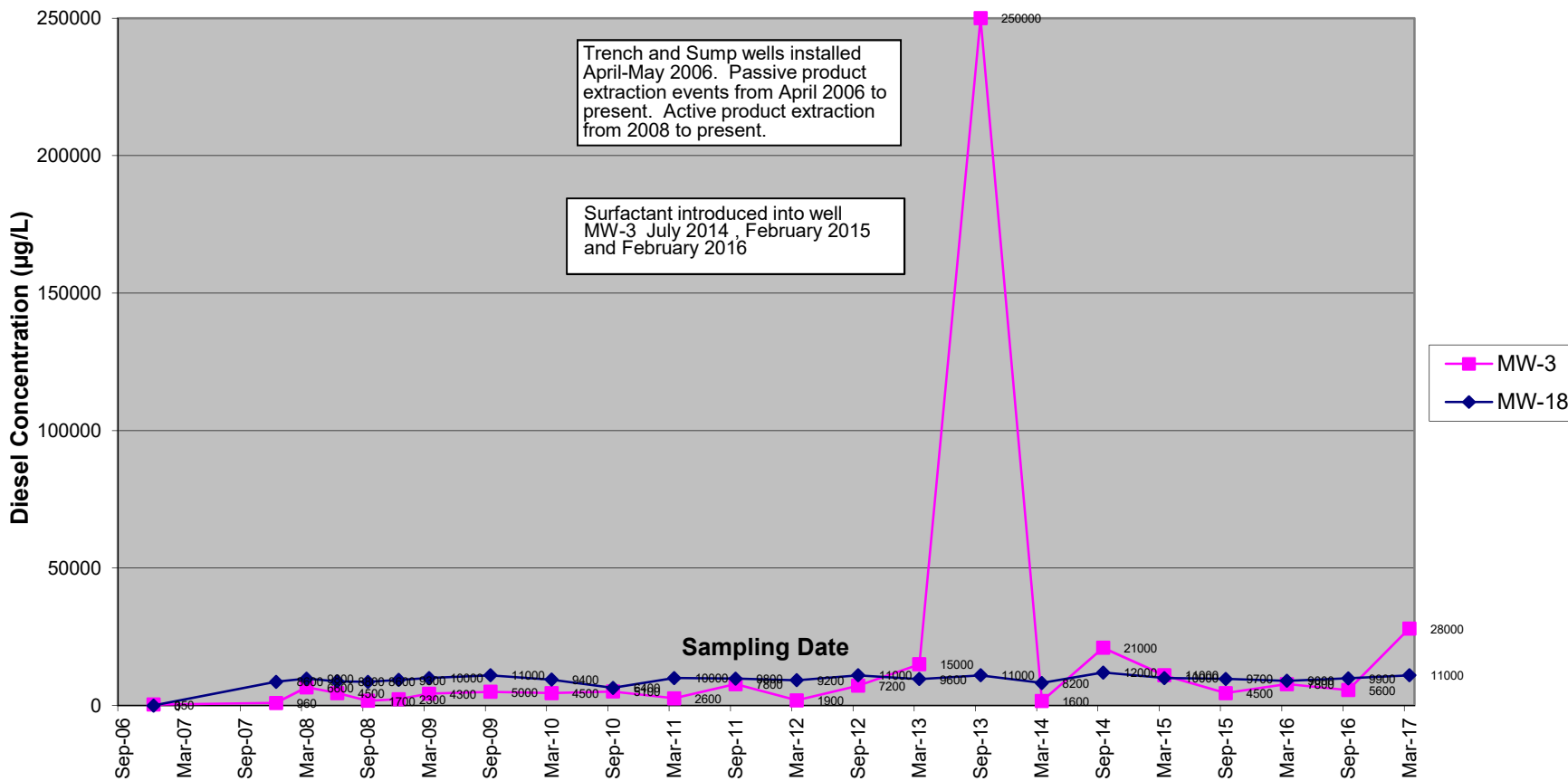




**Figure 9**  
**Historical Groundwater Analytical Results**  
**Total Petroleum Hydrocarbons as Diesel (TPHd)**  
**Source Wells MW-11 and MW-12**  
**December 2006 - March 2017**



**Figure 10**  
**Historical Groundwater Analytical Results**  
**Total Petroleum Hydrocarbons as Diesel (TPHd)**  
**Crossgradient Wells MW-3 and MW-18**  
**December 2006 - March 2017**



## **5.0 FREE-PHASE HYDROCARBON PRODUCT REMEDICATION SYSTEM**

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This section describes the historical extraction of the free product from the Emery Bay/Bridgewater Phase I Condo parking garage, the construction details of the current LNAPL remediation system located on the northeastern portion of the garage, and the most recent product removal activities conducted on March 21, 2017 (prior to the sampling event on March 23, 2017). Appendix E summarizes historical product removal.

### **LNAPL REMEDIATION SYSTEM CONSTRUCTION**

In an attempt to maximize free product removal, PES constructed three trenches, each containing three sump wells, in the northeastern area of the parking garage. Historically, this area has had the highest concentrations of contamination and accumulation of free product. The trenches (TA, TB, and TC) extend to depths of approximately 12.5 to 13 feet bgs, while the collection sumps in the trenches (TAW, TAM, TAE, TBW, TBM, TBE, TCW, TCM, and TCE) extend to approximately 11 to 13 feet bgs. The sumps were constructed using 10-inch-diameter schedule 40 polyvinyl chloride (PVC) casing. Blank casing was used from approximately 0.5 feet bgs to between 6 and 8 feet bgs. Slotted 0.06-inch PVC was used from between 6 and 8 feet bgs to 6 inches from the total depth of the trench. The trenches were then backfilled with high-porosity, high-permeability gravel designed to promote LNAPL migration (PES, 2007). Passive skimmers, manufactured by QED Environmental Systems were then placed in each of the sumps in Trench A and in one of the sumps (TCE) in Trench C.

Skimmers operate in principal by floating on the surface of the water. Water and free product collect in a filtration reservoir, which allows water to pass through. A tube connected to the reservoir then filters the free product into a collection reservoir located below the water surface. The reservoir can be emptied by opening a valve located on the bottom of the cylindrical shaped reservoir. Each of these skimmers is attached to the sump lid by a rope, and can be removed and transferred to another sump as needed. However, the skimmers were never particularly effective at capturing the petroleum product as designed, and by 2013, they contained nearly no free oil. Because the skimmers were no longer effective as of 2014, and because the skimmer equipment was covered with oily residue, possibly contributing to the hydrocarbon impacts to site groundwater, the skimmers were removed from the wells in trenches A (six skimmers) and C (one skimmer) on September 4, 2014.

## **HISTORICAL FREE PRODUCT EXTRACTION**

As mentioned under the “Previous Investigations” subsection in Section 1.0, in approximately 1986, contaminated soil and groundwater were discovered during the removal of 12 UFSTs from the Emery Bay Phase I and Phase II parcels. To dewater the excavation during the Phase I and Phase II Condo construction, a groundwater extraction and remediation system was installed by GTI in 1988. Approximately 1 million gallons of water yielding 100 gallons of hydrocarbon product was removed from RW-1 during its operation (PES, 2007). However, corrosion and other mechanical problems caused the system to fail in 1991, and it was decommissioned in 1994. In February 2008, Stellar Environmental removed all of the old parts of the system from the well and vault.

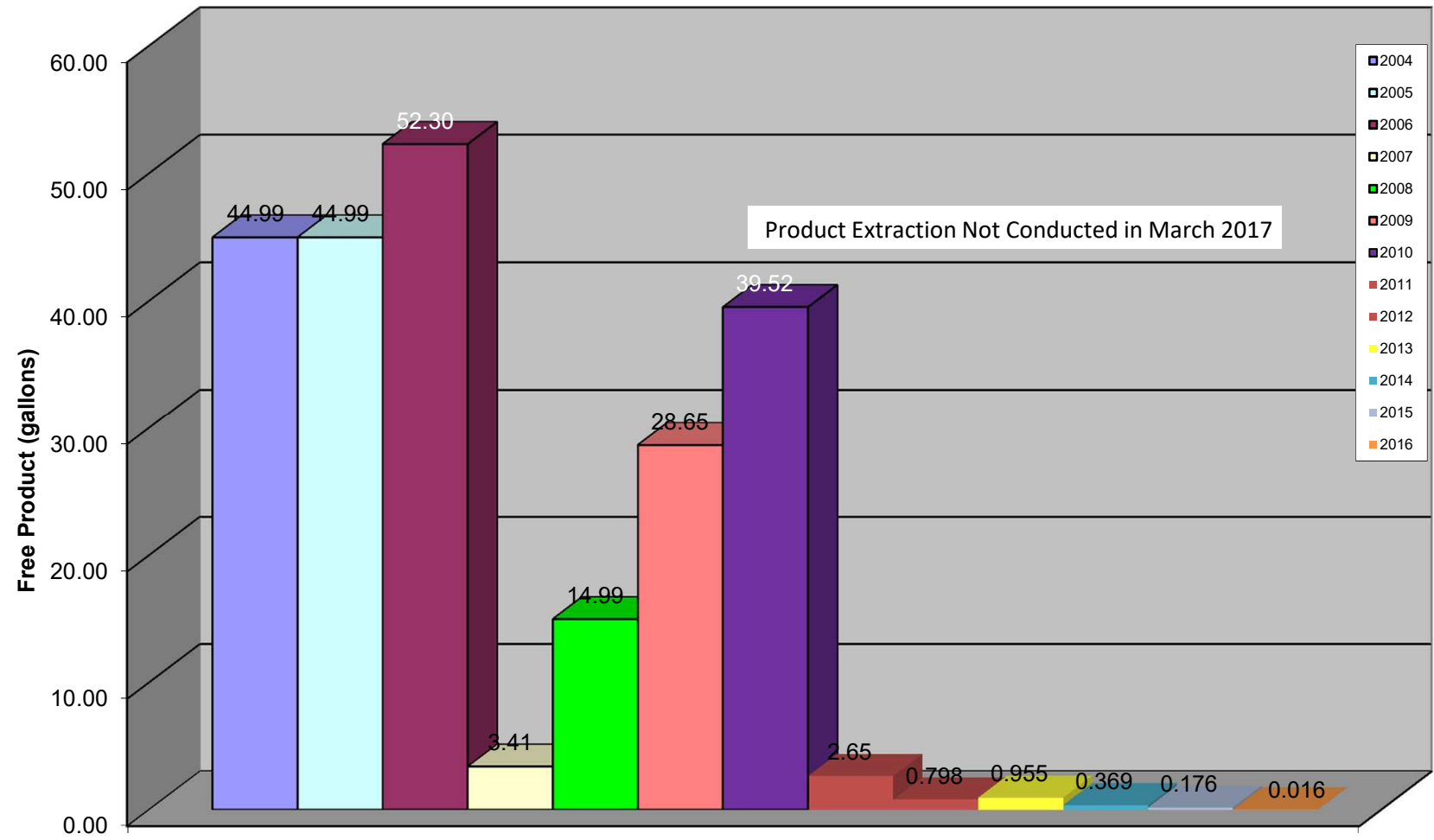
In 2004, PES began manual extraction from well RW-1, and was reported to have removed approximately 48 gallons of LNAPL (PES, 2004a)—although it is unclear whether the removed material was pure product or product mixed with water. To accelerate free product removal, PES constructed a new LNAPL hydrocarbon remediation system (described previously) between April and May 2004 (PES, 2007). Several extraction events were conducted by PES from May 2004 through March 2007; the extraction events yielded a total of approximately 51 gallons of LNAPL. No extraction events were conducted by PES in 2005; approximately 50 gallons of hydrocarbons was removed in 2006; and approximately 0.6 gallon of hydrocarbons was removed by PES between January and November 2007. In November and December 2007, after Stellar Environmental was retained for the project, the skimmer system yielded 2.82 gallons. Figure 11 graphs the comparison of free product extraction on a yearly basis.

No historical product extraction reports were provided to Stellar Environmental by the previous owner or by PES. Therefore, there is little to no information on how active product extraction occurred during 2004 and 2006. Based on better defined recovery in 2008 through 2011 the volume of free product indicated to have been recovered during 2004 and 2006 appears unrealistically high, suggesting that free-phase product mixed with water was reported as free-phase product recovery.

## **2013-2016 SURFACTANT INJECTIONS**

Some of the centrally located wells, and perimeter well MW-3 contain a molasses-like, degraded product that has made well purging and sampling increasingly difficult. Equipment lowered down into the well casings come back out coated with a tar like substance that is difficult or impossible to clean, and may account for low water yield in some wells due to sand pack and well screen fouling. Six of the worst wells in this regard have been MW-3, MW-8, MW-10, MW-12, MW-13 and MW-14. With the exception of MW-3 which is constructed with 2-inch diameter PVC well casing, all these wells are constructed with 3/4-inch diameter PVC casing, and are screened to total depth across

**Figure 11**  
**Total Free Product Extracted Per Year**  
**6400 Christie Avenue, Emeryville, CA**



the same interval of 5 to 20 feet bgs, except for MW-8 which is screened from 5 to 16 feet bgs. In order to attempt to clean the well casings and emulsify the tar thought to exist in the well pack, a surfactant was chosen as a solution.

Surfactants are designed to change the interfacial tension between the water and NAPL and desorb the residual LNAPLs entrained in the soil matrix by micro-emulsifying the organic particles, and forming a micelle. In the case of weathered LNAPLs, surfactants have been used to decrease the viscosity of the material, resulting in increased and more efficient recovery. Surfactants can also be considered bioremediation enhancing and vapor suppression agents. The use of mobile multi-phase extraction that has been occurring at the site twice-yearly since 2008, allows a focused remediation effort at a targeted area of the site, and increases the effective radius of influence of the pumping. This combined approach involves the in-situ application of a surfactant mixture, under pressure, into the site subsurface. The injection is followed by high-vacuum induced multi-phase recovery from the injected wells as well as surrounding wells via a mobile vacuum truck.

In March and September 2013 wells MW-8, MW-12, MW-13 and MW-14 were injected with EnviroClean<sup>®</sup> supplied by Enviro Clean Services, LLC. EnviroClean<sup>®</sup> is a non-flammable, non-toxic, water-based blend of non-toxic, non-ionic ethoxylated octylphenolic surfactants that has been engineered as a cleanup/mitigation agent for a wide range of hydrocarbon products. EnviroClean<sup>®</sup> product information is included in Appendix F. A 4% solution of EnviroClean<sup>®</sup> was mixed per manufacturer recommendations using clean water. Approximately 5 gallons of the solution was introduced into each well. The well casing and screen in each well were then scrubbed using a stiff bristle brush attached to an extension. After the scrubbing, approximately 15 gallons of the working EnviroClean<sup>®</sup> solution was injected under pressure into each well using a dual-diaphragm pump.

Based on the positive results of the non-hazardous surfactant injection into wells MW-8, MW-12, MW-13 and MW-14 in 2013 which resulted in reduced or eliminated oil residue, the same surfactant was introduced into well MW-3 which has historically been difficult to gauge and sample due to the thick oil in the well. On July 2, 2014, approximately 10 gallons of a 5% mixture of the surfactant was introduced into MW-3 and the well casing scrubbed. On September 4, 2014, approximately 20 gallons of the 5% surfactant mixture was introduced into each of the nine trench wells onsite after the skimmers had been removed from the wells in trenches A and C, to test the ability of the surfactant to re-dissolve the viscous hydrocarbon buildup in those wells.

Additional surfactant application occurred on February 3, 2015. Approximately 1 gallon of an 8% surfactant mixture was introduced into wells MW-8, MW-12, MW-13, MW-18 and MW-E. Each well was swabbed as described above. Two gallons of a 10% mixture and 5 gallons of a 15% solution was introduced into wells MW-10 and MW-3 respectively, and swabbed.

Further surfactant application occurred on January 14, 2016. Approximately 1 gallon of a 5% surfactant mixture was introduced into wells MW-8 and MW-10. Each well was swabbed as described above. Three gallons of a 5% solution was introduced into MW-3, then swabbed.

The most recent surfactant application occurred on June 24, 2016 informed by the observation of LNAPL in site wells by Blaine Tech Services during sampling activities conducted on March 31, 2016. Approximately 1 gallon of a 5% surfactant mixture was introduced into wells MW-8, MW-10, MW-11, MW-13 and MW-15. Each well was swabbed after the introduction of surfactant.

### **BIOREMEDIATION COMPOUND INJECTION 2015-2016**

Surfactant injection efforts between 2013 and 2016 have reduced free-floating product phase in the area of the trench wells and other nearby monitoring well hotspots such as MW-8, MW-10 and MW-13. Based on the very low volumes of free product being recovered from site monitoring and extraction wells, introduction of a bioremediation compound into the trench wells was considered as a method of reducing the hydrocarbon plume hotspot.

After reviewing the various options for in-situ bioremediation Stellar Environmental concluded that for this particular site, with the apparent concentration and type of hydrocarbons evident, the most promising remedy is to use a product designed to degrade the petroleum hydrocarbons anaerobically. The proposed remedial design accomplishes this through enhanced natural attenuation/biodegradation and *in situ* chemical reduction induced via the use of a sulfate delivery bioremediation compound. The method relies on sulfate utilization, since the majority of petroleum hydrocarbon sites are sulfate depleted. Sulfate is readily soluble therefore large amounts of it can quickly dissolve into groundwater. Sulfate reducing bacteria will use the petroleum hydrocarbons as a food source and sulfate as the terminal electron acceptor. The result is rapid bioremediation of dissolved petroleum hydrocarbons. The product chosen for the remedial injection is Nutrisulfate<sup>®</sup>. The metabolites in Nutrisulfate<sup>®</sup> are designed to enhance microbial growth. Advantages include:

- Improved bioremediation kinetics
- Thinner (parallel to groundwater flow) bio-barriers
- Faster remedies
- Reduced costs

For the proposed 14,400 cubic feet treatment volume (60ft x 60ft x 4ft) one, 500 lb. drum (55-gallons) of Nutrisulfate<sup>®</sup> was introduced into trench Well arrays A and C on September 3, 2015. An additional 110 gallons of the product was introduced into the trench well arrays A and C on February 17, 2016 and again on August 3, 2016. The product loading is based on the averaging the concentrations in the six monitoring wells MW-8, MW-10, and MW-12-through MW-15 collected in

Y-2014. The product is engineered for the slow release of sulfate and nutrients to stimulate the bioremediation of the hydrocarbon groundwater environment at the site. The injected product has no harmful products or byproducts associated with it.

## **HYDROCHEMICAL ANALYSES TO MONITOR NUTRISULFATE® VIABILITY**

Nutrisulfate® is a high sulfate, yeast based product that stimulates biodegradation by providing a soluble, readily available electron acceptor solution. In the presence of elevated sulfate, anaerobic groundwater bacteria use BTEX compounds and other petroleum hydrocarbons for carbon and energy while mineralizing the hydrocarbons to carbon dioxide and water.

In order to track the hydrochemical conditions in the trench well arrays, samples were collected in February 2017 from the central well in each array with the goal to track the conditions that are being created by the Nutrisulfate® product introduced into trench well arrays A and C in 2015 and 2016. The product has not been introduced into trench well array B. Table 4 summarizes dissolved Iron (Fe), Nitrates, Sulfates, pH, dissolved oxygen (O<sub>2</sub>) and oxidation reduction potential.

**Table 4**  
**Trench Well Groundwater Hydrochemical Analytical Results**  
**February 8, 2017**  
**6400 Christie Avenue, Emeryville, California**

Well ID	Analytical Results							
	Dissolved Fe (µg/L)	Nitrates (mg/L)	Sulfates (mg/L)	pH (Su)	Dissolved O <sub>2</sub> (mg/L)	ORP (Eh)	TVHg (µg/L)	TEHd (µg/L)
TAM	< 100	23,000	5,100	6.8	0.61	- 260	15,000	31,000
TBM	< 100	8,100	9.1	7.1	3.5	- 16	5,100	3,400
TCM	270	62,000	7,800	6.6	0.38	- 300	5,600	65,000

Notes:

ORP = Oxidation Reduction Potential

(TPHd = total petroleum hydrocarbons – diesel range (equivalent to total extractable hydrocarbons – diesel range)

TPHg = total petroleum hydrocarbons – gasoline range (equivalent to total volatile hydrocarbons – gasoline range)

As can be seen in Table 4, the dissolved oxygen is lower in the amended wells, suggesting that the desired anaerobic conditions are being created. Sulfate has increased in the amended wells and pH is within desirable bioremediation range limits. Oxidation-reduction potential (ORP), is a measurement that in this case, indicates the degree to which the Nutrisulfate® is capable of oxidizing or reducing the hydrocarbon contaminants. The negative ORP values in wells TAM and TCM indicate that the desired reducing conditions are being created in trench well arrays A and C. Overall, the Nutrisulfate® product appears to be creating the conditions needed to support natural bioremediation. Since the theoretical sulfate demand is not likely to be met, reapplication of the Nutrisulfate® product may be required when sulfate depletes.



## **MARCH 2017 PRODUCT REMOVAL EVENT**

Product yield from the trench recovery system has been unproductive and inconsistent, with the passive skimmer collection reservoirs not filling up completely, or filling up with water rather than product. As mentioned above, due to their ineffectiveness at collecting free product over the past several monitoring events, and due to the oily residue on the skimmers, the skimmers were removed from the wells in trenches A and C prior to the first surfactant injection into those trench wells on September 4, 2014. As described above, the bioremediation product, Nutrisulfate<sup>®</sup> was introduced into trench well arrays A and C on September 3, 2015, February 17, 2016 and most recently on June 24, 2016. No product recovery was conducted from trench well arrays A and C for the current monitoring event so as to not disturb/remove the Nutrisulfate<sup>®</sup> product. Groundwater extraction (300 gallons) for the purpose of dissolved hydrocarbon recovery was conducted for trench well array B. Due to equipment failure, no pumping or recovery was conducted for well RW-1 or any of the site monitoring wells for the March 2017 monitoring event. A full round of groundwater and product pumping/recovery will be conducted in September 2017.

The removal activities for March 2017 can be summarized as follows:

- Stellar Environmental removed a total of 300 gallons of water from trench wells TBW, TBM and TBE with no measurable free product. No removal was attempted from trench wells TAW, TAE TAM, TCW, TCE or TCM due to the Nutrisulfate<sup>®</sup> product that had been introduced into those wells most recently on June 24, 2016.
- No other monitoring well or recovery well RW-1 was pumped.
- The 300 gallons water and trace of free product extracted from wells TBW, TBM and TBE was contained onsite in the 1,100-gallon AST located in the northeastern gated area of the garage.

## **DISCUSSION OF FREE PRODUCT REMOVAL AND LIMITATIONS**

As mentioned under the “Historical Free Product Extraction” subsection of this chapter, no product extraction was conducted by PES in 2005. “Product” removal in 2006 was reported at a significant 52 gallons by PES; however, it was not achieved through collection from the trench hydrocarbon skimmers, but rather through active pumping; in addition, the “product” referred to by PES appears to actually have been a mixture of petroleum product and water. The PES report provides no documentation (e.g., manifests) of the removal of actual recovered petroleum product. The recovery by PES from the start of 2007 through October 2007 (when Stellar Environmental assumed environmental consulting activities) was limited to 0.6 gallon collected from the skimmers. In addition, there had been no removal of free product from well RW-1 since 2004, at which time approximately 50 gallons of free-floating product was reportedly (PES, 2004c) removed by active

pumping although antidotal evidence suggests that much of this was purge water versus free product. The majority of petroleum product is indicated to have been removed by active pumping and removal activities rather than from the trench well skimmers, the petroleum product recovery being in the form of a mixture of water and hydrocarbons. In 2007, passive extraction of free product through trench well skimmers removed only 3.41 gallons. Stellar Environmental removed approximately 5.65 gallons of free product from these passive skimmers during the 2008 removal events. From 2011 until they were removed in 2014, the skimmers contained only water and a trace of oil when checked. Approximately 14.99 gallons of product were removed by active pumping on wells during 2008, 28.65 gallons in 2009, 39.52 gallons in 2010, 2.65 gallons in 2011, 0.798 gallons in 2012, 0.955 gallons in 2013, 0.369 gallons in 2014, 0.176 gallons in 2015 and 0.016 in 2016, indicating that the active pumping of site wells to be an effective means of product removal as compared to the passive skimmer system. With only about 0.016 gallons of product removed in 2016 (about 2 ounces) it would appear that going forward, the reduction of recoverable LNAPL volume is likely to continue to decrease. Active pumping however will continue to be an effective method of removing groundwater with high dissolved hydrocarbon concentrations which will act as migration control.

For the current monitoring event, 6 of 15 wells in which TVHg is historically detected showed an increase of that compound as compared to 8 of 15 wells for March 2016. Thirteen of 18 wells that have historically contained TVHd showed an increase in TEHd concentrations compared to 3 of 18 wells for March 2016. The observed increase in hydrocarbon concentration (particularly diesel range) for the current monitoring event compared to the March 2016 sampling event is likely due in part to the fact that except for the trench wells in array B, no active pumping was conducted on site for March 2017 as is normally done which likely resulted in higher dissolved TEHd concentrations in groundwater.

The reduction of LNAPL by active extraction, which has since 2013 been combined with surfactant injections in selected wells, was a necessary step prior to current in-situ bio-remedial efforts, the first application of which occurred on September 3, 2015. Inconsistent trends in the hydrocarbon concentrations, particularly the upward spike in gasoline and diesel concentrations observed in wells since the surfactant injection in and/or near that wells may show more consistent trend lines after additional bio-remedial efforts are conducted (see Section 6). Based on observations made during the March 2017 field work, wells RW-1, MW-3, MW-8, MW-13 and MW-17 would benefit from additional surfactant application into those wells.

In general, residual hydrocarbons left in the soil after the USTs were removed from the site in the 1980's, is likely to continue to be a source of contamination to groundwater at the site. Additional surfactant applications at the site are expected to continue to reduce the degraded product present. Additional Nutrisulfate® application into the trench wells as necessary as determined by tracking

sulfate in the trench wells, are expected to be useful to speed the reduction of the dissolved hydrocarbon concentrations to levels acceptable to the regulatory community and to achieve eventual regulatory closure. The outward effect of the surfactant injections based on observations made during recent product removal efforts has been a marked reduction in the viscous hydrocarbon substance in site wells. A significant increase in water yield from wells that received surfactant has not been observed.

## **6.0 SUMMARY, CONCLUSIONS, AND PROPOSED ACTIONS**

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### **FINDINGS AND CONCLUSIONS.**

- The subject property parcel was developed as early as 1958 with the Motor Freight Station, associated with Delta Lines, Inc. The Delta Lines complex contained an “Oil and Gas” building, located at the site of the present-day Emery Bay Phase I Condo complex and parking garage. In 1986, the building was demolished, and 12 UFSTs containing diesel and gasoline were removed from the Emery Bay Phase I and Phase II Condo complex parcels. Soil and groundwater contamination was discovered.
- In response to the contamination, a LNAPL groundwater pump-and-treat system was installed in 1989, but failed in 1991. Active pumping of free product began again in 2004, and a product extraction system consisting of passive product removal was installed in 2006. Groundwater monitoring events have been sporadically conducted since 1988; quarterly groundwater monitoring events were conducted for the first time in 2008. The quarterly sampling was reduced to a semi-annual frequency in 2009.
- The site currently contains 17 monitoring wells, 1 recovery well, and 9 product extraction trench wells. The current event is the 27<sup>th</sup> sampling event conducted since 1988.
- Site geological conditions consist of a combination of fill and soft bay sediment to between 15 and 20 feet bgs, covered by approximately 1 to 2 feet of pavement and imported fill. This is underlain by approximately 20 feet of firm soil consisting of primarily dense silty sand with intermittent layers of silty and sandy clay. Stiff to very stiff clay extends from a depth of approximately 40 feet to approximately 102 feet.
- The groundwater flow direction calculated during this monitoring event was found to be generally to the west.
- Groundwater elevations in site wells for March 2017 ranged from 6.05 feet (MW-3) to 11.09 feet (MW-6) above mean sea level, with the average groundwater gradient for the current monitoring event being 0.007 foot/foot.

- The injection of a (non-hazardous) surfactant into selected site monitoring wells and into the nine trench wells over six separate occasions since 2013 was used to test the ability of the surfactant to emulsify the viscous hydrocarbon buildup in the injected wells and nearby wells. Based on field observations of site wells, 11 of 27 monitoring and trench wells had detectable LNAPL prior to the first surfactant injection in March 2013 compared to 5 of 27 for the current March 2017 monitoring period.
- Surfactant injections into the A and C trench well arrays and wells MW-3, MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-18 and MW-E have reduced or eliminated LNAPL in those wells, and may have contributed to an increase in concentrations of dissolved hydrocarbons and MBTEX in those wells and other site monitoring wells as compared to the September 2015 monitoring event.
- Current contaminants of concern include TPHg, TPHd, and BTEX. Current groundwater concentrations exceeded the ESLs for these contaminants.
- MTBE was not detected in any site well for the current March 2017 monitoring work.
- The highest concentrations of TVHg (34,000 µg/L in MW-8) and TEHd (28,000 µg/L in MW-3) for the current event compares to concentrations of 23,000 µg/L TVHg in MW-8 and 11,000 µg/L TEHd in wells MW-13 in March 2016. Concentrations of hydrocarbons in well MW-8 have trended higher since the March 2016 sampling event with TVHg increasing from 23,000 µg/L to 34,000 µg/L, and TEHd increasing from 1,200 µg/L in 2016 to the current 6,400 µg/L. Concentrations of hydrocarbons in well MW-11 also showed an upward change in hydrocarbon concentrations compared to the March 2016 sampling event, with TVHg increasing from 1,900 µg/L in to 5,000 µg/L for the current event, and TEHd increasing from 5,500 µg/L in 2016 to the current 8,700 µg/L.
- Increases in March 23 and 24 2017 TVHg concentrations compared to the March 2016 monitoring event were observed at wells MW-7, MW-8, MW-11, MW-14, MW-17, and RW-1. This represents six wells exhibiting an increase in TVHg as compared to eight wells reported in March 2016.
- TVHg was detected above the ESL where groundwater is not a likely drinking water resource (440 micrograms per liter [µg/L]) in all wells except wells MW-4, MW-5, MW-6, MW-9, MW-16 and MW-18 where Gasoline was also detected, but at concentrations below the ESL.
- TEHd was detected in all site wells above the ESL of 640 µg/L (where groundwater is not a likely drinking water resource) except for well MW-4, but showed a decrease in concentration in 3 of the 18 wells sampled as compared to 12 of 18 wells in the March 2016 sampling event.

- In monitoring wells MW-3, MW-7, MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-E and RW-1 concentrations of benzene exceeded the ESL of 1.0 µg/L for residential property where groundwater is not a drinking water resource. Comparing March 2016 results to the current results showed a decrease in benzene in 6 of the 18 site wells sampled. An increase in benzene was detected in 9 of the 18 wells. Benzene was detected in well MW-6 but at a concentration below the ESL. Perimeter wells MW-4 and MW-5 remain stable at concentrations below laboratory reporting limits for the current event.
- Toluene was detected at or above the ESL of 130 µg/L in monitoring wells MW-8, MW-13 and MW-14. Toluene was also detected in wells MW-7, MW-8, MW-10, MW-11, MW-12, MW-15, MW-16, MW-E and RW-1 but at levels below the ESL.
- Ethylbenzene was detected above the 43 µg/L ESL in monitoring wells MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-17 and MW-E. Ethylbenzene was also detected in wells MW-7 and RW-1 but at levels below the ESL.
- Total xylene concentrations in wells MW-8, MW-11, MW-13, MW-14, and MW-17 were above the 100-µg/L ESL where groundwater is not a likely drinking water resource. Total xylenes were detected in MW-3, MW-7, MW-10, MW-15, MW-E and RW-1 but below the ESL.
- Due to the ineffectiveness of the product skimmers that were in wells in recovery trenches A and C, the skimmers were removed from the wells in September 2014. The other reason for removal of the skimmers was that they were coated with oil, and thought to be contributing to dissolved hydrocarbon groundwater contamination. Lack of LNAPL allowed for the introduction of the Nutrisulfate<sup>®</sup> bioremediation product into the trench well arrays A and C in September 2015, February 2016 and August 2016.
- The near elimination of viscous LNAPL from site wells has allowed introduction of the product Nutrisulfate<sup>®</sup> which encourages natural attenuation/biodegradation and *in situ* chemical reduction via a sulfate delivery bioremediation compound. The metabolites in Nutrisulfate<sup>®</sup> are designed to enhance microbial growth. An initial application of 500 lbs. of Nutrisulfate<sup>®</sup> trench well arrays A and C was conducted on September 3, 2015. 1,000 lbs of the product was introduced into trench well arrays A and C on February 17, 2016 and an additional application of 1,000 lbs of the product was introduced into trench wells A and C on August 3, 2016.
- Based on samples collected from trench wells TAM, TBM and TCM collected February 8, 2017, the dissolved oxygen is lower in the amended wells, suggesting that the desired anaerobic conditions are being created. Sulfate has increased in the amended wells and pH is within desirable bioremediation range limits. Oxidation-reduction potential (ORP), is a

measurement that in this case, indicates the degree to which the Nutrisulfate<sup>®</sup> is capable of oxidizing or reducing the hydrocarbon contaminants. The negative ORP values in wells TAM and TCM indicate that the desired reducing conditions are being created in trench well arrays A and C. Overall, the Nutrisulfate<sup>®</sup> product appears to be creating the conditions needed to support natural bioremediation. Since the theoretical sulfate demand is not likely to be met, reapplication of the Nutrisulfate<sup>®</sup> product may be required when sulfate depletes.

- The central well (wells TAM, TBM and TCM) in each of the three trench well arrays was sampled June 14, 2016 and again on February 8, 2017 for the purpose of tracking hydrocarbon concentrations in the trench well arrays and to monitor differences in hydrocarbon concentrations in trenches A and C which have been receiving the Nutrisulfate<sup>®</sup> injections, versus the well in trench B which has not received the Nutrisulfate<sup>®</sup>. Although the ratios of TVHg, to TEHd concentrations in the trench wells have slightly shifted towards TEHd after the introduction of the Nutrisulfate<sup>®</sup>, no clear pattern of reducing hydrocarbon concentration in groundwater is yet evident in the Nutrisulfate<sup>®</sup> amended trench wells over the June 2016 to February 2017 time period. TVHg, TEHd and BTEX concentrations in the trench wells currently exceed ESLs with up to 65,000 µg/L TEHd detected in well TCM.
- For the current March 2017 monitoring event, Stellar Environmental conducted active dissolved product removal only from trench B wells. A total of approximately 300 gallons of gallons of groundwater was removed from trench wells TBW, TBM and TBE. Groundwater and free product removal for the remaining site wells was not conducted for the current monitoring event due to equipment failure.
- TVHg and TEHd concentrations in the central area of the site where historically, wells MW-8, MW-10, MW-12, MW-13, MW-14 and MW-16 have shown the highest concentrations of residual fuel, generally trended towards higher TEHd concentrations for the current monitoring event and towards lower concentrations of TVHg.

## RECOMMENDATIONS

- Based on observations made during the March 2017 purging/gauging activities conducted by Baline Tech Services, surfactant injections into wells MW-3, MW-8, MW-13, MW-17 and RW-1 should be conducted in mid-June 2017, prior to the next scheduled semiannual monitoring event scheduled for September 2017. These monitoring wells and the recovery well RW-1 are the only wells currently onsite that contain enough detectable free product that can be expected to benefit from the surfactant.
- As part of the next recommended groundwater sampling event that would occur in September 2017, it is recommended that groundwater samples be collected from the central wells in each of the three trench well arrays. Laboratory analyses would include

TVHg/TEHd/MBTEX and dissolved iron, nitrates, sulfates, pH, dissolved oxygen, oxidation reduction potential. The goal of this work is to continue to track hydrochemical trends in wells TAM and TCM receiving the Nutrisulfate<sup>®</sup> product and to compare trends against the trench well TBM which is not receiving the Nutrisulfate<sup>®</sup>.

- Active groundwater/dissolved product removal events should be continued to ascertain their effectiveness in reducing the plume size over time. Active product removal is currently being conducted on a semiannual basis immediately prior to the sampling event. For the next scheduled monitoring event in September 2017, it is recommended that the product removal be focused on wells MW-3, MW-8, MW-10, MW-12, MW-13, MW-14, MW-15, MW-17, MW-E, RW-1 and trench wells TBE, TBM and TBW. These are the wells with the highest hydrocarbon concentrations and/or contain detectable free product.
- Groundwater monitoring should be continued on a semiannual basis to document contaminant concentrations over time. This monitoring of site wells will allow follow-on evaluation of the Nutrisulfate<sup>®</sup> injection and its efficacy for scaling upward to move the site toward full regulatory site closure.
- An indoor air sampling event is recommended in the ground floor sales office building with an outside control based on the findings for the last such monitoring event in June 2016 which showed some risk of exposure from benzene intrusion to commercial occupants of the ground floor. The indoor air survey would be scheduled for June 2017 and will seek to determine if reductions in vapor intrusion have occurred along with the reduction in the groundwater concentrations.
- Electronic uploads to ACEH's ftp system and the State Water Board's GeoTracker system should be continued as required.



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## 8.0 LIMITATIONS

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This report has been prepared for the exclusive use of Emerybay Commercial Association, their authorized representatives and assigns, and the regulatory agencies. No reliance on this report shall be made by anyone other than those for whom it was prepared.

The findings and conclusions presented in this report are based on a review of previous investigators' findings at the site, as well as site investigations conducted by SES in 2007, 2008, and 2009. This report has been prepared in accordance with generally accepted methodologies and standards of practice. The SES personnel who performed this limited remedial investigation are qualified to perform such investigations and have accurately reported the information available, but cannot attest to the validity of that information. No warranty, expressed or implied, is made as to the findings, conclusions, and recommendations included in the report.

The findings of this report are valid as of the date of this report. Site conditions may change with the passage of time, natural processes, or human intervention, which can invalidate the findings and conclusions presented in this report. As such, this report should be considered a reflection of the current site conditions as based on the activities completed.

## **APPENDIX A**

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### **Historical Groundwater Well Analytical Results**



**TABLE A**  
**Historical Groundwater Monitoring Well Groundwater Analytical Results**  
**Petroleum and Aromatic Hydrocarbons (µg/L)**  
**6400 Christie Avenue, Emeryville, California**

MW-1									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Dec-88	380	17,000	NA	6,600	840	250	570	NA
2	May-89	130	24,000	NA	16,000	300	1,200	NA	NA
3	Feb-91	<10	22,000	NA	6,800	1,500	410	2,000	NA

Monitoring well abandoned - date unclear

MW-2									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Dec-88	72	22	NA	<0.5	<0.5	<0.5	<0.5	NA
2	May-89	40	18	NA	<0.5	<0.5	<0.5	<0.5	NA
3	Feb-91	83	<10	NA	<0.3	<0.3	<0.3	<0.6	NA

Monitoring well abandoned - date unclear

MW-3									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Dec-88	<10	4,200	NA	77	1,400	140	560	NA
2	May-89	110	1,800	NA	64	290	61	110	NA
3	Feb-91	NS	NS	NS	NS	NS	NS	NS	NS
4	Mar-04	3,400	440	3,900	<0.5	<0.5	1.5	<1.0	9.7
5	Dec-06	350	280	230	<0.5	<0.5	<0.5	<0.5	2.0
6	Dec-07	960	150	NA	0.54	0.54	<0.5	<0.5	<2.0
7	Mar-08	6,600	450	NA	<0.5	<0.5	1.8	2.0	4.3
8	Jun-08	4,500	440	NA	<0.5	<0.5	4.0	2.0	9.5
9	Sep-08	1,700	280	NA	<0.5	<0.5	1.0	<0.5	<2.0
10	Dec-08	2,300	240	NA	<0.5	<0.5	1.1	<0.5	<2.0
11	Mar-09	4,300	260	NA	1.3	<0.5	1.8	0.5	2.9
12	Sep-09	5,000	300	NA	2.5	<0.5	<0.5	<0.5	<2.0
13	Mar-10	4,500	290	670	1.7	<0.5	1.0	<0.5	2.7
14	Sep-10	5,100	470	NA	<0.5	0.64	<0.5	1.6	2.9
15	Mar-11	2,600	540	NA	47	28	7.6	11.8	17
16	Sep-11	7,800	290	NA	15	1.5	<0.50	2.0	9.5
17	Mar-12	1,900	430	NA	3.3	<0.5	<0.5	2.5	2.7
18	Sep-12	7,200	380	NA	18	14	6.0	25.3	<2.0
19	Mar-13	15,000	470	NA	1.3	0.68	2.1	2.1	8.6
20	Sep-13	250,000	530	NA	<0.5	<0.5	<0.5	2.4	5.6
21	Mar-14	1,600	270	NA	1.4	<0.5	<0.5	<0.5	<2.0
22	Sep-14	21,000	530	NA	0	0	0.0	0.0	0
23	Mar-15	11,000	580	NA	29	2.7	12.0	4.4	<2.0
24	Sep-15	4,500	330	NA	0.71	0	0.0	3.2	0
25	Mar-16	7,800	610	NA	2	2.3	<0.50	<0.50	2.6
26	Sep-16	5,600	<250	NA	<2.5	<2.5	<2.5	<2.5	13
27	Mar-17	28,000	340	NA	5.0	<0.5	<0.5	<0.5	<2.0

MW-4									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Dec-88	<10	100	NA	2.0	1.0	<0.5	2.0	NA
2	May-89	60	18	NA	1.0	<0.5	<0.5	<0.5	NA
3	Feb-91	<10	<10	NA	<0.3	<0.3	<0.3	<0.6	NA
4	Mar-04	NS	NS	NS	NS	NS	NS	NS	NS
5	Dec-06	<50	50	<200	<0.5	<0.5	<0.5	<0.5	<1.0
6	Dec-07	710	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
7	Mar-08	680	57	NA	<0.5	<0.5	<0.5	<0.5	<2.0
8	Jun-08	620	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
9	Sep-08	440	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
10	Dec-08	720	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
11	Mar-09	940	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
12	Sep-09	660	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
13	Mar-10	680	<50	380	<0.5	<0.5	<0.5	<0.5	<2.0
14	Sep-10	770	71	NA	<0.5	<0.5	<0.5	<0.5	<2.0
15	Mar-11	590	<50	NA	<0.5	<0.5	<0.5	<0.5	2.4
16	Sep-11	380	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
17	Mar-12	340	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
18	Sep-12	350	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
19	Mar-13	390	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
20	Sep-13	250	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
21	Mar-14	380	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
22	Sep-14	380	0	NA	0	0	0	0	0
23	Mar-15	NA	NA	NA	NA	NA	NA	NA	NA
24	Sep-15	370	120	NA	0	0	0	0	0
25	Mar-16	NA	NA	NA	NA	NA	NA	NA	NA
26	Sep-16	350	<50	NA	<0.50	<0.50	<0.50	<0.50	<2.0
27	Mar-17	390	76	NA	<0.50	<0.50	<0.50	<0.50	<2.0

MW-5									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Dec-88	530	880	NA	<1.0	<1.0	1.0	3.0	NA
2	May-89	90	5.0	NA	1.0	<0.5	<0.5	<0.5	NA
3	Feb-91	58	<10	NA	0.6	<0.3	<0.3	<0.6	NA
4	Mar-04	NS	NS	NS	NS	NS	NS	NS	NS
5	Dec-06	330	<25	<200	0.6	<0.5	<0.5	<0.5	<1.0
6	Dec-07	5,100	1.3	NA	1.3	<0.5	<0.5	1.23	<2.0
7	Mar-08	4,500	<50	NA	0.53	<0.5	<0.5	<0.5	<2.0
8	Jun-08	3,300	<50	NA	0.64	<0.5	<0.5	<0.5	<2.0
9	Sep-08	4,200	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
10	Dec-08	5,200	<50	NA	0.61	<0.5	<0.5	<0.5	<2.0
11	Mar-09	5,800	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
12	Sep-09	5,600	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
13	Mar-10	4,300	<50	5,400	4.9	<0.5	<0.5	<0.5	<2.0
14	Sep-10	4,500	<50	NA	0.58	<0.5	<0.5	<0.5	2.0
15	Mar-11	4,900	<50	NA	1.3	<0.5	<0.5	<0.5	5.9
16	Sep-11	4,400	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
17	Mar-12	3,600	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
18	Sep-12	4,100	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
19	Mar-13	3,900	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
20	Sep-13	3,100	<50	NA	0.65	<0.5	<0.5	<0.5	<2.0
21	Mar-14	2,300	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
22	Sep-14	3,700	0	NA	0	0	0	0	0.0
23	Mar-15	4,200	0	NA	0	0	0	0	0.0
24	Sep-15	4,400	60	NA	0	0	0	0	0.0
25	Mar-16	2,400	<50	NA	<0.50	<0.50	<0.50	<0.50	<2.0
26	Sep-16	3,800	<250	NA	<2.5	<2.5	<2.5	<2.5	<10
27	Mar-17	2,500	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0

MW-6									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Dec-88	<10	52	NA	1.0	<0.5	<0.5	<0.5	<1.0
2	May-89	180	31	NA	1.0	<0.5	<0.5	<0.5	NA
3	Feb-91	130	40	NA	0.8	<0.3	<0.3	<0.6	NA
4	Mar-04	NS	NS	NS	NS	NS	NS	NS	NS
5	Dec-06	200	43	<200	1.1	<0.5	<0.5	<0.5	<1.0
6	Dec-07	1,000	<50	NA	0.98	0.81	<0.5	0.5	<2.0
7	Mar-08	940	<50	NA	0.87	1.0	<0.5	<0.5	<2.0
8	Jun-08	1,100	<50	NA	0.92	<0.5	<0.5	<0.5	2.9
9	Sep-08	1,000	<50	NA	0.91	<0.5	<0.5	<0.5	<2.0
10	Dec-08	1,400	<50	NA	1	<0.5	<0.5	<0.5	<2.0
11	Mar-09	1,200	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
12	Sep-09	1,500	<50	NA	0.79	<0.5	<0.5	<0.5	<2.0
13	Mar-10	910	<50	1,500	1.9	<0.5	<0.5	<0.5	<2.0
14	Sep-10	1,200	72	NA	1.0	<0.5	<0.5	<0.5	<2.0
15	Mar-11	1,900	<50	NA	1.3	<0.5	<0.5	<0.5	3.9
16	Sep-11	1,900	<50	NA	1.8	<0.5	<0.5	<0.5	<2.0
17	Mar-12	2,300	<50	NA	0.82	<0.5	<0.5	<0.5	<2.0
18	Sep-12	2,200	<50	NA	0.85	<0.5	<0.5	<0.5	<2.0
19	Mar-13	1,600	<50	NA	0.83	<0.5	<0.5	<0.5	<2.0
20	Sep-13	1,100	<50	NA	1.70	<0.5	<0.5	<0.5	<2.0
21	Mar-14	830	65	NA	0.81	<0.5	<0.5	<0.5	<2.0
22	Sep-14	1,600	0	NA	0.79	<0.5	<0.5	<0.5	<2.0
23	Mar-15	1,200	61	NA	0.87	0.62	<0.5	<0.5	<2.0
24	Sep-15	1,700	65	NA	0.88	0	0	0	0
25	Mar-16	1,500	<50	NA	1.10	<0.50	<0.50	<0.50	<2.0
26	Sep-16	1,200	<50	NA	1.00	<0.50	<0.50	<0.50	<2.0
27	Mar-17	1,500	<50	NA	0.8	<0.50	<0.50	<0.50	<2.0

MW-7									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in March 2004									
1	Mar-04	1,600	490	1,900	240	100	14	56	<2.5
2	Dec-06	420	<25	470	<0.5	<0.5	<0.5	<0.5	<1.0
3	Dec-07	6,300	3,000	NA	640	28	48	231	<10
4	Mar-08	4,200	360	NA	140	5.8	11	58	<2.0
5	Jun-08	5,400	1,700	NA	480	15	28	139	<2.0
6	Sep-08	9,400	1,200	NA	330	12	21	88	<2.0
7	Dec-08	8,700	2,200	NA	640	100	43	185	<4.0
8	Mar-09	8,700	1,700	NA	510	33	47	220	<10
9	Sep-09	6,800	1,400	NA	310	8.5	27	117	<10
10	Mar-10	8,700	330	6,800	68	2.2	10	31.6	<2.0
11	Sep-10	10,000	1,300	NA	580	54	35	163	<20
12	Mar-11	8,100	630	NA	160	5.3	14	65	<2.0
13	Sep-11	8,000	2,900	NA	900	46	51	284	<2.0
14	Mar-12	7,900	740	NA	220	150	14	140	<2.0
15	Sep-12	10,000	1,200	NA	640	35	35	137	<2.0
16	Mar-13	8,600	3,000	NA	950	39	30	149	<33
17	Sep-13	12,000	2,100	NA	540	29	17	89	<29
18	Mar-14	8,200	1,900	NA	440	22	14	63	<29
19	Sep-14	11,000	1,200	NA	330	21	5.8	68	<29
20	Mar-15	7,500	900	NA	260	13	8.8	47.8	7.1
21	Sep-15	10,000	1,000	NA	280	16	10	52.0	21
22	Mar-16	9,900	1,000	NA	280	15	7.9	35.7	<2.0
23	Sep-16	10,000	860	NA	170	8.6	5.1	23.7	<10
24	Mar-17	12,000	1,500	NA	560	25	10.0	62.0	<50

MW-8									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in March 2004									
1	Mar-04	140,000	51,000	56,000	19,000	720	2,400	3,200	<50
2	Dec-06	2,400	29,000	<380	33,000	<100	640	800	<200
3	Dec-07	5,800	30,000	NA	11,000	180	650	561	<100
4	Mar-08	21,000	47,000	NA	10,000	260	1,200	458	<2.0
5	Jun-08	7,300	27,000	NA	9,300	140	790	290	<2.0
6	Sep-08	13,000	35,000	NA	11,000	190	900	402	<100
7	Dec-08	7,600	19,000	NA	6,800	110	380	236	<50
8	Mar-09	10,000	22,000	NA	9,400	200	640	258	<50
9	Sep-09	9,200	26,000	NA	8,600	100	630	230	170
10	Mar-10	11,000	19,000	1,900	6,200	120	830	149	<2.0
11	Sep-10	7,600	7,800	NA	8,800	110	620	212	<100
12	Mar-11	8,800	19,000	NA	8,100	130	890	149	<2.0
13	Sep-11	18,000	19,000	NA	8,000	140	860	178	<2.0
14	Mar-12	9,800	380	NA	100	3	5.9	20	<2.0
15	Sep-12	24,000	73,000	NA	18,000	520	2,300	670	<2.0
16	Mar-13	38,000	39,000	NA	9,400	160	1,600	255	<50
17	Sep-13	2,100	14,000	NA	3,800	140	35	86	440
18	Mar-14	13,000	23,000	NA	6,800	96	620	200	<200
19	Sep-14	13,000	15,000	NA	4,100	45	300	100	0
20	Mar-15	20,000	36,000	NA	8,200	150	910	160	<170
21	Sep-15	9,400	23,000	NA	7,100	100	510	267	0
22	Mar-16	1,200	23,000	NA	5,400	140	570	294	<170
23	Sep-16	8,600	24,000	NA	5,300	77	400	180	<170
24	Mar-17	6,400	34,000	NA	9,200	140	950	301	<170

MW-9									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in March 2004									
1	Mar-04	1,300	95	1,500	4.7	0.68	<0.5	<1.0	<0.5
2	Dec-06	<50	92	<200	2.8	<0.5	<0.5	<0.5	<1.0
3	Dec-07	8,400	84	NA	4.7	1.1	<0.5	1.9	<2.0
4	Mar-08	8,600	100	NA	4.1	1.1	<0.5	<0.5	2.0
5	Jun-08	5,800	90	NA	4.9	<0.5	<0.5	<0.5	2.3
6	Sep-08	9,300	130	NA	4.6	<0.5	<0.5	<0.5	<2.0
7	Dec-08	7,800	95	NA	4.0	0.54	<0.5	<0.5	<2.0
8	Mar-09	9,400	130	NA	4.6	<0.5	<0.5	<0.5	<2.0
9	Sep-09	8,200	98	NA	4.0	<0.5	<0.5	<0.5	<2.0
10	Mar-10	6,500	140	4,000	5.2	<0.5	<0.5	<0.5	<2.0
11	Sep-10	6,400	170	NA	4.8	0.77	<0.5	<0.5	<2.0
12	Mar-11	11,000	150	NA	5.9	0.61	<0.5	0.5	<2.0
13	Sep-11	9,400	62	NA	4.2	<0.5	<0.5	<0.5	<2.0
14	Mar-12	9,400	140	NA	6.2	0.61	<0.5	0.51	<2.0
15	Sep-12	10,000	130	NA	7.2	<0.5	0.53	0.92	<2.0
16	Mar-13	8,500	170	NA	14.0	0.71	0.7	0.63	<2.0
17	Sep-13	11,000	130	NA	12.0	<0.5	0.92	<0.5	4.9
18	Mar-14	7,300	140	NA	9.8	2	<0.5	<0.5	<2.0
19	Sep-14	10,000	120	NA	8.6	2	0.55	0	0
20	Mar-15	9,000	310	NA	8.7	0.75	<0.5	1.25	<2.0
21	Sep-15	11,000	190	NA	8.0	0.71	0	0.87	0
22	Mar-16	9,500	230	NA	7.7	0.82	<0.50	<0.50	<2.0
23	Sep-16	9,200	<500	NA	<5.0	<5.0	<5.0	<5.0	<2.0
24	Mar-17	11,000	<250	NA	11	<2.5	<2.5	<2.5	<10

MW-10									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in March 2004									
1	Mar-04	840,000	14,000	<100,000	4,000	77	200	120	<50
2	Dec-06	19,000	12,000	<4,000	4,600	42	90	52	<50
3	Dec-07	4,500	13,000	NA	5,300	96	42	86	<50
4	Mar-08	280,000	10,000	NA	2,600	50	37	58.7	22
5	Jun-08	4,800	10,000	NA	3,800	62	24	61	<2.0
6	Sep-08	4,700	1,200	NA	350	11	3.4	11	<2.0
7	Dec-08	3,200	2,900	NA	550	45	15	56	<2.0
8	Mar-09	6,200	2,800	NA	890	46	78	130	<2.0
9	Sep-09	6,100	1,400	NA	1,200	35	19	31	<2.0
10	Mar-10	3,900	7,800	960	1,200	46	34	56	54
11	Sep-10	3,500	3,400	NA	1,500	47	18	44	<40
12	Mar-11	4,500	3,700	NA	1,200	81	25	46.4	<2.0
13	Sep-11	3,800	4,600	NA	720	49	26	52.4	<2.0
14	Mar-12	3,500	2,400	NA	240	27	10	33.6	<2.0
15	Sep-12	13,000	6,600	NA	1,800	89	130	46	<2.0
16	Mar-13	24,000	15,000	NA	1,300	66	130	94	<50
17	Sep-13	3,800	4,600	NA	900	87	29	56	<42
18	Mar-14	3,300	6,200	NA	940	43	<0.5	53	<40
19	Sep-14	42,000	7,000	NA	1,500	68	28	56	0
20	Mar-15	7,200	6,500	NA	640	53	44	22	<67
21	Sep-15	11,000	190	NA	8	1	0	0.87	0
22	Mar-16	6,000	12,000	NA	2,600	87	91	50	<67
23	Sep-16	2,100	19,000	NA	1,200	<170	<170	<170	<670
24	Mar-17	2,900	7,000	NA	1,400	59	29.0	42.8	<10

MW-11									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in May 2004									
1	Dec-06	<50	920	<200	26	4.5	1.8	5.4	<1.0
2	Dec-07	6,800	1,500	NA	320	44	53	140	<2.0
3	Mar-08	7,500	1,200	NA	120	7.6	10	24.9	3.0
4	Jun-08	5,100	2,000	NA	190	11	7.7	16.3	<2.0
5	Sep-08	5,600	2,200	NA	260	20	34	60	<2.0
6	Dec-08	7,800	2,100	NA	270	14	7.6	15.6	<2.0
7	Mar-09	7,500	1,400	NA	200	6.4	7.3	10.4	<2.0
8	Sep-09	6,400	1,900	NA	320	13	9.8	15.2	2.0
9	Mar-10	6,500	1,600	6,900	150	<0.5	3.9	12.8	2.9
10	Sep-10	5,500	1,300	NA	330	15	9.2	17.3	<2.0
11	Mar-11	6,500	3,400	NA	1,300	22	9.6	19.9	<2.0
12	Sep-11	4,400	3,600	NA	1,200	36	16	39.1	<2.0
13	Mar-12	4,800	4,500	NA	2,100	27	12	16.7	<2.0
14	Sep-12	5,200	4,100	NA	1,500	33	<0.5	18	<2.0
15	Mar-13	8,400	1,800	NA	97	18	19	30	<2.0
16	Sep-13	7,900	1,900	NA	60	<0.5	3.6	13	27.0
17	Mar-14	5,700	2,000	NA	60	<0.5	3.8	14.2	<2.0
18	Sep-14	7,800	2,000	NA	88	0	6	14.4	0.0
19	Mar-15	7,900	1,600	NA	140	14	5.3	15.5	61.0
20	Sep-15	8,000	1,300	NA	110	16	2.1	20.4	0.0
21	Mar-16	5,500	1,900	NA	91	14	6.4	12.7	<2.0
22	Sep-16	5,800	1,300	NA	130	6.2	3.3	6.2	<10
23	Mar-17	8,700	5,000	NA	1,200	70	45.0	116.0	<10

MW-12									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in May 2004									
1	Dec-06	<50	19,000	<200	9,100	51	<50	110	<100
2	Dec-07	2,700	17,000	NA	8,000	110	25	115	<40
3	Mar-08	3,300	33,000	NA	9,200	140	85	116	<2.0
4	Jun-08	3,000	17,000	NA	6,600	95	50	110	<2.0
5	Sep-08	3,100	14,000	NA	6,200	79	18	83	<10
6	Dec-08	3,800	19,000	NA	7,900	140	72	124	<50
7	Mar-09	4,100	14,000	NA	6,100	150	130	111	<40
8	Sep-09	3,000	1,900	NA	4,500	80	14	51	<40
9	Mar-10	4,000	15,000	1,900	6,200	110	73	101	<2.0
10	Sep-10	3,100	4,900	NA	5,900	97	47	73	<100
11	Mar-11	3,300	15,000	NA	7,900	180	200	127	<2.0
12	Sep-11	1,800	8,600	NA	2,700	85	31	63	<2.0
13	Mar-12	2,500	17,000	NA	6,300	160	180	134	<2.0
14	Sep-12	2,300	10,000	NA	4,600	160	210	85	<2.0
15	Mar-13	9,800	9,100	NA	2,600	110	170	111	<2.0
16	Sep-13	7,800	9,400	NA	2,400	130	130	125	520
17	Mar-14	7,800	10,000	NA	2,500	89	68	55	<100
18	Sep-14	4,000	6,500	NA	1,500	110	26	89.9	0
19	Mar-15	3,500	14,000	NA	3,800	120	82	73	66
20	Sep-15	3,100	13,000	NA	4,300	110	52	71	0
21	Mar-16	2,900	13,000	NA	2,600	74	83	30	<50
22	Sep-16	2,700	7,800	NA	1,300	25	19	<13	<50
23	Mar-17	2,800	6,200	NA	1,200	28	16	<13	<50

MW-13									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in April 2004									
1	Dec-06	12,000	87,000	2,100	18,000	470	2,400	3,500	<60
2	Dec-07	NA	68,000	NA	19,000	650	1,700	2,440	<100
3	Mar-08	1,100,000	98,000	NA	19,000	820	2,300	3,190	<100
4	Jun-08	71,000	44,000	NA	12,800	510	1,600	1,950	<2.0
5	Sep-08	440,000	52,000	NA	<100	500	1,600	1,500	<100
6	Dec-08	1,100,000	2,700,000	NA	23,000	<250	40,000	45,000	<1,000
7	Mar-09	2,000,000	130,000	NA	25,000	1,300	6,400	8,500	<1,000
8	Sep-09	38,000	1,400,000	NA	19,000	2,500	19,000	21,300	<1,000
9	Mar-10	15,000	43,000	670	12,000	310	1,600	1,140	<2,500
10	Sep-10	3,100,000	1,700,000	NA	31,000	2,300	30,000	17,200	7,000
11	Mar-11	13,000	86,000	NA	7,900	180	200	127	<2.0
12	Sep-11	15,000	49,000	NA	16,000	380	1,900	850	<2.0
13	Mar-12	1,100,000	260,000	NA	23,000	1,500	570	410	<2.0
14	Sep-12	7,200,000	60,000	NA	22,000	580	2,100	1,700	<2.0
15	Mar-13	23,000	27,000	NA	5,600	260	1,300	1,060	<200
16	Sep-13	39,000	19,000	NA	3,400	180	760	515	<200
17	Mar-14	19,000	20,000	NA	3,700	120	710	361	<200
18	Sep-14	11,000	16,000	NA	2,400	70	460	253	0
19	Mar-15	11,000	14,000	NA	2,200	76	430	160	<100
20	Sep-15	8,300	13,000	NA	3,100	78	440	255	0
21	Mar-16	11,000	18,000	NA	4,000	100	510	252	<100
22	Sep-16	15,000	20,000	NA	3,700	66	480	205	<100
23	Mar-17	13,000	14,000	NA	3,100	60	350	130	<100

MW-14									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in April 2004									
1	Dec-06	<50	8,300	<200	3,700	240	230	260	<50
2	Dec-07	2,600	6,800	NA	3,100	150	220	168	<20
3	Mar-08	4,400	18,000	NA	4,400	330	340	245	<2.0
4	Jun-08	2,600	7,700	NA	2,600	180	200	141	<2.0
5	Sep-08	2,500	4,100	NA	1,300	50	80	61	<10
6	Dec-08	2,800	2,300	NA	830	27	45	30.7	<10
7	Mar-09	3,200	13,000	NA	4,300	870	260	283	<50
8	Sep-09	2,100	550	NA	650	14	28	17	<20
9	Mar-10	3,900	6,700	3,100	2,400	400	140	185	<20
10	Sep-10	2,500	2,000	NA	1,700	44	98	89	<40
11	Mar-11	2,800	16,000	NA	6,600	1600	450	600	<2.0
12	Sep-11	5,900	20,000	NA	6,600	690	550	740	<2.0
13	Mar-12	4,400	13,000	NA	3,000	1400	340	870	<2.0
14	Sep-12	9,900	31,000	NA	4,800	2400	720	2,450	<2.0
15	Mar-13	21,000	11,000	NA	2,300	340	280	371	<50
16	Sep-13	24,000	7,200	NA	1,900	200	160	197	<83
17	Mar-14	8,200	6,900	NA	2,100	220	170	155	<110
18	Sep-14	8,500	7,100	NA	1,600	220	120	180	0
19	Mar-15	11,000	14,000	NA	2,900	390	210	222	<100
20	Sep-15	5,500	9,500	NA	2,600	250	190	237	0
21	Mar-16	7,300	12,000	NA	3,100	250	220	223	<100
22	Sep-16	4,700	9,900	NA	2,100	100	150	77	180
23	Mar-17	6,200	16,000	NA	4,100	570	360	191	<100

MW-15									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in April 2004									
1	Dec-06	<50	9,200	<200	3,700	<25	60	57	<50
2	Dec-07	3,300	8,100	NA	3,000	48	28	44.5	<20
3	Mar-08	3,000	13,000	NA	3,600	66	210	59.5	<64
4	Jun-08	2,900	15,000	NA	5,800	61	250	56.4	<2.0
5	Sep-08	3,400	18,000	NA	7,800	73	270	59.9	<10
6	Dec-08	3,000	20,000	NA	1,600	95	300	84.2	<50
7	Mar-09	3,400	17,000	NA	1,200	91	170	60	<50
8	Sep-09	2,700	2,500	NA	6,200	71	68	42	<50
9	Mar-10	3,700	14,000	910	5,900	74	170	69	<2.0
10	Sep-10	3,500	5,800	NA	8,100	95	170	71	<100
11	Mar-11	3,200	11,000	NA	5,600	88	110	66.1	<2.0
12	Sep-11	2,500	15,000	NA	6,400	100	71	77.7	<2.0
13	Mar-12	3,500	16,000	NA	7,200	110	160	177	<2.0
14	Sep-12	3,500	28,000	NA	12,000	300	380	297	<2.0
15	Mar-13	3,100	15,000	NA	6,100	170	360	266	<67
16	Sep-13	2,800	17,000	NA	4,100	92	76	144	<200
17	Mar-14	2,200	12,000	NA	3,900	75	30	54	<2.0
18	Sep-14	3,200	9,600	NA	2,600	110	22	46.7	0
19	Mar-15	8,500	16,000	NA	3,400	66	93	29	<100
20	Sep-15	3,100	10,000	NA	3,100	63	33	48	0
21	Mar-16	3,200	19,000	NA	3,800	96	44	41	<100
22	Sep-16	5,300	18,000	NA	5,000	66	<25	49	<100
23	Mar-17	3,700	7,100	NA	1,300	31	72.0	40	<100

MW-16									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in April 2004									
1	Dec-06	<50	190	<200	11.0	1.4	<0.5	<0.5	<1.0
2	Dec-07	8,500	71	NA	13	2.6	<0.5	1.46	<2.0
3	Mar-08	12,000	60	NA	11	0.73	<0.5	<0.5	<2.0
4	Jun-08	10,000	120	NA	13	2.2	<0.5	<0.5	2
5	Sep-08	8,200	64	NA	9.9	1.9	<0.5	<0.5	<2.0
6	Dec-08	8,800	40	NA	11	2.8	<0.5	0.53	<2.0
7	Mar-09	14,000	78	NA	12	2.3	<0.5	<0.5	<2.0
8	Sep-09	10,000	51	NA	9.3	1.6	<0.5	<0.5	2.2
9	Mar-10	12,000	70	4,700	12	2.1	0.56	1.35	<2.0
10	Sep-10	9,800	77	NA	12	1.9	<0.5	0.55	2
11	Mar-11	9,900	64	NA	13	1.6	<0.5	2.3	16
12	Sep-11	10,000	740	NA	17	2.3	<0.5	1.33	<2.0
13	Mar-12	8,400	66	NA	12	1.8	<0.5	1.07	<2.0
14	Sep-12	7,700	84	NA	17	1.5	0.57	0.69	<2.0
15	Mar-13	8,100	80	NA	15	1.4	<0.5	0.75	<2.0
16	Sep-13	9,800	66	NA	13	1.7	<0.5	1.38	<2.0
17	Mar-14	5,800	76	NA	11	1.2	<0.5	0.94	<2.0
18	Sep-14	10,000	110	NA	14	1.5	0	0	0
19	Mar-15	9,500	200	NA	34	2.4	2.5	1.82	<2
20	Sep-15	6,200	110	NA	10	1.1	0	0	0
21	Mar-16	8,200	80	NA	12	1.9	<0.50	1.46	<2.0
22	Sep-16	8,500	330	NA	7.9	<2.5	<2.5	<2.5	<10
23	Mar-17	8,400	<250	NA	27	3.4	<2.5	<2.5	<10

MW-17									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in April 2004									
1	Dec-06	<50	14,000	<200	3,400	1,100	480	<0.5	<1.0
2	Dec-07	2,900	5,000	NA	1,100	260	110	206	<10
3	Mar-08	3,100	6,800	NA	1,200	110	91	94	21
4	Jun-08	2,800	7,500	NA	1,100	45	75	66	<2.0
5	Sep-08	3,300	5,500	NA	900	63	69	69	<10
6	Dec-08	3,200	7,100	NA	1,100	530	190	390	<10
7	Mar-09	3,000	5,400	NA	770	150	87	161	<2.0
8	Sep-09	3,000	2,300	NA	120	3.1	11	1.6	<2.0
9	Mar-10	3,400	5,000	1,600	910	66	73	93	<2.0
10	Sep-10	2,800	3,500	NA	1,400	62	46	76	<40
11	Mar-11	3,900	6,100	NA	1,100	44	55	70	<2.0
12	Sep-11	2,400	4,600	NA	850	49	51	64	<2.0
13	Mar-12	2,200	5,800	NA	1,500	57	58	67	<2.0
14	Sep-12	1,400	4,800	NA	1,300	45	100	41	<2.0
15	Mar-13	2,800	7,500	NA	1,200	89	220	110	<25
16	Sep-13	2,100	8,000	NA	1,400	150	220	122	<67
17	Mar-14	2,600	8,600	NA	1,800	150	320	118	<67
18	Sep-14	3,000	7,900	NA	1,500	160	130	91	0
19	Mar-15	3,200	9,800	NA	1,600	220	120	136	57
20	Sep-15	3,700	8,100	NA	1,800	160	90	143	0
21	Mar-16	2,600	10,000	NA	1,100	75	42	60	<2.0
22	Sep-16	1,900	7,900	NA	1,200	230	81	146	<50
23	Mar-17	3,700	27,000	NA	2,100	<13	93.0	167	<50

MW-18									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
Installed in May 2004									
1	Dec-06	<50	120	<200	22	6.2	3.2	6.2	<2.0
2	Dec-07	8,600	<50	NA	0.98	<0.5	<0.5	<0.5	<2.0
3	Mar-08	9,800	<50	NA	0.52	<0.5	<0.5	<0.5	2.0
4	Jun-08	8,800	<50	NA	<0.5	<0.5	<0.5	<0.5	3.1
5	Sep-08	8,600	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
6	Dec-08	9,300	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
7	Mar-09	10,000	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
8	Sep-09	11,000	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
9	Mar-10	9,400	<50	2,700	<0.5	<0.5	<0.5	<0.5	<2.0
10	Sep-10	2,600	1,800	NA	2,200	45	64.0	76.0	<50
11	Mar-11	10,000	68	NA	5.5	1.1	<0.5	1.3	17
12	Sep-11	9,800	<50	NA	0.58	<0.5	<0.5	<0.5	<2.0
13	Mar-12	9,200	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
14	Sep-12	11,000	160	NA	5.1	<0.5	5.7	0.6	<2.0
15	Mar-13	9,600	<50	NA	<0.5	<0.5	<0.5	<0.5	<2.0
16	Sep-13	11,000	<50	NA	0.52	<0.5	<0.5	<0.5	<2.0
17	Mar-14	8,200	<50	NA	0.52	<0.5	<0.5	<0.5	<2.0
18	Sep-14	12,000	0	NA	0	0	0.0	0.0	0
19	Mar-15	10,000	69	NA	6	<0.5	<0.5	<0.5	0
20	Sep-15	9,700	0	NA	0	0	0.0	0.0	0
21	Mar-16	9,000	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0
22	Sep-16	9,900	<250	NA	<2.5	<2.5	<2.5	<2.5	<10
23	Mar-17	11,000	<250	NA	<2.5	<2.5	<2.5	<2.5	<10

MW-E									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Dec-88	100	5,600	NA	3,200	690	97	330	NA
2	May-89	NS	NS	NS	NS	NS	NS	NS	NS
3	Feb-91	NS	NS	NS	NS	NS	NS	NS	NS
4	Mar-04	470	810	<500	340	6.1	2.2	7.7	<1.0
5	Dec-06	280	1,800	<200	910	<10	10	<10	<20
6	Dec-07	6,900	7,000	NA	3,300	50	51	80	<20
7	Mar-08	6,300	2,700	NA	780	17	20	20.9	12
8	Jun-08	5,200	7,400	NA	2,900	43	85	50	<2.0
9	Sep-08	7,800	11,000	NA	3,800	170	130	257	<50
10	Dec-08	9,400	9,100	NA	3,400	110	180	182	<50
11	Mar-09	5,600	850	NA	270	7.5	13	17.5	<2.0
12	Sep-09	6,200	540	NA	1,200	22	37	17.2	<2.0
13	Mar-10	3,800	2,400	5,100	1,000	20	37	26.9	4.9
14	Sep-10	6,600	1,800	NA	2,200	45	64	78	<50
15	Mar-11	5,900	4,400	NA	2,600	46	64	90	<50
16	Sep-11	7,600	3,600	NA	4,500	150	340	402	<2.0
17	Mar-12	5,800	6,500	NA	2,600	50	52	84	<2.0
18	Sep-12	8,300	7,800	NA	5,500	190	430	431	<2.0
19	Mar-13	7,700	21,000	NA	5,900	210	850	970	<50
20	Sep-13	9,400	15,000	NA	3,800	120	470	351	200
21	Mar-14	5,600	9,500	NA	3,200	110	240	178	<140
22	Sep-14	7,800	4,800	NA	1,600	55	86	67	0
23	Mar-15	12,000	6,800	NA	2,200	70	140	131	<67
24	Sep-15	11,000	22,000	NA	6,400	230	750	810	120
25	Mar-16	4,200	9,000	NA	1,700	55	130	181	<67
26	Sep-16	9,400	29,000	NA	3,500	190	360	370	<670
27	Mar-17	6,700	2,200	NA	6,700	32	43	57	<2

RW-4									
Sampling Event No.	Date Sampled	TEH-d	TVH-g	TEH-mo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Dec-88	NS	NS	NS	NS	NS	NS	NS	NS
2	May-89	NS	NS	NS	NS	NS	NS	NS	NS
3	Feb-91	NS	NS	NS	NS	NS	NS	NS	NS
4	Mar-04	NS	NS	NS	NS	NS	NS	NS	NS
5	Dec-06	<50	640	<200	100	1.3	2.1	1.6	<1.0
6	Dec-07	2,100	770	NA	110	<0.5	3.8	1.96	<2.0
7	Mar-08	11,000	890	NA	100	4.2	4.4	2.0	<2.0
8	Jun-08	1,500	1,200	NA	290	4.8	10	4.8	<2.0
9	Sep-08	1,900	1,400	NA	280	9.8	10	6.7	<2.0
10	Dec-08	54,000	1,000,000	NA	500	<250	3,200	530	<1,000
11	Mar-09	2,800	950	NA	180	3.6	13	3	<2.0
12	Sep-09	770	350	NA	120	3.1	11	2	<2.0
13	Mar-10	810	200	<300	<0.5	<0.5	<0.5	<0.5	<2.0
14	Sep-10	980	860	NA	170	4.0	5.6	2.8	8.0
15	Mar-11	810	310	NA	15	4.4	2.5	3.9	8.5
16	Sep-11	440	200	NA	28	2.7	1.7	1.5	<2.0
17	Mar-12	1,900	502	NA	70	2.0	2.2	2.1	<2.0
18	Sep-12	890	790	NA	150	9.6	5.5	12.0	<2.0
19	Mar-13	2,800	280	NA	2.7	1.7	2.5	1.9	<2.0
20	Sep-13	1,500	420	NA	10.2	6.0	<0.5	5.7	8.2
21	Mar-14	4,300	440	NA	1.3	1.8	2.4	3.4	2.8
22	Sep-14	1,000	440	NA	41	0.9	1.5	2.2	2.8
23	Mar-15	2,300	710	NA	100	3.8	6.6	131.0	<2
24	Sep-15	660	450	NA	75	4.2	1.4	0.0	0.0
25	Mar-16	830	260	NA	7.3	<0.540	1.9	1.1	<2.0
26	Sep-16	1,500	1,100	NA	49	4.6	6.5	8.9	<2.0
27	Mar-17	2,800	910	NA	130	6.2	4.9	5.9	<2.0

Notes:  
 The 1988, 1989, and 1991 sampling events were conducted by Groundwater Technology, Inc.  
 The 2004 and 2006 sampling events were conducted by PES Environmental.  
 NS = Not sampled  
 NA = Not analyzed for this constituent  
 All concentrations shown in µg/L.

## **APPENDIX B**

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### **Groundwater Monitoring Field Data Sheets**

### WELL GAUGING DATA

Project # 170323-WWI Date 3-23-17 Client STELLAR

Site 6400 CHRISTIE AVE, EMERYVILLE, CA

Well ID	Time	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	Notes
MW-3	0919	2	SHIEN ODOR	10.59	0.01		10.60	—		STICKY BLACK SPH
MW-4	0841	2					7.27	24.82 <del>24.82</del>		
MW-5	0850	2					7.27	24.77		
MW-6	0859	2					5.73	<del>23.30</del> 23.30		
MW-7	0830	3/4					10.10	19.85		
MW-8	0906	3/4	ODOR SHIEN	9.15	0.27		9.42	<del>15.72</del> 15.72		
MW-9	0835	3/4					9.65	19.65		
MW-10	0912	3/4	ODOR				8.73	19.44		
MW-11	0841	3/4	ODOR				10.19	19.70		
MW-12	0847	3/4	ODOR				8.75	18.95		
MW-13	0912	3/4	ODOR	8.45	0.25		8.70	—		
MW-14	0926	3/4	ODOR SHIEN				8.53	19.51		
MW-15	0932	3/4	ODOR				8.97	18.89		
MW-16	0852	3/4					9.33	19.05		
MW-17	0909	3/4	ODOR SHIEN	9.05	0.01		9.06	19.50		THICK SPH
MW-18	0915	3/4					7.64	19.44		
MW-E	0900	2					9.86	49.40	✓	





# WELL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: <u>WW</u> / BA / _____	Date: 3/23/2017
Well I.D.: MW-3	Well Diameter: <u>2</u> 3 4 6 8 _____
Total Well Depth (TD): _____	Depth to Water (DTW): 10.60
Depth to Free Product: 10.59	Thickness of Free Product (feet): 0.01
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer  Disposable Bailer  Positive Air Displacement  Electric Submersible  Waterra  Peristaltic Extraction Pump  Other \_\_\_\_\_

Sampling Method: Bailer  Disposable Bailer  Extraction Port  Dedicated Tubing  Other: new tubing

Spot Present

\_\_\_\_\_ (Gals.) X \_\_\_\_\_ = \_\_\_\_\_ Gals.  
 1 Case Volume      Specified Volumes      Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1252						WL: 10.91
1258						WL: 10.99

Did well dewater? Yes  No Gallons actually evacuated: 0.2

Sampling Date: 3/23/17      Sampling Time: 1305      Depth to Water: 10.60

Sample I.D.: MW-3      Laboratory: Curtis & Tompkins

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: See COC

EB I.D. (if applicable): @ \_\_\_\_\_ Time      Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

# LL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: <u>WW</u> BA / _____	Date: 3/23/2017
Well I.D.: MW-4	Well Diameter: <u>(2)</u> 3 4 6 8 _____
Total Well Depth (TD): 24.82	Depth to Water (DTW): 7.27
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 10.78	

Purge Method: Bailer      Water      Sampling Method: Bailer  
~~Disposable Bailer~~      Peristaltic      ~~Disposable Bailer~~  
 Positive Air Displacement      Extraction Pump      Extraction Port  
 Electric Submersible      Other \_\_\_\_\_      Dedicated Tubing  
 Other: \_\_\_\_\_

2.8 (Gals.) X 3 = 8.4 Gals.  
 1 Case Volume      Specified Volumes      Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1020	14.2	7.73	1006	589	2.8	gray, odor
1023	14.6	7.67	1010	643	5.6	"
1026	14.9	7.72	1000	739	8.4	"

Did well dewater? Yes  No  Gallons actually evacuated: 8.4

Sampling Date: 3/23/17      Sampling Time: 1035      Depth to Water: 7.34

Sample I.D.: MW-4      Laboratory: Curtis & Tompkins

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: See COC

EB I.D. (if applicable): @ \_\_\_\_\_ Time      Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV



# LL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: <u>WW/BA</u> / _____	Date: 3/23/2017
Well I.D.: MW-6	Well Diameter: <u>2</u> 3 4 6 8 _____
Total Well Depth (TD): 2330	Depth to Water (DTW): 5.73
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 9.24	

Purge Method: Bailer <u>Disposable Bailer</u> Positive Air Displacement Electric Submersible	Waterra Peristaltic Extraction Pump Other _____	Sampling Method: Bailer <u>Disposable Bailer</u> Extraction Port Dedicated Tubing Other: _____
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$\frac{2.8}{1 \text{ Case Volume}} \times \frac{3}{\text{Specified Volumes}} = \frac{8.4}{\text{Calculated Volume}} \text{ Gals.}$	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Well Diameter</th> <th>Multiplier</th> <th>Well Diameter</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td>0.16</td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	0.16	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	0.16	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1101	14.1	11.10	1315	88	2.8	slight odor
1104	14.0	11.20	1300	97	5.6	"
1107	14.2	11.25	1297	75	8.4	"

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Gallons actually evacuated: 8.4	
Sampling Date: 3/23/17	Sampling Time: 1115	Depth to Water: 5.86
Sample I.D.: MW-6	Laboratory: Curtis & Tompkins	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: See COC		
EB I.D. (if applicable): @ _____ Time	Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:		
D.O. (if req'd): Pre-purge: _____ mg/L	Post-purge: _____ mg/L	
O.R.P. (if req'd): Pre-purge: _____ mV	Post-purge: _____ mV	

## WELL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: WW / (BA) / _____	Date: 3/23/2017
Well I.D.: MW- 7	Well Diameter: 2 3 4 6 8 <u>3/4</u>
Total Well Depth (TD): 19.85	Depth to Water (DTW): 10.10
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 12.05	

Purge Method: Bailer Disposable Bailer Positive Air Displacement Electric Submersible	Waterra Peristaltic Extraction Pump Other _____	Sampling Method: Bailer Disposable Bailer Extraction Port Dedicated Tubing Other: <u>new tubing</u>
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0.2 (Gals.) X	3	= 0.6 Gals.
I Case Volume	Specified Volumes	Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1030	57.5	8.27	11.54	131	0.2	Brownish
— well dewatered @ 0.35 gals —						
1322	56.7	8.23	11.71	135	—	Brown

Did well dewater?  Yes No Gallons actually evacuated: 0.35

Sampling Date: 3/23/17 Sampling Time: 1322 Depth to Water: 10.19

Sample I.D.: MW- 7 Laboratory: Curtis & Tompkins

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: See COC

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd): Pre-purge: \_\_\_\_\_ mg/L Post-purge: \_\_\_\_\_ mg/L

O.R.P. (if req'd): Pre-purge: \_\_\_\_\_ mV Post-purge: \_\_\_\_\_ mV

# LL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: WW <u>BA</u> / _____	Date: 3/24/2017
Well I.D.: MW- <u>4</u>	Well Diameter: 2 3 4 6 8 <u>3/4</u>
Total Well Depth (TD): _____	Depth to Water (DTW): 9.42
Depth to Free Product: 9.15	Thickness of Free Product (feet): 0.27
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer Disposable Bailer Positive Air Displacement Electric Submersible	Waterra Peristaltic Extraction Pump Other _____	Sampling Method: Bailer Disposable Bailer Extraction Port Dedicated Tubing Other: <u>New Tubing</u>
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SPH Purges

_____ (Gals.) X _____ = _____ Gals. I Case Volume                      Specified Volumes                      Calculated Volume	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Well Diameter</th> <th style="text-align: left;">Multiplier</th> <th style="text-align: left;">Well Diameter</th> <th style="text-align: left;">Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td>0.16</td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	0.16	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	0.16	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0730						started purge @ 100ml/min
0736						stopped purge
						couldn't gauge
						white tubing inside well.

Did well dewater?    Yes <u>No</u>	Gallons actually evacuated: 600 mL
Sampling Date: 3/24/17	Sampling Time: 0736      Depth to Water: 9.42
Sample I.D.: MW- <u>4</u>	Laboratory: Curtis & Tompkins
Analyzed for: TPH-G   BTEX   MTBE   TPH-D   Oxygenates (5)   Other: <u>See COC</u>	
EB I.D. (if applicable): _____ @ _____ Time	Duplicate I.D. (if applicable): _____
Analyzed for: TPH-G   BTEX   MTBE   TPH-D   Oxygenates (5)   Other: _____	
D.O. (if req'd):    Pre-purge: _____ mg/L	Post-purge: _____ mg/L
O.R.P. (if req'd):    Pre-purge: _____ mV	Post-purge: _____ mV







# LL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: WW / <u>BA</u> / _____	Date: 3/23/2017
Well I.D.: MW- 11	Well Diameter: 2 3 4 6 8 <u>3/4</u>
Total Well Depth (TD): 19.40	Depth to Water (DTW): 10.19
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 12.09	

Purge Method: Bailer Disposable Bailer Positive Air Displacement Electric Submersible	Watertra Peristaltic Extraction Pump Other _____	Sampling Method: Bailer Disposable Bailer Extraction Port Dedicated Tubing <u>new tubing</u>
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$$\frac{0.2 \text{ (Gals.)} \times 3}{\text{Specified Volumes}} = \frac{0.6 \text{ Gals.}}{\text{Calculated Volume}}$$

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1146	56.6	8.14	2472	285	0.2	
1147	57.4	7.00	2444	122	0.4	
1148	58.0	7.79	2415	88	0.6	

Did well dewater? Yes  No  Gallons actually evacuated: 0.6

Sampling Date: 3/23/17 Sampling Time: 1150 Depth to Water: 11.05

Sample I.D.: MW- 11 Laboratory: Curtis & Tompkins

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: See COC

EB I.D. (if applicable): @ \_\_\_\_\_ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

# LL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: WW / <u>BA</u> / _____	Date: 3/23/2017
Well I.D.: MW- 12	Well Diameter: 2 3 4 6 8 <u>3/4</u>
Total Well Depth (TD): 18.95	Depth to Water (DTW): 8.75
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 10.71	

Purge Method: Bailer Disposable Bailer Positive Air Displacement Electric Submersible	Waterra Peristaltic Extraction Pump Other _____	Sampling Method: Bailer Disposable Bailer Extraction Port Dedicated Tubing Other: <u>New Tubing</u>
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$\frac{0.2 \text{ (Gals.)} \times 3}{\text{Specified Volumes}} = \frac{0.6 \text{ Gals.}}{\text{Calculated Volume}}$	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Well Diameter</th> <th>Multiplier</th> <th>Well Diameter</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td>0.16</td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	0.16	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	0.16	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (°F or °C)	pH	Cond. (mS or <u>µS</u> )	Turbidity (NTUs)	Gals. Removed	Observations
1311	57.3	7.02	1566	6	0.2	
1312	58.3	7.01	1522	7	0.4	
1313	58.0	7.50	1504	6	0.6	

Did well dewater? Yes  No  Gallons actually evacuated: 0.6

Sampling Date: 3/23/17 Sampling Time: 1315 Depth to Water: 9.13

Sample I.D.: MW- 12 Laboratory: Curtis & Tompkins

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: See COC

EB I.D. (if applicable): @ \_\_\_\_\_ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV



## WELL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: WW / <u>BA</u> / _____	Date: 3/ <u>24</u> / 2017
Well I.D.: MW- <u>14</u>	Well Diameter: 2 3 4 6 8 <u>3/4</u>
Total Well Depth (TD): <u>19.51</u>	Depth to Water (DTW): <u>8.53</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <u>10.72</u>	

Purge Method: Bailer Disposable Bailer Positive Air Displacement Electric Submersible	Waterra Peristaltic Extraction Pump Other _____	Sampling Method: Bailer Disposable Bailer Extraction Port Dedicated Tubing <u>New Tubing</u>
--	--	--

3/4" = 0.02 Other: \_\_\_\_\_

$\frac{0.2}{1 \text{ Case Volume}} \text{ (Gals.)} \times \frac{3}{\text{Specified Volumes}} = \frac{0.6}{\text{Calculated Volume}} \text{ Gals.}$	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Well Diameter</th> <th>Multiplier</th> <th>Well Diameter</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td>0.16</td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	0.16	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	0.16	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (F or °C)	pH	Cond. (mS or <u>µS</u> )	Turbidity (NTUs)	Gals. Removed	Observations
<u>0930</u>	<u>57.4</u>	<u>7.86</u>	<u>1292</u>	<u>173</u>	<u>0.2</u>	<u>Gray</u>
<u>0931</u>	<u>57.8</u>	<u>7.80</u>	<u>1213</u>	<u>67</u>	<u>0.4</u>	
<u>0932</u>	<u>58.2</u>	<u>7.77</u>	<u>1215</u>	<u>60</u>	<u>0.6</u>	

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Gallons actually evacuated: <u>0.6</u>
Sampling Date: <u>3/24/17</u>	Sampling Time: <del>0930</del> <u>0935</u>
Depth to Water: <u>9.87</u>	
Sample I.D.: MW- <u>14</u>	Laboratory: Curtis & Tompkins
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: <u>See COC</u>	
EB I.D. (if applicable): @ _____ Time	Duplicate I.D. (if applicable):
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:	
D.O. (if req'd): Pre-purge: _____ mg/L	Post-purge: _____ mg/L
O.R.P. (if req'd): Pre-purge: _____ mV	Post-purge: _____ mV

# LL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: WW / (BA) / _____	Date: 3/24/2017
Well I.D.: MW- 15	Well Diameter: 2 3 4 6 8 <u>3/4</u>
Total Well Depth (TD): <u>14.89</u>	Depth to Water (DTW): <u>8.97</u>
Depth to Free Product: _____	Thickness of Free Product (feet): _____
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <u>10.95</u>	

Purge Method: Bailer	Watrerra	Sampling Method: Bailer
Disposable Bailer	Peristaltic	Disposable Bailer
Positive Air Displacement	Extraction Pump	Extraction Port
Electric Submersible	Other _____	Dedicated Tubing
		<u>New Tubing</u>

$3/4" = 0.02$

<u>0.2</u> (Gals.) X	<u>3</u>	=	<u>0.6</u> Gals.
1 Case Volume	Specified Volumes		Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or $\mu$ S)	Turbidity (NTUs)	Gals. Removed	Observations
1112	57.4	7.62	1281	194	0.2	Grayish
1113	58.4	7.38	1057	159	0.4	
1114	58.4	7.32	1024	151	0.6	

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Gallons actually evacuated: <u>0.6</u>	
Sampling Date: 3/24/17	Sampling Time: <u>1116</u>	Depth to Water: <u>10.09</u>
Sample I.D.: MW- 15	Laboratory: Curtis & Tompkins	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: <u>See COC</u>		
EB I.D. (if applicable): @ _____ Time	Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:		
D.O. (if req'd): Pre-purge: _____ mg/L	Post-purge: _____ mg/L	
O.R.P. (if req'd): Pre-purge: _____ mV	Post-purge: _____ mV	

# LL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: WW / (BA) / _____	Date: 3/23/2017
Well I.D.: MW- 16	Well Diameter: 2 3 4 6 8 <u>3/4</u>
Total Well Depth (TD): 19.05	Depth to Water (DTW): 9.33
Depth to Free Product: _____	Thickness of Free Product (feet): _____
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 11.27	

Purge Method: Bailer Disposable Bailer Positive Air Displacement Electric Submersible	Wattera Peristaltic Extraction Pump Other _____	Sampling Method: Bailer Disposable Bailer Extraction Port Dedicated Tubing New Tubing
--	--	---

$0.2 \text{ (Gals.)} \times 3 = 0.6 \text{ Gals.}$ <p>1 Case Volume                      Specified Volumes                      Calculated Volume</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Well Diameter</th> <th>Multiplier</th> <th>Well Diameter</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td>0.16</td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	0.16	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	0.16	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1356	57.1	9.83	2938	154	0.2	Brown
1357	58.5	9.84	2820	160	0.4	↓
1358	59.0	9.84	2999	159	0.6	

Did well dewater?    Yes <u>No</u>	Gallons actually evacuated: 0.6	
Sampling Date: 3/23/17	Sampling Time: 1400	Depth to Water: 10.00
Sample I.D.: MW- 16	Laboratory: Curtis & Tompkins	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: <u>See COC</u>		
EB I.D. (if applicable): @ _____ Time	Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: <u>SEE COC</u>		
D.O. (if req'd): Pre-purge: _____ mg/L	Post-purge: _____ mg/L	
O.R.P. (if req'd): Pre-purge: _____ mV	Post-purge: _____ mV	



# LL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: WW (BA) / _____	Date: 3/23/2017
Well I.D.: MW- 18	Well Diameter: 2 3 4 6 8 <u>3/4</u>
Total Well Depth (TD): 19.44	Depth to Water (DTW): 7.64
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 10.00	

Purge Method: Bailer Disposable Bailer Positive Air Displacement Electric Submersible	Waterra Peristaltic Extraction Pump Other _____	Sampling Method: Bailer Disposable Bailer Extraction Port Dedicated Tubing Other: <u>New Tubing</u>
--	--	---

$$\frac{0.2 \text{ (Gals.)} \times 3}{\text{Specified Volumes}} = \frac{0.6 \text{ Gals.}}{\text{Calculated Volume}}$$

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or μS)	Turbidity (NTUs)	Gals. Removed	Observations
1431	57.3	7.24	6930	151	0.2	
1432	56.6	7.15	6612	800	0.4	
1433	59.0	7.13	6593	71000	0.6	

Did well dewater? Yes  No  Gallons actually evacuated: 0.6

Sampling Date: 3/23/17 Sampling Time: 1435 Depth to Water: 8.07

Sample I.D.: MW- 18 Laboratory: Curtis & Tompkins

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: See COC

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV



# LL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: WW BA / _____	Date: 3/23/2017
Well I.D.: MW- E	Well Diameter: (2) 3 4 6 8 _____
Total Well Depth (TD): 49.40	Depth to Water (DTW): 9.86
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <del>17.77</del> 17.77	

Purge Method: Bailer Disposable Bailer Positive Air Displacement Electric Submersible	<u>Water</u> Peristaltic Extraction Pump Other _____	Sampling Method: Bailer Disposable Bailer Extraction Port Dedicated Tubing Other: <u>New Tubing</u>
--	---	---

$\frac{6.3 \text{ (Gals.)} \times 3}{\text{Specified Volumes}} = \frac{19}{\text{Calculated Volume}} \text{ Gals.}$	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Well Diameter</th> <th>Multiplier</th> <th>Well Diameter</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td><u>0.16</u></td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	<u>0.16</u>	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	<u>0.16</u>	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (°F or °C)	pH	Cond. (mS or <u>µS</u> )	Turbidity (NTUs)	Gals. Removed	Observations
1251	51.0	7.94	3047	> 1000	6.3	
— well dewatered (w/ 10.5 gallons) —						
1335	58.9	7.71	2951	> 1000	—	

Did well dewater? Yes No      Gallons actually evacuated: 10.5

Sampling Date: 3/23/17      Sampling Time: 1335      Depth to Water: 9.99

Sample I.D.: MW- E      Laboratory: Curtis & Tompkins

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: See COC

EB I.D. (if applicable): @ \_\_\_\_\_ Time      Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
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O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV
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# LL MONITORING DATA SHEET

Project #: 170323-WW1	Client: Stellar Env Solutions @ Bay Center Apts
Sampler: WW / <u>BA</u> / _____	Date: 3/ <u>24</u> /2017
Well I.D.: <del>MW</del> - <u>RW-1</u>	Well Diameter: 2 3 4 6 8 <u>10</u>
Total Well Depth (TD):	Depth to Water (DTW): <u>8.81</u>
Depth to Free Product: <u>8.81</u>	Thickness of Free Product (feet): <u>0.01</u>
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer Disposable Bailer Positive Air Displacement Electric Submersible	Waterra Peristaltic Extraction Pump Other: _____	Sampling Method: Bailer Disposable Bailer Extraction Port Dedicated Tubing Other: <u>New Tubing</u>
--	---	---

_____ (Gals.) X _____	= _____ Gals.
1 Case Volume Specified Volumes	Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1224						start purge @ 100 mL/min
1230						END purge

Did well dewater? Yes  No  Gallons actually evacuated: 600 mL / 6A

Sampling Date: 3/24/17 Sampling Time: 1232 Depth to Water: trouble getting a water level reading after purge.

Sample I.D.: ~~MW~~ - RW-1 Laboratory: Curtis & Tompkins

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: See COC

EB I.D. (if applicable): @ \_\_\_\_\_ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

## **APPENDIX C**

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### **Analytical Laboratory Report and Chain-of-Custody Record**





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







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

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

Laboratory Job Number 287276
ANALYTICAL REPORT

Stellar Environmental Solutions
2198 6th Street
Berkeley, CA 94710

Project : 2007-65
Location : Bay Center Apts
Level : II

Table with 2 columns: Sample ID, Lab ID. Rows include MW-3 through MW-18 and MW-E.

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: Patrick McCarthy
Project Manager
patrick.mccarthy@ctberk.com
(510) 204-2236

Date: 04/03/2017

**CASE NARRATIVE**

Laboratory number: 287276  
Client: Stellar Environmental Solutions  
Project: 2007-65  
Location: Bay Center Apts  
Request Date: 03/23/17  
Samples Received: 03/23/17

This data package contains sample and QC results for twelve water samples, requested for the above referenced project on 03/23/17. The samples were received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):**

Low response was observed for MTBE in the CCV analyzed 03/28/17 20:34; affected data was qualified with "b". Low response was observed for MTBE in the CCV analyzed 03/29/17 04:06; affected data was qualified with "b". High surrogate recovery was observed for bromofluorobenzene (PID) in MW-17 (lab # 287276-005). Gasoline C7-C12 was detected above the RL in the method blank for batch 246027; this analyte was either not detected in samples at or above the RL, or detected at a level at least 10 times that of the blank. MW-7 (lab # 287276-006), MW-9 (lab # 287276-007), and MW-16 (lab # 287276-011) were diluted due to foaming. MW-12 (lab # 287276-009) and MW-E (lab # 287276-010) were diluted due to client history of high non-target or organic acid interference. No other analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

MW-3 (lab # 287276-001) and MW-7 (lab # 287276-006) were diluted due to the dark and viscous nature of the sample extracts. No other analytical problems were encountered.

# 287276

## Chain of Custody Record

Laboratory CURTIS & TOMPKINS  
 Address 2323 FIFTH ST.  
BERKELEY, CA

Method of Shipment HAND DELIVERY or LAB COURIER

Lab job no. \_\_\_\_\_  
 Date 3-23-17  
 Page 1 of \_\_\_\_\_

Project Owner \_\_\_\_\_  
 Site Address 6400 CHRISTIE AVE  
BERKELEY, CA

Shipment No. \_\_\_\_\_  
 Airbill No. \_\_\_\_\_  
 Cooler No. \_\_\_\_\_

Project Name BAY CENTER APARTMENT  
 Project Number 2007-65

Project Manager R. MAKDISI  
 Telephone No. (510) 644-3123  
 Fax No. (510) 644-3859

Samplers: (Signature) [Signature]

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		Analysis Required	Remarks
						Cooler	Chemical		
1 MW-3		3-23-17	1305		3ML VIALS 2-500µL ALI	✓	✓		
2 MW-4			1035						
3 MW-5			1320						
4 MW-6			1115						
5 MW-17			1215						
6 MW-7			1322						
7 MW-9			1120						
8 MW-11			1150						
9 MW-12			1315						
10 MW-E			1335						
11 MW-16			1400						
12 MW-14			1435						

Filled  
 No. of Containers  
 TEH-D (8015 M)  
 TPH-G (8015 M)  
 TPH-G, M/BTEX

Relinquished by: [Signature]  
 Signature \_\_\_\_\_  
 Printed Bianca Angulo  
 Company BLAINE TECH SERVICES

Date 3-23-17  
 Received by: [Signature]  
 Signature \_\_\_\_\_  
 Printed Dina Ali  
 Company CST

Date \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_  
 Signature \_\_\_\_\_  
 Printed \_\_\_\_\_  
 Company \_\_\_\_\_

Date \_\_\_\_\_  
 Received by: \_\_\_\_\_  
 Signature \_\_\_\_\_  
 Printed \_\_\_\_\_  
 Company \_\_\_\_\_

Turnaround Time: STANDARD  
 Comments: EDF REQUIRED  
GLOBAL ID # SLT2005561

Relinquished by: \_\_\_\_\_  
 Signature \_\_\_\_\_  
 Printed \_\_\_\_\_  
 Company \_\_\_\_\_

Date \_\_\_\_\_  
 Received by: \_\_\_\_\_  
 Signature \_\_\_\_\_  
 Printed \_\_\_\_\_  
 Company \_\_\_\_\_

2000-00-01

**COOLER RECEIPT CHECKLIST**



Curtis & Tompkins, Ltd.

Login # 287276 Date Received 3/23/17 Number of coolers 2  
 Client Stellar Project 6400 Christie Ave

Date Opened 3/23/17 By (print) VO (sign) [Signature]  
 Date Logged in ↓ By (print) VO (sign) [Signature]  
 Date Labeled ↓ By (print) VO (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) 3.4

Temperature blank(s) included?  Thermometer# \_\_\_\_\_  IR Gun# 20150921

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  
 13. Sample 9 - One container mislabeled as "MW-12".  
Sample 10 - One container mislabeled as "MW-5".

3/23/17  
 VO



### Detections Summary for 287276

Results for any subcontracted analyses are not included in this summary.

Client : Stellar Environmental Solutions  
 Project : 2007-65  
 Location : Bay Center Apts

Client Sample ID : MW-3                      Laboratory Sample ID :                      287276-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	340	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Benzene	5.0		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
m,p-Xylenes	0.73		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Diesel C10-C24	28,000	Y	2,500	ug/L	As Recd	50.00	EPA 8015B	EPA 3520C

Client Sample ID : MW-4                      Laboratory Sample ID :                      287276-002

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	76	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Diesel C10-C24	390	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-5                      Laboratory Sample ID :                      287276-003

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	2,500	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-6                      Laboratory Sample ID :                      287276-004

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Benzene	0.77		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Diesel C10-C24	1,500	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-17                      Laboratory Sample ID :                      287276-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	27,000		1,300	ug/L	As Recd	25.00	EPA 8015B	EPA 5030B
Benzene	2,100		13	ug/L	As Recd	25.00	EPA 8021B	EPA 5030B
Ethylbenzene	93		13	ug/L	As Recd	25.00	EPA 8021B	EPA 5030B
m,p-Xylenes	130		13	ug/L	As Recd	25.00	EPA 8021B	EPA 5030B
o-Xylene	37		13	ug/L	As Recd	25.00	EPA 8021B	EPA 5030B
Diesel C10-C24	3,700	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-7

Laboratory Sample ID :

287276-006

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	1,500	Y	250	ug/L	As Recd	5.000	EPA 8015B	EPA 5030B
Benzene	560		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
Toluene	25		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
Ethylbenzene	10	C	2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
m,p-Xylenes	47		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
o-Xylene	15		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
Diesel C10-C24	12,000	Y	100	ug/L	As Recd	2.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-9

Laboratory Sample ID :

287276-007

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Benzene	14		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
Diesel C10-C24	11,000	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-11

Laboratory Sample ID :

287276-008

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	5,000		250	ug/L	As Recd	5.000	EPA 8015B	EPA 5030B
Benzene	360		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
Toluene	70		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
Ethylbenzene	45		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
m,p-Xylenes	87		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
o-Xylene	29		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
Diesel C10-C24	8,700	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-12

Laboratory Sample ID :

287276-009

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	6,200	Y	1,300	ug/L	As Recd	25.00	EPA 8015B	EPA 5030B
Benzene	1,200		13	ug/L	As Recd	25.00	EPA 8021B	EPA 5030B
Toluene	28		13	ug/L	As Recd	25.00	EPA 8021B	EPA 5030B
Ethylbenzene	16		13	ug/L	As Recd	25.00	EPA 8021B	EPA 5030B
Diesel C10-C24	2,800		50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-E

Laboratory Sample ID :

287276-010

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	2,200		250	ug/L	As Recd	5.000	EPA 8015B	EPA 5030B
Benzene	580		170	ug/L	As Recd	333.3	EPA 8021B	EPA 5030B
Toluene	32		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Ethylbenzene	43		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
m,p-Xylenes	38		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
o-Xylene	19		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Diesel C10-C24	6,700	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-16

Laboratory Sample ID :

287276-011

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Benzene	27		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
Toluene	3.4		2.5	ug/L	As Recd	5.000	EPA 8021B	EPA 5030B
Diesel C10-C24	8,400	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-18

Laboratory Sample ID :

287276-012

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	11,000	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

C = Presence confirmed, but RPD between columns exceeds 40%

Y = Sample exhibits chromatographic pattern which does not resemble standard



**Curtis & Tompkins Laboratories Analytical Report**

Lab #: 287276	Location: Bay Center Apts
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 2007-65	
Matrix: Water	Sampled: 03/23/17
Units: ug/L	Received: 03/23/17

Field ID: MW-5 Diln Fac: 1.000  
 Type: SAMPLE Analyzed: 03/29/17  
 Lab ID: 287276-003

Analyte	Result	RL	Batch#	Analysis
Gasoline C7-C12	ND	50	246065 EPA	8015B
MTBE	ND b	2.0	246027 EPA	8021B
Benzene	ND	0.50	246027 EPA	8021B
Toluene	ND	0.50	246027 EPA	8021B
Ethylbenzene	ND	0.50	246027 EPA	8021B
m,p-Xylenes	ND	0.50	246027 EPA	8021B
o-Xylene	ND	0.50	246027 EPA	8021B

Surrogate	%REC	Limits	Batch#	Analysis
Bromofluorobenzene (FID)	98	80-122	246065 EPA	8015B
Bromofluorobenzene (PID)	109	80-124	246027 EPA	8021B

Field ID: MW-6 Diln Fac: 1.000  
 Type: SAMPLE Analyzed: 03/29/17  
 Lab ID: 287276-004

Analyte	Result	RL	Batch#	Analysis
Gasoline C7-C12	ND	50	246065 EPA	8015B
MTBE	ND b	2.0	246027 EPA	8021B
Benzene	0.77	0.50	246027 EPA	8021B
Toluene	ND	0.50	246027 EPA	8021B
Ethylbenzene	ND	0.50	246027 EPA	8021B
m,p-Xylenes	ND	0.50	246027 EPA	8021B
o-Xylene	ND	0.50	246027 EPA	8021B

Surrogate	%REC	Limits	Batch#	Analysis
Bromofluorobenzene (FID)	105	80-122	246065 EPA	8015B
Bromofluorobenzene (PID)	106	80-124	246027 EPA	8021B

\*= Value outside of QC limits; see narrative  
 C= Presence confirmed, but RPD between columns exceeds 40%  
 Y= Sample exhibits chromatographic pattern which does not resemble standard  
 b= See narrative  
 NA= Not Analyzed  
 ND= Not Detected  
 RL= Reporting Limit

**Curtis & Tompkins Laboratories Analytical Report**

Lab #: 287276	Location: Bay Center Apts
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 2007-65	
Matrix: Water	Sampled: 03/23/17
Units: ug/L	Received: 03/23/17

Field ID: MW-17 Diln Fac: 25.00  
 Type: SAMPLE Batch#: 246027  
 Lab ID: 287276-005 Analyzed: 03/29/17

Analyte	Result	RL	Analysis
Gasoline C7-C12	27,000	1,300	EPA 8015B
MTBE	ND b	50	EPA 8021B
Benzene	2,100	13	EPA 8021B
Toluene	ND	13	EPA 8021B
Ethylbenzene	93	13	EPA 8021B
m,p-Xylenes	130	13	EPA 8021B
o-Xylene	37	13	EPA 8021B

Surrogate	%REC	Limits	Analysis
Bromofluorobenzene (FID)	106	80-122	EPA 8015B
Bromofluorobenzene (PID)	126 *	80-124	EPA 8021B

Field ID: MW-7 Diln Fac: 5.000  
 Type: SAMPLE Analyzed: 03/29/17  
 Lab ID: 287276-006

Analyte	Result	RL	Batch#	Analysis
Gasoline C7-C12	1,500 Y	250	246065	EPA 8015B
MTBE	ND	10	246027	EPA 8021B
Benzene	560	2.5	246027	EPA 8021B
Toluene	25	2.5	246027	EPA 8021B
Ethylbenzene	10 C	2.5	246027	EPA 8021B
m,p-Xylenes	47	2.5	246027	EPA 8021B
o-Xylene	15	2.5	246027	EPA 8021B

Surrogate	%REC	Limits	Batch#	Analysis
Bromofluorobenzene (FID)	101	80-122	246065	EPA 8015B
Bromofluorobenzene (PID)	108	80-124	246027	EPA 8021B

\*= Value outside of QC limits; see narrative  
 C= Presence confirmed, but RPD between columns exceeds 40%  
 Y= Sample exhibits chromatographic pattern which does not resemble standard  
 b= See narrative  
 NA= Not Analyzed  
 ND= Not Detected  
 RL= Reporting Limit

**Curtis & Tompkins Laboratories Analytical Report**

Lab #: 287276	Location: Bay Center Apts
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 2007-65	
Matrix: Water	Sampled: 03/23/17
Units: ug/L	Received: 03/23/17

Field ID: MW-9 Diln Fac: 5.000  
 Type: SAMPLE Analyzed: 03/29/17  
 Lab ID: 287276-007

Analyte	Result	RL	Batch#	Analysis
Gasoline C7-C12	ND	250	246065 EPA	8015B
MTBE	ND b	10	246027 EPA	8021B
Benzene	14	2.5	246027 EPA	8021B
Toluene	ND	2.5	246027 EPA	8021B
Ethylbenzene	ND	2.5	246027 EPA	8021B
m,p-Xylenes	ND	2.5	246027 EPA	8021B
o-Xylene	ND	2.5	246027 EPA	8021B

Surrogate	%REC	Limits	Batch#	Analysis
Bromofluorobenzene (FID)	101	80-122	246065 EPA	8015B
Bromofluorobenzene (PID)	100	80-124	246027 EPA	8021B

Field ID: MW-11 Diln Fac: 5.000  
 Type: SAMPLE Batch#: 246027  
 Lab ID: 287276-008 Analyzed: 03/29/17

Analyte	Result	RL	Analysis
Gasoline C7-C12	5,000	250	EPA 8015B
MTBE	ND b	10	EPA 8021B
Benzene	360	2.5	EPA 8021B
Toluene	70	2.5	EPA 8021B
Ethylbenzene	45	2.5	EPA 8021B
m,p-Xylenes	87	2.5	EPA 8021B
o-Xylene	29	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Bromofluorobenzene (FID)	89	80-122	EPA 8015B
Bromofluorobenzene (PID)	110	80-124	EPA 8021B

\*= Value outside of QC limits; see narrative  
 C= Presence confirmed, but RPD between columns exceeds 40%  
 Y= Sample exhibits chromatographic pattern which does not resemble standard  
 b= See narrative  
 NA= Not Analyzed  
 ND= Not Detected  
 RL= Reporting Limit





**Curtis & Tompkins Laboratories Analytical Report**

Lab #: 287276	Location: Bay Center Apts
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 2007-65	
Matrix: Water	Sampled: 03/23/17
Units: ug/L	Received: 03/23/17

Field ID: MW-16 Diln Fac: 5.000  
 Type: SAMPLE Analyzed: 03/29/17  
 Lab ID: 287276-011

Analyte	Result	RL	Batch#	Analysis
Gasoline C7-C12	ND	250	246065 EPA	8015B
MTBE	ND b	10	246027 EPA	8021B
Benzene	27	2.5	246027 EPA	8021B
Toluene	3.4	2.5	246027 EPA	8021B
Ethylbenzene	ND	2.5	246027 EPA	8021B
m,p-Xylenes	ND	2.5	246027 EPA	8021B
o-Xylene	ND	2.5	246027 EPA	8021B

Surrogate	%REC	Limits	Batch#	Analysis
Bromofluorobenzene (FID)	95	80-122	246065 EPA	8015B
Bromofluorobenzene (PID)	111	80-124	246027 EPA	8021B

Field ID: MW-18 Diln Fac: 5.000  
 Type: SAMPLE Batch#: 246027  
 Lab ID: 287276-012 Analyzed: 03/29/17

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	250	EPA 8015B
MTBE	ND b	10	EPA 8021B
Benzene	ND	2.5	EPA 8021B
Toluene	ND	2.5	EPA 8021B
Ethylbenzene	ND	2.5	EPA 8021B
m,p-Xylenes	ND	2.5	EPA 8021B
o-Xylene	ND	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Bromofluorobenzene (FID)	94	80-122	EPA 8015B
Bromofluorobenzene (PID)	112	80-124	EPA 8021B

\*= Value outside of QC limits; see narrative  
 C= Presence confirmed, but RPD between columns exceeds 40%  
 Y= Sample exhibits chromatographic pattern which does not resemble standard  
 b= See narrative  
 NA= Not Analyzed  
 ND= Not Detected  
 RL= Reporting Limit





## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC878921	Batch#:	246027
Matrix:	Water	Analyzed:	03/28/17
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,095	110	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	95	80-122

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8021B
Matrix:	Water	Diln Fac:	1.000
Units:	ug/L	Batch#:	246027

Type: BS Analyzed: 03/28/17  
 Lab ID: QC878922

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	8.103 b	81	62-131
Benzene	10.00	10.22	102	80-120
Toluene	10.00	9.631	96	80-120
Ethylbenzene	10.00	10.30	103	79-120
m,p-Xylenes	10.00	10.11	101	80-120
o-Xylene	10.00	9.994	100	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	106	80-124

Type: BSD Analyzed: 03/29/17  
 Lab ID: QC878923

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	20.00	16.81	84	62-131	4	38
Benzene	20.00	19.97	100	80-120	2	20
Toluene	20.00	18.73	94	80-120	3	20
Ethylbenzene	20.00	19.36	97	79-120	6	27
m,p-Xylenes	20.00	19.51	98	80-120	4	26
o-Xylene	20.00	19.00	95	80-120	5	20

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	94	80-124

b= See narrative

RPD= Relative Percent Difference

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8015B
Field ID:	MW-3	Batch#:	246027
MSS Lab ID:	287276-001	Sampled:	03/23/17
Matrix:	Water	Received:	03/23/17
Units:	ug/L	Analyzed:	03/29/17
Diln Fac:	1.000		

Type: MS Lab ID: QC878924

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	334.3	2,000	2,227	95	79-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	94	80-122

Type: MSD Lab ID: QC878925

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,142	90	79-120	4	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	90	80-122

RPD= Relative Percent Difference

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC879076	Batch#:	246065
Matrix:	Water	Analyzed:	03/29/17
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,019	102	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	94	80-122

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	246065
MSS Lab ID:	287448-001	Sampled:	03/27/17
Matrix:	Water	Received:	03/28/17
Units:	ug/L	Analyzed:	03/29/17
Diln Fac:	1.000		

Type: MS Lab ID: QC879077

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	27.97	2,000	2,065	102	79-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	103	80-122

Type: MSD Lab ID: QC879078

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,140	106	79-120	4	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	110	80-122

RPD= Relative Percent Difference



## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC879298	Batch#:	246117
Matrix:	Water	Analyzed:	03/30/17
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	962.4	96	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	96	80-122

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	246129
Units:	ug/L	Analyzed:	03/30/17
Diln Fac:	1.000		

Type: BS Lab ID: QC879349

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	8.963	90	62-131
Toluene	10.00	10.18	102	80-120
Ethylbenzene	10.00	10.36	104	79-120
m,p-Xylenes	10.00	10.81	108	80-120
o-Xylene	10.00	10.50	105	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	109	80-124

Type: BSD Lab ID: QC879350

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	10.00	9.353	94	62-131	4	38
Toluene	10.00	9.972	100	80-120	2	20
Ethylbenzene	10.00	10.47	105	79-120	1	27
m,p-Xylenes	10.00	10.17	102	80-120	6	26
o-Xylene	10.00	10.27	103	80-120	2	20

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	106	80-124

RPD= Relative Percent Difference

Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	246117
MSS Lab ID:	287462-001	Sampled:	03/28/17
Matrix:	Water	Received:	03/28/17
Units:	ug/L	Analyzed:	03/31/17
Diln Fac:	1.000		

Type: MS Lab ID: QC879387

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	40.06	2,000	1,859	91	79-120

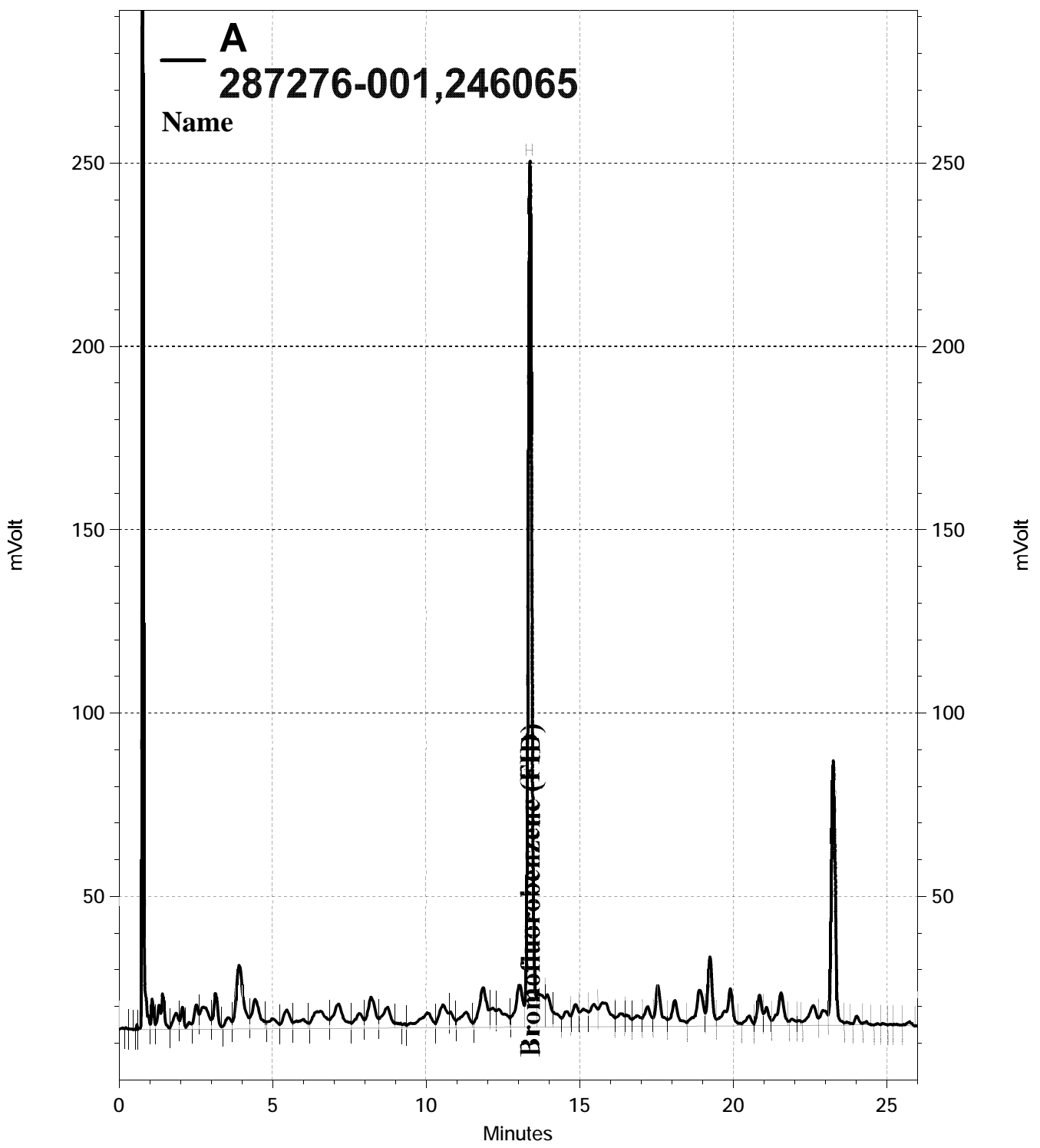
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	80-122

Type: MSD Lab ID: QC879388

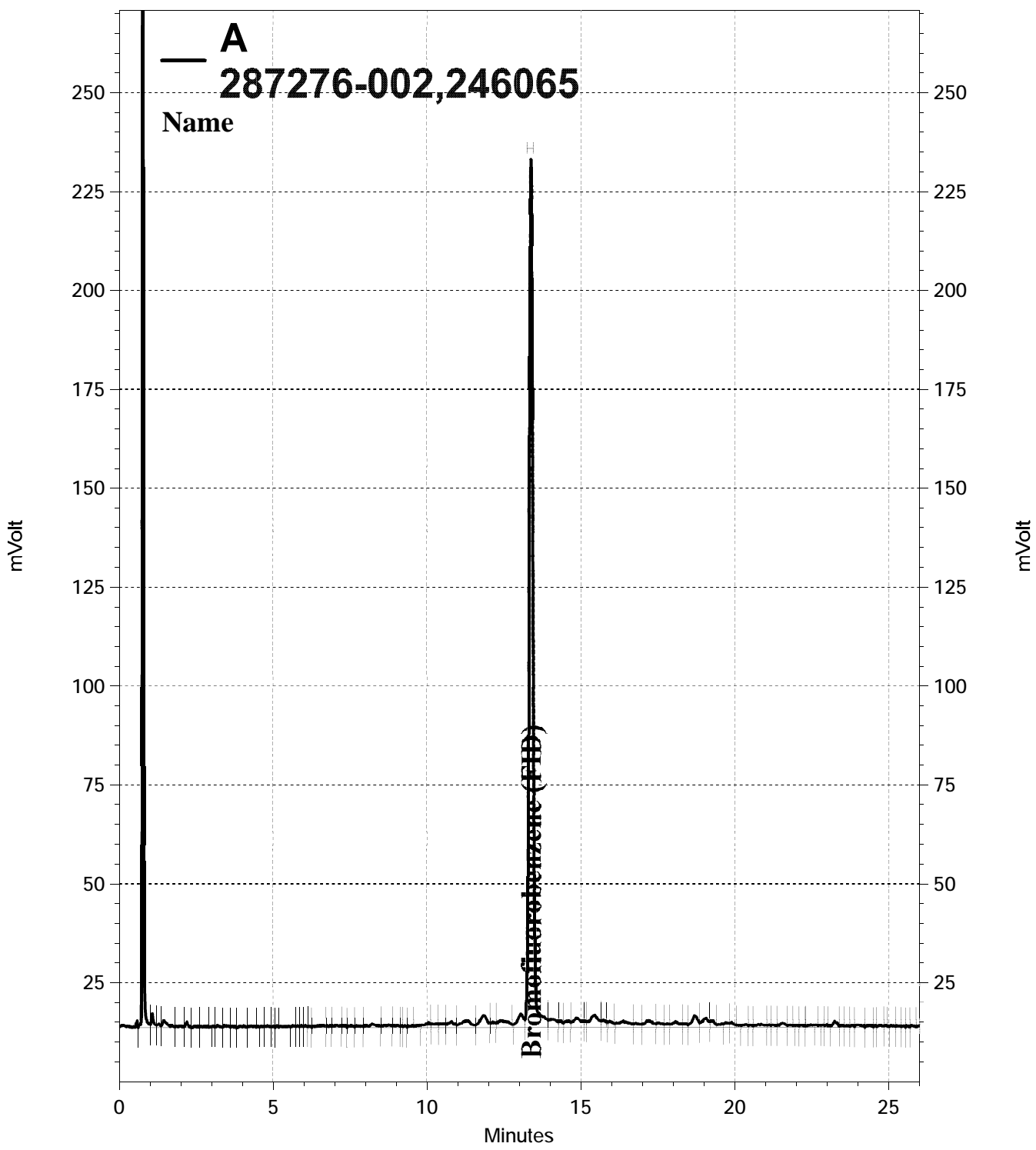
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,906	93	79-120	3	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	80-122

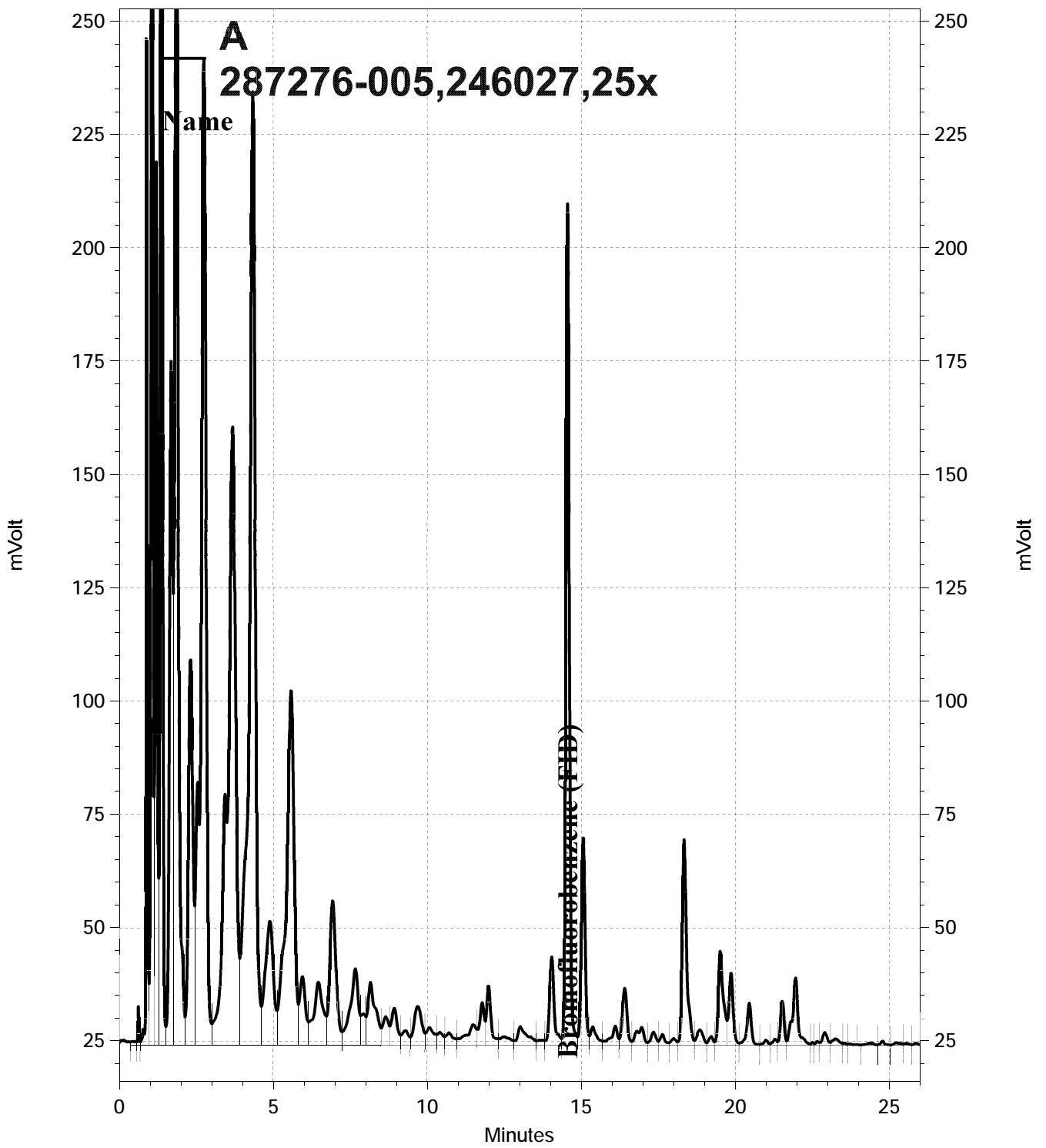
RPD= Relative Percent Difference



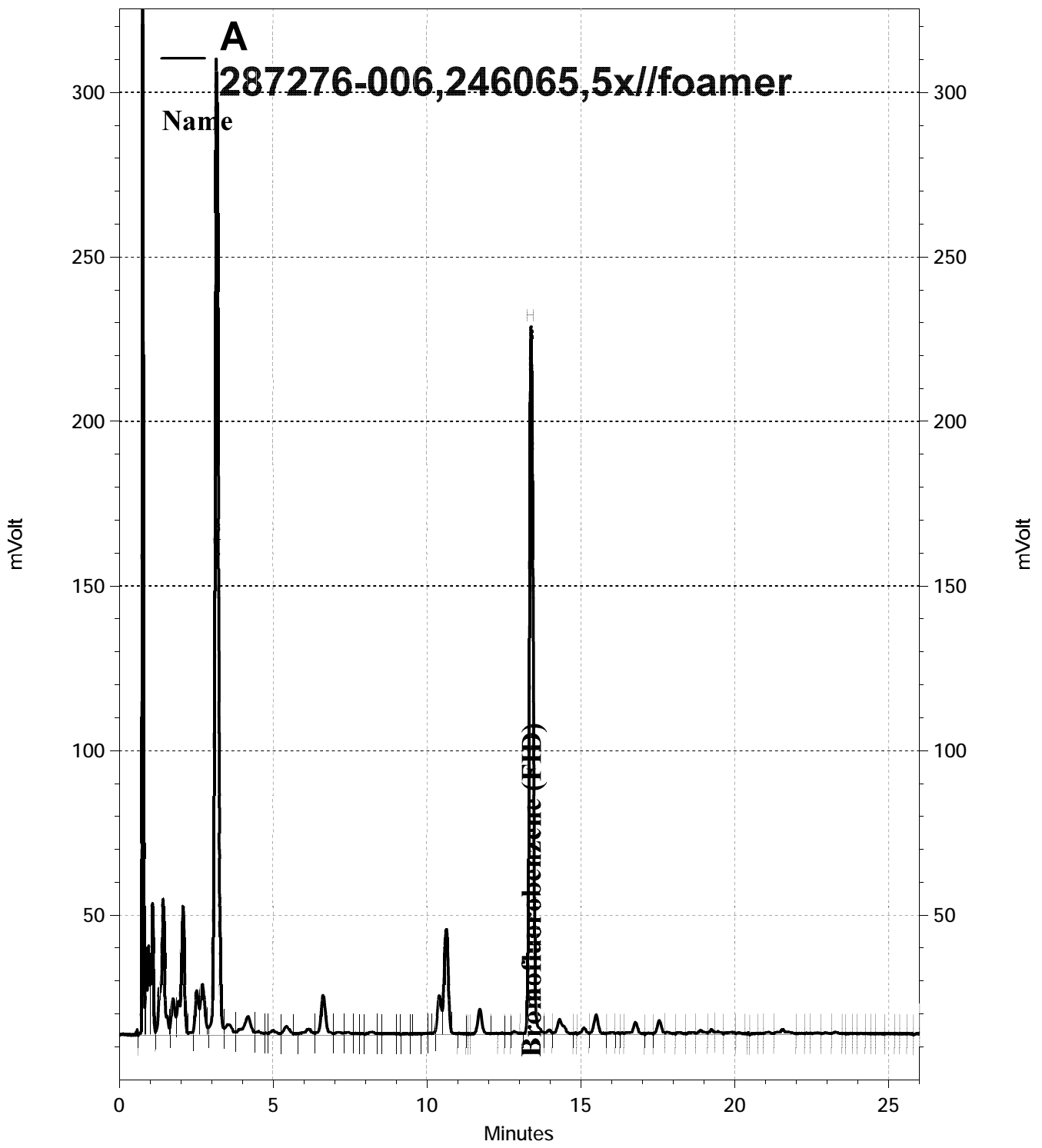
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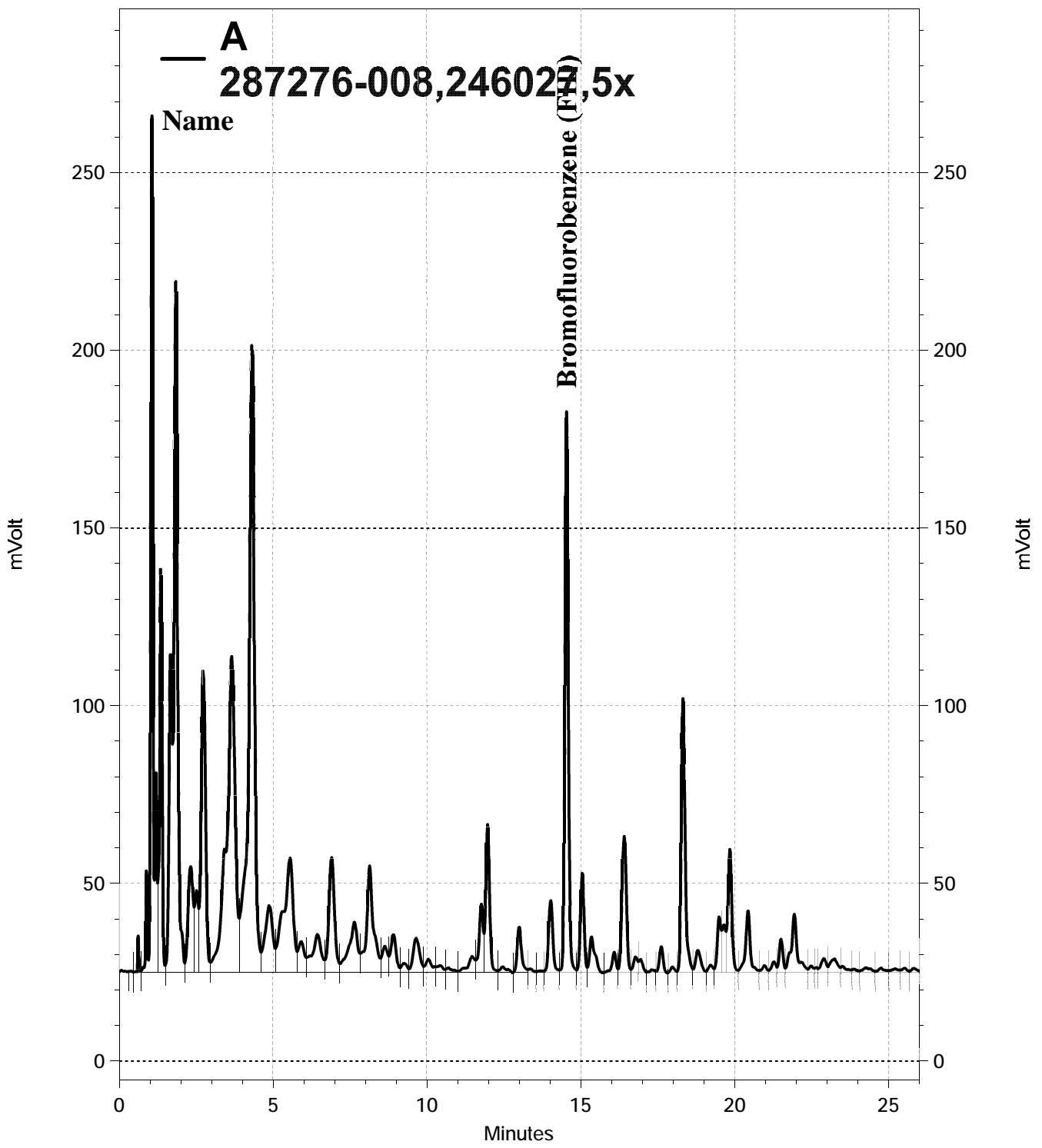
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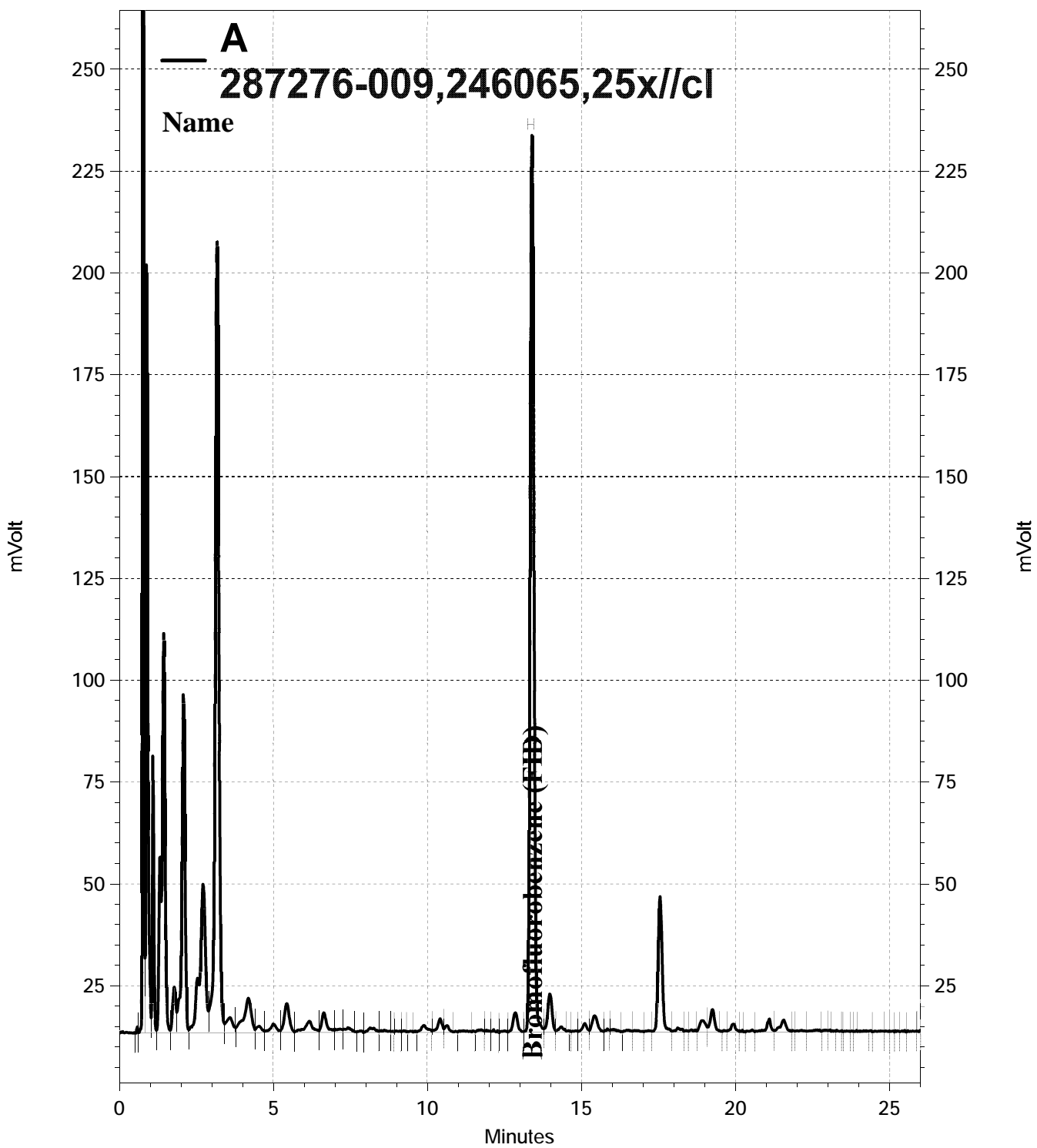


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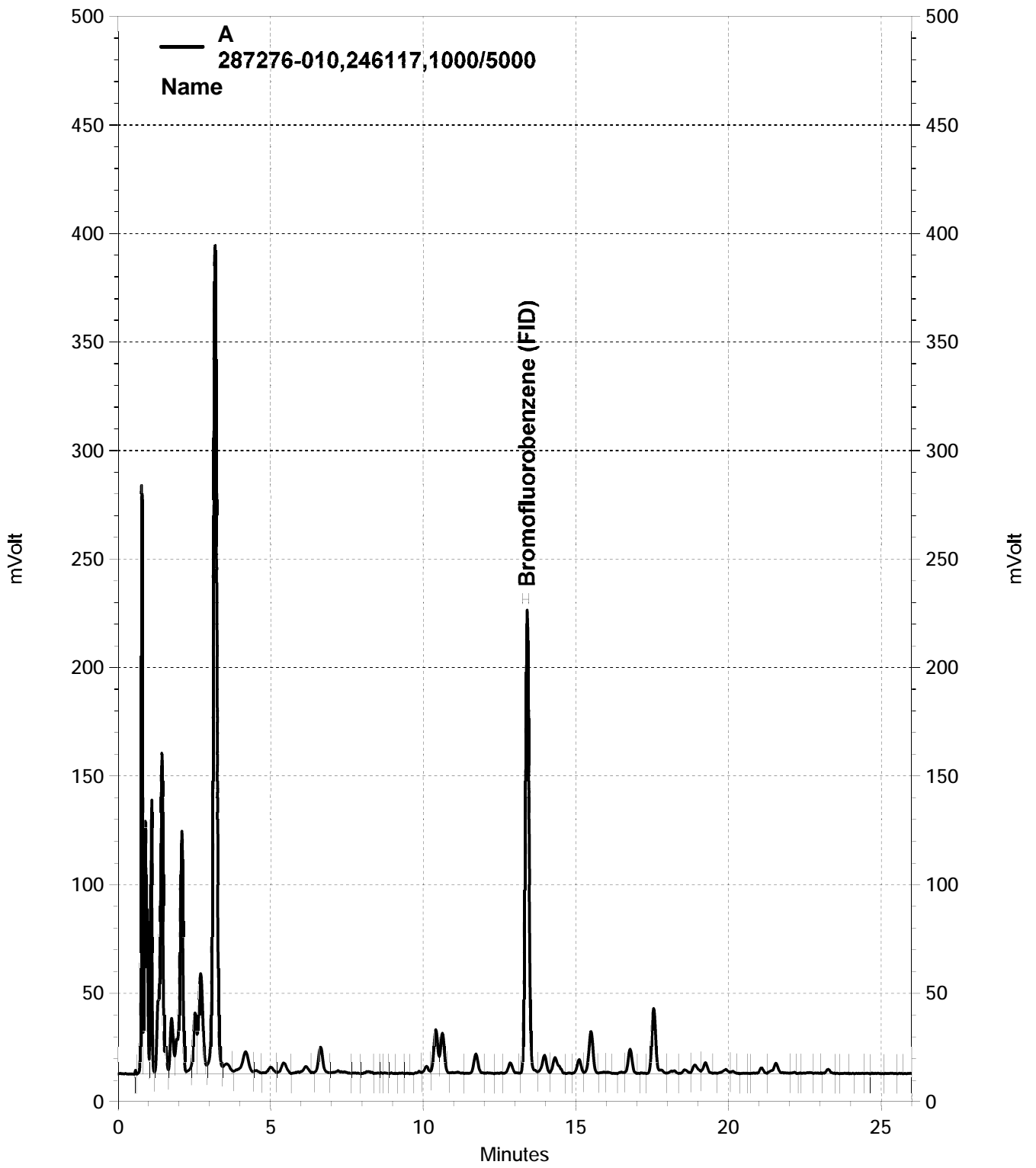


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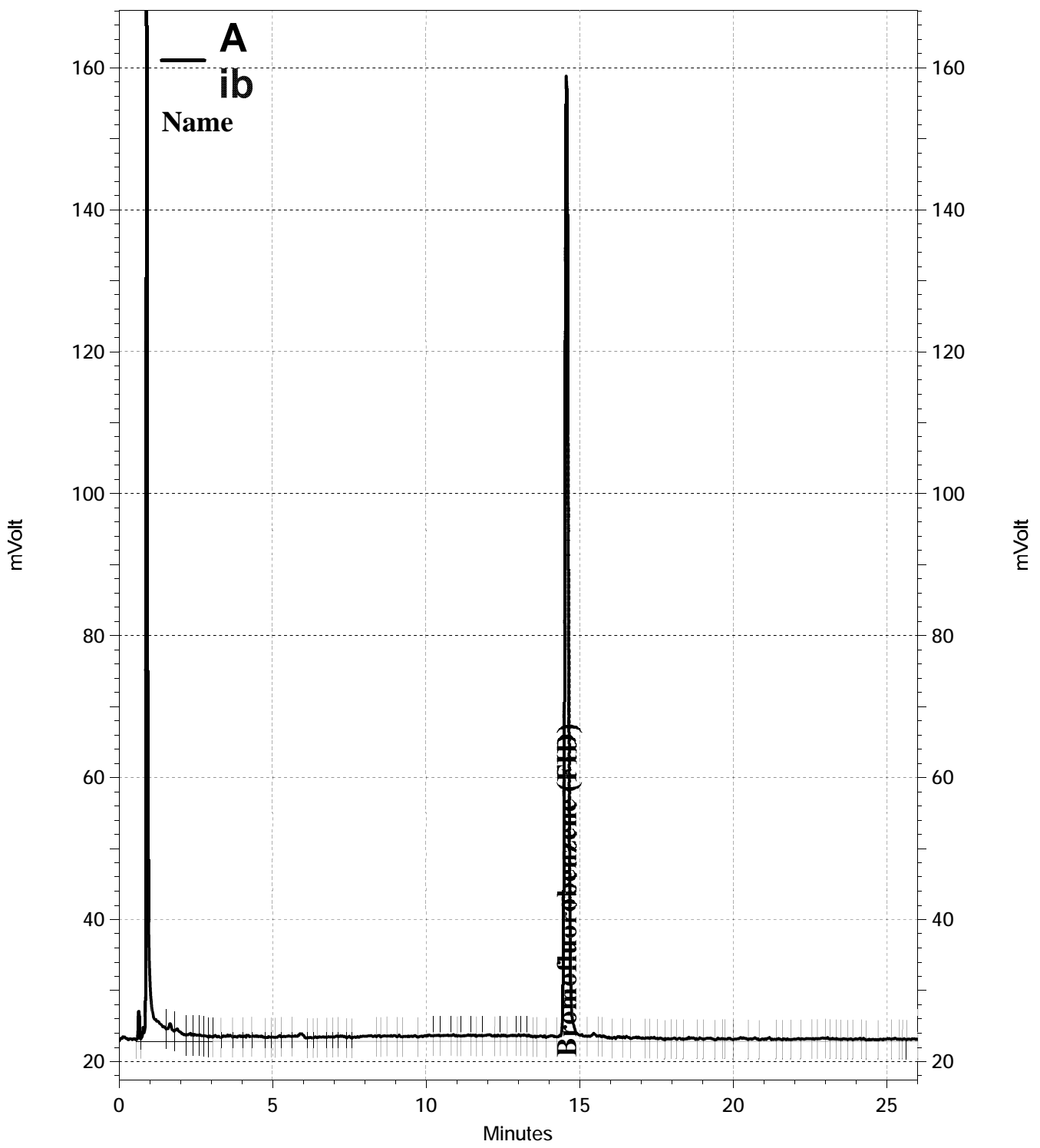




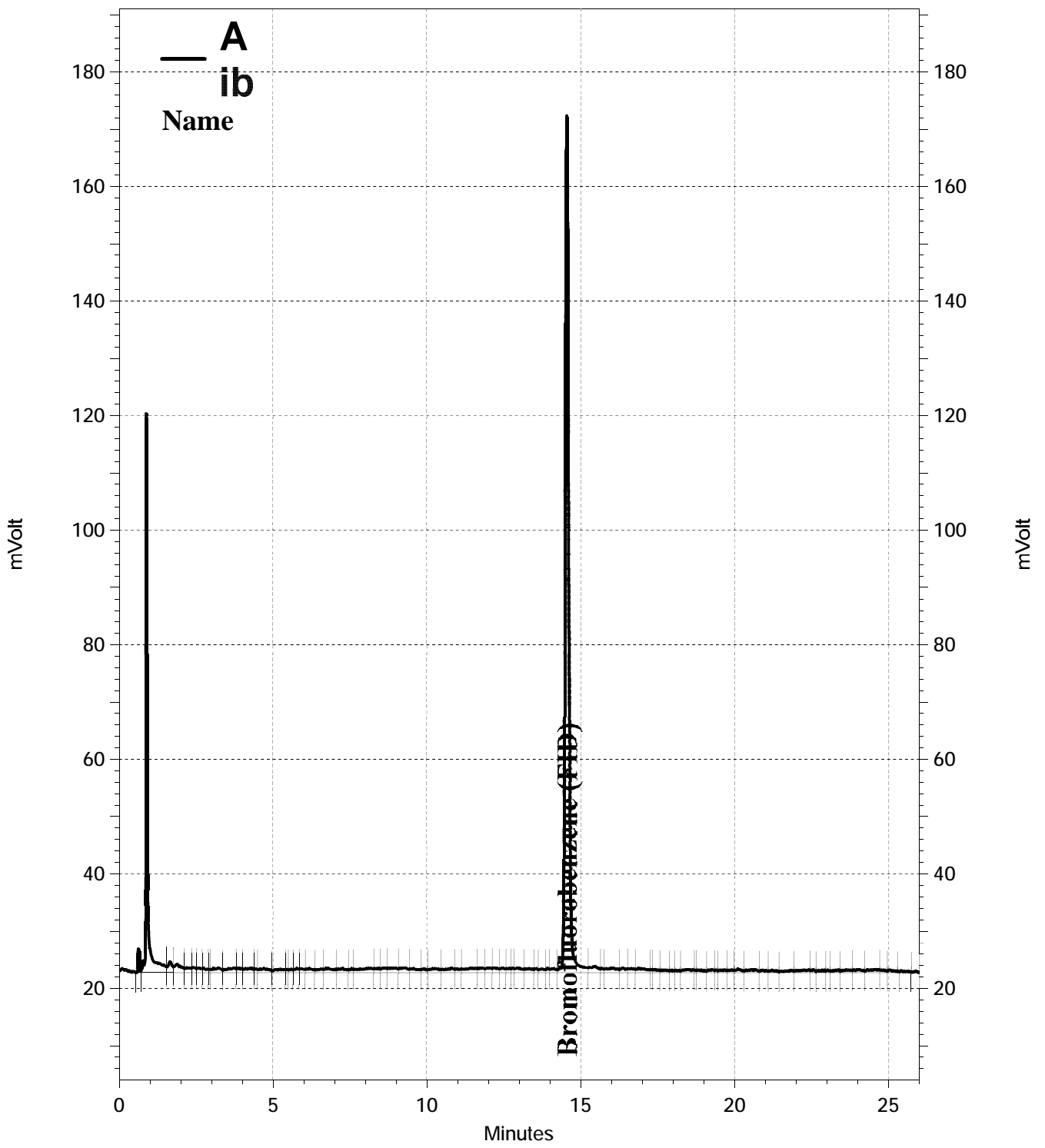
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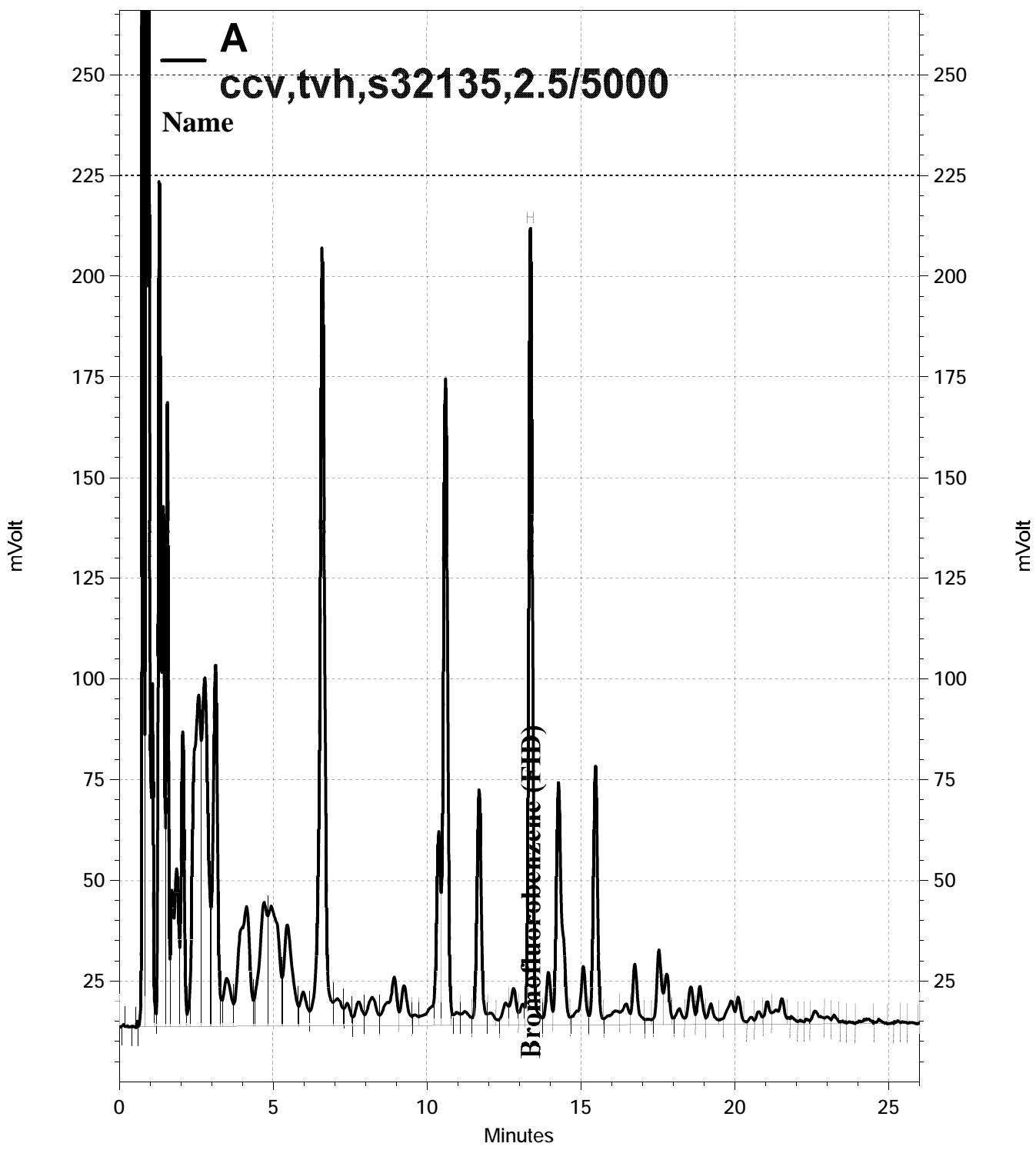
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Total Extractable Hydrocarbons			
Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2007-65	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	03/23/17
Units:	ug/L	Received:	03/23/17

Field ID:	MW-3	Batch#:	246019
Type:	SAMPLE	Prepared:	03/28/17
Lab ID:	287276-001	Analyzed:	03/30/17
Diln Fac:	50.00		

Analyte	Result	RL
Diesel C10-C24	28,000 Y	2,500

Surrogate	%REC	Limits
o-Terphenyl	DO	52-138

Field ID:	MW-4	Batch#:	246019
Type:	SAMPLE	Prepared:	03/28/17
Lab ID:	287276-002	Analyzed:	03/30/17
Diln Fac:	1.000		

Analyte	Result	RL
Diesel C10-C24	390 Y	50

Surrogate	%REC	Limits
o-Terphenyl	103	52-138

Field ID:	MW-5	Batch#:	246019
Type:	SAMPLE	Prepared:	03/28/17
Lab ID:	287276-003	Analyzed:	03/30/17
Diln Fac:	1.000		

Analyte	Result	RL
Diesel C10-C24	2,500 Y	50

Surrogate	%REC	Limits
o-Terphenyl	98	52-138

Field ID:	MW-6	Batch#:	246019
Type:	SAMPLE	Prepared:	03/28/17
Lab ID:	287276-004	Analyzed:	03/30/17
Diln Fac:	1.000		

Analyte	Result	RL
Diesel C10-C24	1,500 Y	50

Surrogate	%REC	Limits
o-Terphenyl	88	52-138

Y= Sample exhibits chromatographic pattern which does not resemble standard  
 DO= Diluted Out  
 ND= Not Detected  
 RL= Reporting Limit

Total Extractable Hydrocarbons			
Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2007-65	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	03/23/17
Units:	ug/L	Received:	03/23/17

Field ID:	MW-17	Batch#:	246019
Type:	SAMPLE	Prepared:	03/28/17
Lab ID:	287276-005	Analyzed:	03/30/17
Diln Fac:	1.000		

Analyte	Result	RL
Diesel C10-C24	3,700 Y	50
Surrogate	%REC	Limits
o-Terphenyl	119	52-138

Field ID:	MW-7	Batch#:	246165
Type:	SAMPLE	Prepared:	03/31/17
Lab ID:	287276-006	Analyzed:	04/03/17
Diln Fac:	2.000		

Analyte	Result	RL
Diesel C10-C24	12,000 Y	100
Surrogate	%REC	Limits
o-Terphenyl	66	52-138

Field ID:	MW-9	Batch#:	246019
Type:	SAMPLE	Prepared:	03/28/17
Lab ID:	287276-007	Analyzed:	03/30/17
Diln Fac:	1.000		

Analyte	Result	RL
Diesel C10-C24	11,000 Y	50
Surrogate	%REC	Limits
o-Terphenyl	98	52-138

Field ID:	MW-11	Batch#:	246019
Type:	SAMPLE	Prepared:	03/28/17
Lab ID:	287276-008	Analyzed:	03/30/17
Diln Fac:	1.000		

Analyte	Result	RL
Diesel C10-C24	8,700 Y	50
Surrogate	%REC	Limits
o-Terphenyl	110	52-138

Y= Sample exhibits chromatographic pattern which does not resemble standard  
 DO= Diluted Out  
 ND= Not Detected  
 RL= Reporting Limit





Total Extractable Hydrocarbons			
Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2007-65	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	03/23/17
Units:	ug/L	Received:	03/23/17

Type:	BLANK	Batch#:	246019
Lab ID:	QC878894	Prepared:	03/28/17
Diln Fac:	1.000	Analyzed:	03/30/17

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
o-Terphenyl	95	52-138

Type:	BLANK	Batch#:	246165
Lab ID:	QC879500	Prepared:	03/31/17
Diln Fac:	1.000	Analyzed:	04/03/17

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
o-Terphenyl	108	52-138

Y= Sample exhibits chromatographic pattern which does not resemble standard  
 DO= Diluted Out  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2007-65	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	246019
Units:	ug/L	Prepared:	03/28/17
Diln Fac:	1.000	Analyzed:	03/30/17

Type: BS Lab ID: QC878895

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	1,975	79	52-124

Surrogate	%REC	Limits
o-Terphenyl	81	52-138

Type: BSD Lab ID: QC878896

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	5,000	4,133	83	52-124	5	34

Surrogate	%REC	Limits
o-Terphenyl	94	52-138

RPD= Relative Percent Difference

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	287276	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2007-65	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	246165
Units:	ug/L	Prepared:	03/31/17
Diln Fac:	1.000	Analyzed:	04/03/17

Type: BS Lab ID: QC879501

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,077	83	52-124

Surrogate	%REC	Limits
o-Terphenyl	110	52-138

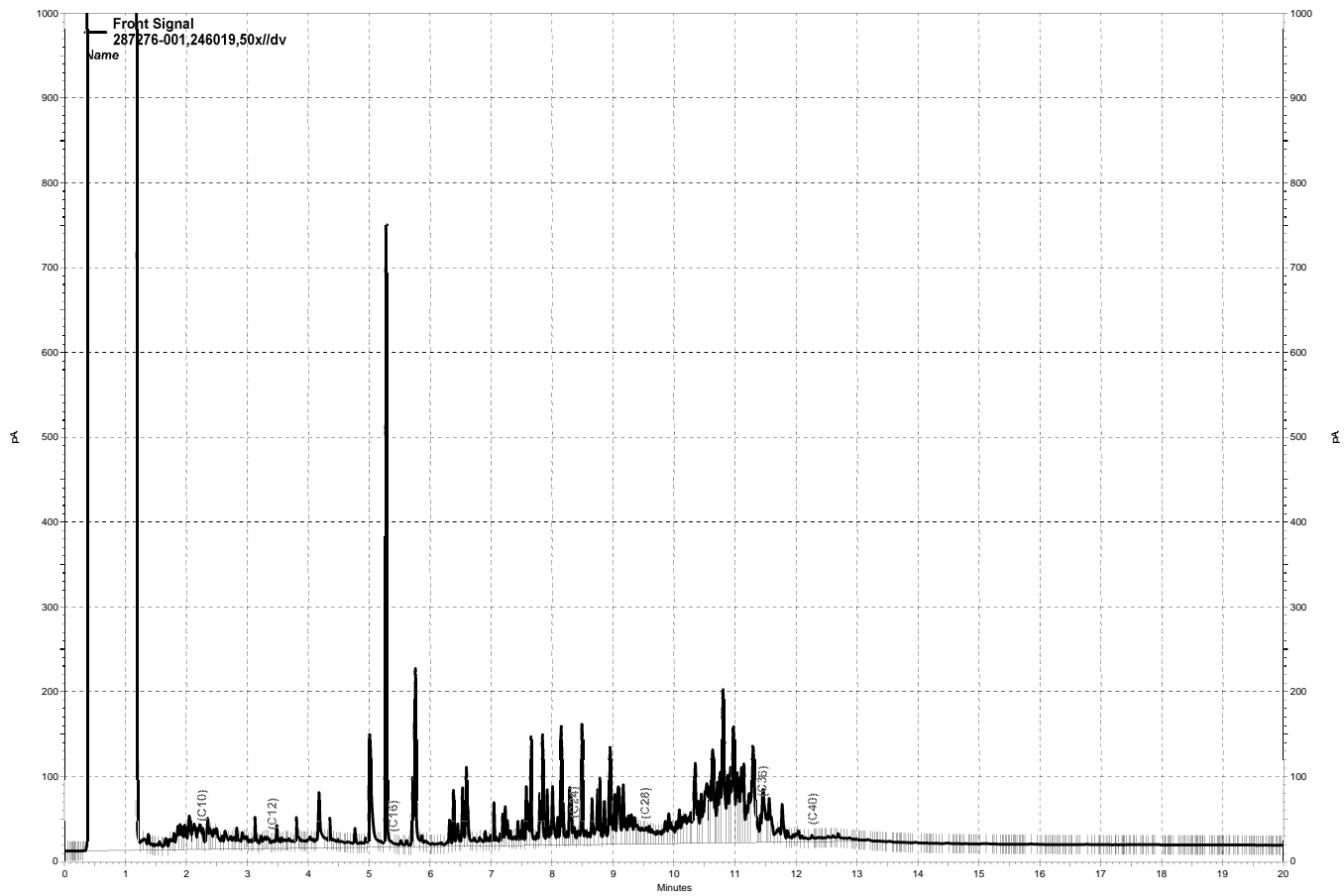
Type: BSD Lab ID: QC879502

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	1,998	80	52-124	4	34

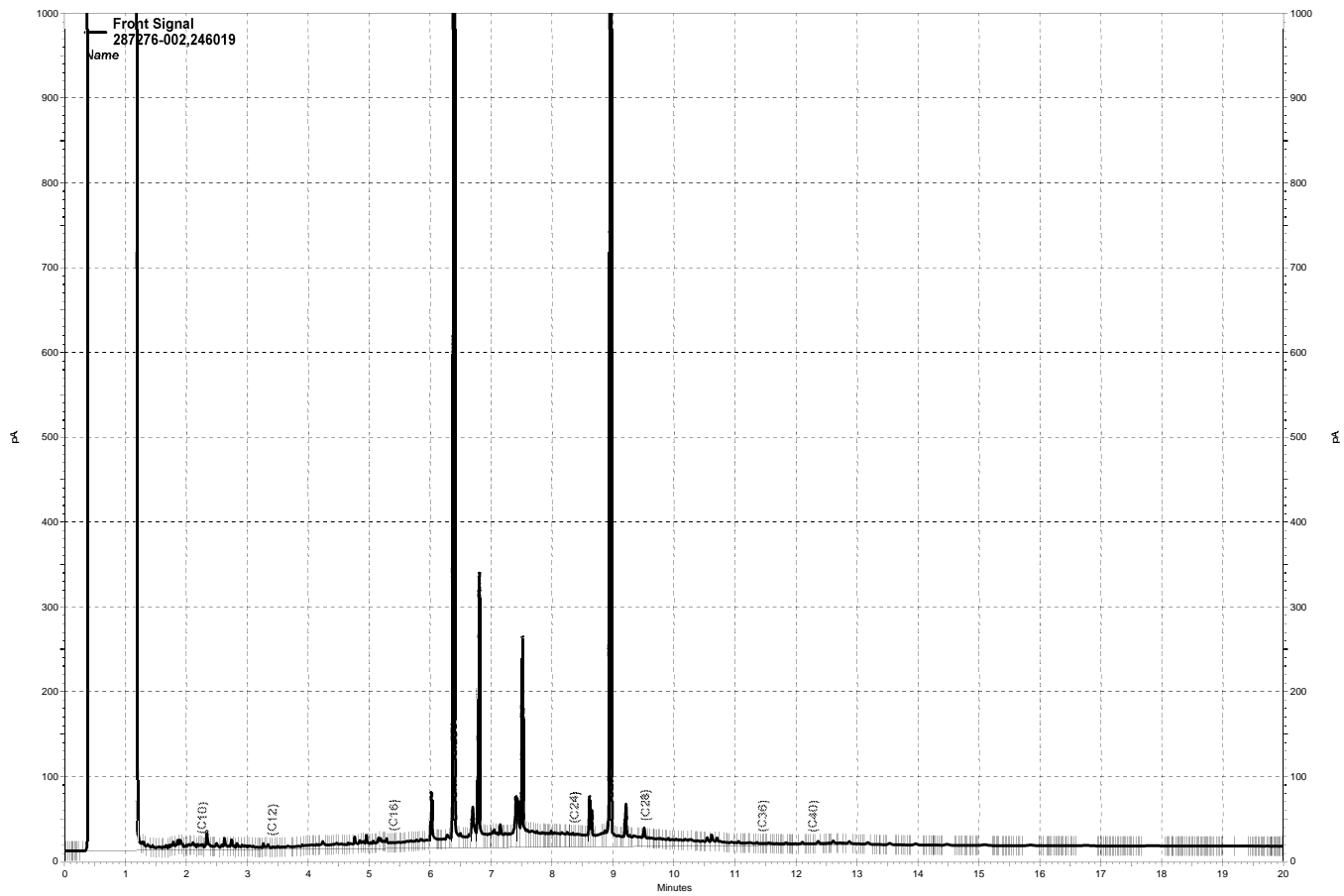
  

Surrogate	%REC	Limits
o-Terphenyl	107	52-138

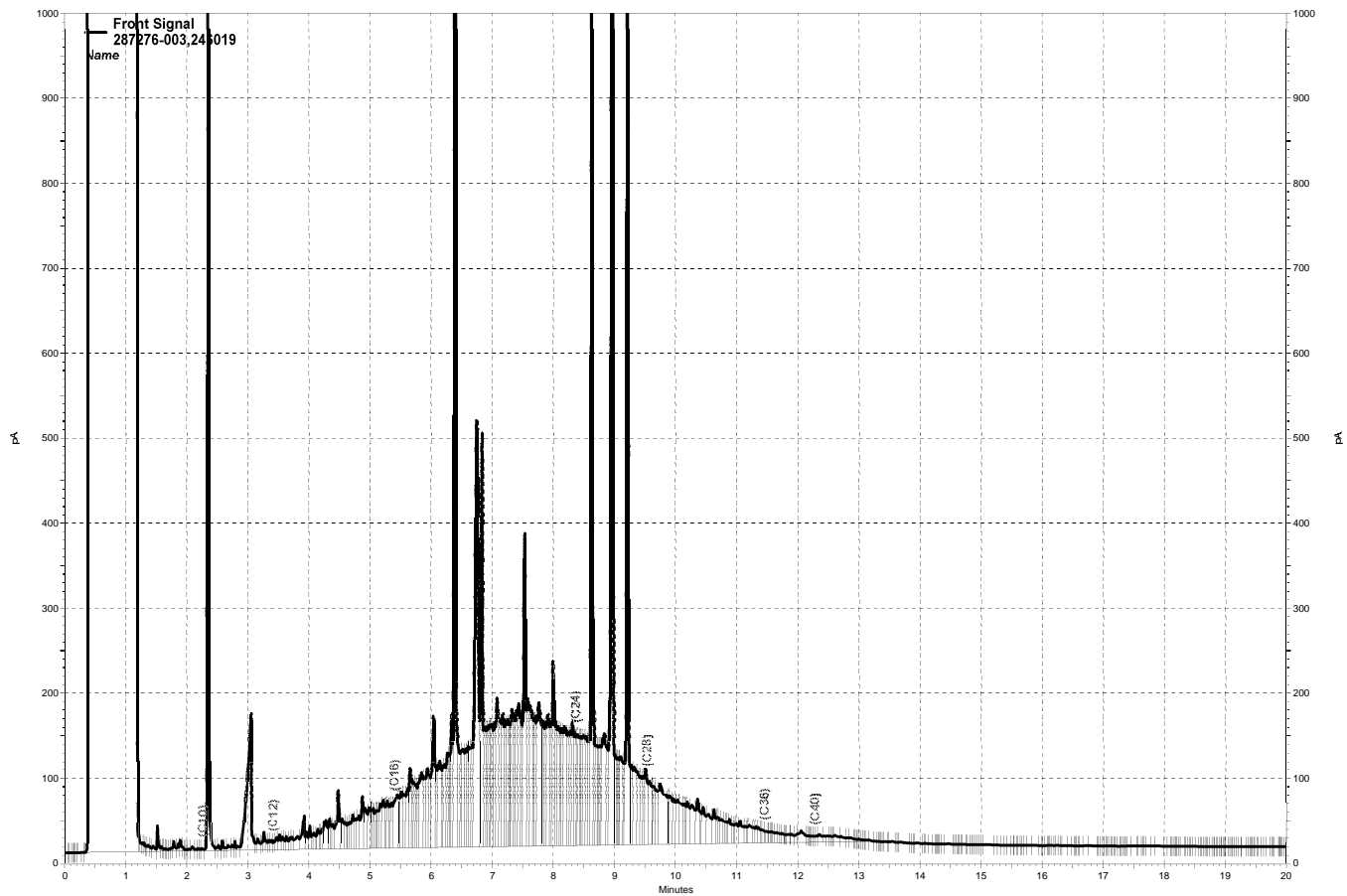
RPD= Relative Percent Difference



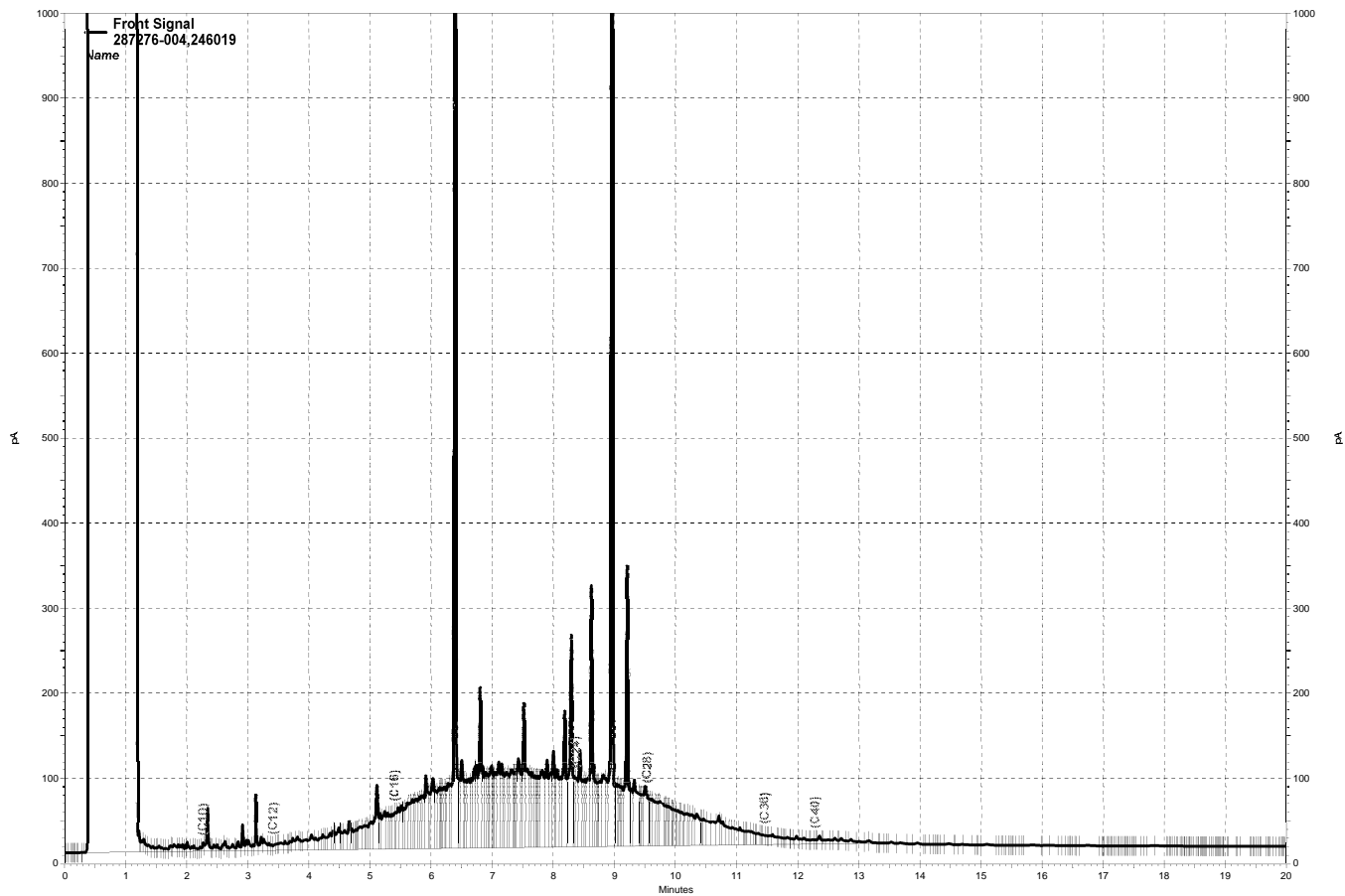
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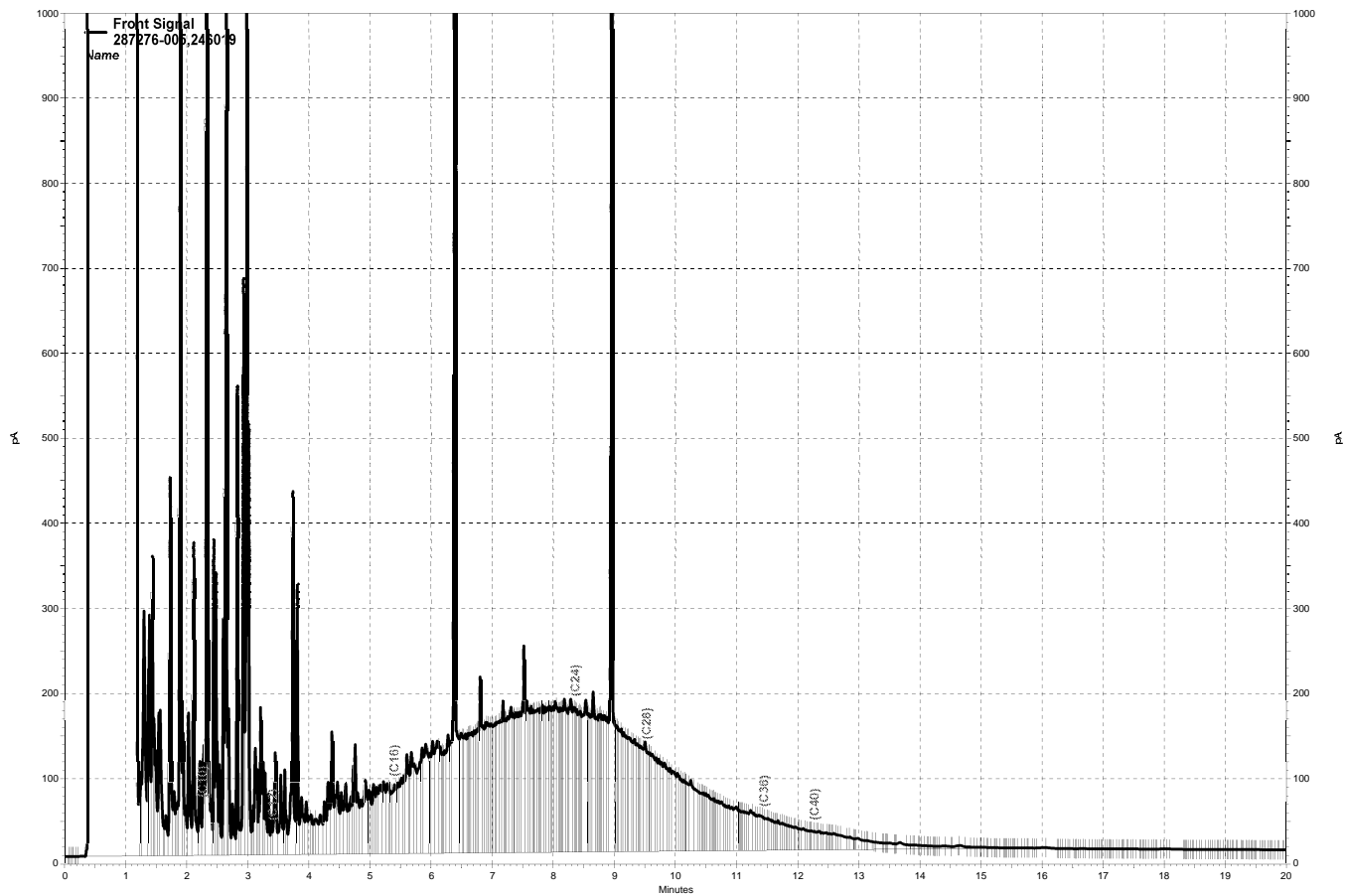
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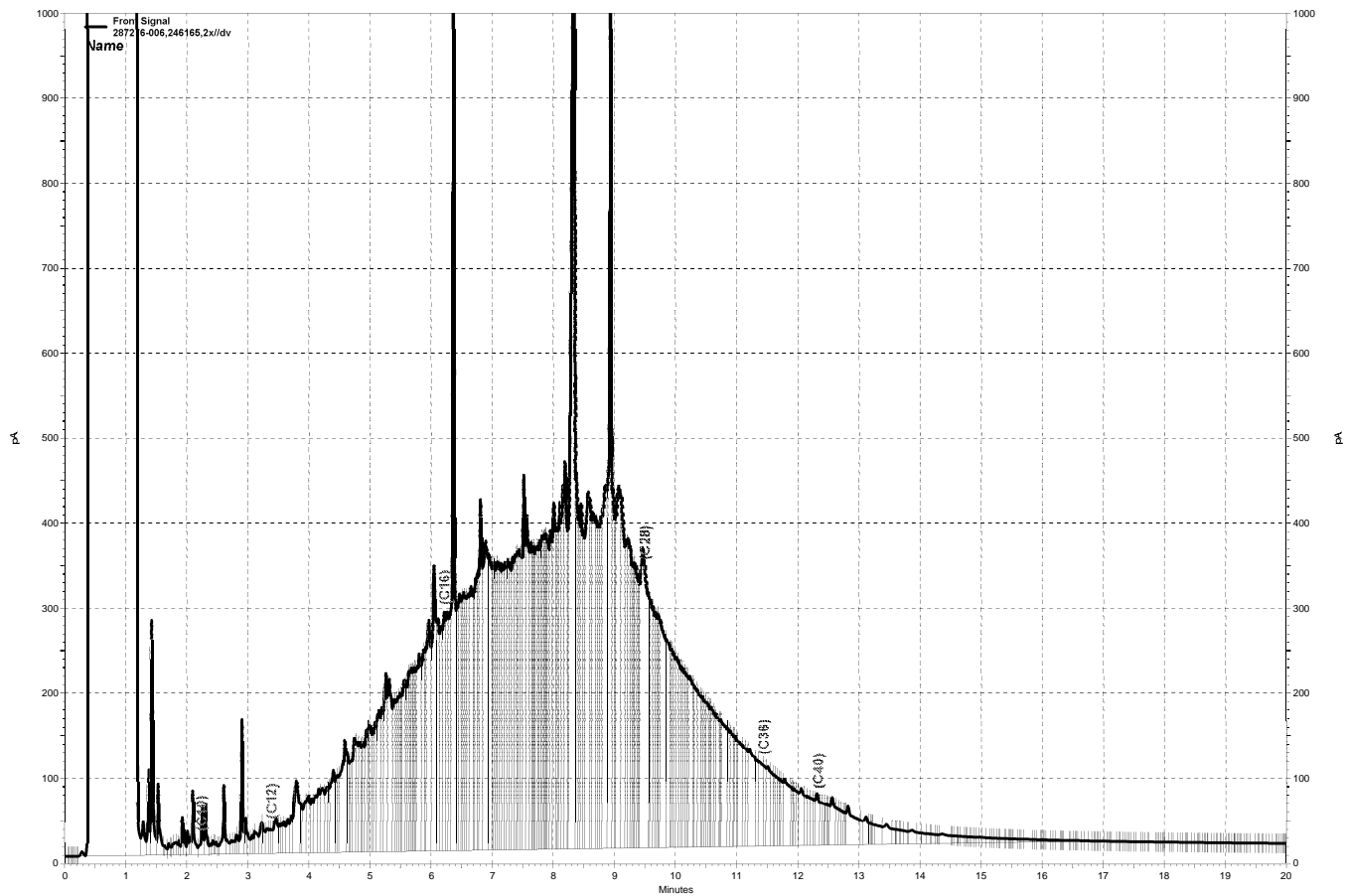


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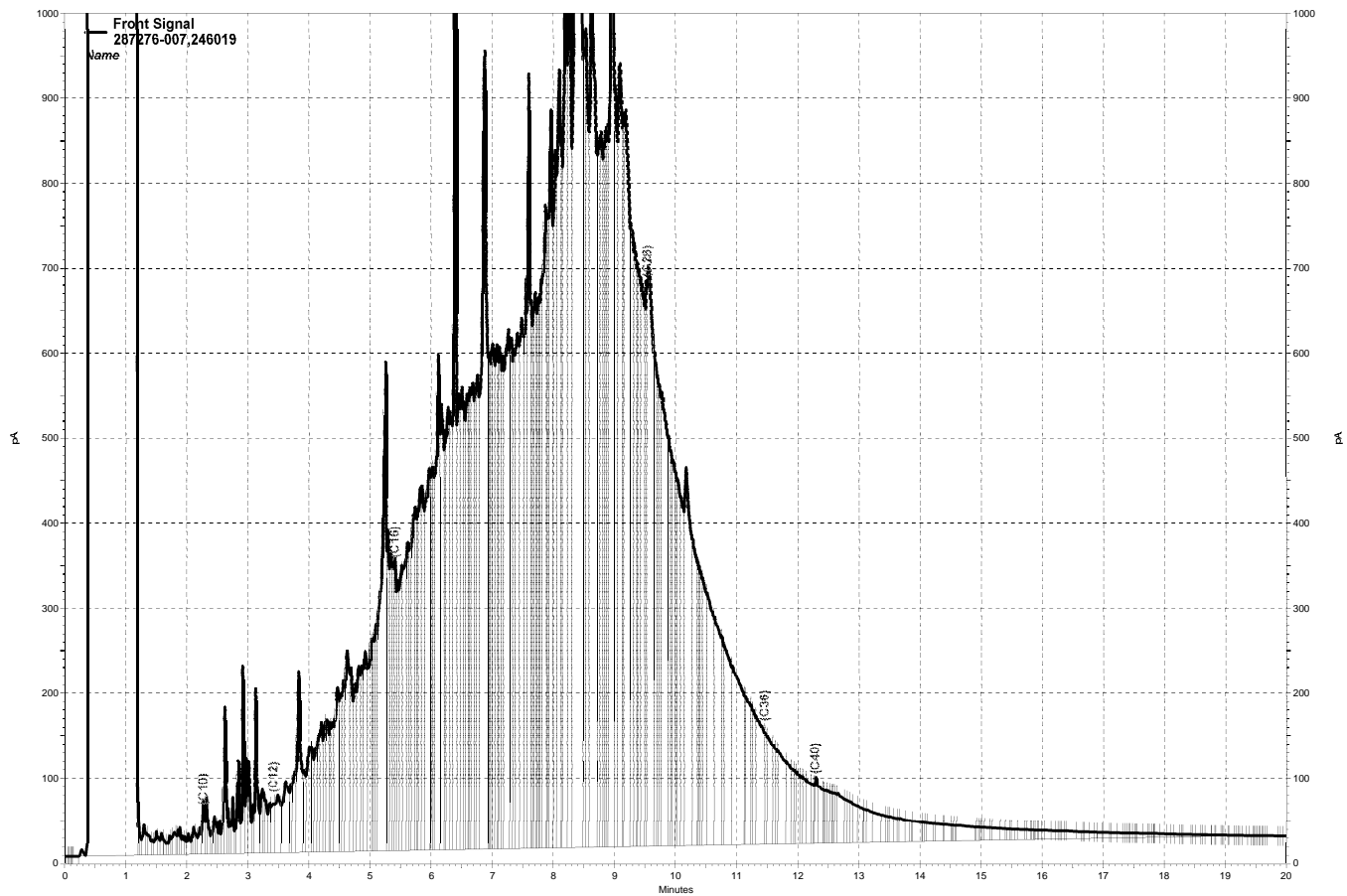


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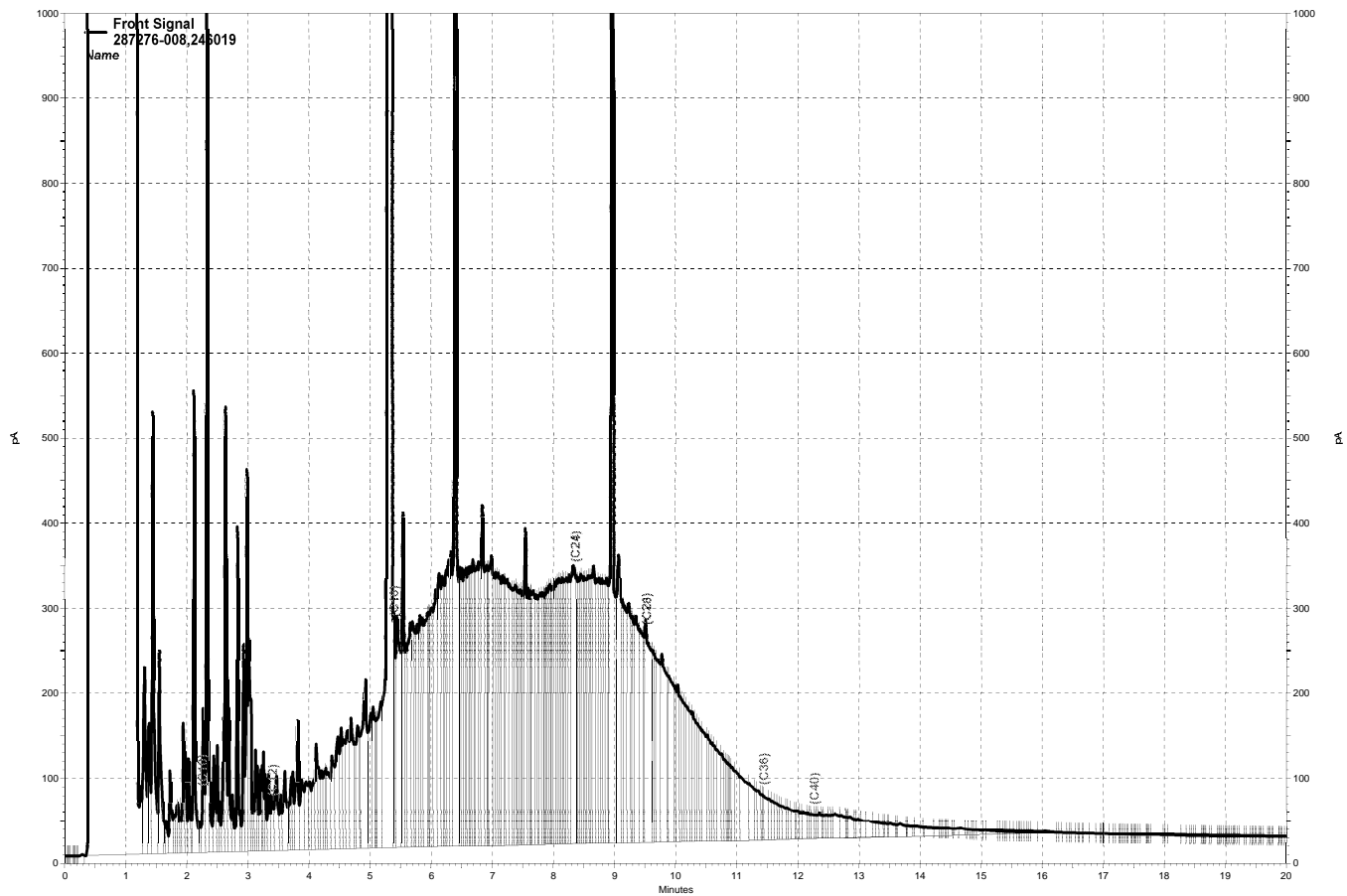




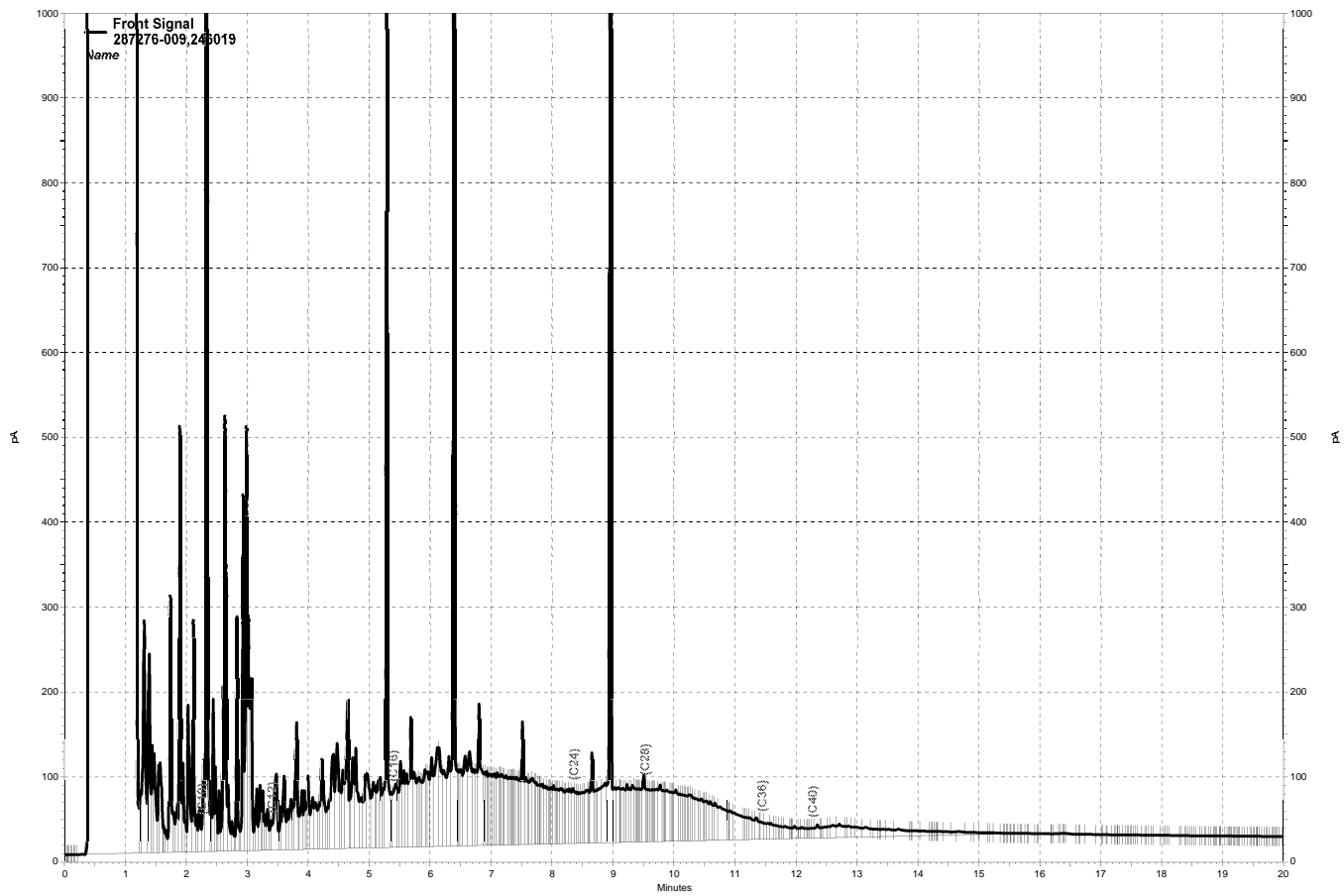
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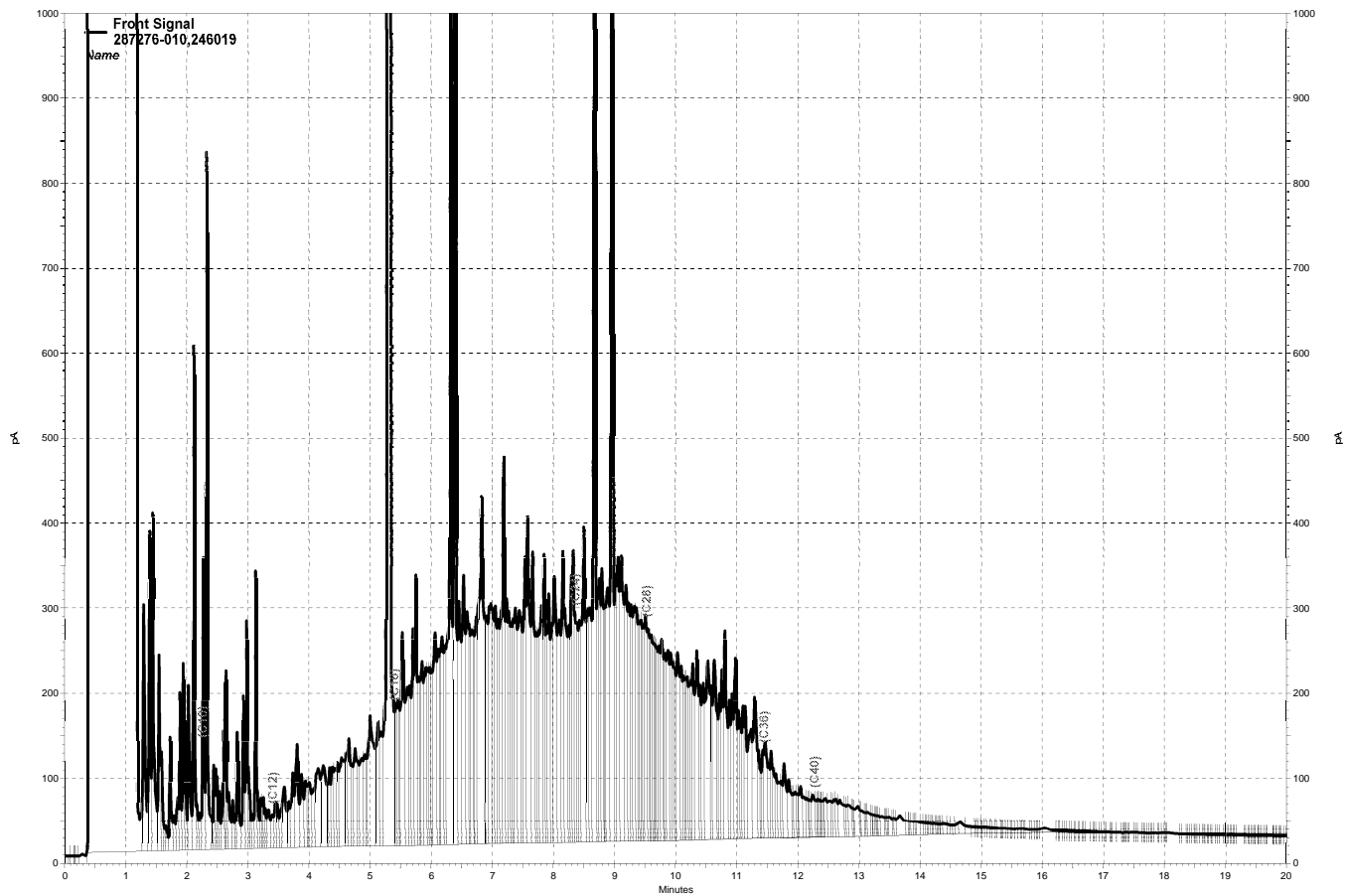
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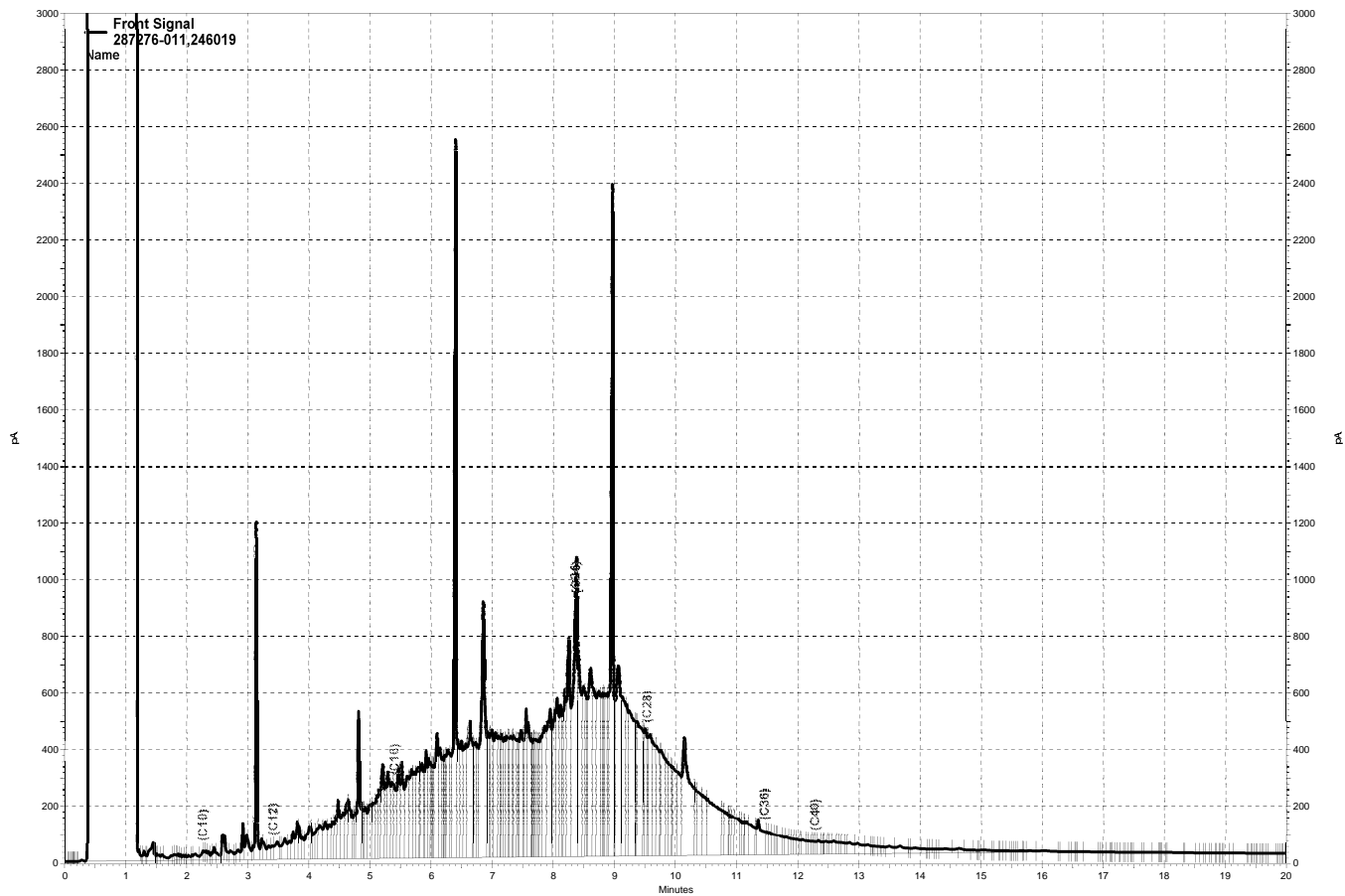
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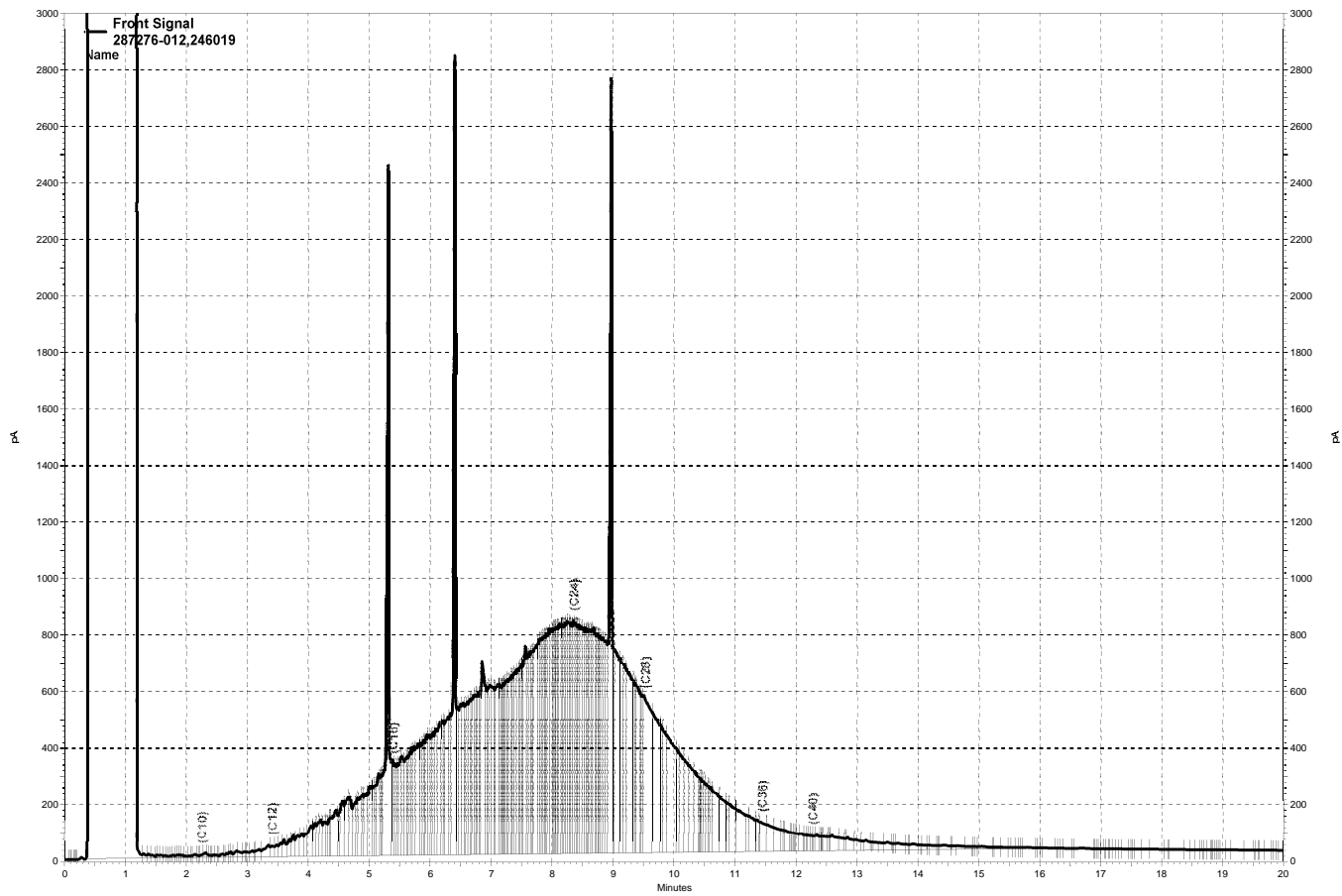
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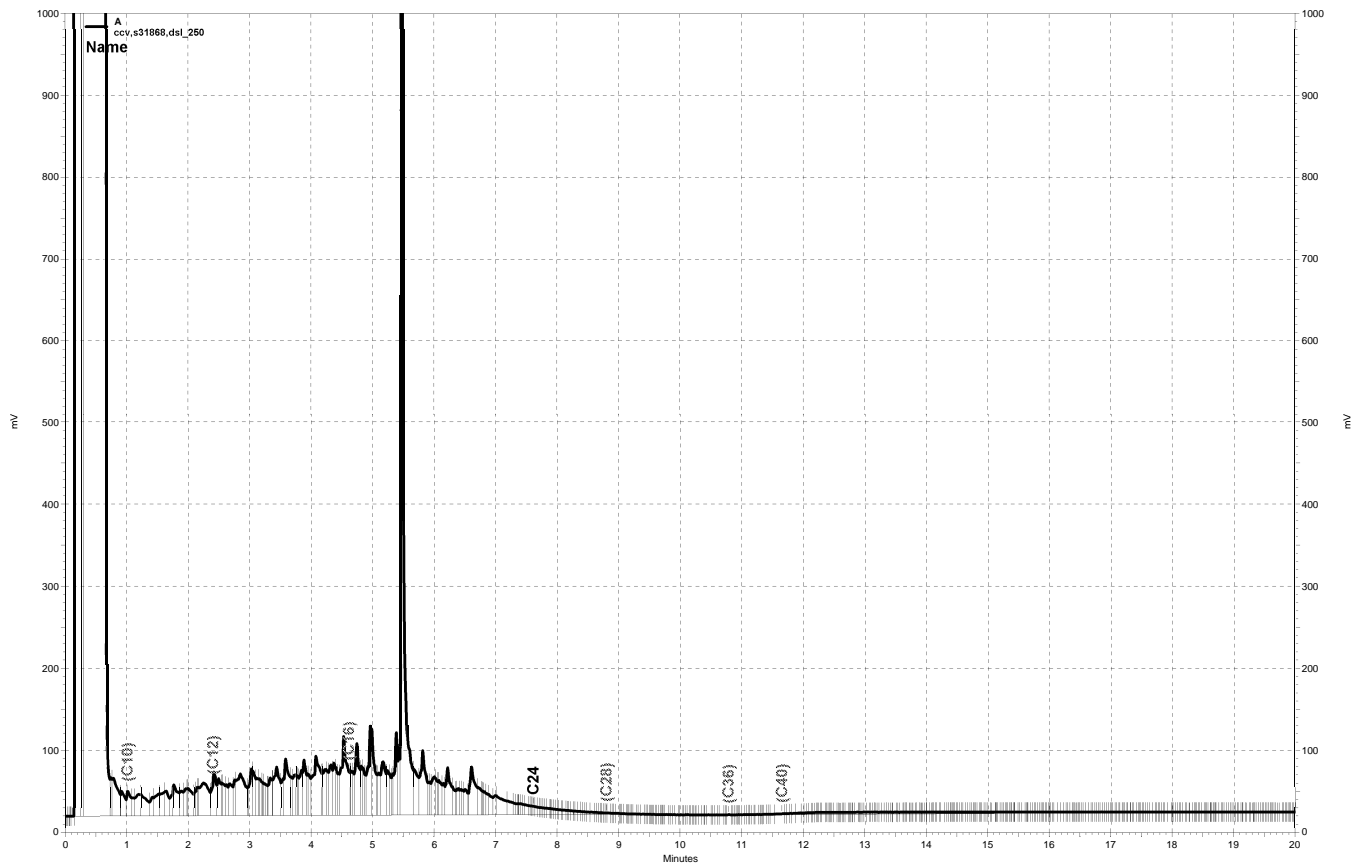
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**Curtis & Tompkins, Ltd.**  
Analytical Laboratories, Since 1878







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

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

Laboratory Job Number 287327  
ANALYTICAL REPORT

Stellar Environmental Solutions  
2198 6th Street  
Berkeley, CA 94710

Project : 2007-65  
Location : Bay Center Apartment  
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
MW-8	287327-001
MW-10	287327-002
MW-13	287327-003
MW-14	287327-004
MW-15	287327-005
RW-1	287327-006
HOLD	287327-007

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: \_\_\_\_\_  
Patrick McCarthy  
Project Manager  
patrick.mccarthy@ctberk.com  
(510) 204-2236

Date: 04/03/2017

**CASE NARRATIVE**

Laboratory number: 287327  
Client: Stellar Environmental Solutions  
Project: 2007-65  
Location: Bay Center Apartment  
Request Date: 03/24/17  
Samples Received: 03/24/17

This data package contains sample and QC results for six water samples, requested for the above referenced project on 03/24/17. The samples were received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):**

Low response was observed for MTBE in the CCV analyzed 03/30/17 01:34; affected data was qualified with "b". Gasoline C7-C12 was detected above the RL in the method blank for batch 246091; this analyte was detected in the sample at a level at least 10 times that of the blank. A number of samples were diluted due to client history of high non-target or organic acid interference. No other analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

High surrogate recovery was observed for o-terphenyl in MW-8 (lab # 287327-001). No other analytical problems were encountered.

207327

Chain of Custody Record

Lab job no. \_\_\_\_\_  
Date \_\_\_\_\_  
Page \_\_\_\_\_ of \_\_\_\_\_

Laboratory CURTIS & TOMPKINS  
Address 2323 FIFTH ST.  
BERKELEY, CA

Method of Shipment HAND DELIVERY or LAB COURIER

Shipment No. \_\_\_\_\_

Airbill No. \_\_\_\_\_

Cooler No. \_\_\_\_\_

Project Owner \_\_\_\_\_  
Site Address 6400 CHRISTIE AVE.  
BERKELEY, CA

Project Manager R. MAKDISI

Telephone No. (510) 644-3123

Project Name BAY CENTER APARTMENT

Fax No. (510) 644-3859

Project Number 2007-05

Samplers: (Signature) \_\_\_\_\_

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		Filtered	No. of Containers	Analysis Required	Remarks
						Cooler	Chemical				
1 MW-9		3/24/11	0938		3 HCL VBS 2 = 300 ml Amb.		HCl/NP	S	S	X	
2 MW-10			0612					S	S	X	
3 MW-13			0948					S	S	X	
4 MW-14			0935					S	S	X	
5 MW-15			1116					S	S	X	
6 RW-1			1252					S	S	X	

1  
2  
3  
4  
5  
6

Filtered  
No. of Containers  
TEH-D (8015 M)  
TPH-G (8015 M)  
BTEX (8015 M)  
TPH-G, M/BTEX

Relinquished by: Bianca Angulo  
Signature \_\_\_\_\_  
Printed Bianca Angulo  
Company Stellar Tech Services

Date 3/24/11  
Time 1315  
Received by: Dina Ali  
Signature \_\_\_\_\_  
Printed Dina Ali  
Company C&T

Date \_\_\_\_\_  
Time \_\_\_\_\_  
Relinquished by: \_\_\_\_\_  
Signature \_\_\_\_\_  
Printed \_\_\_\_\_  
Company \_\_\_\_\_

Date \_\_\_\_\_  
Time \_\_\_\_\_  
Received by: \_\_\_\_\_  
Signature \_\_\_\_\_  
Printed \_\_\_\_\_  
Company \_\_\_\_\_

Turnaround Time: STANDARD  
Comments: EDF REQUIRED  
GLOBAL ID # SLT2005561

Date \_\_\_\_\_  
Time \_\_\_\_\_  
Relinquished by: \_\_\_\_\_  
Signature \_\_\_\_\_  
Printed \_\_\_\_\_  
Company \_\_\_\_\_

2000-00-01

COOLER RECEIPT CHECKLIST



Curtis & Tompkins, Ltd.

3/24/17

Login # 207327 Date Received 3/23/17 DJA Number of coolers 1

Client Stellar Environmental Project 2007-05

Date Opened 3.24.17 By (print) em (sign) [Signature]

Date Logged in ↓ By (print) ↓ (sign)

Date Labeled ↓ By (print) ↓ (sign)

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) 4.8

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

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 em

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

COMMENTS

Blank lines for handwritten comments.



Client Sample ID : MW-14

Laboratory Sample ID :

287327-004

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	16,000		2,500	ug/L	As Recd	50.00	EPA 8015B	EPA 5030B
Benzene	4,100		25	ug/L	As Recd	50.00	EPA 8021B	EPA 5030B
Toluene	370		25	ug/L	As Recd	50.00	EPA 8021B	EPA 5030B
Ethylbenzene	360		25	ug/L	As Recd	50.00	EPA 8021B	EPA 5030B
m,p-Xylenes	140		25	ug/L	As Recd	50.00	EPA 8021B	EPA 5030B
o-Xylene	51	C	25	ug/L	As Recd	50.00	EPA 8021B	EPA 5030B
Diesel C10-C24	6,200	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	2,600		300	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-15

Laboratory Sample ID :

287327-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	7,100		2,500	ug/L	As Recd	50.00	EPA 8015B	EPA 5030B
Benzene	1,300		25	ug/L	As Recd	50.00	EPA 8021B	EPA 5030B
Toluene	31		25	ug/L	As Recd	50.00	EPA 8021B	EPA 5030B
Ethylbenzene	72		25	ug/L	As Recd	50.00	EPA 8021B	EPA 5030B
m,p-Xylenes	40		25	ug/L	As Recd	50.00	EPA 8021B	EPA 5030B
Diesel C10-C24	3,700	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	1,700		300	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : RW-1

Laboratory Sample ID :

287327-006

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	910		50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Benzene	130		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Toluene	6.2	C	0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Ethylbenzene	4.9		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
m,p-Xylenes	1.8		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
o-Xylene	4.1	C	0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Diesel C10-C24	2,800	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	980		300	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

C = Presence confirmed, but RPD between columns exceeds 40%

Y = Sample exhibits chromatographic pattern which does not resemble standard









### Curtis & Tompkins Laboratories Analytical Report

Lab #: 287327	Location: Bay Center Apartment
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 2007-65	
Matrix: Water	Sampled: 03/24/17
Units: ug/L	Received: 03/24/17

Type: BLANK	Batch#: 246129
Lab ID: QC879353	Analyzed: 03/30/17
Diln Fac: 1.000	

Analyte	Result	RL	Analysis
MTBE	ND	2.0	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
Bromofluorobenzene (FID)	88	80-122	EPA 8015B
Bromofluorobenzene (PID)	102	80-124	EPA 8021B

C= Presence confirmed, but RPD between columns exceeds 40%  
 b= See narrative  
 NA= Not Analyzed  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287327	Location:	Bay Center Apartment
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC879176	Batch#:	246091
Matrix:	Water	Analyzed:	03/29/17
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,062	106	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	88	80-122

Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287327	Location:	Bay Center Apartment
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	246091
Units:	ug/L	Analyzed:	03/29/17
Diln Fac:	1.000		

Type: BS Lab ID: QC879177

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	8.486	85	62-131
Benzene	10.00	10.52	105	80-120
Toluene	10.00	9.873	99	80-120
Ethylbenzene	10.00	10.55	105	79-120
m,p-Xylenes	10.00	10.15	101	80-120
o-Xylene	10.00	10.19	102	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	108	80-124

Type: BSD Lab ID: QC879178

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	20.00	16.48 b	82	62-131	3	38
Benzene	20.00	19.80	99	80-120	6	20
Toluene	20.00	18.59	93	80-120	6	20
Ethylbenzene	20.00	20.01	100	79-120	5	27
m,p-Xylenes	20.00	19.17	96	80-120	6	26
o-Xylene	20.00	19.17	96	80-120	6	20

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	96	80-124

b= See narrative

RPD= Relative Percent Difference

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287327	Location:	Bay Center Apartment
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8015B
Field ID:	RW-1	Batch#:	246091
MSS Lab ID:	287327-006	Sampled:	03/24/17
Matrix:	Water	Received:	03/24/17
Units:	ug/L	Analyzed:	03/30/17
Diln Fac:	1.000		

Type: MS Lab ID: QC879179

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	906.9	2,000	2,856	97	79-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	99	80-122

Type: MSD Lab ID: QC879180

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,860	98	79-120	0	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	100	80-122

RPD= Relative Percent Difference

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287327	Location:	Bay Center Apartment
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC879298	Batch#:	246117
Matrix:	Water	Analyzed:	03/30/17
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	962.4	96	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	96	80-122

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287327	Location:	Bay Center Apartment
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	246129
Units:	ug/L	Analyzed:	03/30/17
Diln Fac:	1.000		

Type: BS Lab ID: QC879349

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	8.963	90	62-131
Toluene	10.00	10.18	102	80-120
Ethylbenzene	10.00	10.36	104	79-120
m,p-Xylenes	10.00	10.81	108	80-120
o-Xylene	10.00	10.50	105	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	109	80-124

Type: BSD Lab ID: QC879350

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	10.00	9.353	94	62-131	4	38
Toluene	10.00	9.972	100	80-120	2	20
Ethylbenzene	10.00	10.47	105	79-120	1	27
m,p-Xylenes	10.00	10.17	102	80-120	6	26
o-Xylene	10.00	10.27	103	80-120	2	20

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	106	80-124

RPD= Relative Percent Difference



Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	287327	Location:	Bay Center Apartment
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	246117
MSS Lab ID:	287462-001	Sampled:	03/28/17
Matrix:	Water	Received:	03/28/17
Units:	ug/L	Analyzed:	03/31/17
Diln Fac:	1.000		

Type: MS Lab ID: QC879387

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	40.06	2,000	1,859	91	79-120

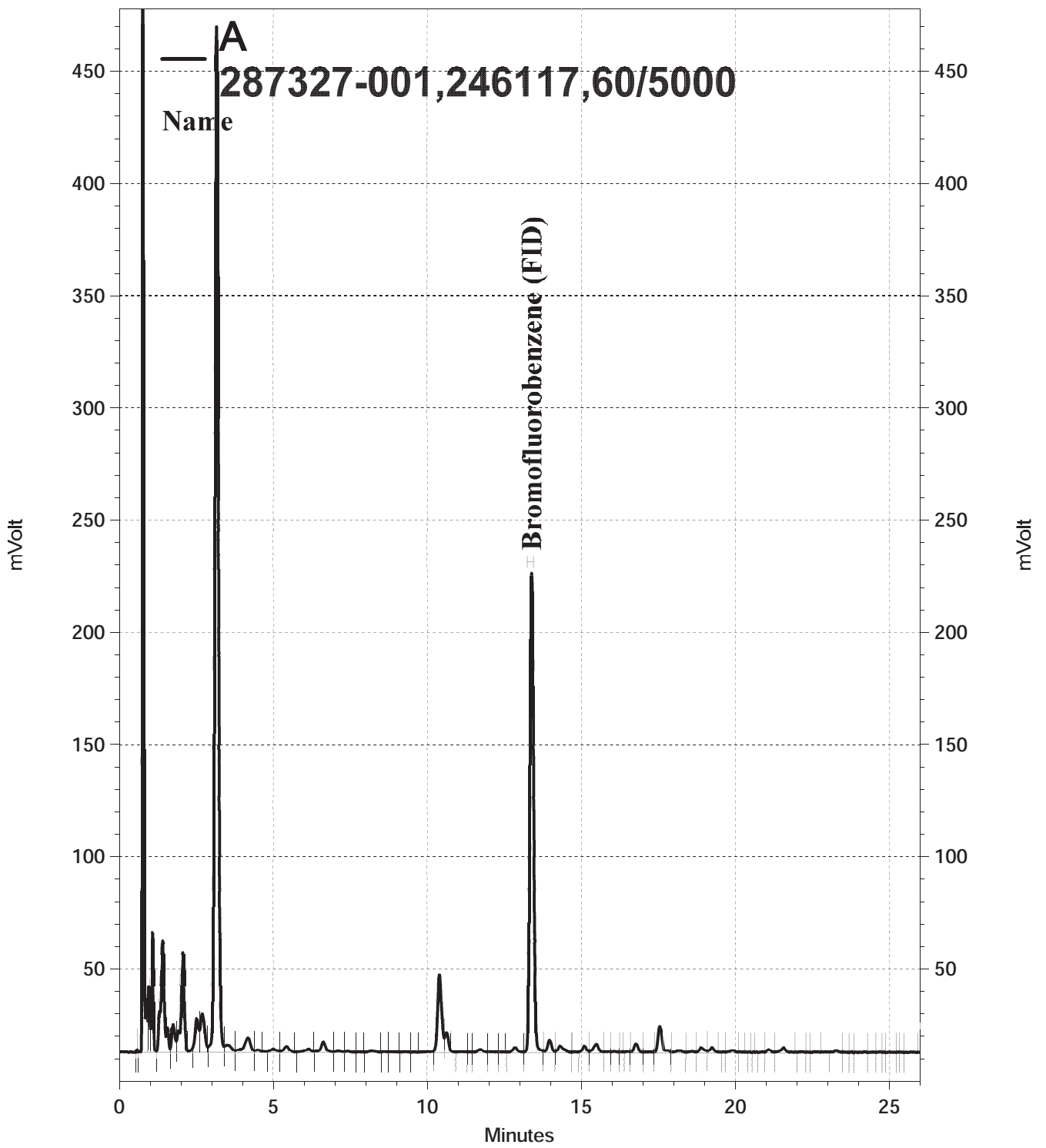
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	80-122

Type: MSD Lab ID: QC879388

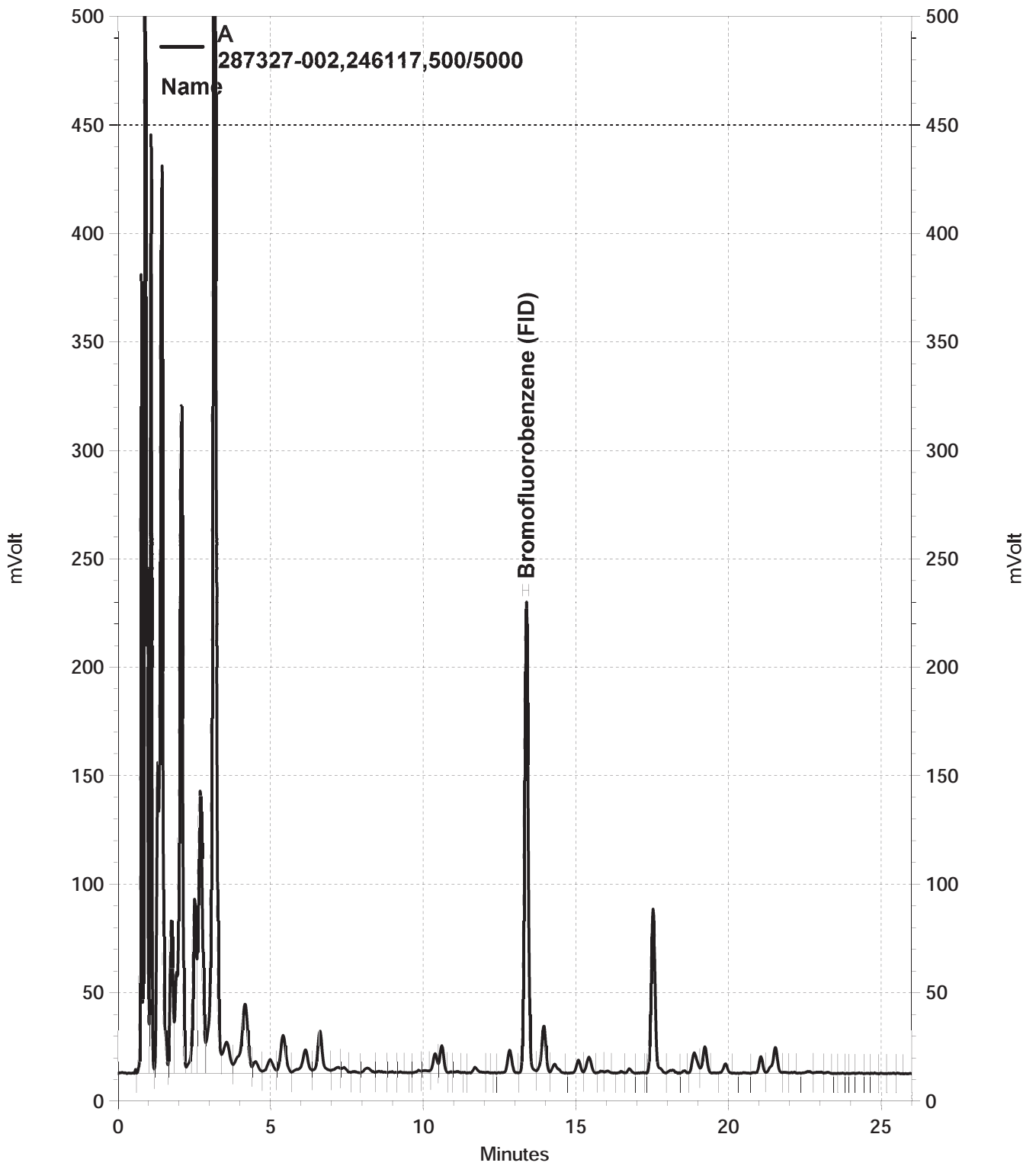
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,906	93	79-120	3	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	80-122

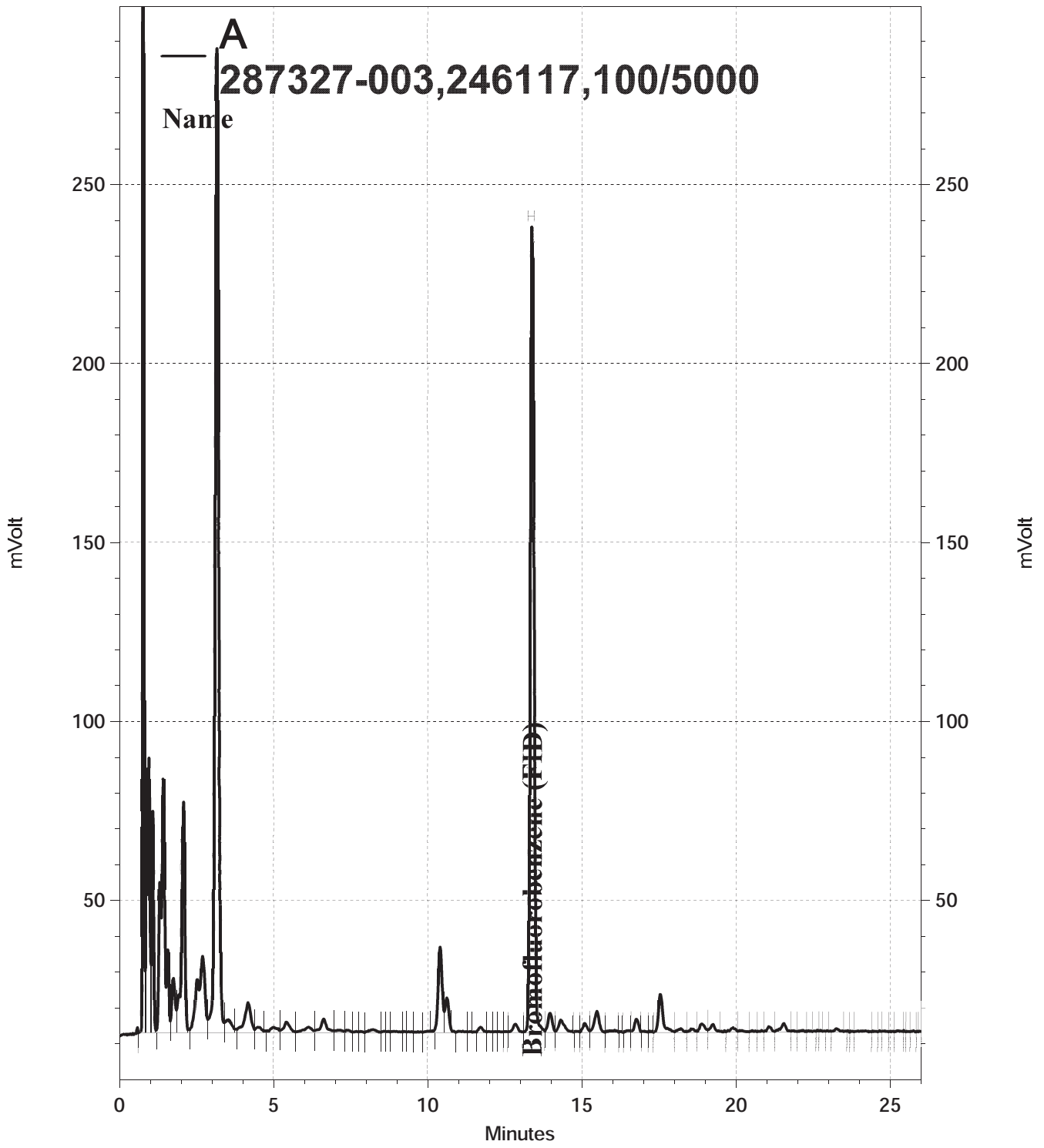
RPD= Relative Percent Difference



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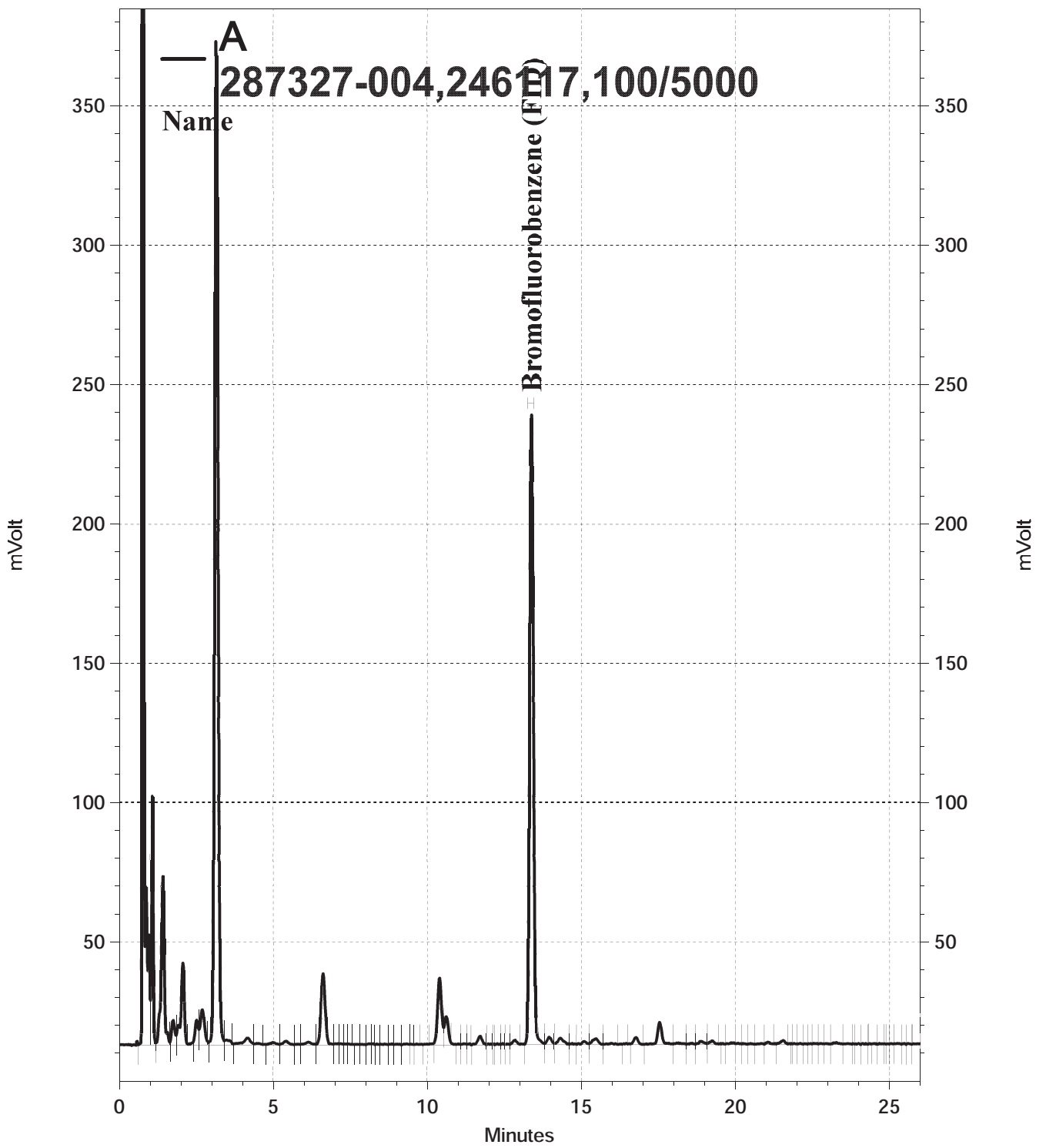


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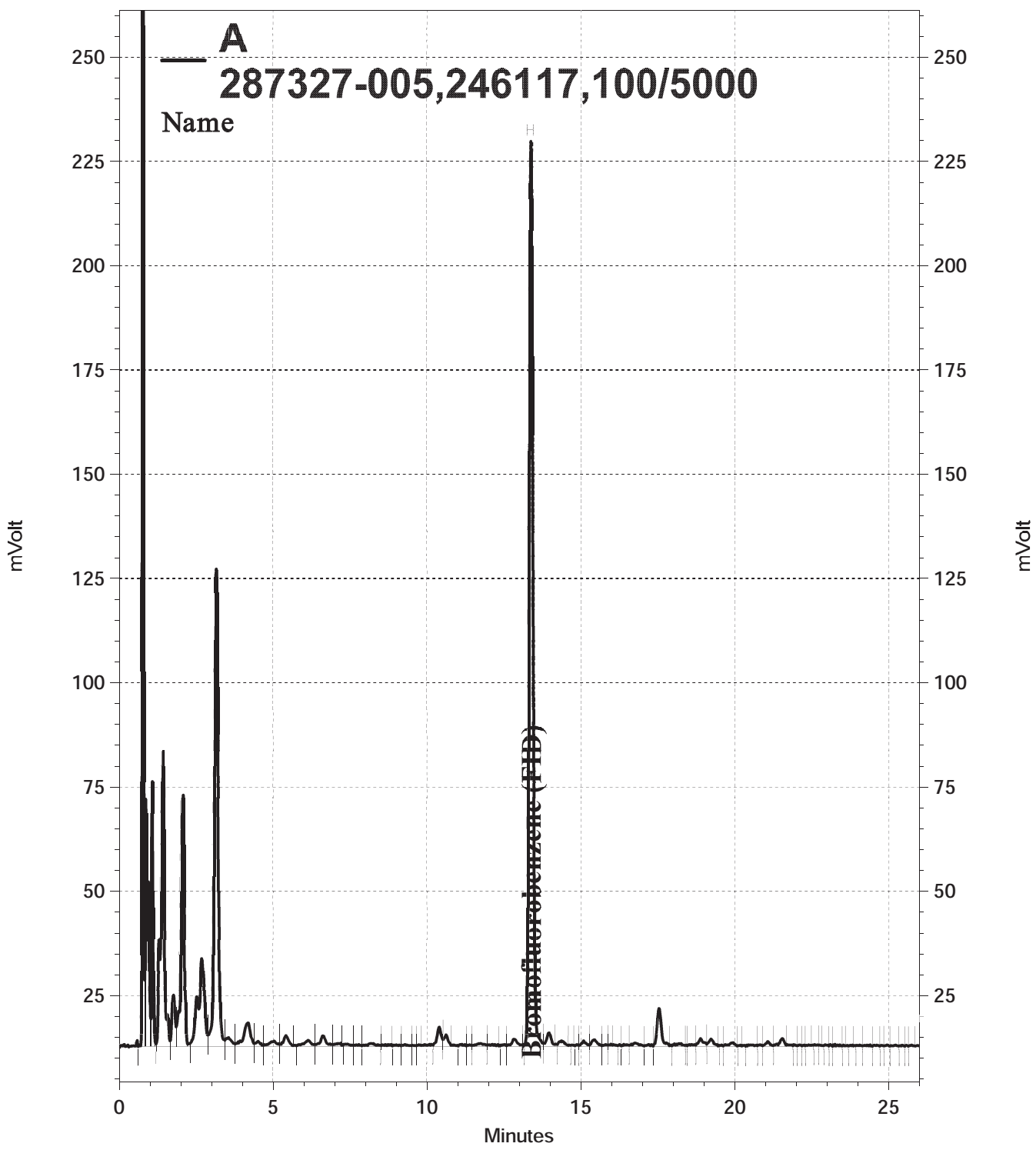


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Name

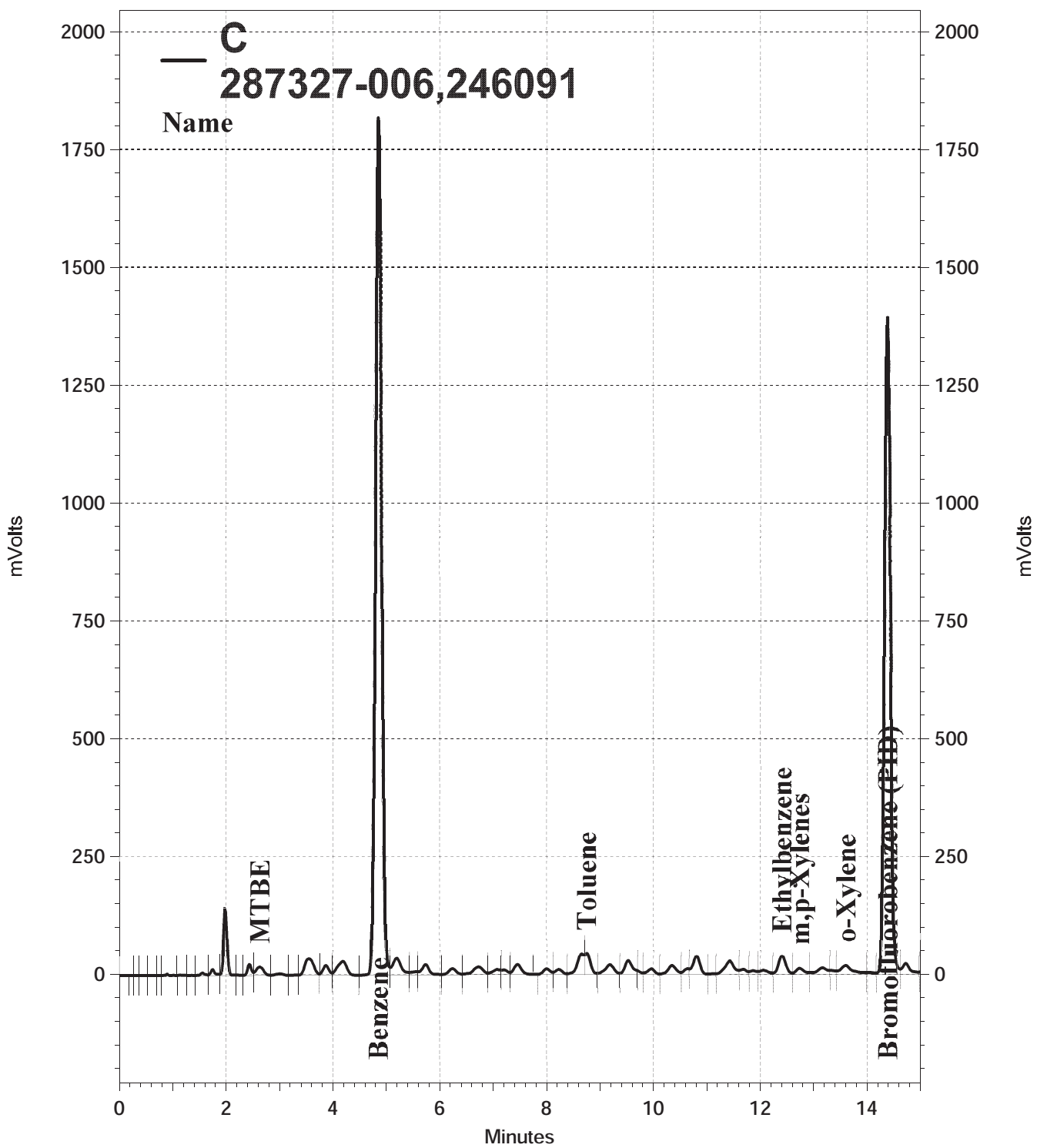
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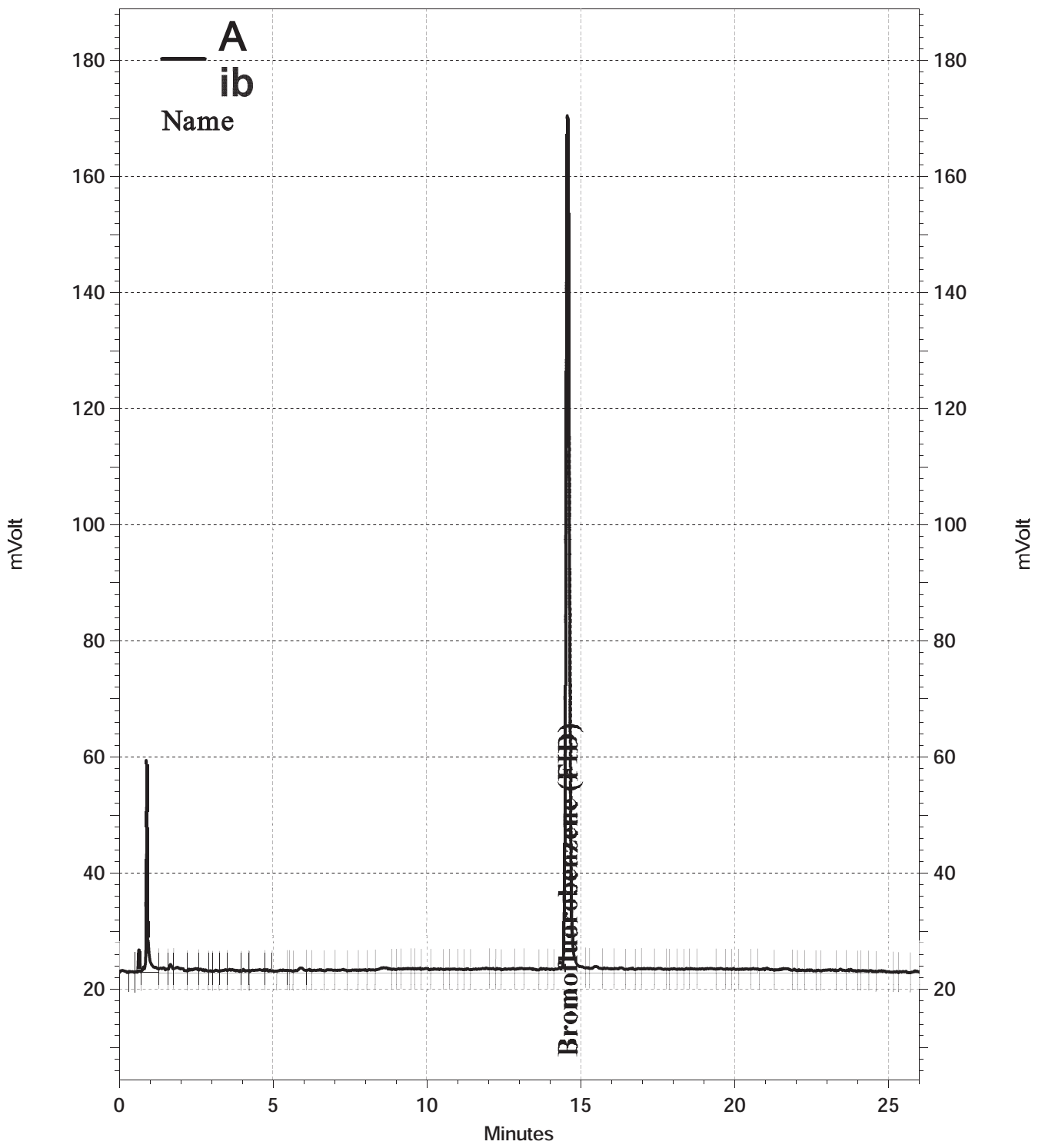
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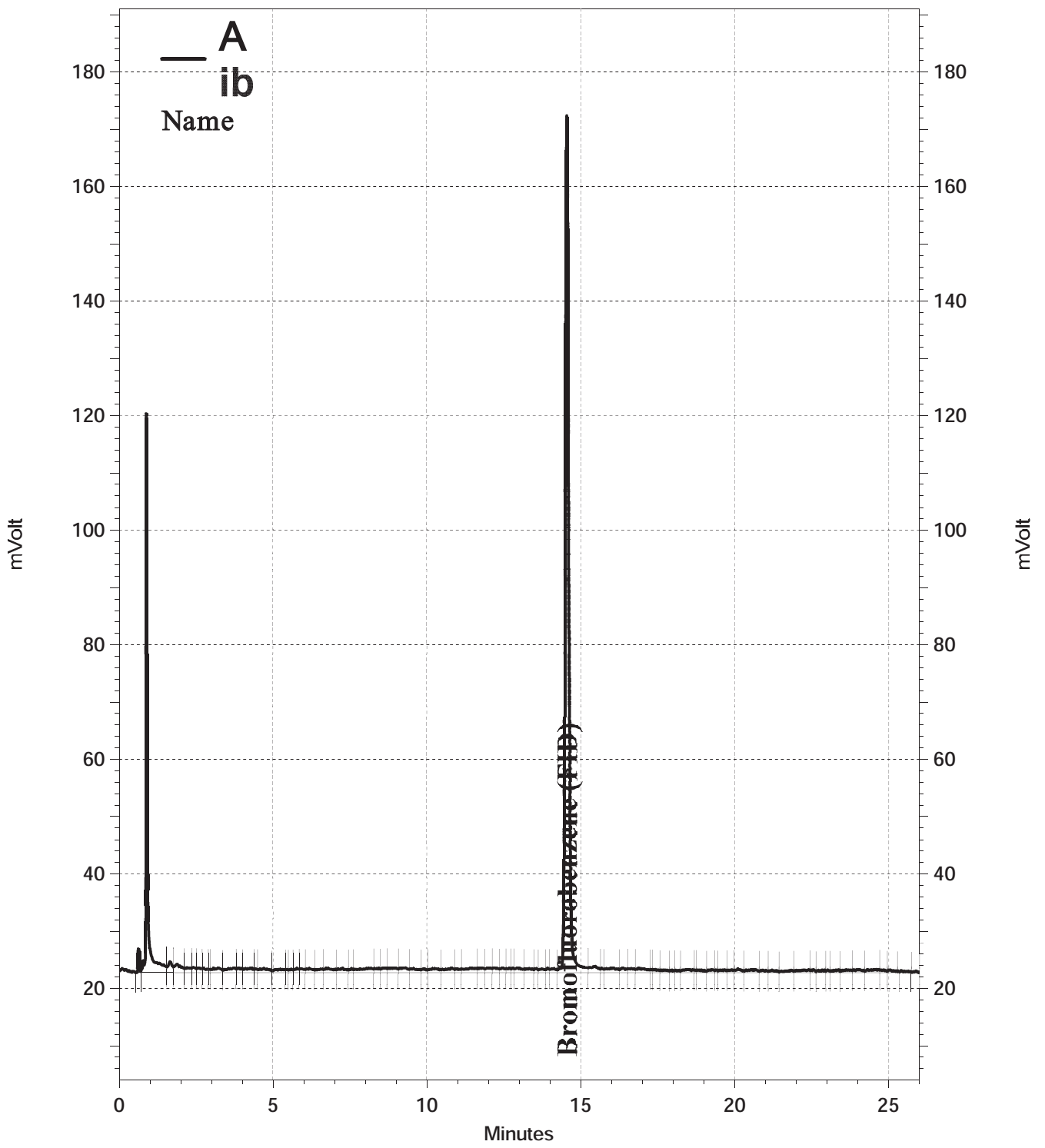


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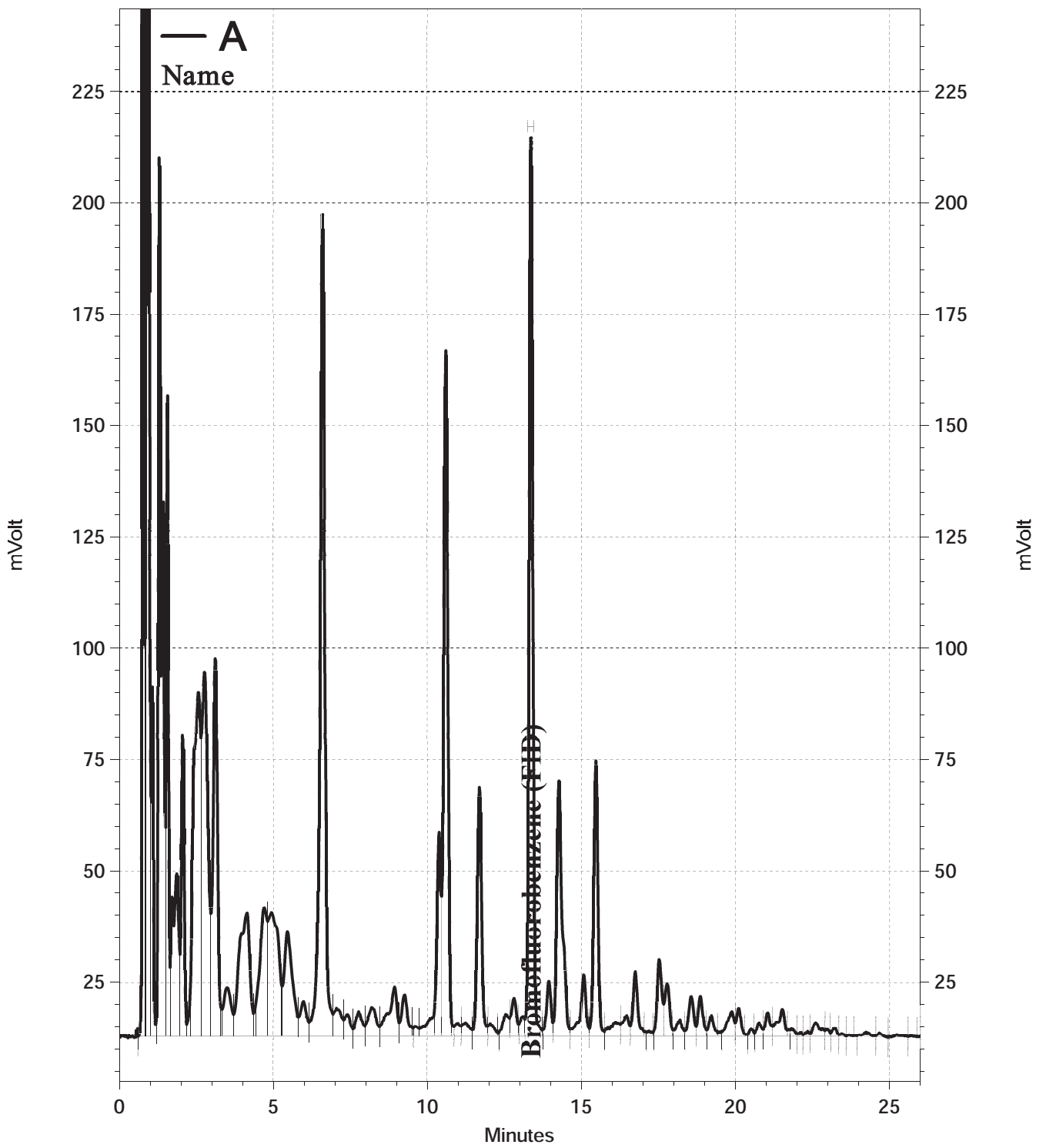


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## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	287327	Location:	Bay Center Apartment
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2007-65	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	246085
Units:	ug/L	Prepared:	03/29/17
Diln Fac:	1.000	Analyzed:	03/30/17

Type: BS Lab ID: QC879156

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,046	82	52-124

Surrogate	%REC	Limits
o-Terphenyl	98	52-138

Type: BSD Lab ID: QC879157

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,193	88	52-124	7	34

Surrogate	%REC	Limits
o-Terphenyl	104	52-138

RPD= Relative Percent Difference

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	287327	Location:	Bay Center Apartment
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2007-65	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	246165
Units:	ug/L	Prepared:	03/31/17
Diln Fac:	1.000	Analyzed:	04/03/17

Type: BS Lab ID: QC879501

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,077	83	52-124

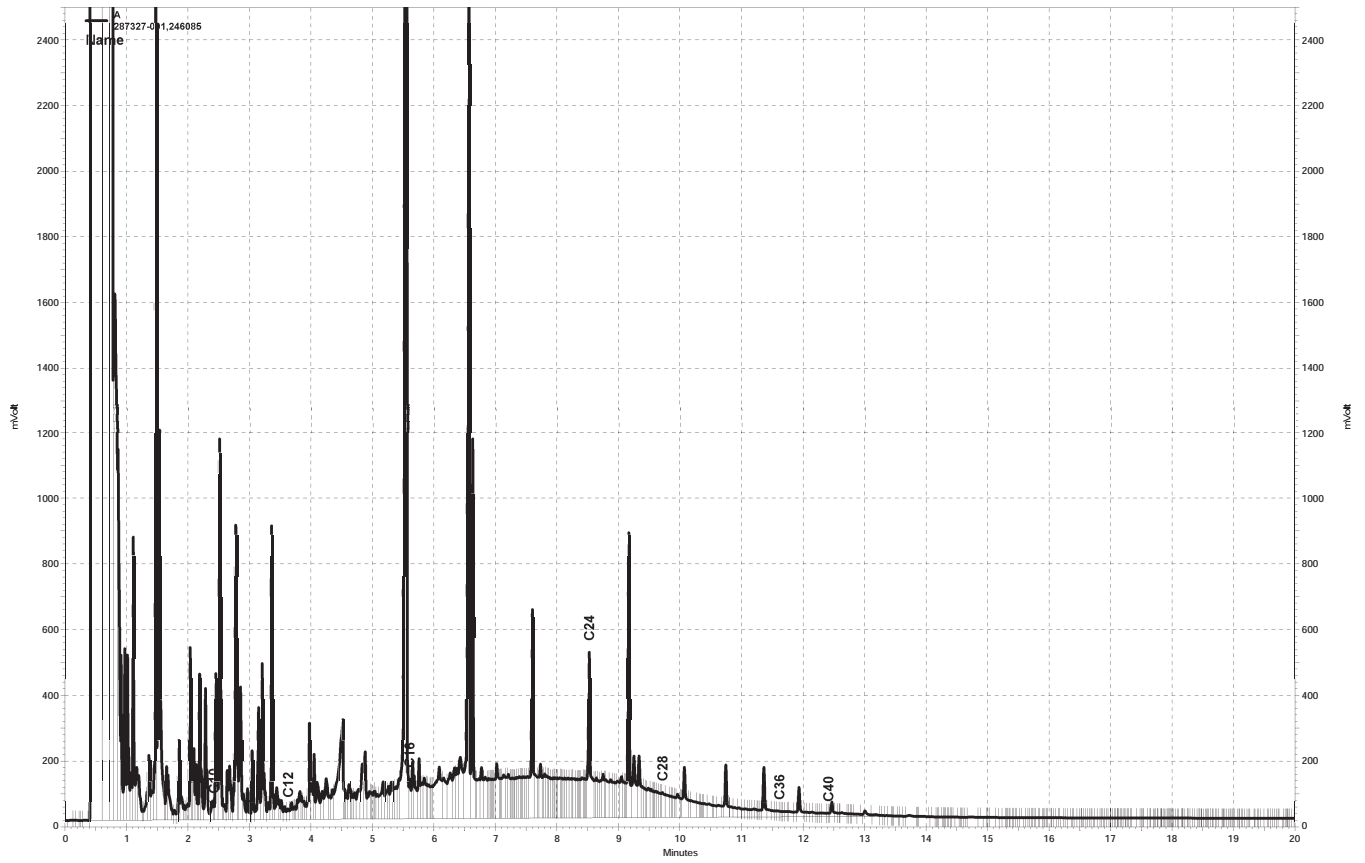
Surrogate	%REC	Limits
o-Terphenyl	110	52-138

Type: BSD Lab ID: QC879502

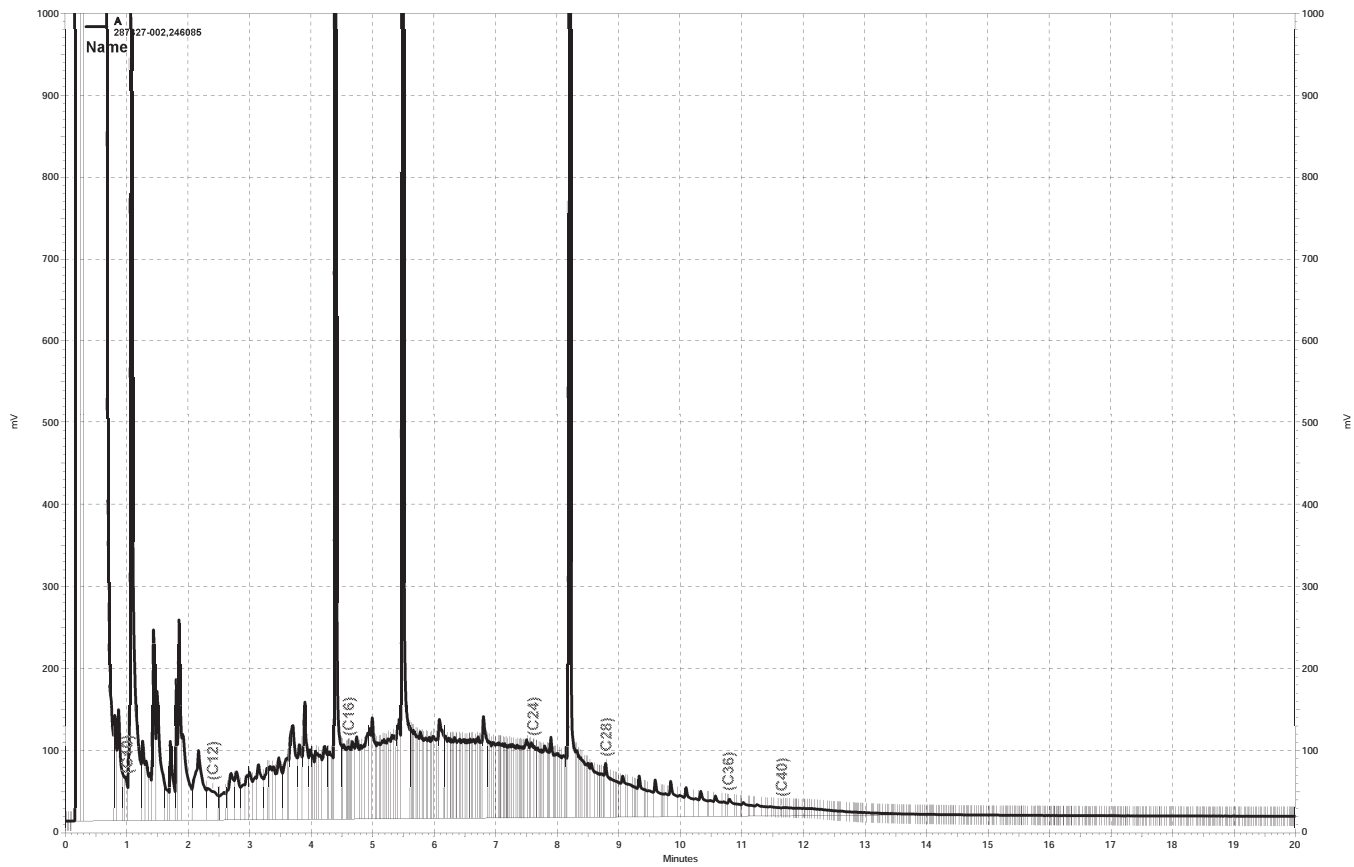
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	1,998	80	52-124	4	34

Surrogate	%REC	Limits
o-Terphenyl	107	52-138

RPD= Relative Percent Difference

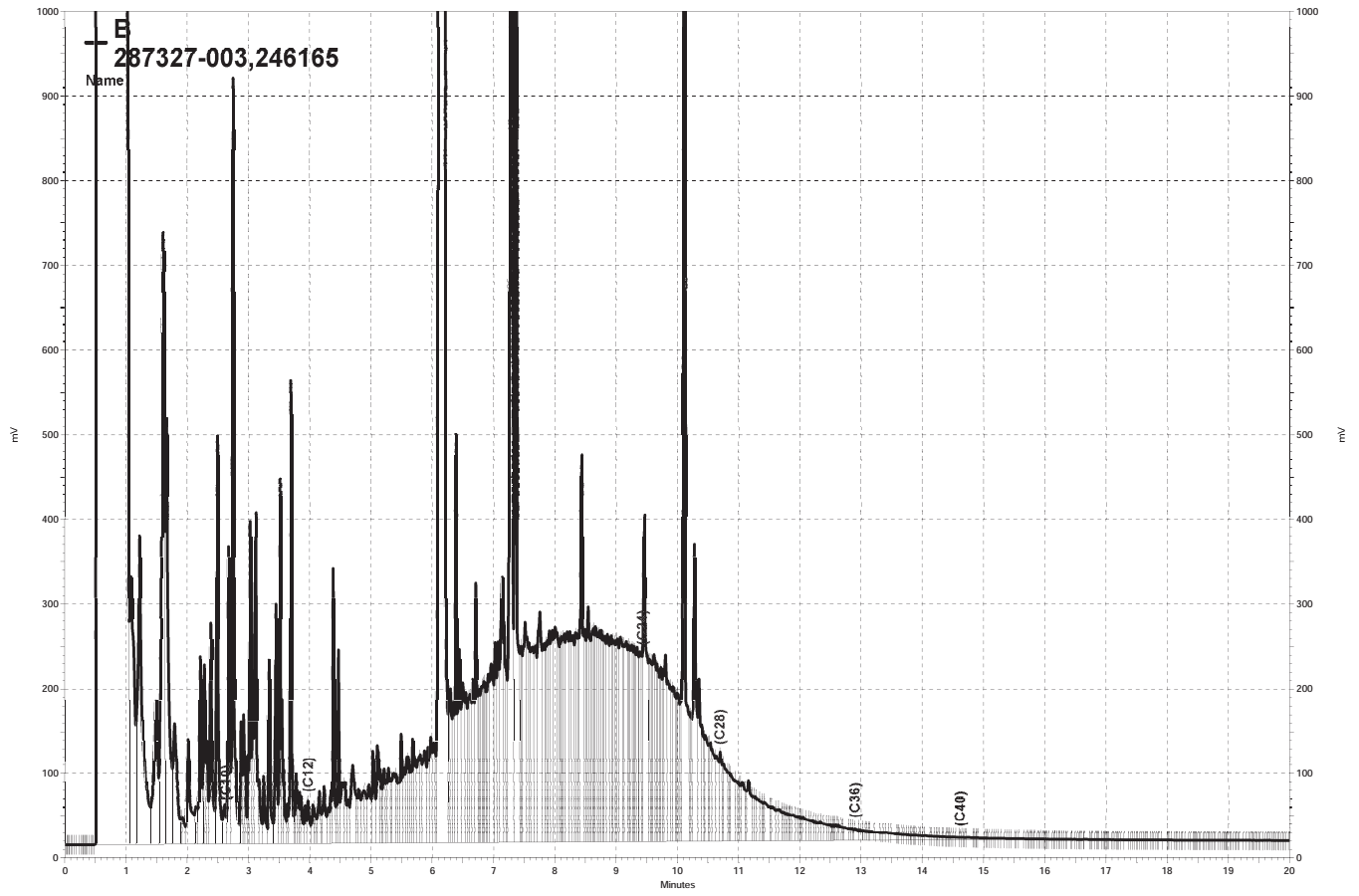


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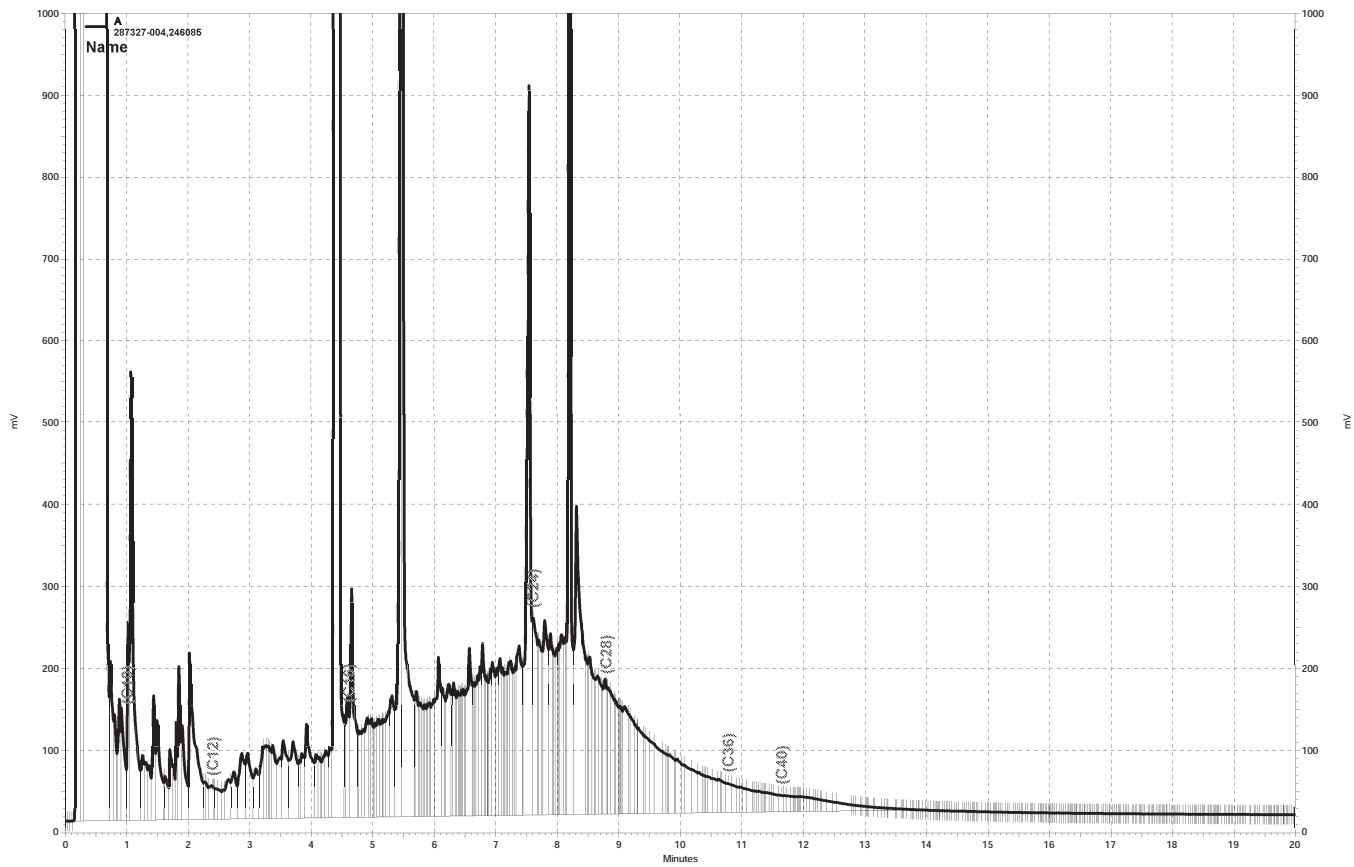


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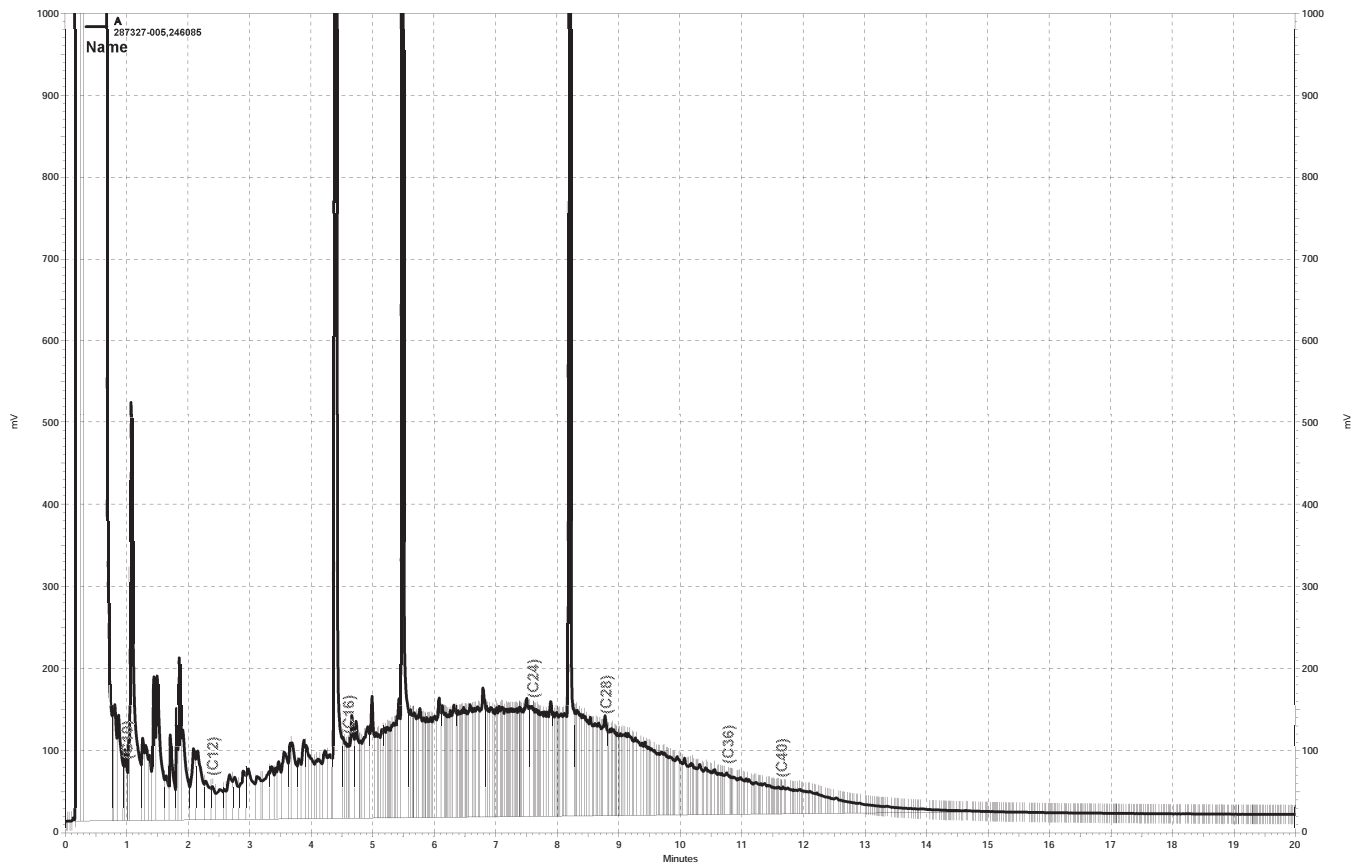




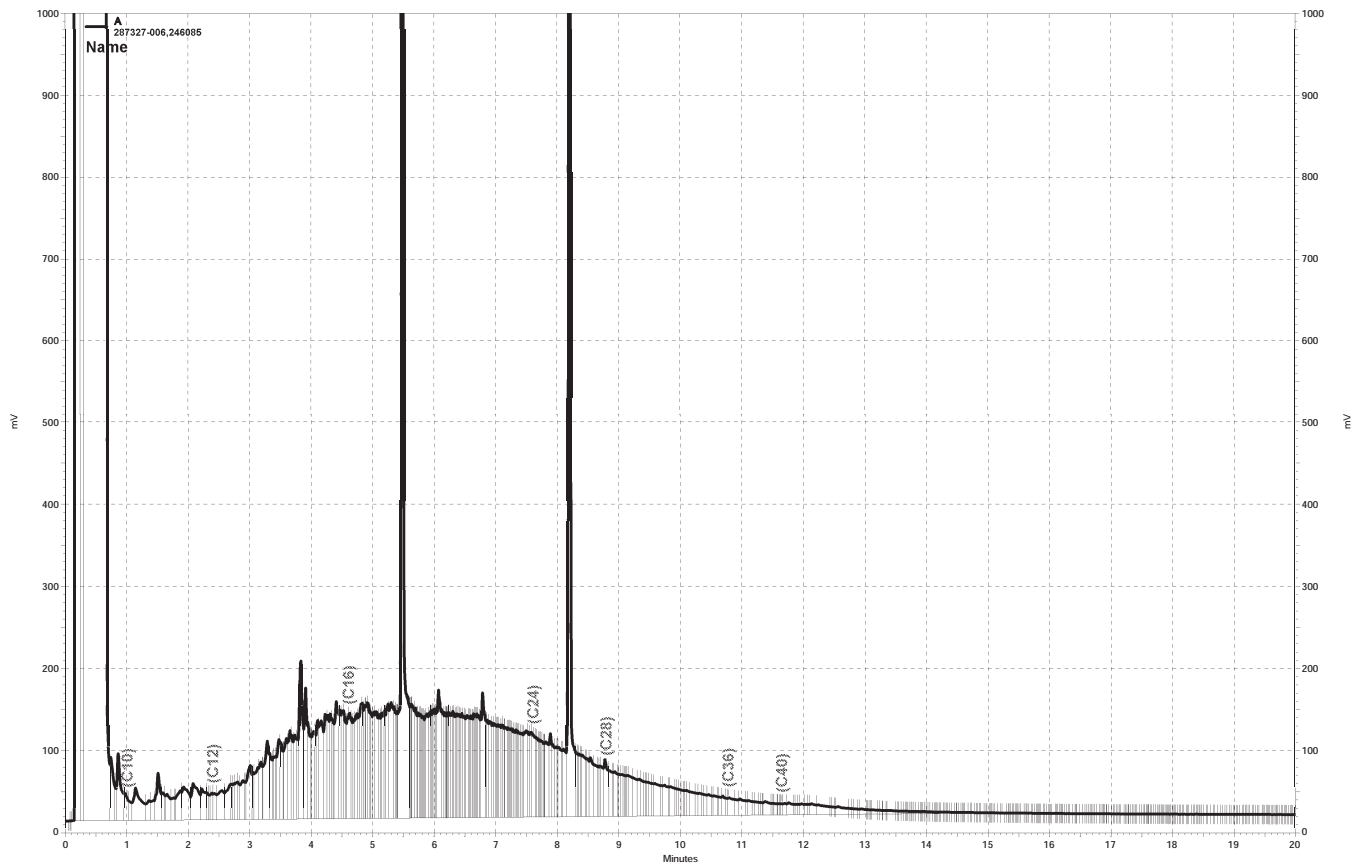
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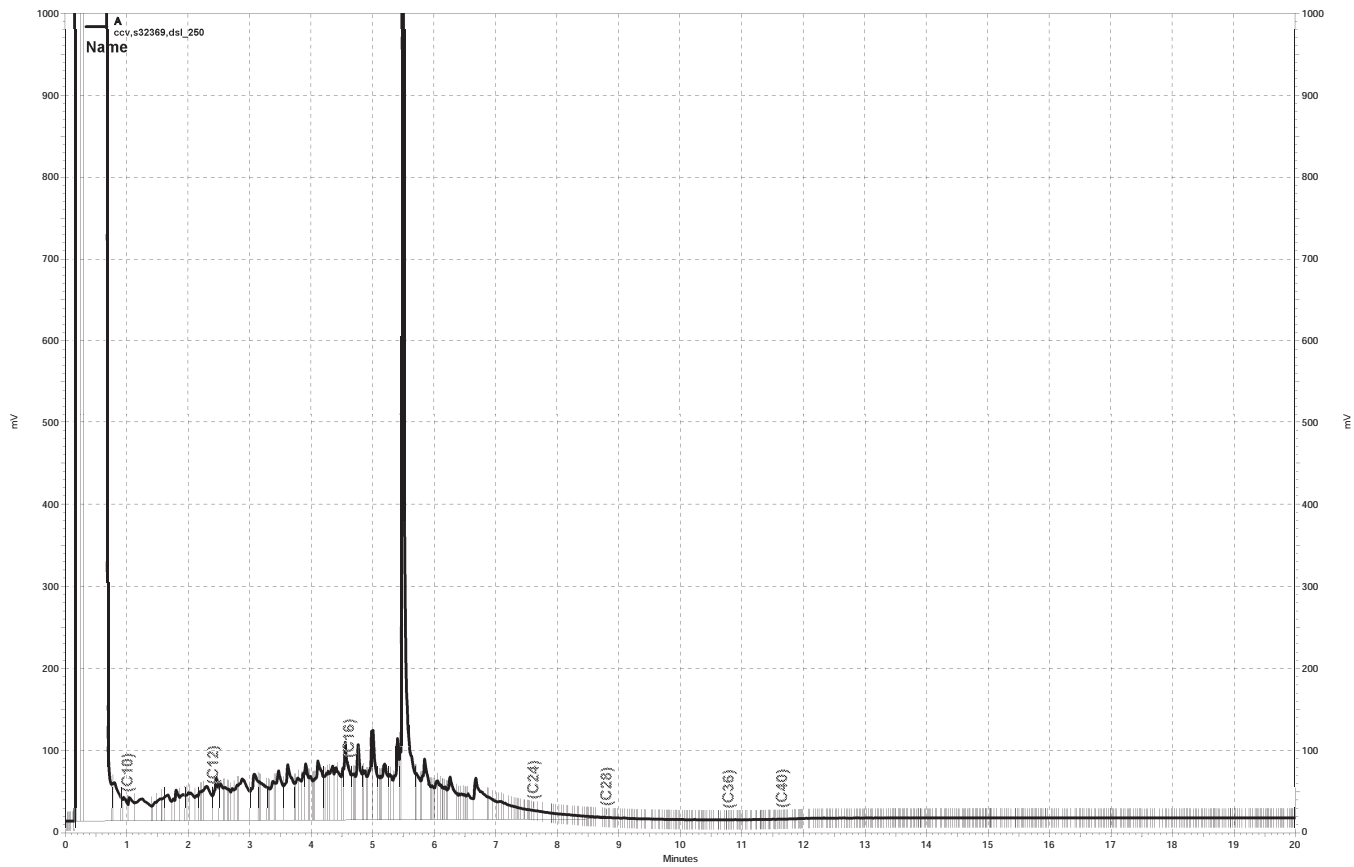
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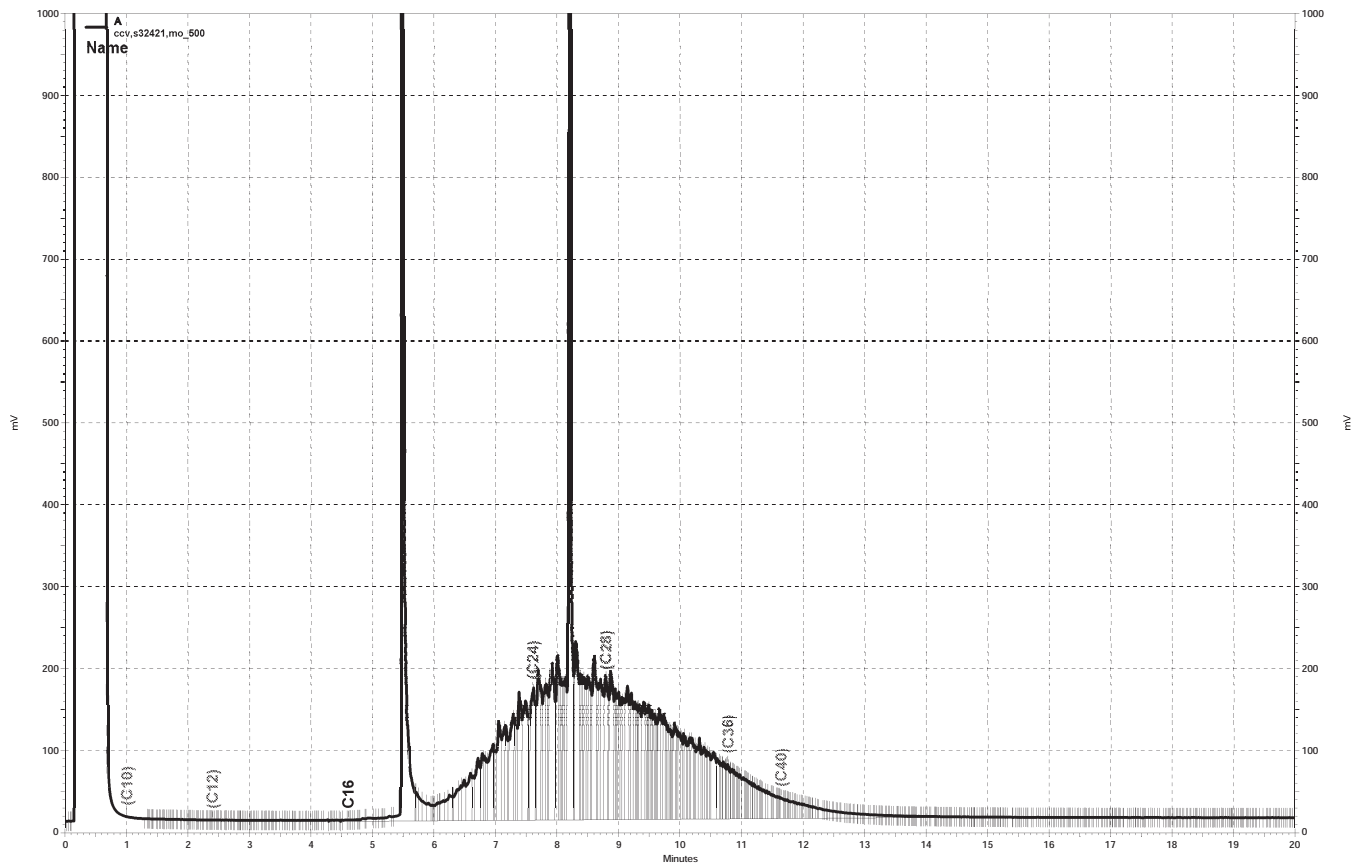
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**Curtis & Tompkins, Ltd.**  
Analytical Laboratories, Since 1878







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

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

**Laboratory Job Number 285856  
ANALYTICAL REPORT**

Stellar Environmental Solutions  
2198 6th Street  
Berkeley, CA 94710

Project : 2007-65  
Location : Bay Center Apts  
Level : II

Sample ID

Lab ID

TAM

285856-001

TBM

285856-002

TCM

285856-003

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: \_\_\_\_\_

Date: 02/27/2017

Tracy Babjar  
Project Manager  
tracy.babjar@ctberk.com  
(510) 204-2226 Ext 13107

CA ELAP# 2896, NELAP# 4044-001



## CASE NARRATIVE

Laboratory number: 285856  
Client: Stellar Environmental Solutions  
Project: 2007-65  
Location: Bay Center Apts  
Request Date: 02/08/17  
Samples Received: 02/08/17

This data package contains sample and QC results for three water samples, requested for the above referenced project on 02/08/17. The samples were received cold and intact.

### TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):

Low response was observed for MTBE in the CCV analyzed 02/15/17 17:30; affected data was qualified with "b". TAM (lab # 285856-001) and TCM (lab # 285856-003) were diluted due to foaming. No other analytical problems were encountered.

### TPH-Extractables by GC (EPA 8015B):

TAM (lab # 285856-001) and TCM (lab # 285856-003) were diluted due to the dark and viscous nature of the sample extracts. No other analytical problems were encountered.

### Metals (EPA 6010B):

High response was observed for iron in the CCV analyzed 02/20/17 19:14; affected data was qualified with "b". High response was observed for iron in the CCV analyzed 02/20/17 19:46; affected data was qualified with "b". No other analytical problems were encountered.

### Ion Chromatography (EPA 300.0):

TAM (lab # 285856-001) and TCM (lab # 285856-003) were diluted due to high sulfate concentrations. No other analytical problems were encountered.

### Dissolved Oxygen (SM4500-G):

No analytical problems were encountered.

### Oxidation-Reduction Potential (SM2580B):

High RPD was observed for oxidation-reduction potential in the SDUP of TBM (lab # 285856-002). No other analytical problems were encountered.

### pH (EPA 9040C):

No analytical problems were encountered.

285856

### Chain of Custody Record

Lab job no. \_\_\_\_\_

Date \_\_\_\_\_

Page 1 of 1

Laboratory Curtis & Tompkins  
 Address 2323 5th St  
Berkeley CA

Method of Shipment Delivered

Shipment No. \_\_\_\_\_

Airbill No. \_\_\_\_\_

Cooler No. \_\_\_\_\_

Project Owner \_\_\_\_\_  
 Site Address 6400 Christie Ave  
Emeryville CA

Project Manager R Makdisi

Telephone No. 510-644-3123

Project Name Bay Center

Fax No. \_\_\_\_\_

Project Number 2007-65

Samplers: (Signature) ST. Bittman

Filtered	No. of Containers	Analysis Required										Remarks		
		Disolved Fe	Nitrate	Sulfate	pH	DO	ORP	TPH	MBTEX	TEHd				
		X	X	X	X	X								
		X												
											X			
												X		
		X	X	X	X	X								
		X												
											X			
		X	X	X	X	X								
		X												
											X			
												X		

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation										
						Cooler	Chemical									
TAM		2/5/17		W	1 Liter Plastic	/	Ø	N	1							
TAM				W	250 ml Plastic	/	HNO <sub>3</sub>	N	1	X						
TAM				W	40 ml UOA	/	HCl	N	2							
TAM				W	1 Liter Amber	/	Ø	N	1							
TBM				W	1 Liter Plastic	/	Ø	N	1	X	X	X	X	X		
TBM				W	250 ml Plastic	/	HNO <sub>3</sub>	N	1	X						
TBM				W	40 ml UOA	/	HCl	N	2							
TBM				W	1 Liter Amber	/	Ø	N	1							
TCM				W	1 Liter Plastic	/	Ø	N	1	X	X	X	X	X		
TCM				W	250 ml UOA Plastic	/	HNO <sub>3</sub>	N	1	X						
TCM				W	40 ml UOA	/	HCl	N	2							
TCM		2/5/17		W	1 Liter Amber	/	Ø	N	1							

Relinquished by: <u>ST. Bittman</u> Signature _____ Printed <u>Steve Bittman</u> Company <u>SES</u>	Date <u>2/5/17</u> Time <u>11:25</u>	Received by: <u>Pat Gonzalez</u> Signature _____ Printed <u>Pat Gonzalez</u> Company <u>C&amp;T</u>	Date <u>2/5/17</u> Time <u>11:05</u>	Relinquished by: _____ Signature _____ Printed _____ Company _____	Date _____ Time _____	Received by: _____ Signature _____ Printed _____ Company _____	Date _____ Time _____
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Turnaround Time: <u>Normal 5-Day</u>	Relinquished by: _____ Signature _____ Printed _____ Company _____	Date _____ Time _____	Received by: _____ Signature _____ Printed _____ Company _____	Date _____ Time _____
Comments: _____				

**COOLER RECEIPT CHECKLIST**



Curtis & Tompkins, Ltd.

Login # 285856 Date Received 2/8/17 Number of coolers 1  
 Client SES Project 2007-65

Date Opened 2/8 By (print) DTN (sign) [Signature]  
 Date Logged in ↓ By (print) ↓ (sign) ↓  
 Date Labeled ↓ By (print) ↓ (sign) ↓

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

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# 80BDK2561) 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**

15. Added HNO<sub>3</sub> (#110955) to pH < 2 on 2/8/17 @ 12:50  
for sample 1, 2, 3

Curtis & Tompkins Sample Preservation for 285856

Sample	pH: <2	>9	>12	Other
-001a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
e	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
-002a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
e	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
-003a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
e	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Analyst: DTN  
Date: 2/8/19





**Curtis & Tompkins Laboratories Analytical Report**

Lab #: 285856	Location: Bay Center Apts
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 2007-65	
Matrix: Water	Sampled: 02/08/17
Units: ug/L	Received: 02/08/17

Type: BLANK	Batch#: 244529
Lab ID: QC872961	Analyzed: 02/15/17
Diln Fac: 1.000	Analysis: EPA 8021B

Analyte	Result	RL
Benzene	ND	0.50

Surrogate	Result	%REC	Limits
Bromofluorobenzene (FID)	NA		
Bromofluorobenzene (PID)		85	71-141

Type: BLANK	Batch#: 244543
Lab ID: QC873009	Analyzed: 02/15/17
Diln Fac: 1.000	Analysis: EPA 8015B

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	Result	%REC	Limits
Bromofluorobenzene (FID)		89	80-132
Bromofluorobenzene (PID)	NA		

Type: BLANK	Batch#: 244575
Lab ID: QC873144	Analyzed: 02/16/17
Diln Fac: 1.000	Analysis: EPA 8021B

Analyte	Result	RL
MTBE	ND	2.0
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	Result	%REC	Limits
Bromofluorobenzene (FID)	NA		
Bromofluorobenzene (PID)		89	71-141

C= Presence confirmed, but RPD between columns exceeds 40%  
 NA= Not Analyzed  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	244529
Units:	ug/L	Analyzed:	02/15/17
Diln Fac:	1.000		

Type: BS Lab ID: QC872957

Analyte	Spiked	Result	%REC	Limits
Benzene	10.00	9.494	95	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	97	71-141

Type: BSD Lab ID: QC872958

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Benzene	20.00	17.77	89	80-120	7	20

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	93	71-141

RPD= Relative Percent Difference



## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8015B
Matrix:	Water	Diln Fac:	1.000
Units:	ug/L	Batch#:	244543

Type: BS Analyzed: 02/15/17  
 Lab ID: QC873007

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2,000	2,119	106	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	108	80-132

Type: BSD Analyzed: 02/16/17  
 Lab ID: QC873008

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	3,000	3,117	104	80-120	2	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	112	80-132

RPD= Relative Percent Difference

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2007-65	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	244575
Units:	ug/L	Analyzed:	02/16/17
Diln Fac:	1.000		

Type: BS Lab ID: QC873142

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	9.736	97	74-137
Toluene	10.00	9.471	95	80-120
Ethylbenzene	10.00	9.758	98	80-120
m,p-Xylenes	10.00	9.585	96	80-120
o-Xylene	10.00	9.479	95	80-120

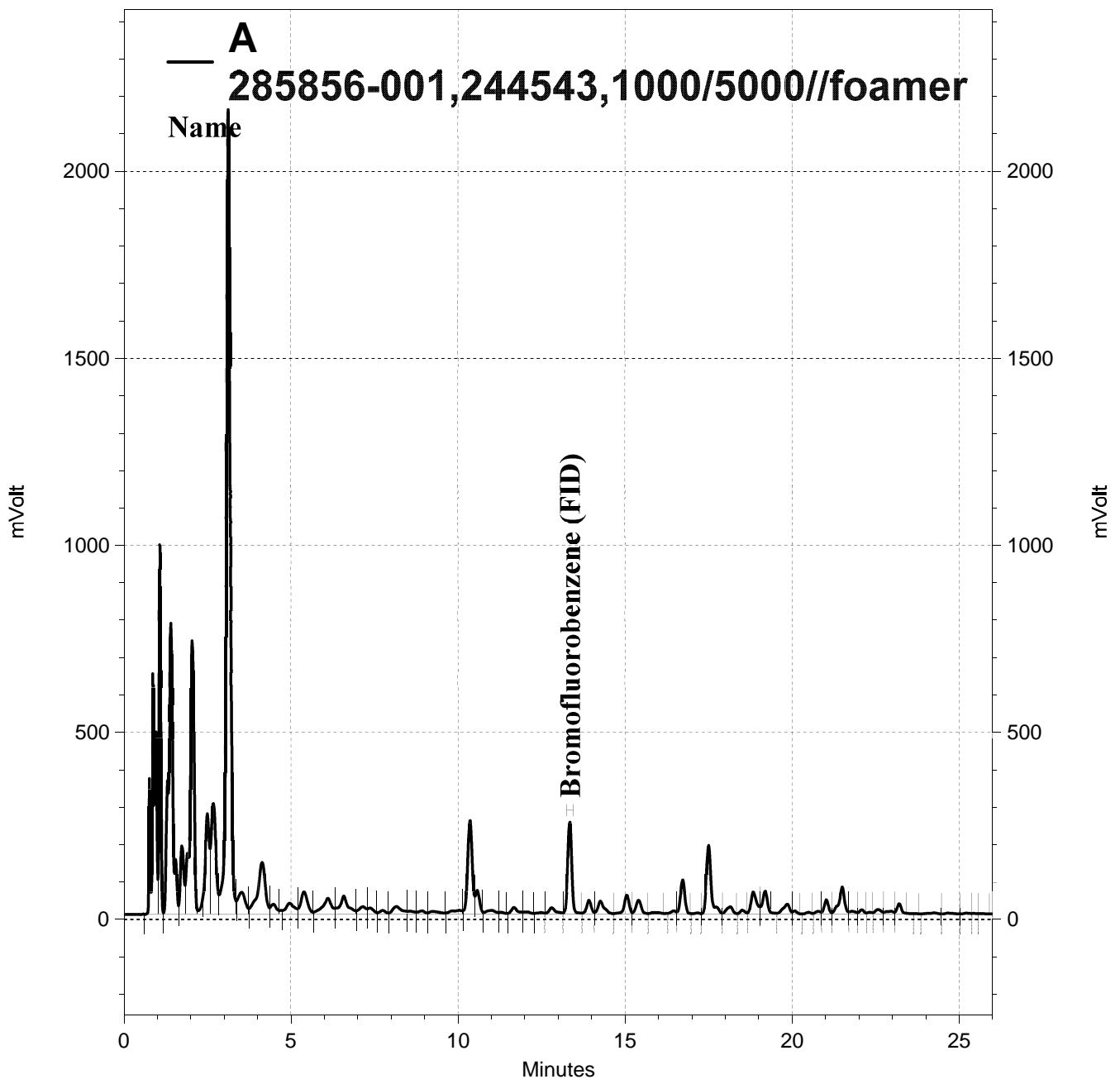
Surrogate	%REC	Limits
Bromofluorobenzene (PID)	96	71-141

Type: BSD Lab ID: QC873143

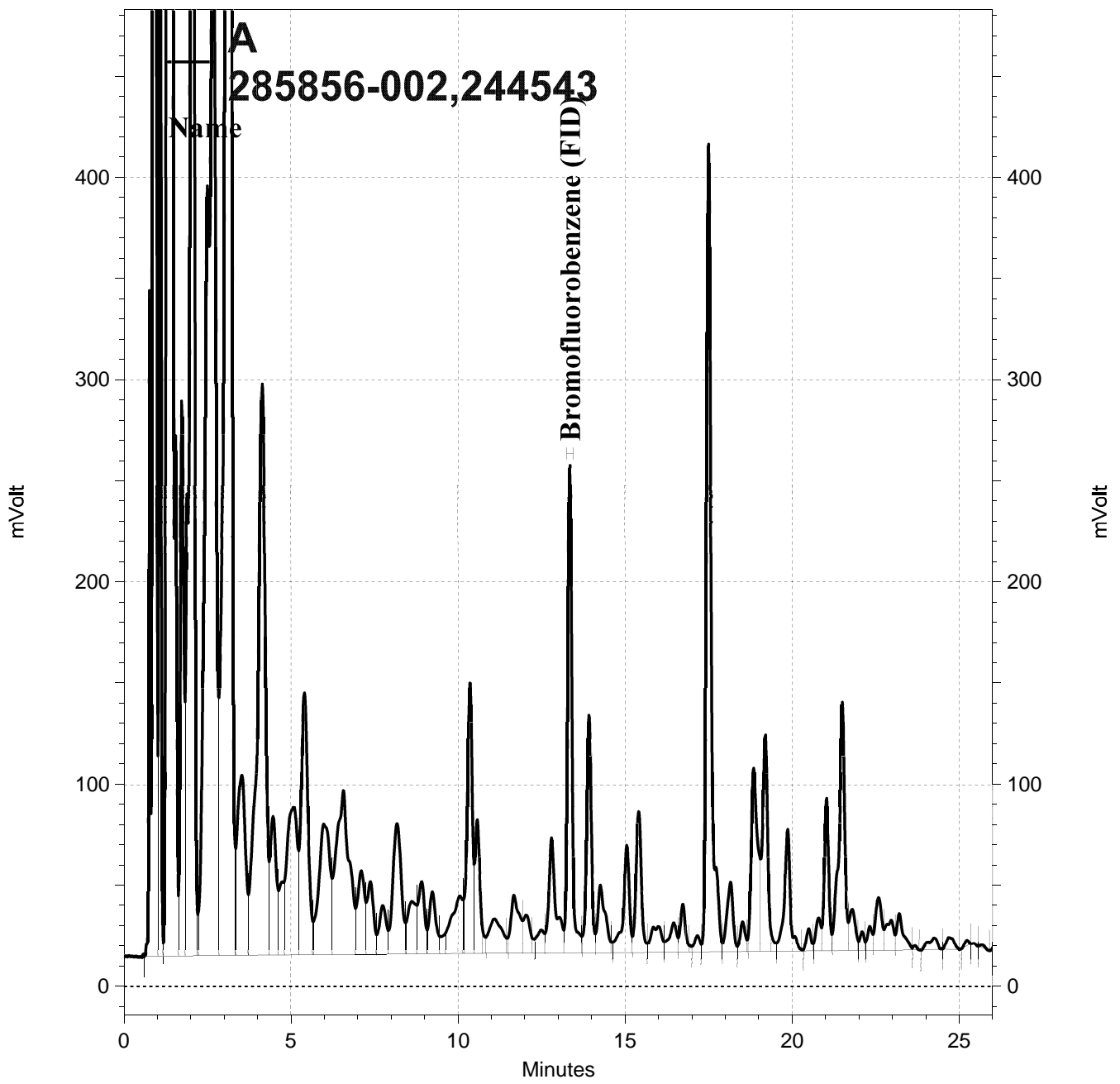
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	10.00	9.000	90	74-137	8	37
Toluene	10.00	9.277	93	80-120	2	20
Ethylbenzene	10.00	9.389	94	80-120	4	20
m,p-Xylenes	10.00	9.259	93	80-120	3	20
o-Xylene	10.00	9.238	92	80-120	3	20

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	92	71-141

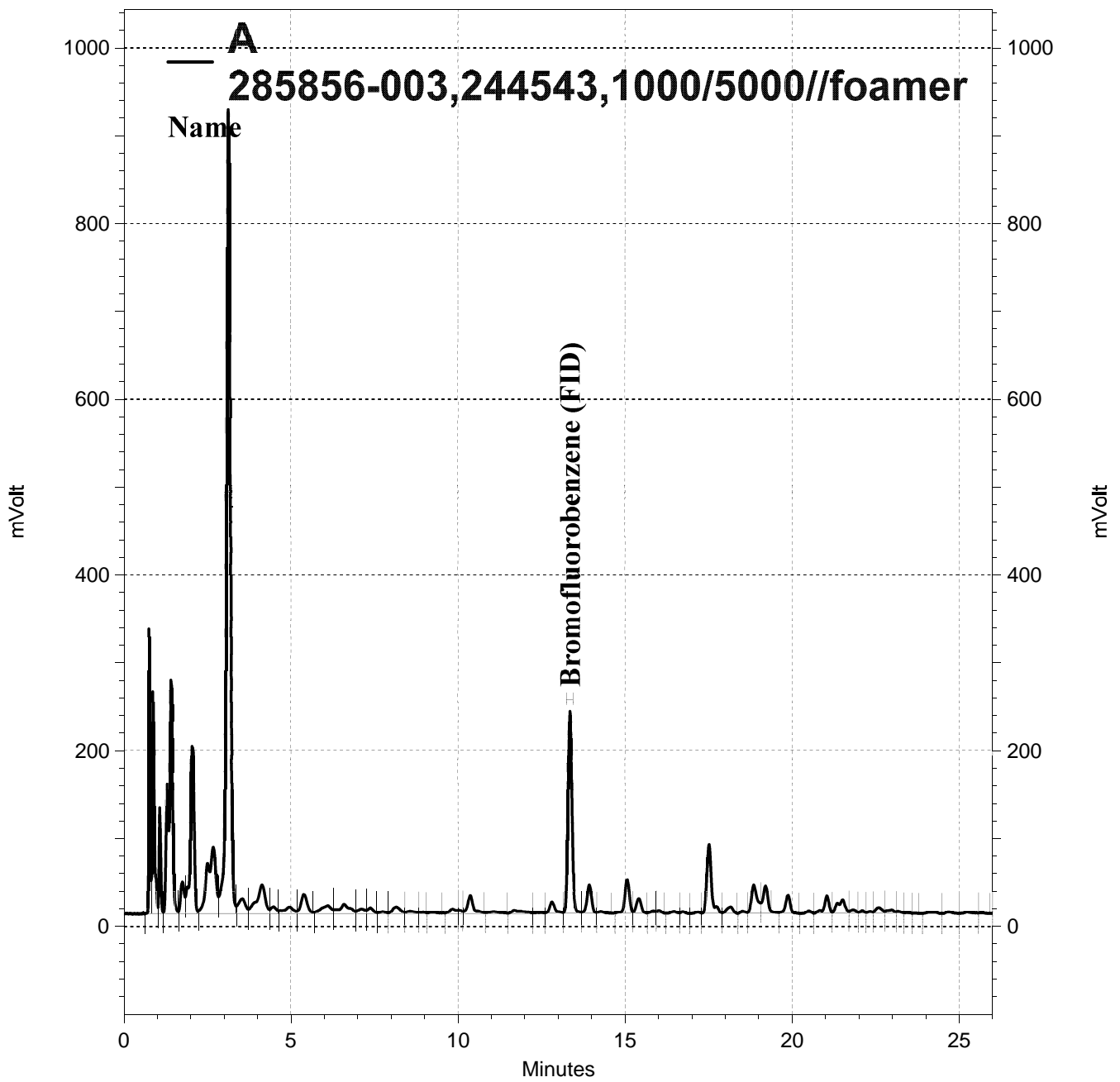
RPD= Relative Percent Difference



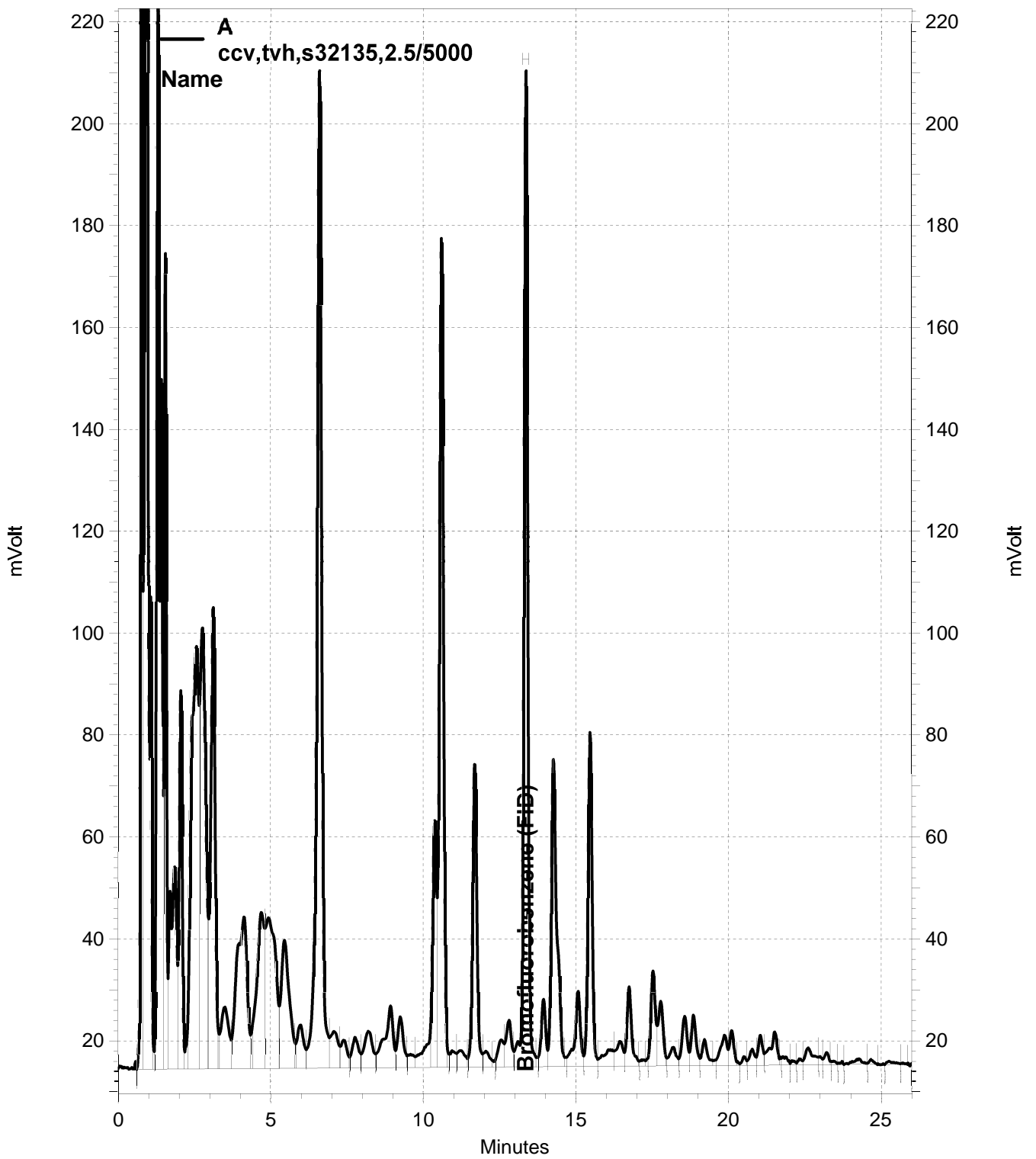
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Total Extractable Hydrocarbons			
Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2007-65	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	02/08/17
Units:	ug/L	Received:	02/08/17
Batch#:	244290		

Field ID: TAM Diln Fac: 5.000  
 Type: SAMPLE Prepared: 02/09/17  
 Lab ID: 285856-001 Analyzed: 02/11/17

Analyte	Result	RL
Diesel C10-C24	31,000	240

Surrogate	%REC	Limits
o-Terphenyl	103	67-136

Field ID: TBM Diln Fac: 1.000  
 Type: SAMPLE Prepared: 02/09/17  
 Lab ID: 285856-002 Analyzed: 02/11/17

Analyte	Result	RL
Diesel C10-C24	3,400	47

Surrogate	%REC	Limits
o-Terphenyl	119	67-136

Field ID: TCM Diln Fac: 50.00  
 Type: SAMPLE Prepared: 02/09/17  
 Lab ID: 285856-003 Analyzed: 02/13/17

Analyte	Result	RL
Diesel C10-C24	65,000	2,400

Surrogate	%REC	Limits
o-Terphenyl	DO	67-136

Type: BLANK Prepared: 02/08/17  
 Lab ID: QC872029 Analyzed: 02/10/17  
 Diln Fac: 1.000

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
o-Terphenyl	109	67-136

DO= Diluted Out  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2007-65	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	244290
Units:	ug/L	Prepared:	02/08/17
Diln Fac:	1.000	Analyzed:	02/11/17

Type: BS Cleanup Method: EPA 3630C  
 Lab ID: QC872030

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,389	96	60-121

Surrogate	%REC	Limits
o-Terphenyl	102	67-136

Type: BSD Cleanup Method: EPA 3630C  
 Lab ID: QC872031

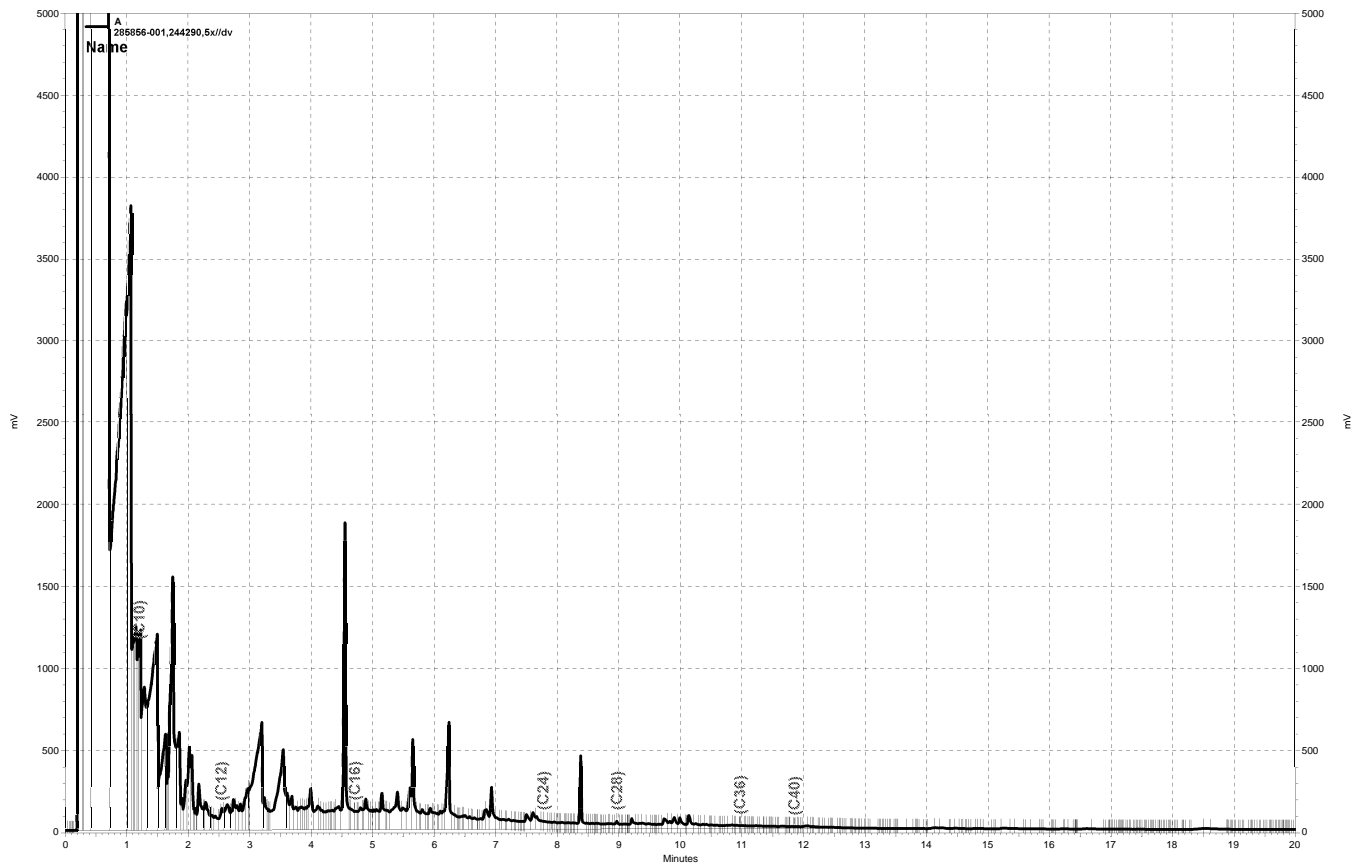
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,569	103	60-121	7	32

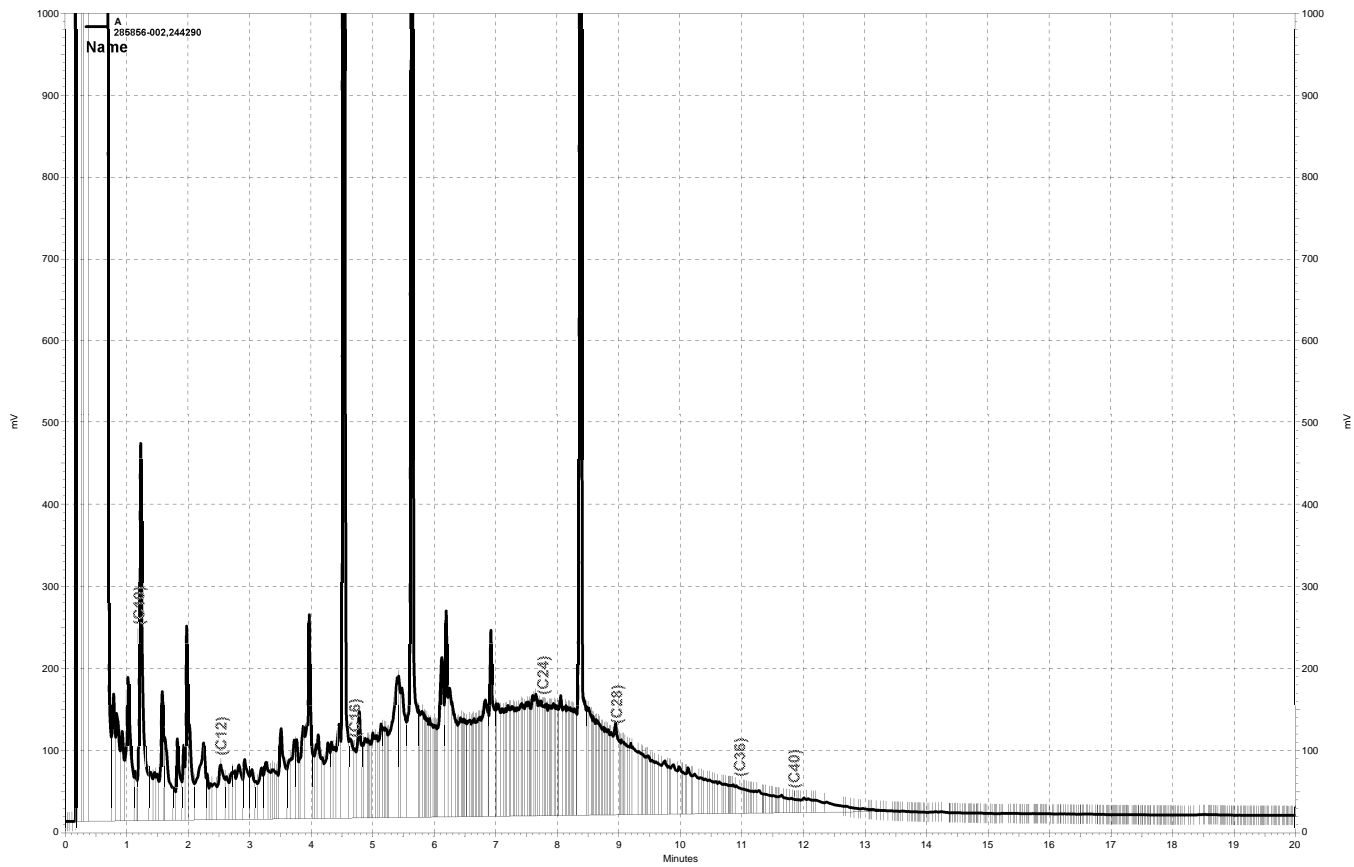
Surrogate	%REC	Limits
o-Terphenyl	113	67-136

RPD= Relative Percent Difference

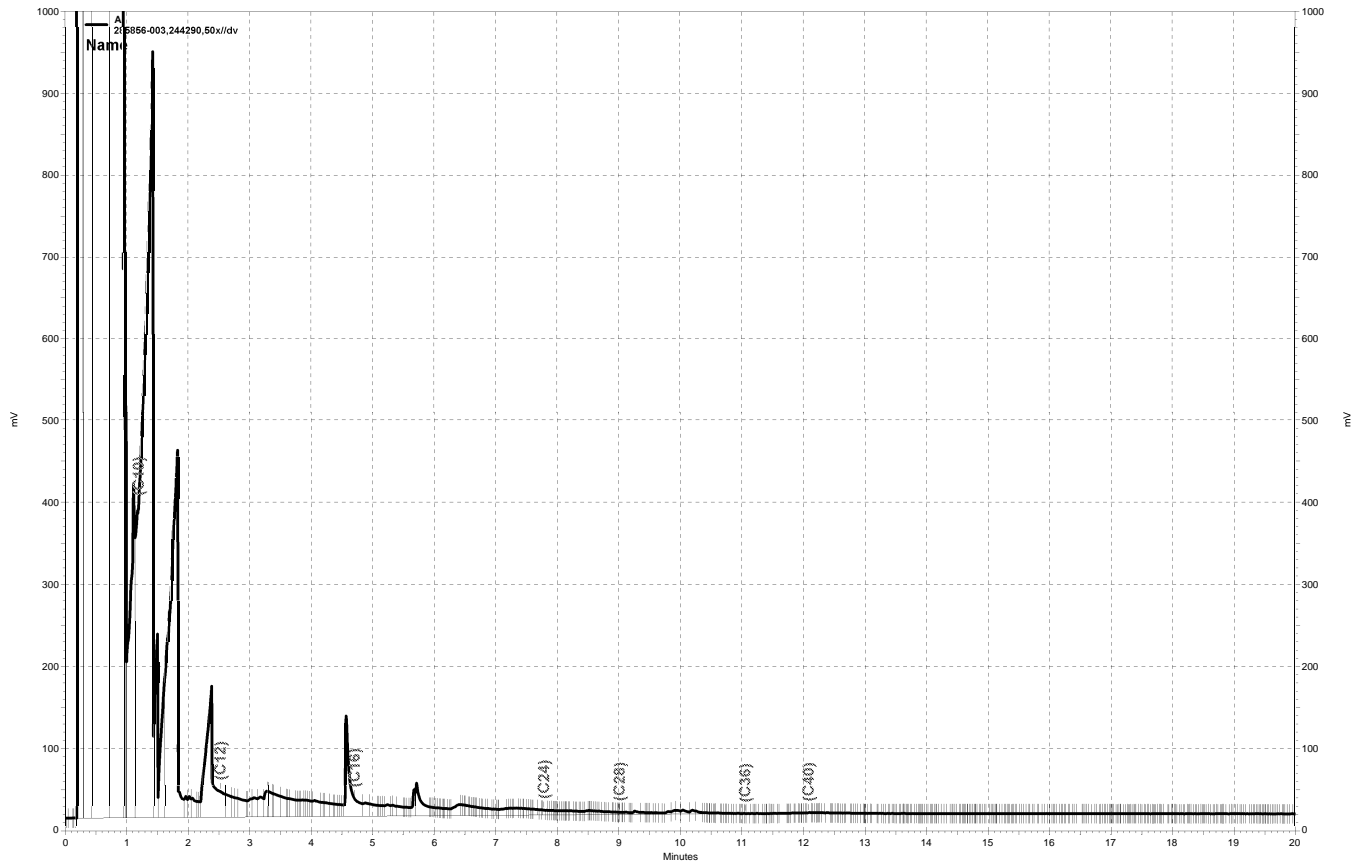




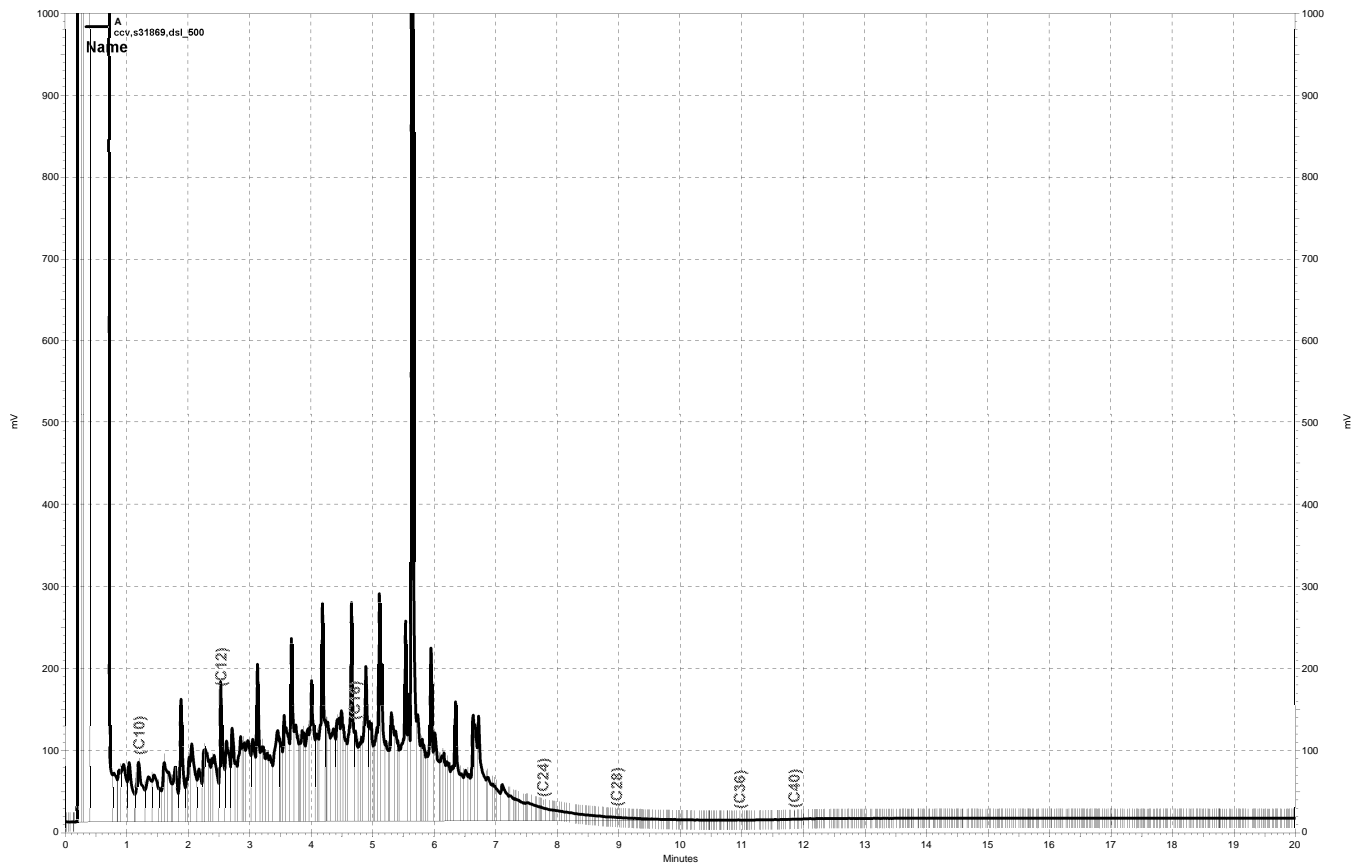
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Dissolved Iron			
Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2007-65	Analysis:	EPA 6010B
Analyte:	Iron	Sampled:	02/08/17
Matrix:	Filtrate	Received:	02/08/17
Units:	ug/L	Prepared:	02/13/17
Diln Fac:	1.000	Analyzed:	02/20/17
Batch#:	244456		

Field ID	Type	Lab ID	Result	RL
TAM	SAMPLE	285856-001	ND	100
TBM	SAMPLE	285856-002	ND	100
TCM	SAMPLE	285856-003	270 b	100
	BLANK	QC872670	ND	100
	BLANK	QC872675	ND	100

b= See narrative  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Dissolved Iron			
Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2007-65	Analysis:	EPA 6010B
Analyte:	Iron	Batch#:	244456
Field ID:	ZZZZZZZZZZ	Sampled:	02/09/17
MSS Lab ID:	285891-001	Received:	02/09/17
Matrix:	Filtrate	Prepared:	02/13/17
Units:	ug/L	Analyzed:	02/20/17
Diln Fac:	1.000		

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC872671	10,000	11,410 b	114	80-120		
BSD	QC872672	10,000	11,400 b	114	80-120	0	20
MS	QC872673		NA				
MSD	QC872674		NA				

b= See narrative

NA= Not Analyzed

RPD= Relative Percent Difference



## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2007-65	Analysis:	EPA 300.0
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC872033	Batch#:	244291
Matrix:	Water	Analyzed:	02/08/17 11:45
Units:	mg/L		

Analyte	Spiked	Result	%REC	Limits
Nitrogen, Nitrate	0.5000	0.4790	96	80-120
Sulfate	5.000	4.922	98	80-120



Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2007-65	Analysis:	EPA 300.0
Field ID:	ZZZZZZZZZZ	Diln Fac:	5.000
MSS Lab ID:	285861-001	Batch#:	244291
Matrix:	Water	Sampled:	02/08/17 12:45
Units:	mg/L	Received:	02/08/17

Type: MS Analyzed: 02/08/17 18:48  
 Lab ID: QC872056

Analyte	MSS Result	Spiked	Result	%REC	Limits
Nitrogen, Nitrate	0.06562	1.250	1.294	98	80-120
Sulfate	1.018	12.50	14.06	104	80-120

Type: MSD Analyzed: 02/08/17 19:05  
 Lab ID: QC872057

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Nitrogen, Nitrate	1.250	1.327	101	80-120	3	20
Sulfate	12.50	13.59	101	80-120	3	20

RPD= Relative Percent Difference

Dissolved Oxygen			
Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Analysis:	SM45000-G
Project#:	2007-65		
Analyte:	Dissolved Oxygen	Batch#:	244276
Matrix:	Water	Sampled:	02/08/17
Units:	mg/L	Received:	02/08/17
Diln Fac:	1.000	Analyzed:	02/08/17 11:36

Field ID	Lab ID	Result	RL
TAM	285856-001	0.61	1.0
TBM	285856-002	3.5	1.0
TCM	285856-003	0.38	1.0

RL= Reporting Limit

## Batch QC Report

Dissolved Oxygen				
Lab #:	285856	Location:	Bay Center Apts	
Client:	Stellar Environmental Solutions	Analysis:	SM45000-G	
Project#:	2007-65			
Analyte:	Dissolved Oxygen	Units:	mg/L	
Field ID:	TBM	Diln Fac:	1.000	
Type:	SDUP	Batch#:	244276	
MSS Lab ID:	285856-002	Sampled:	02/08/17	
Lab ID:	QC871982	Received:	02/08/17	
Matrix:	Water	Analyzed:	02/08/17 11:36	
MSS Result	Result	RL	RPD	Lim
3.460	3.860	1.000	11	20

RL= Reporting Limit

RPD= Relative Percent Difference

pH			
Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2007-65	Analysis:	EPA 9040C
Analyte:	pH	Batch#:	244249
Matrix:	Water	Sampled:	02/08/17
Units:	SU	Received:	02/08/17
Diln Fac:	1.000	Analyzed:	02/08/17 11:58

Field ID	Lab ID	Result	RL
TAM	285856-001	6.8	1.0
TBM	285856-002	7.1	1.0
TCM	285856-003	6.6	1.0

RL= Reporting Limit

Batch QC Report

pH			
Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2007-65	Analysis:	EPA 9040C
Analyte:	pH	Units:	SU
Field ID:	ZZZZZZZZZZ	Diln Fac:	1.000
Type:	SDUP	Batch#:	244249
MSS Lab ID:	285832-001	Sampled:	02/07/17 14:00
Lab ID:	QC871879	Received:	02/07/17
Matrix:	Water	Analyzed:	02/07/17 15:40

MSS Result	Result	RL	RPD	Lim
6.960	7.070	1.000	2	20

RL= Reporting Limit

RPD= Relative Percent Difference

**Oxidation-Reduction Potential**

Lab #:	285856	Location:	Bay Center Apts
Client:	Stellar Environmental Solutions	Analysis:	SM2580B
Project#:	2007-65		
Analyte:	Oxidation-Reduction Potential	Batch#:	244292
Matrix:	Water	Sampled:	02/08/17
Units:	Eh	Received:	02/08/17
Diln Fac:	1.000	Analyzed:	02/08/17

Field ID	Lab ID	Result	RL
TAM	285856-001	-260	1.0
TBM	285856-002	-16	1.0
TCM	285856-003	-300	1.0

RL= Reporting Limit

## Batch QC Report

Oxidation-Reduction Potential				
Lab #:	285856	Location:	Bay Center Apts	
Client:	Stellar Environmental Solutions	Analysis:	SM2580B	
Project#:	2007-65			
Analyte:	Oxidation-Reduction Potential	Units:	Eh	
Field ID:	TBM	Diln Fac:	1.000	
Type:	SDUP	Batch#:	244292	
MSS Lab ID:	285856-002	Sampled:	02/08/17	
Lab ID:	QC872036	Received:	02/08/17	
Matrix:	Water	Analyzed:	02/08/17	
MSS Result	Result	RL	RPD	Lim
-15.70	-25.60	1.000	48 *	20

\*= Value outside of QC limits; see narrative

RL= Reporting Limit

RPD= Relative Percent Difference

## **APPENDIX D**

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### **Historical Groundwater Elevation Data**



**TABLE B**  
**Historical Monitoring, Extraction, and Trench Well Elevations**  
**6400 Christie Avenue, Emeryville, California**

MW-1					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
1	Dec-88	14.39	9.60	NP	4.79
2	May-89	14.31 <sup>(a)</sup>	8.73	NP	5.58
3	Feb-91	14.31	9.18	NP	5.13
Monitoring well abandoned - date unclear					

MW-2					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
1	Dec-88	14.36	9.64	NP	4.72
2	May-89	14.28 <sup>(a)</sup>	8.78	NP	5.50
3	Feb-91	14.28	9.61	NP	4.67
Monitoring well abandoned - date unclear					

MW-3					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
1	Dec-88	14.53	8.93	trace	5.60
2	May-89	14.43 <sup>(a)</sup>	8.69	NP	5.74
3	Feb-91	14.43	8.31	NP	6.12
4	Mar-04	16.96 <sup>(b)</sup>	9.47	NP	7.49
5	Dec-06	NA	NA	NA	NA
6	Dec-07	16.65 <sup>(c)</sup>	7.76 <sup>(c)</sup>	7.76	8.89
7	Mar-08	16.65	8.72	8.70	7.93
8	Jun-08	16.65	8.56	NP	8.09
9	Sep-08	16.65	9.27	7.95	7.38
10	Dec-08	16.65	8.36	7.49	8.29
11	Mar-09	16.65	7.94	NP	8.71
12	Sep-09	16.65	8.58	NP	8.07
13	Mar-10	16.65	8.08 <sup>(c)</sup>	8.08	8.57
14	Sep-10	16.65	8.68 <sup>(c)</sup>	8.68	7.97
15	Mar-11	16.65	10.40	NM	6.25
16	Sep-11	16.65	10.84	10.83	6.17
17	Mar-12	16.65	8.21	NM	8.44
18	Sep-12	16.65	10.77	NM	5.88
19	Mar-13	16.65	11.27	NM	5.38
20	Sep-13	16.65	11.50	NM	5.15
21	Mar-14	16.65	9.64	9.61	7.01
22	Sep-14	16.65	NM	10.85	NM
23	Mar-15	16.65	9.40	9.35	7.25
24	Sep-15	16.65	9.00	7.22	7.65
25	Mar-16	16.65	11.35	NM	5.30
26	Sep-16	16.65	11.01	NM	5.64
27	Mar-17	16.65	10.60	10.59	6.05

\*Thick pro

MW-4					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
1	Dec-88	14.21	8.29	NP	5.92
2	May-89	14.12 <sup>(a)</sup>	7.75	NP	6.37
3	Feb-91	14.12	8.04	NP	6.08
4	Mar-04	16.74 <sup>(b)</sup>	6.90	NP	7.49
5	Dec-06	NA	NA	NA	NA
6	Dec-07	16.29 <sup>(c)</sup>	6.61	NP	9.68
7	Mar-08	16.29	7.24	NP	9.05
8	Jun-08	16.29	6.94	NP	9.35
9	Sep-08	16.29	6.85	NP	6.85
10	Dec-08	16.29	7.42	NP	8.87
11	Mar-09	16.29	6.90	NP	9.39
12	Sep-09	16.29	7.40	NP	8.89
13	Mar-10	16.29	7.08	NP	9.21
14	Sep-10	16.29	7.08	NP	9.21
15	Mar-11	16.29	7.02	NP	9.27
16	Sep-11	16.29	7.83	NP	8.46
17	Mar-12	16.29	7.01	NP	9.28
18	Sep-12	16.29	7.82	NP	8.45
19	Mar-13	16.29	9.15	NP	7.14
20	Sep-13	16.29	8.00	NP	8.29
21	Mar-14	16.29	7.72	NP	8.57
22	Sep-14	16.29	8.23	NP	8.06
23	Mar-15	16.29	8.42	NP	7.87
24	Sep-15	16.29	7.68	NP	8.61
25	Mar-16	16.29	NM	NM	--
26	Sep-16	16.29	8.48	NP	7.81
27	Mar-17	16.29	7.27	NP	9.02

MW-5					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
1	Dec-88	14.65	10.23	NP	4.42
2	May-89	14.56 <sup>(a)</sup>	9.29	NP	5.27
3	Feb-91	14.56	10.04	NP	4.52
4	Mar-04	17.11 <sup>(b)</sup>	9.10	NP	8.01
5	Dec-06	NA	NA	NA	NA
6	Dec-07	16.72 <sup>(c)</sup>	9.66	NP	7.06
7	Mar-08	16.72	9.72	NP	7.00
8	Jun-08	16.72	9.72	NP	7.00
9	Sep-08	16.72	8.56	NP	8.16
10	Dec-08	16.72	9.75	NP	6.97
11	Mar-09	16.72	9.31	NP	7.41
12	Sep-09	16.72	9.79	NP	6.93
13	Mar-10	16.72	9.48	NP	7.24
14	Sep-10	16.72	9.90	NP	6.82
15	Mar-11	16.72	9.29	NP	7.43
16	Sep-11	16.72	9.77	NP	6.95
17	Mar-12	16.72	9.19	NP	7.53
18	Sep-12	16.72	9.70	NP	7.02
19	Mar-13	16.72	10.63	NP	6.09
20	Sep-13	16.72	10.20	NP	6.52
21	Mar-14	16.72	9.68	NP	7.04
22	Sep-14	16.72	9.73	NP	6.99
23	Mar-15	16.72	9.59	NP	7.13
24	Sep-15	16.72	9.78	NP	6.94
25	Mar-16	16.72	8.03	NP	8.69
27	Mar-17	16.72	7.27	NP	9.45

MW-6					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
1	Dec-88	14.75	8.10	NP	6.65
2	May-89	14.67 <sup>(a)</sup>	7.58	NP	7.09
3	Feb-91	14.67	7.05	NP	7.62
4	Mar-04	17.22 <sup>(b)</sup>	6.51	NP	10.71
5	Dec-06	NA	NA	NA	NA
6	Dec-07	16.82 <sup>(c)</sup>	6.61	NP	10.21
7	Mar-08	16.82	7.02	NP	9.80
8	Jun-08	16.82	7.55	NP	9.27
9	Sep-08	16.82	6.06	NP	10.76
10	Dec-08	16.82	6.91	NP	9.91
11	Mar-09	16.82	6.45	NP	10.37
12	Sep-09	16.82	8.05	NP	8.77
13	Mar-10	16.82	6.66	NP	10.16
14	Sep-10	16.82	7.98	NP	8.84
15	Mar-11	16.82	5.91	NP	10.91
16	Sep-11	16.82	7.66	NP	9.16
17	Mar-12	16.82	5.65	NP	11.17
18	Sep-12	16.82	7.51	NP	9.31
19	Mar-13	16.82	7.60	NP	9.22
20	Sep-13	16.82	5.65	NP	11.17
21	Mar-14	16.82	6.33	NP	10.49
22	Sep-14	16.82	8.13	NP	8.69
23	Mar-15	16.82	7.63	NP	9.19
24	Sep-15	16.82	9.09	NP	7.73
25	Mar-16	16.82	6.39	NP	10.43
26	Sep-16	16.82	7.75	NP	9.07
27	Mar-17	16.82	5.73	NP	11.09

MW-7					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed March 2004					
1	Mar-04	18.09	9.93	NP	8.16
2	Dec-06	NA	NA	NA	NA
3	Dec-07	17.73 <sup>(c)</sup>	10.30	NP	7.43
4	Mar-08	17.73	10.51	NP	7.22
5	Jun-08	17.73	10.50	NP	7.23
6	Sep-08	17.73	10.37	NP	7.36
7	Dec-08	17.73	10.60	NP	7.13
8	Mar-09	17.73	10.13	NP	7.60
9	Sep-09	17.73	10.61	NP	7.12
10	Mar-10	17.73	10.02	NP	7.71
11	Sep-10	17.73	10.59	NP	7.14
12	Mar-11	17.73	10.14	NP	7.59
13	Sep-11	17.73	10.58	NP	7.15
14	Mar-12	17.73	10.12	NP	7.61
15	Sep-12	17.73	10.50	NP	7.23
16	Mar-13	17.73	11.30	NP	6.43
17	Sep-13	17.73	5.50	NP	12.23
18	Mar-14	17.73	10.82	NP	6.91
19	Sep-14	17.73	10.61	NP	7.02
20	Mar-15	17.73	10.57	NP	7.16
21	Sep-15	17.73	10.54	NP	7.19
22	Mar-16	17.73	10.51	NP	7.22
24	Mar-17	17.73	10.10	NP	7.63

MW-8					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed March 2004					
1	Mar-04	18.25	9.32	8.15	8.93
2	Nov-06 <sup>(d)</sup>	16.96	10.59	NP	6.37
3	Dec-07	17.84 <sup>(e)</sup>	9.42	NP	8.42
4	Mar-08	17.84	10.50	9.18	7.34
5	Jun-08	17.84	9.68	9.10	8.16
6	Sep-08	17.84	9.63	8.89	8.21
7	Dec-08	17.84	9.58	8.89	8.26
8	Mar-09	17.84	9.62	8.89	8.22
9	Sep-09	17.84	8.55 <sup>(e)</sup>	8.55	9.29
10	Mar-10	17.84	9.02 <sup>(e)</sup>	9.02	8.82
11	Sep-10	17.84	9.75	9.89	7.95
12	Mar-11	17.84	8.89	8.99	8.85
13	Sep-11	17.84	9.87	9.55	7.97
14	Mar-12	17.84	9.29	9.01	8.55
15	Sep-12	17.84	9.25	8.46	8.59
16	Mar-13	17.84	9.95	9.59	7.89
17	Sep-13	17.84	10.32	10.28	7.52
18	Mar-14	17.84	10.22	10.28	7.62
19	Sep-14	17.84	9.91	9.85	7.93
20	Mar-15	17.84	9.71	9.47	8.13
21	Sep-15	17.84	9.88	9.93	7.96
22	Mar-16	17.84	9.51	9.46	8.33
23	Sep-16	17.84	9.90	9.89	7.94
24	Mar-17	17.84	9.42	9.15	8.42

MW-9					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed March 2004					
1	Mar-04	18.27	9.38	NP	8.89
2	Dec-06	NA	NA	NA	NA
3	Dec-07	17.84 <sup>(e)</sup>	9.54	NP	8.30
4	Mar-08	17.84	9.77	NP	8.07
5	Jun-08	17.84	9.68	NP	9.27
6	Sep-08	17.84	9.30	NP	8.54
7	Dec-08	17.84	9.83	NP	8.01
8	Mar-09	17.84	9.37	NP	8.47
9	Sep-09	17.84	9.70	NP	8.14
10	Mar-10	17.84	9.46	NP	8.38
11	Sep-10	17.84	9.75	NP	8.09
12	Mar-11	17.84	9.52	NP	8.32
13	Sep-11	17.84	9.80	NP	8.04
14	Mar-12	17.84	9.54	NP	8.30
15	Sep-12	17.84	9.54	NP	8.30
16	Mar-13	17.84	10.08	NP	7.76
17	Sep-13	17.84	10.13	NP	7.71
18	Mar-14	17.84	10.01	NP	7.83
19	Mar-15	17.84	9.98	NP	7.86
20	Sep-15	17.84	10.05	NP	7.79
21	Mar-16	17.84	9.72	NP	8.12
22	Sep-16	17.84	10.02	NP	7.82
23	Mar-17	17.84	9.65	NP	8.19

MW-10					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed March 2004					
1	Mar-04	18.21	9.87	8.24	8.34
2	Dec-06	18.21	9.30	8.86	8.91
3	Dec-07	17.83 <sup>(e)</sup>	8.98 <sup>(e)</sup>	8.98	8.85
4	Mar-08	17.83	9.28	8.98	8.55
5	Jun-08	17.83	8.86	8.78	7.23
6	Sep-08	17.83	8.95	8.84	8.88
7	Dec-08	17.83	8.97	8.74	8.86
8	Mar-09	17.83	9.25	8.54	9.25
9	Sep-09	17.83	8.63	8.52	9.20
10	Mar-10	17.83	10.30	8.58	7.53
11	Sep-10	17.83	8.76	8.82	9.01
12	Mar-11	17.83	8.15	8.14	9.68
13	Sep-11	17.83	8.83	8.78	9.00
14	Mar-12	17.83	7.89	7.75	9.94
15	Sep-12	17.83	7.48	7.40	10.35
16	Mar-13	17.83	10.30	9.33	7.53
17	Sep-13	17.83	10.02	9.65	7.81
18	Mar-14	17.83	9.92	9.65	7.91
19	Sep-14	17.83	9.74	9.36	8.09
20	Mar-15	17.83	9.19	9.16	8.64
21	Sep-15	17.83	9.69	9.34	8.14
22	Mar-16	17.83	9.30	9.29	8.53
23	Sep-16	17.83	9.28	9.27	8.55
24	Mar-17	17.83	8.73	9.27	9.10

MW-11					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed May 2004					
1	Nov-06 <sup>(d)</sup>	17.76 <sup>(c)</sup>	10.33	NP	7.43
2	Dec-07	17.76	10.27	NP	7.49
3	Mar-08	17.76	10.34	NP	7.42
4	Jun-08	17.76	10.20	NP	8.16
5	Sep-08	17.76	10.03	NP	7.73
6	Dec-08	17.76	10.34	NP	7.42
7	Mar-09	17.76	10.20	NP	7.56
8	Sep-10	17.76	10.25	NP	7.51
9	Mar-10	17.76	10.23	NP	7.53
10	Sep-10	17.76	10.24	NP	7.52
11	Mar-11	17.76	10.10	NP	7.66
12	Sep-11	17.76	10.30	NP	7.46
13	Mar-12	17.76	10.18	NP	7.58
14	Sep-12	17.76	10.24	NP	7.52
15	Mar-13	17.76	10.62	NP	7.14
16	Sep-13	17.76	10.21	NP	7.55
17	Mar-14	17.76	10.33	NP	7.43
18	Sep-14	17.76	10.40	NP	7.36
19	Mar-15	17.76	10.40	NP	7.36
20	Sep-15	17.76	10.48	NP	7.28
21	Mar-16	17.76	10.35	10.34	7.41
22	Sep-16	17.76	10.39	NP	7.37
23	Mar-17	17.76	10.19	NP	7.57

MW-12					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed between 2004-2006					
1	Nov-06 <sup>(d)</sup>	17.83 <sup>(c)</sup>	9.37	NP	8.46
2	Dec-07	17.83	9.15	NP	8.68
3	Mar-08	17.83	9.11	NP	8.72
4	Jun-08	17.83	8.86	NP	8.97
5	Sep-08	17.83	8.76	NP	9.07
6	Dec-08	17.83	8.98	NP	8.85
7	Mar-09	17.83	8.50	NP	9.33
8	Sep-09	17.83	8.95	NP	8.88
9	Mar-10	17.83	8.66	NP	9.17
10	Sep-10	17.83	8.89	NP	8.94
11	Mar-11	17.83	8.18	NP	9.65
12	Sep-11	17.83	8.80	NP	9.03
13	Mar-12	17.83	7.79	NP	10.04
14	Sep-12	17.83	7.44	NP	10.39
15	Mar-13	17.83	9.39	NP	8.44
16	Sep-13	17.83	9.72	NP	8.11
17	Mar-14	17.83	9.55	NP	8.26
18	Sep-14	17.83	9.46	NP	8.37
19	Mar-15	17.83	9.18	NP	8.65
20	Sep-15	17.83	10.48	NP	7.35
21	Mar-16	17.83	9.19	NP	8.64
22	Sep-16	17.83	9.28	NP	8.55
23	Mar-16	17.83	8.75	NP	9.08

MW-13					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed between 2004-2006					
1	Dec-06	17.66 <sup>(c)</sup>	9.81	9.44	7.85
2	Dec-07	17.66	9.95	9.39	7.71
3	Mar-08	17.66	10.02	9.54	7.64
4	Jun-08	17.66	9.86	9.45	7.80
5	Sep-08	17.66	10.34	9.54	7.32
6	Dec-08	17.66	10.54	9.65	7.12
7	Mar-09	17.66	9.26	9.14	8.40
8	Sep-09	17.66	9.91 <sup>(c)</sup>	9.72	7.75
9	Mar-10	17.66	9.22 <sup>(c)</sup>	9.22	8.44
10	Sep-10	17.66	9.40	10.18	7.48
11	Mar-11	17.66	9.90	NM	NM
12	Sep-11	17.66	10.41	9.64	7.25
13	Mar-12	17.66	10.09	9.02	7.57
14	Sep-12	17.66	9.54	9.23	8.12
15	Mar-13	17.66	9.36	9.35	8.30
16	Sep-13	17.66	9.48	9.45	8.18
17	Mar-14	17.66	9.58	9.45	8.08
18	Sep-14	17.66	8.89	8.87	8.77
19	Mar-15	17.66	9.13	9.12	8.53
20	Sep-15	17.66	9.59	9.57	8.07
21	Mar-16	17.66	9.24	9.23	8.42
22	Sep-16	17.66	9.36	9.35	8.30
23	Mar-17	17.66	8.70	8.45	8.96

MW-14					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed between 2004-2006					
1	Nov-06 <sup>(d)</sup>	17.60 <sup>(c)</sup>	9.11	9.11(sheen)	8.49
2	Dec-07	17.60	8.86	8.84	8.74
3	Mar-08	17.60	8.91	8.88	8.69
4	Jun-08	17.60	8.66	8.62	8.94
5	Sep-08	17.60	8.64	NP	8.96
6	Dec-08	17.60	8.70	NP	8.90
7	Mar-09	17.60	9.25	NP	9.25
8	Sep-09	17.60	8.80	NP	8.80
9	Mar-10	17.60	8.42	NP	9.18
10	Sep-10	17.60	8.56	8.62	8.98
11	Mar-11	17.60	7.93	7.92	9.67
12	Sep-11	17.60	8.60	8.55	9.00
13	Mar-12	17.60	7.71	7.61	9.89
14	Sep-12	17.60	7.22	7.20	10.38
15	Mar-13	17.60	9.18	9.17	8.42
16	Sep-13	17.60	9.49	9.47	8.11
17	Mar-14	17.60	9.48	9.47	8.12
18	Sep-14	17.60	9.16	NP	8.44
19	Mar-15	17.60	8.93	NP	8.67
20	Sep-15	17.60	8.41	NP	8.19
21	Mar-16	17.60	9.40	NP	8.20
22	Sep-16	17.60	9.05	NP	8.55
23	Mar-17	17.60	8.53	NP	9.07

MW-15					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed between 2004-2006					
1	Dec-06	17.80 <sup>(c)</sup>	9.15	NP	8.65
2	Dec-07	17.80	9.30	NP	8.50
3	Mar-08	17.80	9.20	9.18	8.60
4	Jun-08	17.80	9.60	9.63	8.20
5	Sep-08	17.80	8.84	8.84 <sup>(d)</sup>	8.96
6	Dec-08	17.80	9.19	8.36	8.61
7	Mar-09	17.80	8.70	NP	9.10
8	Sep-09	17.80	9.40 <sup>(c)</sup>	9.22	8.08
9	Mar-10	17.80	8.81 <sup>(c)</sup>	8.81	8.99
10	Sep-10	17.80	9.42	9.45	8.35
11	Mar-11	17.80	8.50	NM	9.30
12	Sep-11	17.80	9.32	NP	8.48
13	Mar-12	17.80	8.55	NP	9.25
14	Sep-12	17.80	8.03	NP	9.77
15	Mar-13	17.80	9.45	NP	8.35
16	Sep-13	17.80	10.01	NP	7.79
17	Mar-14	17.80	10.18	NP	7.62
18	Sep-14	17.80	9.74	NP	8.06
19	Mar-15	17.80	9.34	NP	8.46
20	Sep-15	17.80	9.85	NP	7.95
21	Mar-16	17.80	9.36	9.35	8.44
22	Sep-16	17.80	9.76	9.75	8.04
23	Mar-17	17.80	8.97	9.75	8.83

MW-16					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed between 2004-2006					
1	Dec-06	NA	NA	NA	NA
2	Dec-07	17.74 <sup>(c)</sup>	9.36	NP	8.38
3	Mar-08	17.74	9.88	NP	7.86
4	Jun-08	17.74	9.25	NP	7.80
5	Sep-08	17.74	9.07	NP	8.67
6	Dec-08	17.74	9.45	NP	8.29
7	Mar-09	17.74	8.88	NP	8.86
8	Sep-09	17.74	9.51	NP	8.23
9	Mar-10	17.74	8.92	NP	8.82
10	Sep-10	17.74	9.40	NP	8.34
11	Mar-11	17.74	9.16	NP	8.57
12	Sep-11	17.74	9.56	NP	8.18
13	Mar-12	17.74	9.38	NP	8.36
14	Sep-12	17.74	9.15	NP	8.59
15	Mar-13	17.74	9.60	NP	8.14
16	Sep-13	17.74	10.03	NP	7.71
17	Mar-14	17.74	9.81	NP	7.93
18	Sep-14	17.74	9.80	NP	7.94
19	Mar-15	17.74	9.56	NP	8.18
20	Sep-15	17.74	8.50	NP	9.24
21	Mar-16	17.74	9.46	NP	8.28
22	Sep-16	17.74	10.31	NP	7.43
23	Mar-17	17.74	9.33	NP	8.41

MW-17					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed between 2004-2006					
1	Dec-06	NA	NA	NA	NA
2	Dec-07	18.17 <sup>(6)</sup>	9.40	9.32	8.77
3	Mar-08	18.17	9.34	9.18	8.83
4	Jun-08	18.17	8.98	8.97	9.19
5	Sep-08	18.17	9.21	7.92	8.96
6	Dec-08	18.17	9.25	9.11	8.92
7	Mar-09	18.17	8.89	NP	9.28
8	Sep-09	18.17	9.31	NP	8.86
9	Mar-10	18.17	8.93	NP	9.24
10	Sep-10	18.17	9.15	NP	9.02
11	Mar-11	18.17	8.52	8.50	9.65
12	Sep-11	18.17	9.15	NP	9.02
13	Mar-12	18.17	8.17	NP	10.00
14	Sep-12	18.17	7.77	NP	10.40
15	Mar-13	18.17	9.17	NP	9.00
16	Sep-13	18.17	10.00	NP	8.17
17	Mar-14	18.17	10.00	NP	8.17
18	Sep-14	18.17	9.72	NP	8.45
19	Mar-15	18.17	9.51	NP	8.86
20	Sep-15	18.17	10.00	NP	8.17
21	Mar-16	18.17	9.98	NP	8.19
22	Sep-16	18.17	9.62	NP	8.55
23	Mar-17	18.17	9.06	9.05	9.11

MW-18					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
Installed between 2004-2006					
1	Dec-06	NA	NA	NA	NA
2	Dec-07	16.35 <sup>(6)</sup>	8.30	NP	8.05
3	Mar-04	16.35	8.34	NP	8.01
4	Jun-08	16.35	8.34	NP	8.20
5	Sep-08	16.35	8.48	NP	7.87
6	Dec-08	16.35	8.61	NP	7.74
7	Mar-09	16.35	7.75	NP	8.60
8	Sep-09	16.35	8.50	NP	7.85
9	Mar-10	16.35	7.97	NP	8.38
10	Sep-10	16.35	8.28	NP	8.07
11	Mar-11	16.35	8.63	NP	7.72
12	Sep-11	16.35	8.90	NP	7.45
13	Mar-12	16.35	8.56	NP	7.79
14	Sep-12	16.35	8.59	NP	7.76
15	Mar-13	16.35	9.92	NP	6.43
16	Sep-13	16.35	9.81	NP	6.54
17	Mar-14	16.35	9.19	NP	7.16
18	Sep-14	16.35	9.56	NP	6.79
19	Mar-15	16.35	8.51	NP	6.84
20	Sep-15	16.35	8.69	NP	7.66
21	Mar-16	16.35	8.66	NP	7.69
22	Sep-16	16.35	9.61	NP	6.74
23	Mar-17	16.35	7.64	NP	8.71

MW-E					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
1	Dec-88	NM	NM	NM	NM
2	May-89	15.32	10.39	NP	4.93
3	Feb-91	NM	NM	NM	NM
4	Mar-04	17.80	9.92	NP	7.88
5	Nov-06 <sup>(6)</sup>	17.80	10.22	NP	7.58
6	Dec-07	17.47 <sup>(6)</sup>	10.03	NP	7.44
7	Mar-08	17.47	10.21	NP	7.26
8	Jun-08	17.47	10.20	NP	7.27
9	Sep-08	17.47	9.55	NP	7.92
10	Dec-08	17.47	10.32	NP	7.15
11	Mar-09	17.47	9.79	NP	7.68
12	Sep-09	17.47	10.22	NP	7.25
13	Mar-10	17.47	9.82	NP	7.65
14	Sep-10	17.47	10.11	NP	7.36
15	Mar-11	17.47	9.10	NP	8.37
16	Sep-11	17.47	8.41	NP	9.06
17	Mar-12	17.47	9.86	NP	7.61
18	Sep-12	17.47	9.95	NP	7.52
19	Mar-13	17.47	10.41	NP	7.06
20	Sep-13	17.47	10.21	NP	7.26
21	Mar-14	17.47	10.15	NP	7.32
22	Sep-14	17.47	9.98	NP	7.49
23	Mar-15	17.47	10.15	NP	7.32
24	Sep-15	17.47	10.07	NP	7.40
25	Mar-16	17.47	10.00	NP	7.47
26	Sep-16	17.47	10.15	NP	7.32
27	Mar-17	17.47	9.86	NP	7.61

RW-1					
Sampling Event No.	Date	TOC Elevation	DTW	DTP	GW Elevation
1	Dec-88	NM	NM	NM	NM
2	May-89	14.54	10.17	10.14	4.37
3	Feb-91	14.54	11.46	10.85	3.57
4	Mar-04	18.32	7.20	5.62	11.12
5	Nov-06 <sup>(d)</sup>	18.32	9.15	9.11	9.17
6	Dec-07	16.70 <sup>(e)</sup>	9.53 <sup>(e)</sup>	9.53	7.17
7	Mar-08	16.70	8.99	8.92	7.71
8	Jun-08	16.70	8.95	8.87	7.75
9	Sep-08	16.70	NM <sup>(c)</sup>	NM <sup>(c)</sup>	NM <sup>(c)</sup>
10	Dec-08	16.70	NM	NM	NM
11	Mar-09	16.70	9.06 <sup>(e)</sup>	9.06	7.64
12	Sep-09	16.70	9.45 <sup>(e)</sup>	9.45	7.25
13	Mar-10	16.70	8.93 <sup>(e)</sup>	8.93	7.77
14	Sep-10	16.70	9.50	9.65	7.05
15	Mar-11	16.70	9.05	9.04	7.65
16	Sep-11	16.70	9.75	9.74	6.95
17	Mar-12	16.70	9.33	NP	7.35
18	Sep-12	16.70	NM	9.69	NM
19	Mar-13	16.70	NM	9.99	NM
20	Sep-13	16.70	11.60	9.99	5.10
21	Mar-14	16.70	9.13	9.99	7.57
22	Sep-14	16.70	11.10	11.09	5.60
23	Mar-15	16.70	9.67	11.09	7.03
24	Sep-15	16.70	9.69	11.09	7.01
25	Mar-16	16.70	9.29	9.29	7.41
26	Sep-16	16.70	9.90	NA	6.80
27	Mar-17	16.70	8.81	8.80	7.89

Notes:

The 1988, 1989, and 1991 water elevations were measured by Groundwater Technology, Inc.

The 2004 and 2006 water elevations were measured by PES Environmental.

NS = Not sampled

NP = No product

NM = Not measured/ Could Not Measure

NA = data not available from the previous consultant for this event

TOC Elevation = Top of Casing Elevation

DTW = Depth to water from the top of the casing

DTP = Depth to product from the top of the casing

GW Elevation - Groundwater elevation as compared to mean sea level

<sup>(a)</sup> Wells resurveyed in May 1989

<sup>(b)</sup> New elevation recorded by PES. Date of survey unclear.

<sup>(c)</sup> Wells resurveyed by PES in April 2007

<sup>(d)</sup> no water level data available for the December 2006 sampling event

<sup>(e)</sup> Thickness of product interfered with determining oil/water interface.

<sup>(f)</sup> Depth to groundwater = depth to free product as difference could not be determined

## **APPENDIX E**

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### **Historical Product Extraction Data Table**



**Historical Trench and Monitoring Well Product Recovery, 6400 Christie Avenue, Emeryville, CA**

Extraction Date	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-E	RW-1	TA-E	TA-M	TA-W	TB-E	TB-M	TB-W	TC-E	TC-M	TC-W	Total Extracted
Apr-04	---	---	---	---	---	1.00	---	1.00	---	---	---	---	---	---	---	---	---	19.75	---	---	---	---	---	---	---	---	---	21.75
May-04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	22.5	---	---	---	---	---	---	---	---	---	22.50
Sep-04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.74	---	---	---	---	---	---	---	---	---	0.74
Oct-04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.22	---	---	---	---	---	---	---	---	---	0.00
<b>2004 Total</b>																												<b>44.99</b>
Jan-05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.00
Apr-06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3.3	---	---	---	---	---	3.30
Jun-06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	8.9	9.2	10.3	---	---	---	---	---	---	28.40
Jul-06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3.6	5	5.3	---	---	---	---	---	---	13.90
Aug-06	---	---	---	---	---	0.8	---	0.8	---	---	1	0.2	0.2	---	---	---	---	---	0.2	0.2	0.4	---	---	---	---	---	---	3.80
Sep-06	---	---	---	---	---	---	---	0.8	---	---	0.2	0.3	---	---	---	---	---	---	0.6	---	0.6	---	---	---	---	---	---	2.50
Nov-06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.2	---	---	---	---	---	---	---	---	0.20
Dec-06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.2	---	---	---	---	---	---	---	---	0.20
<b>2006 Total</b>																												<b>52.30</b>
Jan-07	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.2	---	---	---	---	---	---	---	---	0.20
Feb-07	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.2	---	---	---	---	---	---	---	---	0.20
Mar-07	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.2	---	---	---	---	---	---	---	---	0.20
Nov-07	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.81	0.68	---	---	---	0.63	---	---	2.12
Dec-07	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.01	0.61	0.07	---	---	---	0.002	---	---	0.69
<b>2007 Total</b>																												<b>3.41</b>
Feb-08	0.03	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.45	0.08	0.06	0.18	0.04	0.06	0.06	0.08	0.05	0.05	1.14
Feb-08	---	---	0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.45	0.15	0.15	0.30	---	---	---	---	---	---	1.10
Mar-08	---	---	---	0.02	0.002	0.02	0.001	0.04	0.02	0.03	0.004	0.01	0.02	0.01	0.01	0.003	0.012	0.3	0.09	0.06	0.09	---	---	---	0.06	---	0.80	
Mar-08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.002	0.008	---	---	---	---	---	---	0.01
May-08	0.09	---	---	---	---	---	---	0.075	---	0.075	0.019	0.009	---	---	0.13	---	---	1.397	0.866	1.466	1.431	---	---	---	---	---	5.56	
Jun-08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.15	0.11	0.57	---	---	---	---	---	0.83	
Aug-08	0.12	---	---	---	---	---	---	0.048	---	0.024	0.009	---	---	---	---	---	---	0.75	0.9	1.6	0.7	0.3	0.3	---	0.15	---	4.90	
Sep-08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.03	0.09	0.048	---	---	---	---	---	0.17	
Nov-08	0.078	---	---	---	---	0.009	---	---	---	0.06	0.009	---	---	0.003	0.06	---	---	0.6	0.1	0.03	---	0.06	0.06	0.06	0.06	0.09	0.09	1.37
Dec-08	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.0003	0.08	---	---	---	---	0.03	---	---	0.11
<b>2008 Total</b>																												<b>14.99</b>
Mar-09	0.279	---	---	---	---	0.378	---	0.369	---	0.261	0.007	0.023	0.117	---	0.342	---	0.023	1.800	0.750	0.950	1.010	0.153	0.153	0.153	0.653	0.153	0.153	7.73
Jun-09	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.5	---	---	---	---	---	---	---	---	0.50
Sep-09	0.286	---	---	---	0.022	0.418	---	0.176	0.308	0.176	0.088	0.007	0.176	0.088	0.176	0.022	0.066	7.15	1.4	1.1	1.2	1.1	1.1	1.1	1.1	1.1	19.46	
Dec-09	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0	0.9	0.06	---	---	---	0	---	---	0.96
<b>2009 Total</b>																												<b>28.65</b>
Mar-10	0.14	---	---	---	0.01	0.18	0.02	0.60	---	0.60	0.03	0.10	0.69	0.04	0.30	0.02	---	8.00	1.30	1.00	1.00	0.50	1.00	0.50	1.00	1.00	1.00	19.03
Jun-10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.75	---	---	---	---	---	---	---	0.75
Sep-10	0.3	0.2	0.4	0.5	0.01	0.5	0.01	0.5	---	1.6	0.02	0.01	1.5	0.02	1.0	0.02	0.1	6.9	1.00	1.00	1.00	0.3	0.3	0.4	1.00	0.5	0.5	19.59
Dec-10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.10	0.00	0.05	---	---	---	0.00	---	---	0.15
<b>2010 Total</b>																												<b>39.52</b>
Mar-11	---	---	---	---	---	0.002	---	0.002	---	---	---	0.002	---	---	0.003	---	---	0.002	0.06	0.06	0.02	---	---	---	0	---	---	0.15
Sep-11	0.2	---	---	---	---	0.3	---	---	---	---	0.2	---	---	0.1	---	---	---	0.5	---	0.45	0.25	0.1	0.1	0.1	---	0.1	0.1	2.50
<b>2011 Total</b>																												<b>2.65</b>
Mar-12	0.015	---	---	---	---	0.015	---	---	---	---	0.06	---	---	---	0.01	---	---	0.06	0.13	0.03	0.015	---	0.01	---	---	0.015	0.015	0.375
Sep-12	---	---	---	---	---	0.03	---	0.023	---	---	0.08	---	---	---	---	---	0.015	0.06	0.045	0.08	0.09	---	---	---	---	---	---	0.423
<b>2012 Total</b>																												<b>0.798</b>
Mar-13	0.06	---	---	---	---	0.08	---	0.015	---	---	0.08	---	---	---	---	---	0.01	0.06	0.05	0.12	0.07	---	---	---	0.03	0.03	0.03	0.635
Sep-13	0.06	---	---	---	---	0.02	---	0.05	---	---	---	---	---	---	---	---	0.02	0.06	0.02	0.02	0.02	---	---	---	0.01	0.02	0.02	0.320
<b>2013 Total</b>																												<b>0.955</b>
Mar-14	0.08	---	---	---	---	---	---	0.023	---	---	---	---	---	0.015	---	---	0.01	0.09	0.03	0.03	0.015	---	---	---	0.015	0.015	0.015	0.338
Sep-14	---	---	---	---	---	---	---	0.031	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.031
<b>2014 Total</b>																												<b>0.369</b>
Mar-15	---	---	---	---	---	---	---	0.031	---	---	---	---	---	---	---	---	0.0078	0.0078	0.031	0.0228	0.0228	---	---	---	---	---	---	0.123
Sep-15	0.015	---	---	---	---	0.015	---	0.0078	---	---	---	---	---	---	---	---	---	0.015	---	---	---	---	---	---	---	---	---	0.053
<b>2015 Total</b>																												<b>0.176</b>
Mar-16	---	---	---	---	---	---	---	0.008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.008
Sep-16	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.008	---	---	---	---	---	---	---	---	---	0.008
<b>2016 Total</b>																												<b>0.016</b>
<b>Total Extracted</b>	<b>1.74</b>	<b>0.00</b>	<b>0.40</b>	<b>0.50</b>	<b>0.04</b>	<b>3.75</b>	<b>0.03</b>	<b>4.62</b>	<b>0.31</b>	<b>2.72</b>	<b>0.61</b>	<b>0.16</b>	<b>2.50</b>	<b>0.28</b>	<b>1.89</b>	<b>0.06</b>	<b>0.26</b>	<b>76.85</b>	<b>22.03</b>	<b>25.96</b>	<b>28.80</b>	<b>2.51</b>	<b>3.02</b>	<b>2.31</b>	<b>4.83</b>	<b>3.08</b>	<b>3.08</b>	<b>194.94</b>

Note: All free product quantities presented in gallons  
 Product extraction events conducted before November 2007 were completed by PES Environmental  
 46 gallons removed from trench wells by PES between April 2006 and March 2007  
 About 30 of that was re-gallons removed from trench wells by PES between April 2006 and March 2008  
 The majori gallons removed from trench wells by PES between April 2006 and March 2009  
 Depth to w:gallons removed from trench wells by PES between April 2006 and March 2010