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# FIRST SEMIANNUAL 2015 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**

**June 2015**

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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**

**June 8, 2015**

Project No. 2007-65

STELLAR
ENVIRONMENTAL SOLUTIONS, INC.
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GEOSCIENCE & ENGINEERING CONSULTING

June 8, 2015

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 2015 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 April 2015 at the referenced site. This report is being submitted on behalf of the owner and Responsible Party, Emerybay Commercial Association. The subject site activities since the beginning of 2015included a surfactant injection into selected wells, a product extraction event and the first semiannual 2015 groundwater monitoring event.

This report summarizes the 23nd sampling event conducted at the site since 1988. The bulk of the residual contamination beneath the site remains concentrated around wells MW-8, MM-10, MW-12, MW-13, MW-14 and MW-15, 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

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

## 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.

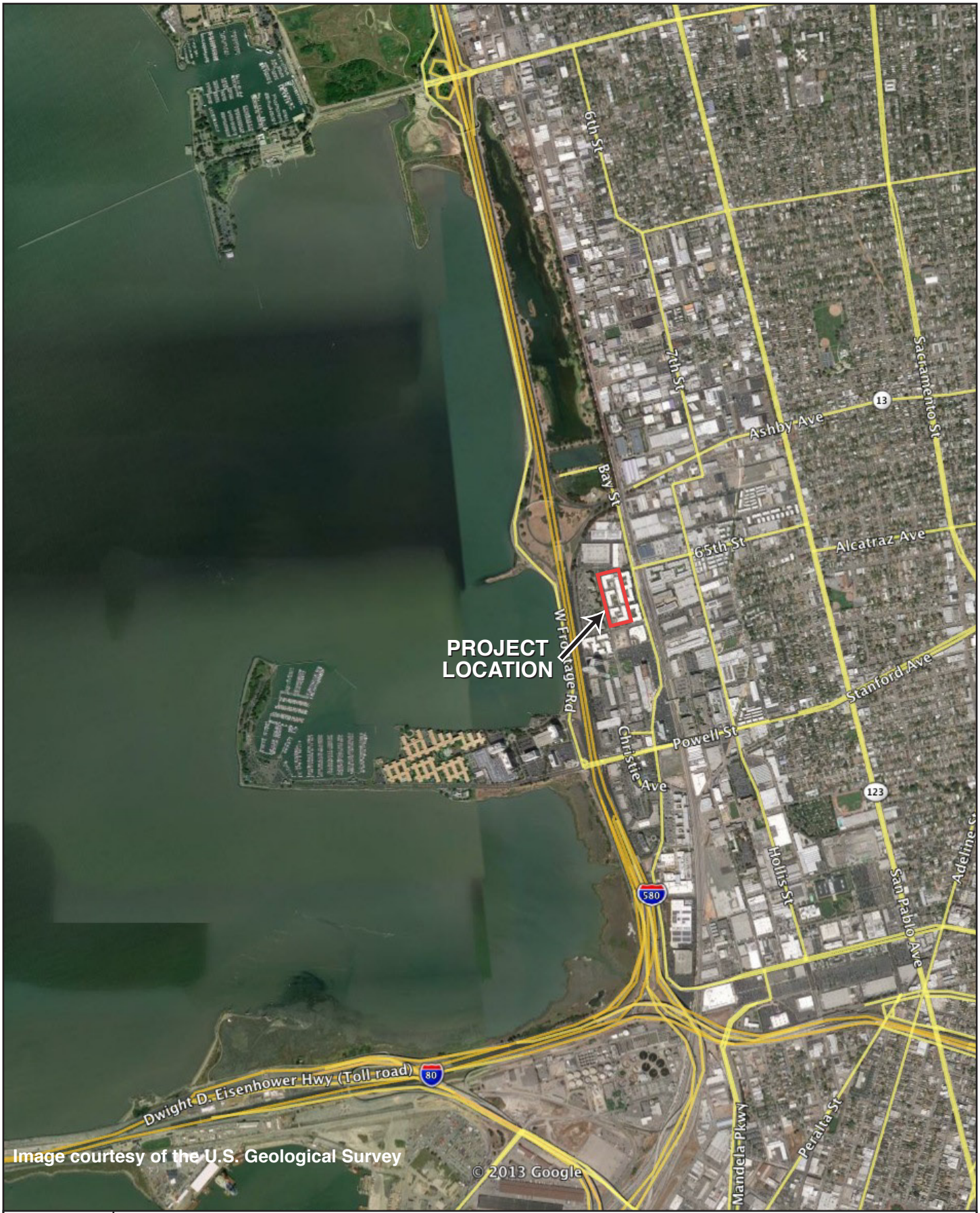
## SITE AND VICINITY DESCRIPTION

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$^{th}$ Street, beyond Christie Avenue and to the west by the Bay Center Offices, and to the south by 64$^{th}$ 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.

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# SITE LOCATION ON AERIAL PHOTO

6400 Christie Ave.
Emeryville, CA

By: MJC | JUNE 2015

Figure 1

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2007-65-01


# SITE PLAN AND ADJACENT LAND USE

| | | | |
|---|---|---|---|
| N | 6400 Christie Ave.<br>Emeryville, CA | By: MJC | JUNE 2015 |
| | | Figure 2 | |

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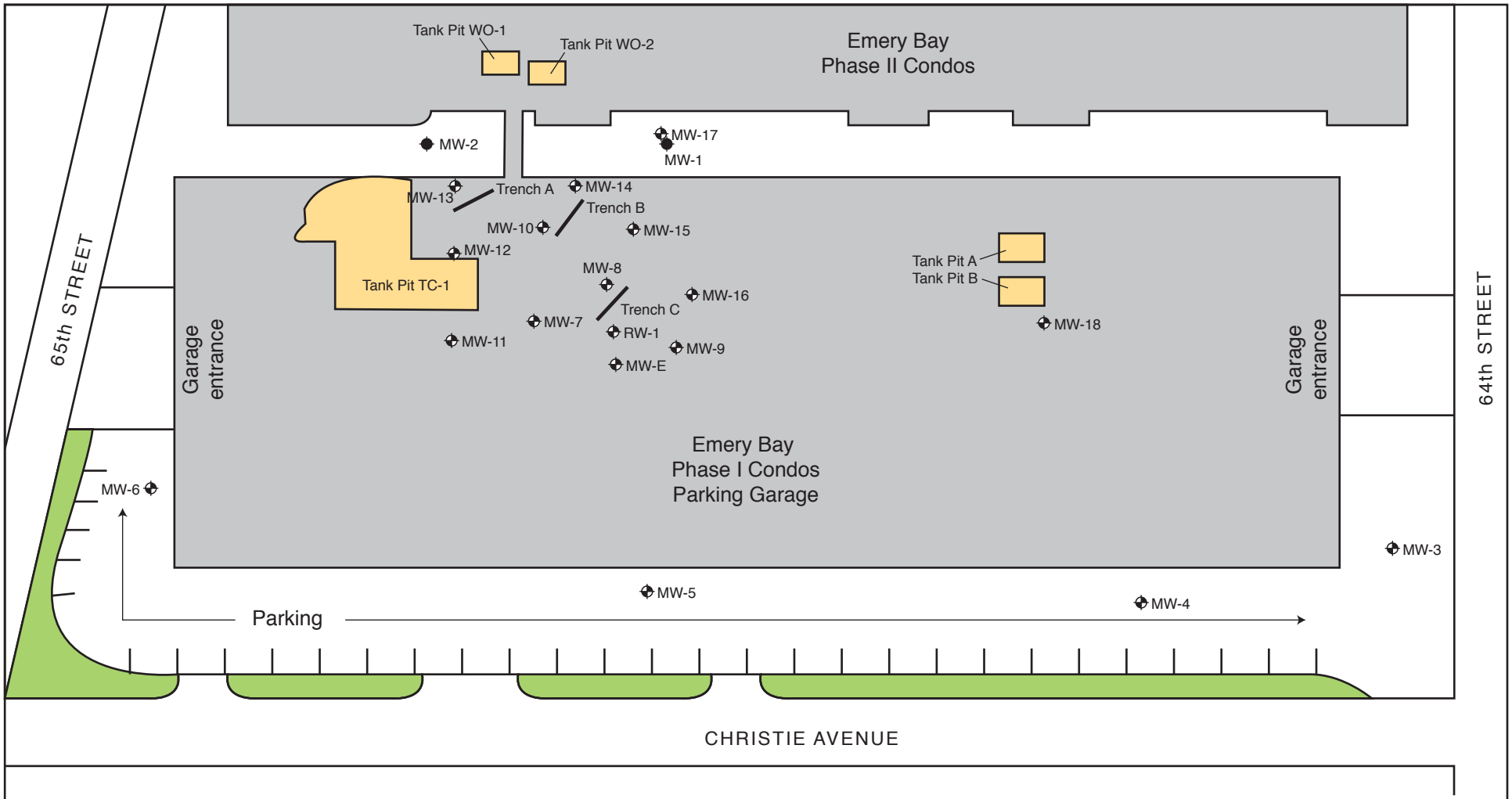
2007-65-80

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 (former location of seven UFSTs) 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




**LEGEND**

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

0 60

SCALE: 1/2" = 60 FEET

N

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# MONITORING WELL AND TRENCH LOCATIONS

## 6400 Christie Ave., Emeryville, CA

**Figure 3**

by: MJC | JUNE 2015

2007-65-02

(Stellar 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$^{th}$ Street, south of the subject property garage area.

The impact of 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 hydochemical impact, as documented in well data described in later sections had been 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 on the southern property line 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 that was impacting well MW-3. However the plume appears to have stabilized since the cessation of construction dewatering at the site across 64$^{th}$ Street along with the product recovery efforts in the garage area. That groundwater flow direction and plume geometry has now reverted to the pre-pumping groundwater regime. TVHg and TEHd concentrations in well MW-3 have decreased since the November 2014 monitoring event.

## OBJECTIVES AND SCOPE OF WORK

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

- Introduction of a hydrocarbon emulsifying surfactant into wells MW-3, MW-8, MW-10, MW-12, MW-13, MW-18 and MW-E in February, 2015 with the goal of capturing the viscous hydrocarbon layer around these wells and cleaning the wells screens to reduce the accumulated heavy product fraction.
- Active extraction on all groundwater monitoring wells, trench sump wells, and recovery well RW-1.

- Record water levels in site wells to determine groundwater flow direction.
- Sampling of site wells for contaminant analysis.
- 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. SLT2O05561 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 as documented in the 2014 monitoring events.

# 2.0 PHYSICAL SETTING

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$^{th}$, and 65$^{th}$ 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

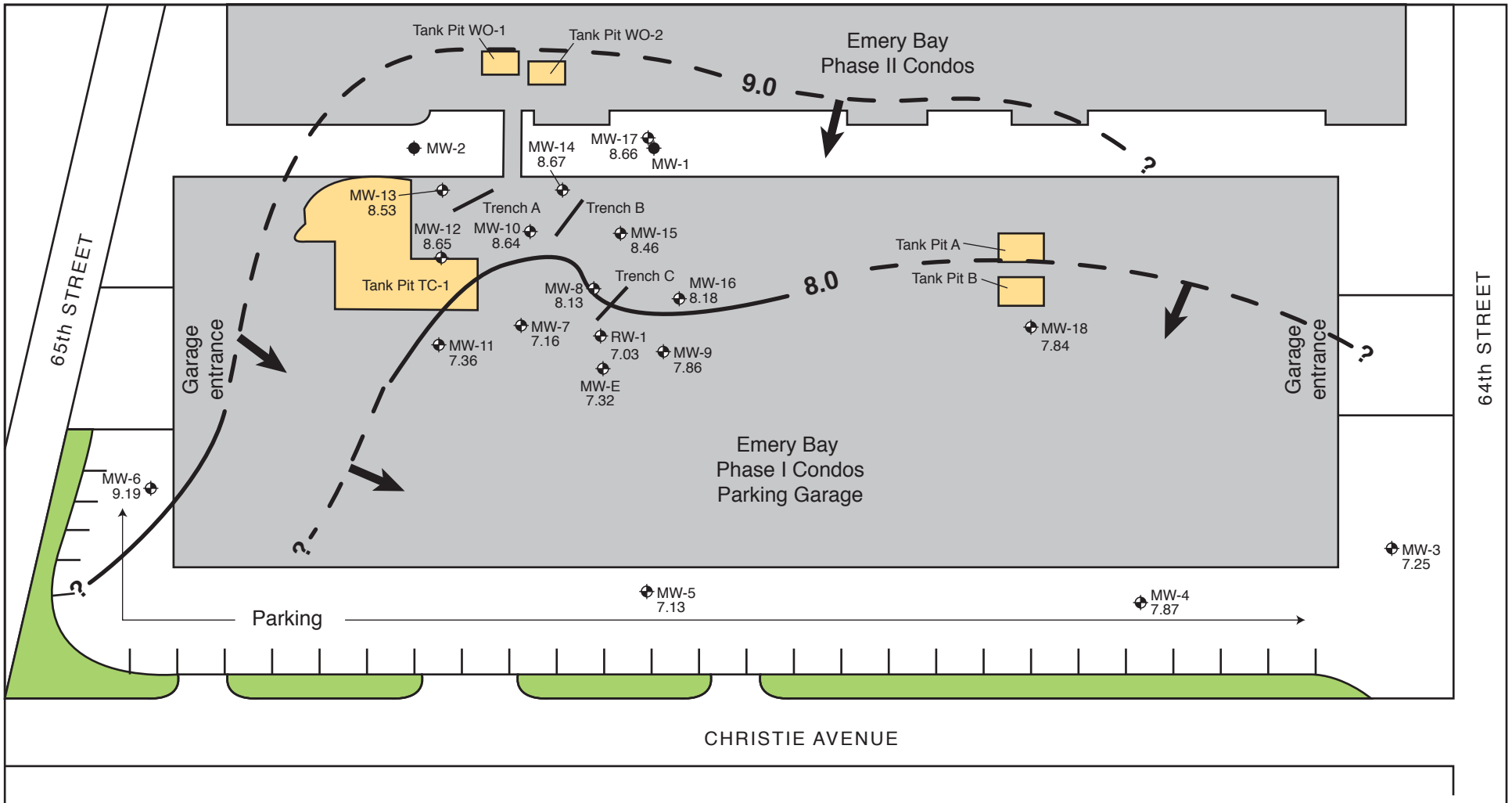
fault zone, the legislatively defined zone of restricted land use 200 feet around an active fault due to the high probability of ground rupture.

## 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 March 2015 monitoring event was generally towards the west-southwest. 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$^{th}$ 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 7.5 to 10.5 feet below ground surface (bgs). Groundwater elevations recorded during the last monitoring event in September 2014, ranged from 5.6 feet (RW-1) to 10.79 feet (MW-18) above mean sea level. For this "spring" monitoring event of March 2015, groundwater elevations ranged from 7.03 feet (RW-1) to 9.19 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
- NM = Not measured
- Historical tank pit area
- Landscaping
- Groundwater elevation contour in feet amsl
- Extrapolated groundwater elevation contour
- Groundwater flow direction

0 60

SCALE: 1/2" = 60 FEET

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# MONITORING WELL AND TRENCH LOCATIONS

## 6400 Christie Ave., Emeryville, CA

**Figure 4**

by: MJC | JUNE 2015

2007-65-93

# 3.0 MARCH 2015 GROUNDWATER MONITORING AND SAMPLING ACTIVITIES

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 all 18 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.

## CURRENT MONITORING EVENT

Blaine Tech Services conducted groundwater monitoring well level measurements, purging, sampling, and field analyses on March 30 and April 3, 2015 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

## March 30, 2015
## 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 [(a)] | Depth to Free Product (TOC) | Thickness of Free Product (feet) | Groundwater Elevation (March 30, 2015) |
|---|---|---|---|---|---|---|
| MW-3 | 25 | 5 to 20 | 16.65 | 9.35 | 0.05 | 7.25 |
| MW-4 | 25 | 5 to 20 | 16.29 | NP | NP | 7.87 |
| MW-5 | 25 | 5 to 20 | 16.72 | NP | NP | 7.13 |
| MW-6 | 25 | 5 to 20 | 16.82 | NP | NP | 9.19 |
| MW-7 | 20 | 5 to 20 | 17.73 | NP | NP | 7.16 |
| MW-8 | 16 | 5 to 16 | 17.84 | 9.47 | 0.24 | 8.13 |
| MW-9 | 20 | 5 to 20 | 17.84 | NP | NP | 7.65 |
| MW-10 | 20 | 5 to 20 | 17.83 | 9.16 | 0.03 | 8.64 |
| MW-11 | 20 | 5 to 20 | 17.76 | 10.39 | 0.01 | 7.36 |
| MW-12 | 20 | 5 to 20 | 17.83 | NP | NP | 8.65 |
| MW-13 | 20 | 5 to 20 | 17.66 | 9.12 | 0.01 | 8.53 |
| MW-14 | 20 | 5 to 20 | 17.60 | NP | NP | 8.67 |
| MW-15 | 20 | 5 to 20 | 17.80 | 9.33 | 0.01 | 8.46 |
| MW-16 | 20 | 5 to 20 | 17.74 | NP | NP | 8.18 |
| MW-17 | 20 | 5 to 20 | 18.17 | NP | NP | 8.66 |
| MW-18 | 20 | 5 to 20 | 16.35 | NP | NP | 7.84 |
| MW-E | 47 | 7 to 40 | 17.47 | NP | NP | 7.32 |
| RW-1 | 30 | unknown | 16.70 | NM | NM | 7.03 |
| 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.

Approximately 1,050 gallons of water and 0.083 gallons of product were removed/purged from wells during the active product removal on March 26 and 27, 2015; The water generated during the active product and water removal was stored in a 1,100 gallon, plastic above ground storage tank locate in the fenced compound.

On April 21, 2015, Safety Kleen Corporation vacuumed and transported the 1,050 gallons of water to Seaport Refining and Environmental, LLC under manifest number 48039 (EPA ID No. CAL000374146). Appendix F contains copies of the manifest and recycling certificate.

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

This section presents the analytical results of the most recent monitoring event and summarizes the relevant regulatory considerations. Appendix C contains the certified analytical laboratory report and chain-of-custody record.

## 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. The basin is shallow in this area, with depths of less than 300 feet. Groundwater in this area is 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, 2013), 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 contaminant analytical results of the current monitoring event samples.

**Table 2**
**Groundwater Sample Analytical Results – March 30 and April 3, 2015**
**6400 Christie Avenue, Emeryville, California**

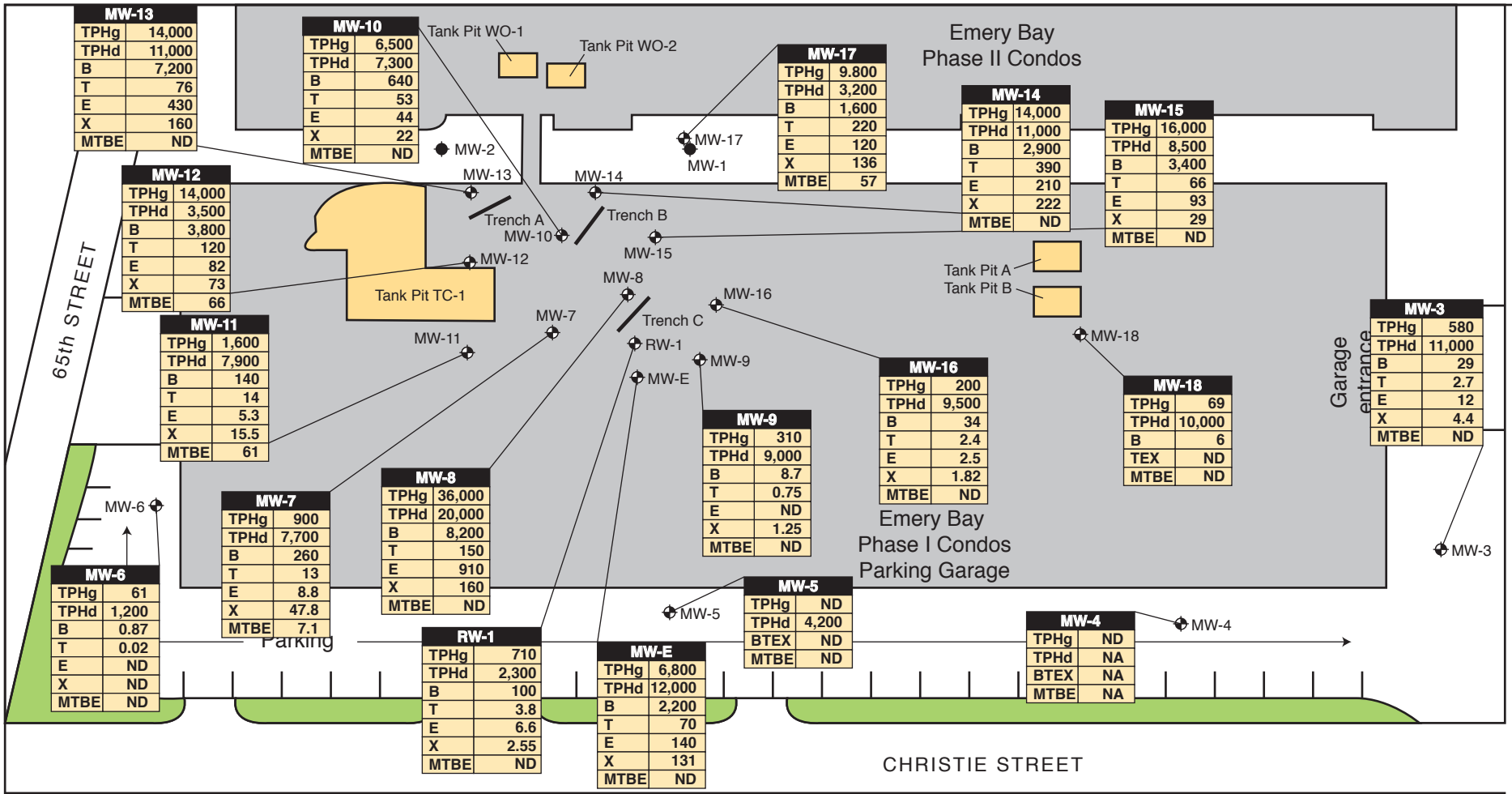
| Well ID | Analytical Results | | | | | | |
|---|---|---|---|---|---|---|---|
| | TPHg | TPHd | Benzene | Toluene | Ethyl-benzene | Total Xylenes | MTBE |
| MW-3 | **580** | **11,000** | 29 | 2.7 | 12 | 4.4 | <2.0 |
| MW-4 | NA | NA | NA | NA | NA | NA | NA |
| MW-5 | <50 | **4,200** | <0.5 | <0.5 | <0.5 | <0.5 | <2.0 |
| MW-6 | 61 | **1,200** | 0.87 | 0.62 | <0.5 | <0.5 | < 2.0 |
| MW-7 | **900** | **7,700** | **260** | 13 | 8.8 | **47.8** | 7.1 |
| MW-8 | **36,000** | **20,000** | **8,200** | **150** | **910** | **160** | <170 |
| MW-9 | 310 | **9,000** | 8.7 | 0.75 | <0.5 | <0.5 | <2.0 |
| MW-10 | **6,500** | **7,300** | **640** | 53 | **44** | 22 | <67 |
| MW-11 | **1,600** | **7,900** | **140** | 14 | 5.3 | 15.5 | 61 |
| MW-12 | **14,000** | **3,500** | **3,800** | 120 | **82** | **73** | 66 |
| MW-13 | **14,000** | **11,000** | **2,200** | 76 | **430** | **160** | <100 |
| MW-14 | **14,000** | **11,000** | **2,900** | **390** | **210** | **222** | <100 |
| MW-15 | **16,000** | **8,500** | **3,400** | 66 | **93** | **29** | <100 |
| MW-16 | 200 | **9,500** | 34 | 2.4 | 2.5 | 1.82 | <2.0 |
| MW-17 | **9,800** | **3,200** | **1,600** | **220** | **120** | **136** | 57 |
| MW-18 | 69 | **10,000** | 6 | <0.5 | <0.5 | <0.5 | <2.0 |
| MW-E | **6,800** | **12,000** | **2,200** | 70 | **140** | **131** | <67 |
| RW-1 | **710** | **2,300** | 100 | 3.8 | 6.6 | 2.55 | <2.0 |
| **ESLs [(a)]** | **100 / 500** | **100 / 640** | **1.0 / 46** | **40 / 130** | **30 / 43** | **20 / 100** | **5.0 / 1,800** |

Notes:

[(a)] Water Board Environmental Screening Levels for residential sites where groundwater *is*/*is not* a drinking water resource (Water Board, 2013).

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.




**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 ($\mu$g/L)

0 60

SCALE: 1/2" = 60 FEET

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STELLAR ENVIRONMENTAL SOLUTIONS, INC
GEOSCIENCE & ENGINEERING CONSULTING

# GROUNDWATER MONITORING WELL ANALYTICAL RESULTS – Q1, 2015
## 6400 Christie Ave., Emeryville, CA

**Figure 5**

by: MJC | JUNE 2015

2007-65-92

**Distribution of Hydrocarbon Contaminants**

For the current sampling event, several wells have hydrocarbon concentrations greatly in excess of the 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 (see Section 5) into the trench and selected monitoring wells with the aim of reducing accumulated LNAPL in those wells is likely to affect dissolved concentrations.

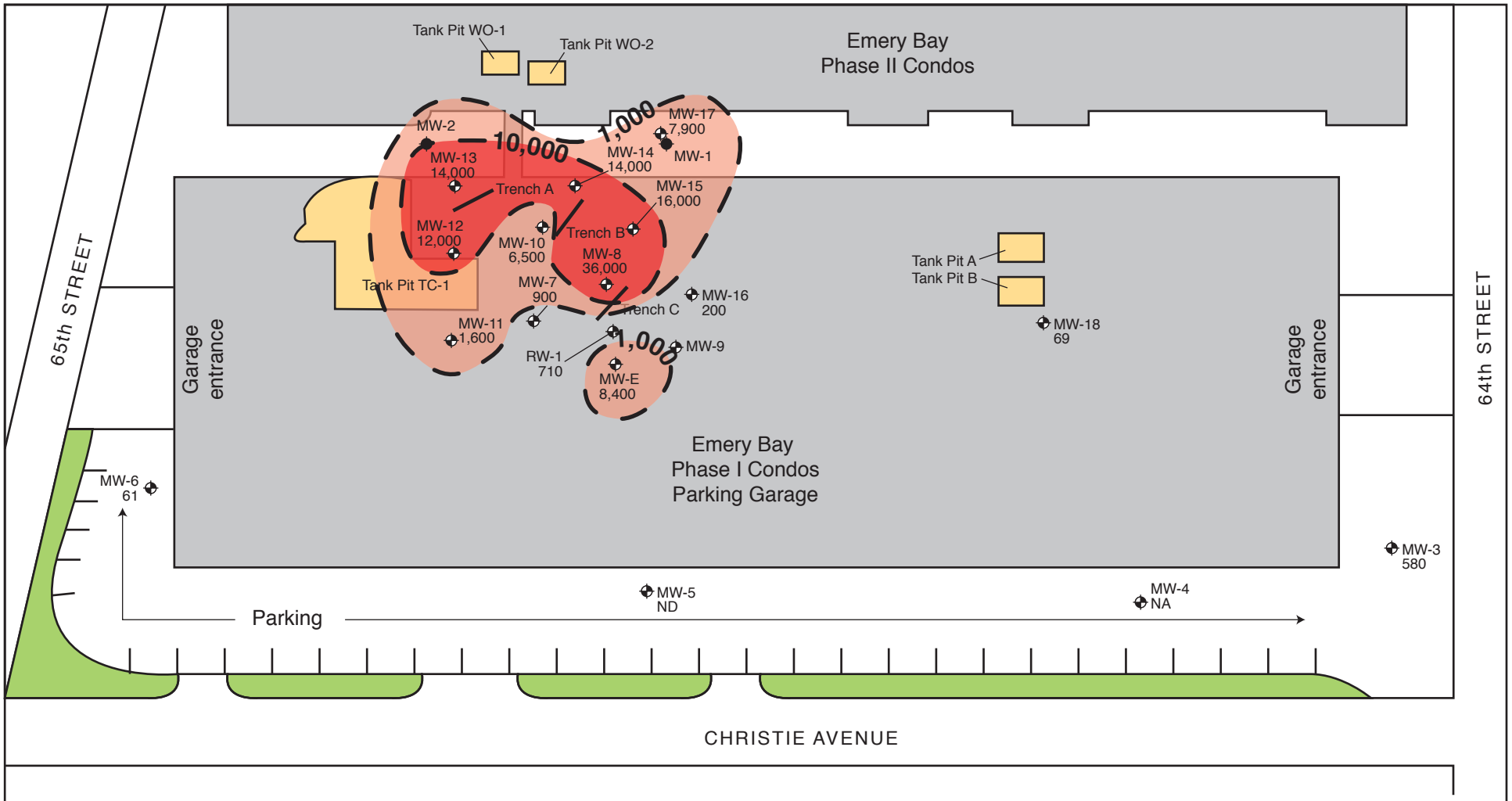
Increases in March 30 and April 3, 2015 TVHg concentrations compared to the March 2014 monitoring event were observed in wells MW-3, MW-6, MW-8, MW-9, MW-10, MW-12, MW-14, MW-15, MW-16, MW-17 and RW-1. This represents eleven wells exhibiting an increase in TVHg as compared to five wells for the March 2014 sampling event. The remaining wells either remained below laboratory detection limits (in well MW-5) or exhibited a decrease in TVHg concentrations.

Gasoline was detected in MW-3, MW-7, MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-17, MW-E and RW-1 above the ESL where groundwater is not a likely drinking water resource (500 micrograms per liter [µg/L]). Gasoline was also detected in MW-6, MW-9, MW-16, MW-18 and RW-1, but at concentrations below the ESL. MW-4 was inaccessible, so not sampled.

Diesel was detected in all site wells (except MW-4) above the ESL of 640 µg/L (where groundwater is not a likely drinking water resource), but showed a decrease in concentration in 4 of the 18 wells sampled as compared to 16 of 18 wells in the March 2014 sampling event.

The highest concentrations of TVHg (36,000 µg/L in MW-8) and TEHd (20,000 µg/L in MW-8) for the current event can be compared to concentrations of 23,000 µg/L TVHg in MW-8 and 19,000 µg/L TEHd observed in well MW-13 in March 2014. Concentrations of hydrocarbons in well MW-13 have decreased steadily since the September 2012 sampling event, with TVHg decreasing from 60,000 µg/L to 14,000 µg/L, and TEHd decreasing from 7,200,000 µg/L in 2012 to the current 11,000 µg/L. Concentrations of hydrocarbons in well MW-8 increased since the March 2012 sampling event, with TVHg increasing from 380 µg/L in 2012 to 36,000 µg/L for the current event, and TEHd increasing from 9,800 µg/L in 2012 to the current 20,000 µg/L.

Figures 6 and 7 are isoconcentration maps of TPHg and TEHd concentrations in groundwater based on the March 30 and April 3, 2015 analytical results.




**LEGEND**

- Monitoring well
- Monitoring well (presumed abandoned)
- Trench location
- Historical tank pit area
- Landscaping
- 1,000 Gasoline concentration contour

0 60

SCALE: 1/2" = 60 FEET

N

STELLAR ENVIRONMENTAL SOLUTIONS, INC
GEOSCIENCE & ENGINEERING CONSULTING

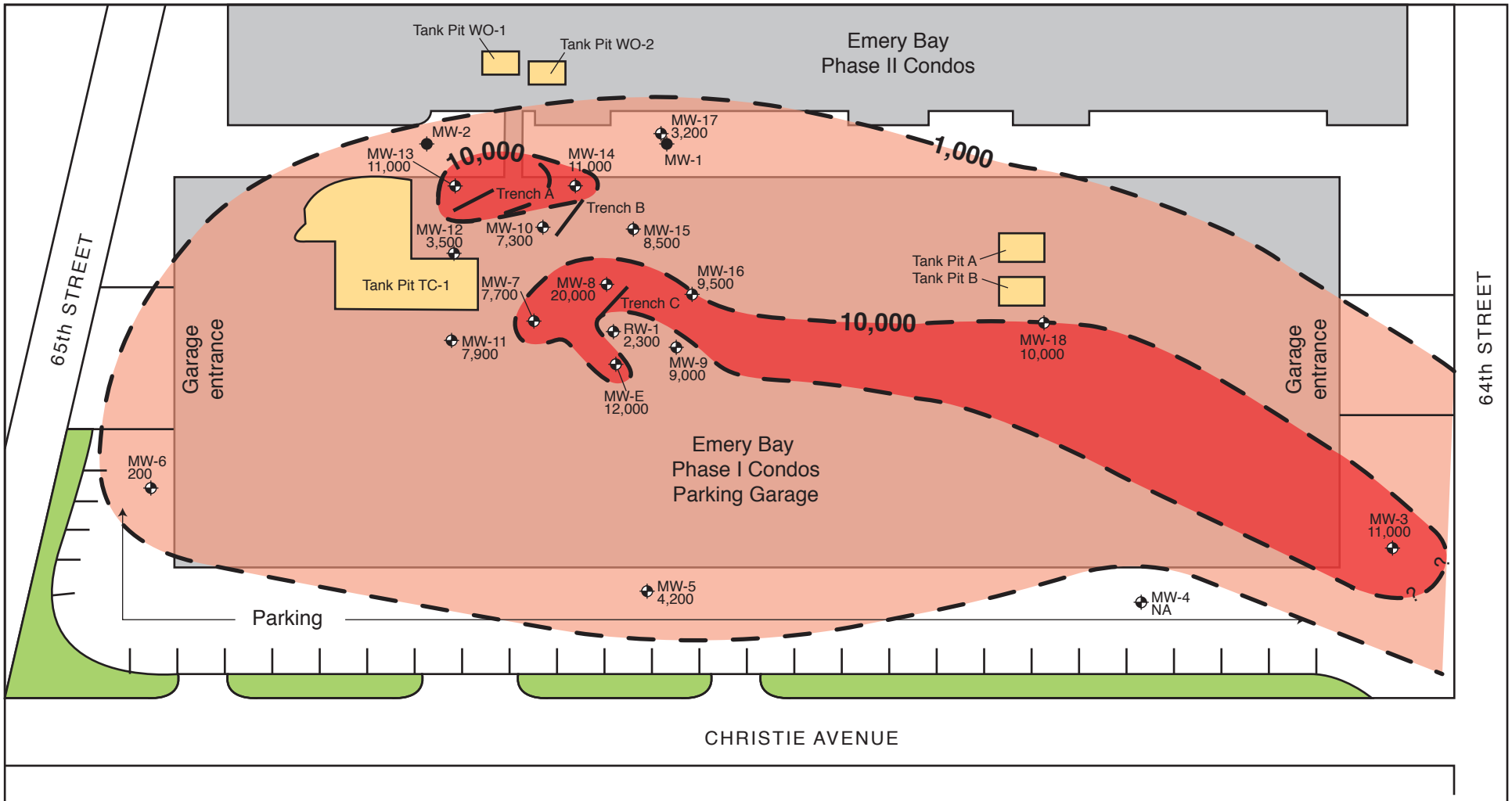
# TOTAL PETROLEUM HYDROCARBONS AS GASOLINE—Q1, 2015

## 6400 Christie Ave., Emeryville, CA

**Figure 6**

by: MJC | MAY 2015

2007-65-91




**LEGEND**

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

0 60

SCALE: 1/2" = 60 FEET

N

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# TOTAL PETROLEUM HYDROCARBONS AS DIESEL—Q1, 2015

## 6400 Christie Ave., Emeryville, CA

**Figure 7**

by: MJC | MAY 2015

2007-65-90

Since the introduction of the surfactant in wells MW-3 MW-8, MW-12, MW-13 and MW-14 and into all nine trench wells in 2014 and 2015, hydrocarbon concentrations in site wells have increased overall, while well MW-13 have shown decreases in overall hydrocarbon concentration. Fluctuating concentrations of TVHg and TEHd in these wells may be attributed to LNAPL recovery and introduction of surfactant since March 2013.

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

In monitoring wells MW-7, MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-17, and MW-E concentrations of benzene exceeded the ESL of 46 µg/L where groundwater is not a drinking water resource. Comparing March 2014 results to the current results showed a decrease in benzene in 7 of the 18 site wells sampled. An increase in benzene was detected in 9 of the 18 wells. Benzene was detected in wells MW-3, MW-6, MW-9, MW-16, MW-18 and RW-1, but at concentrations below the ESL. Perimeter wells MW-5 and MW-6, which in March 2014 contained concentrations of benzene at <0.05 µg/L and 0.81 µg/L benzene respectively, remain stable at < 0.5 µg/L and 0.87 µg/L respectively for the current event.

Toluene was detected at or above the ESL of 130 µg/L in monitoring wells MW-8, MW-14 and MW-17. Toluene was also detected in wells MW-3, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, 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-12, MW-13, MW-14, MW-15, MW-17 and MW-E. Ethylbenzene was also detected in MW-3, MW-7, MW-11, MW-16, and RW-1 but at levels below the ESL.

Total xylene concentrations in wells MW-7, MW-8, MW-12, MW-13, MW-14, MW-15, MW-17 and MW-E were above the 100-µg/L ESL where groundwater is not a likely drinking water resource. Total xylenes were detected in MW-3, MW-10, MW-11, MW-16 and RW-1 but below the ESL.

MTBE was not detected above the ESL of 1,800 µg/L in any of the monitoring wells. MTBE was detected in MW-7, MW-11, MW-12 and MW-17 but below the ESL.

**Quality Control Sample Analytical Results**

Laboratory quality control (QC) samples (e.g., method blanks, matrix spikes, surrogate spikes, etc.) were analyzed by the laboratory 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**
**Historical Groundwater Analytical Results**
**Total Petroleum Hydrocarbons as Diesel (TPHd)**
**Downgradient Wells MW-5 and MW-6**
**February 1991 - March 2015**

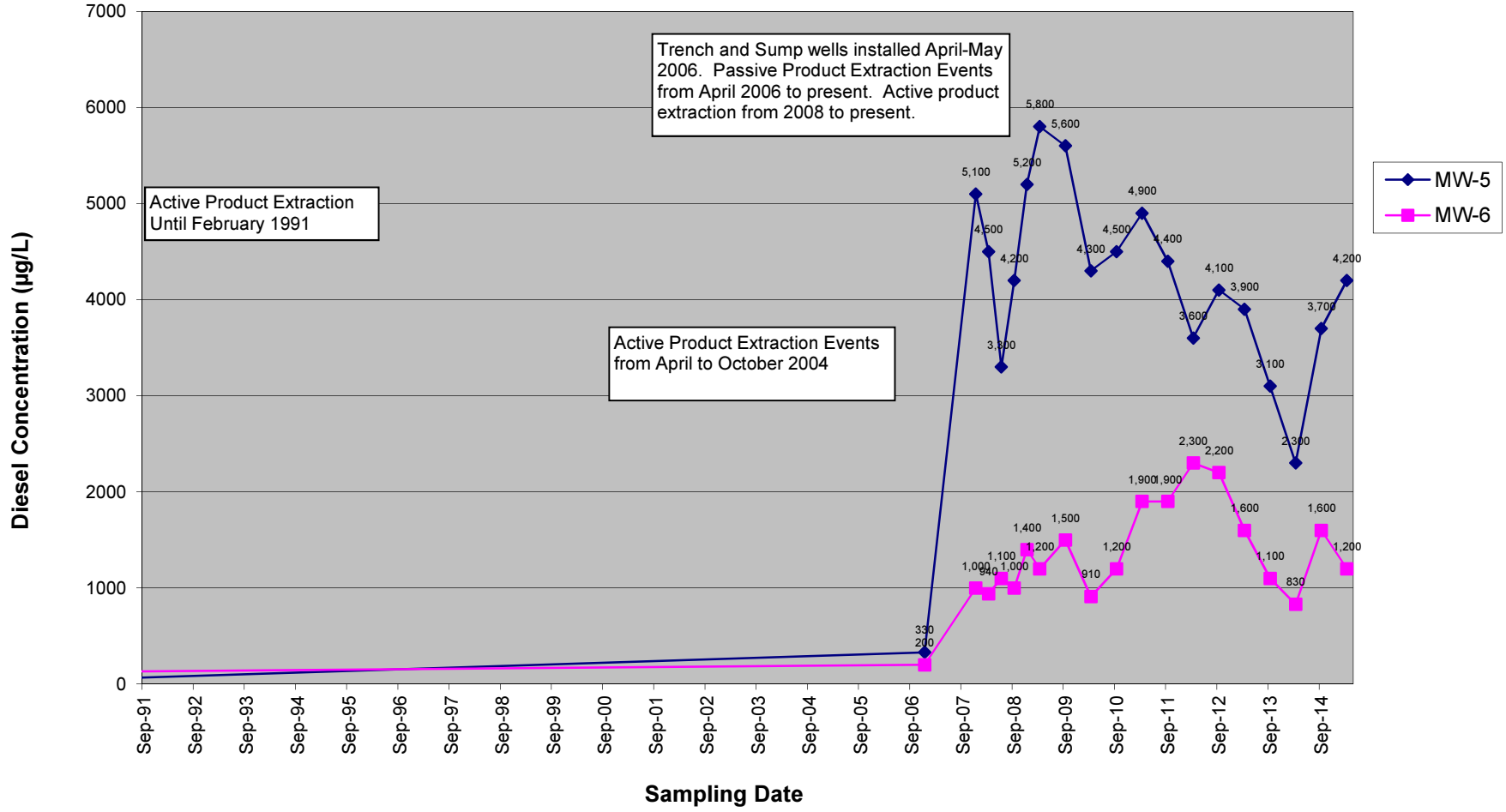


**Figure 9**
**Historical Groundwater Analytical Results**
**Total Petroleum Hydrocarbons as Diesel (TPHd)**
**Source Wells MW-11 and MW-12**
**December 2006 - March 2015**

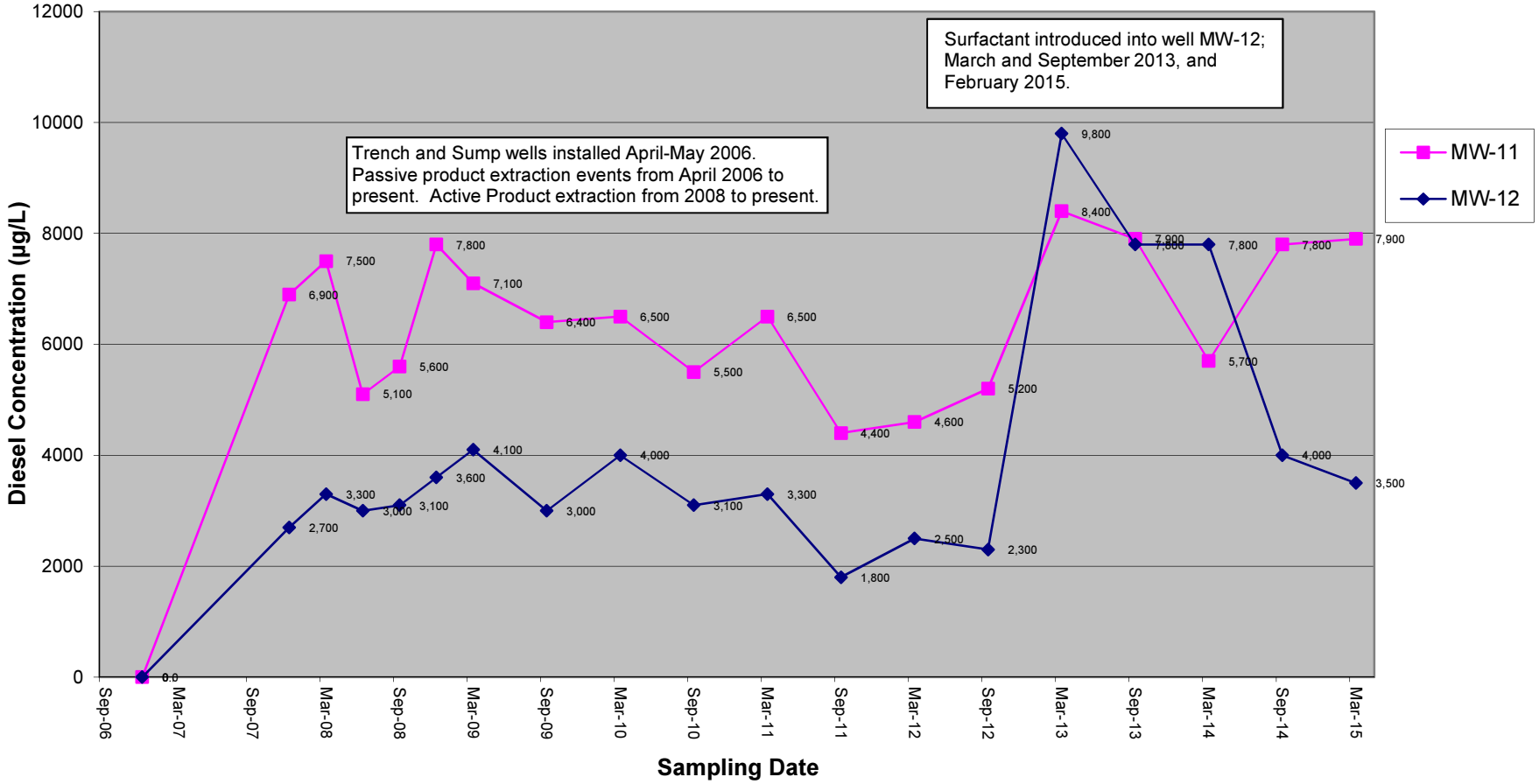
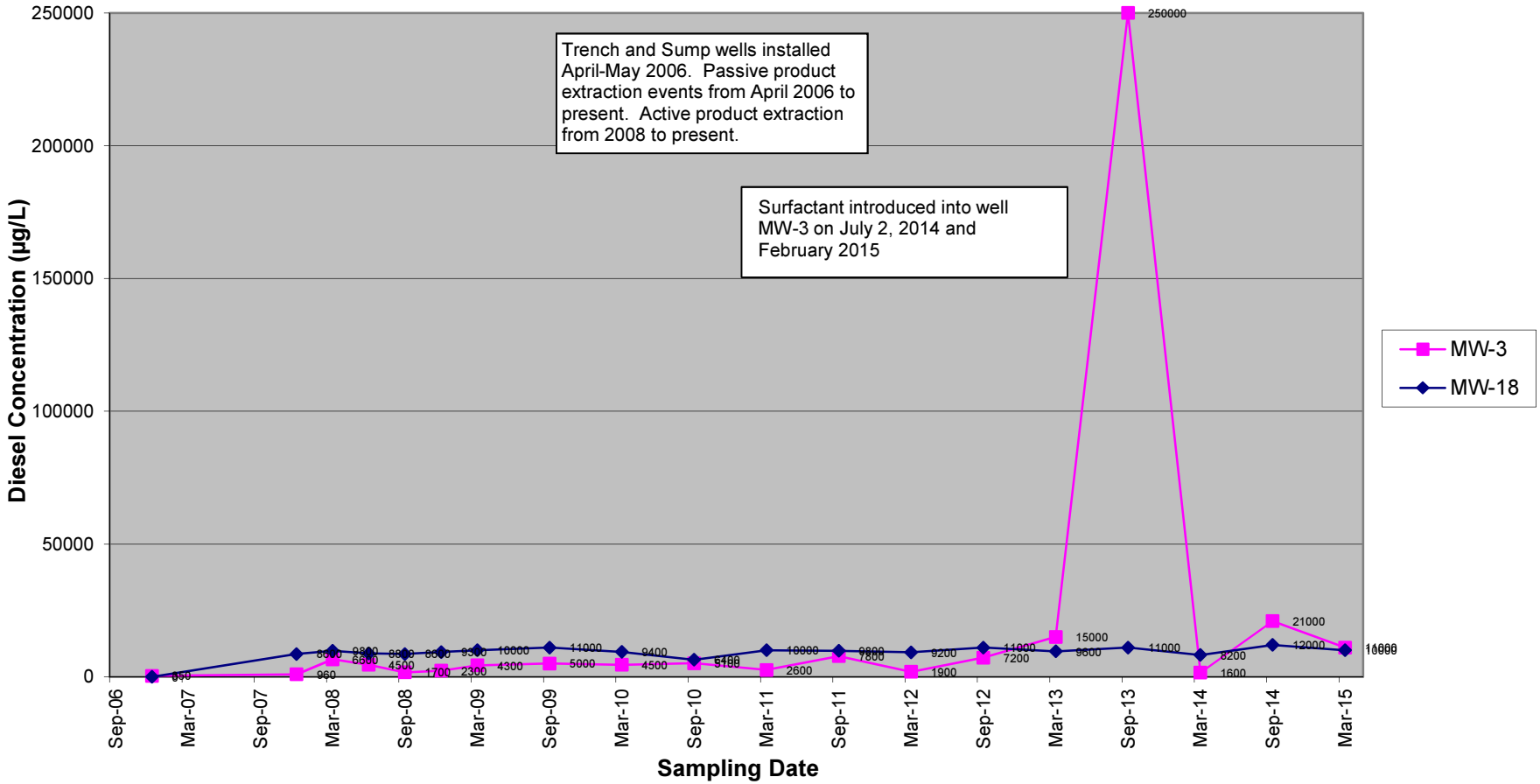


**Figure 10**
**Historical Groundwater Analytical Results**
**Total Petroleum Hydrocarbons as Diesel (TPHd)**
**Crossgradient Wells MW-3 and MW-18**
**December 2006 - March 2015**



# 5.0 FREE-PHASE HYDROCARBON PRODUCT REMEDIATION SYSTEM

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 26 and 27, 2015 (prior to the sampling event on March 30 and April 3, 2015). 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 (TA-W, TA-M, TA-E, TB-W, TB-M, TB-E, TC-W, TC-M, and TC-E) 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 (TC-E) in Trench C.

The 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 as of the past several monitoring events, have 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, 2015.

## 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 on 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 project mixed with water was reported as free-phase product recovery.

## 2013-2015 SURFACTANT INJECTIONS

Many of the centrally located wells and 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. Four of the worst wells in this regard are MW-3, MW-8, MW-10, MW-12, MW-13 and MW-14. All these wells are constructed with ¾-inch diameter PVC casing, and are screened to total depth across 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.

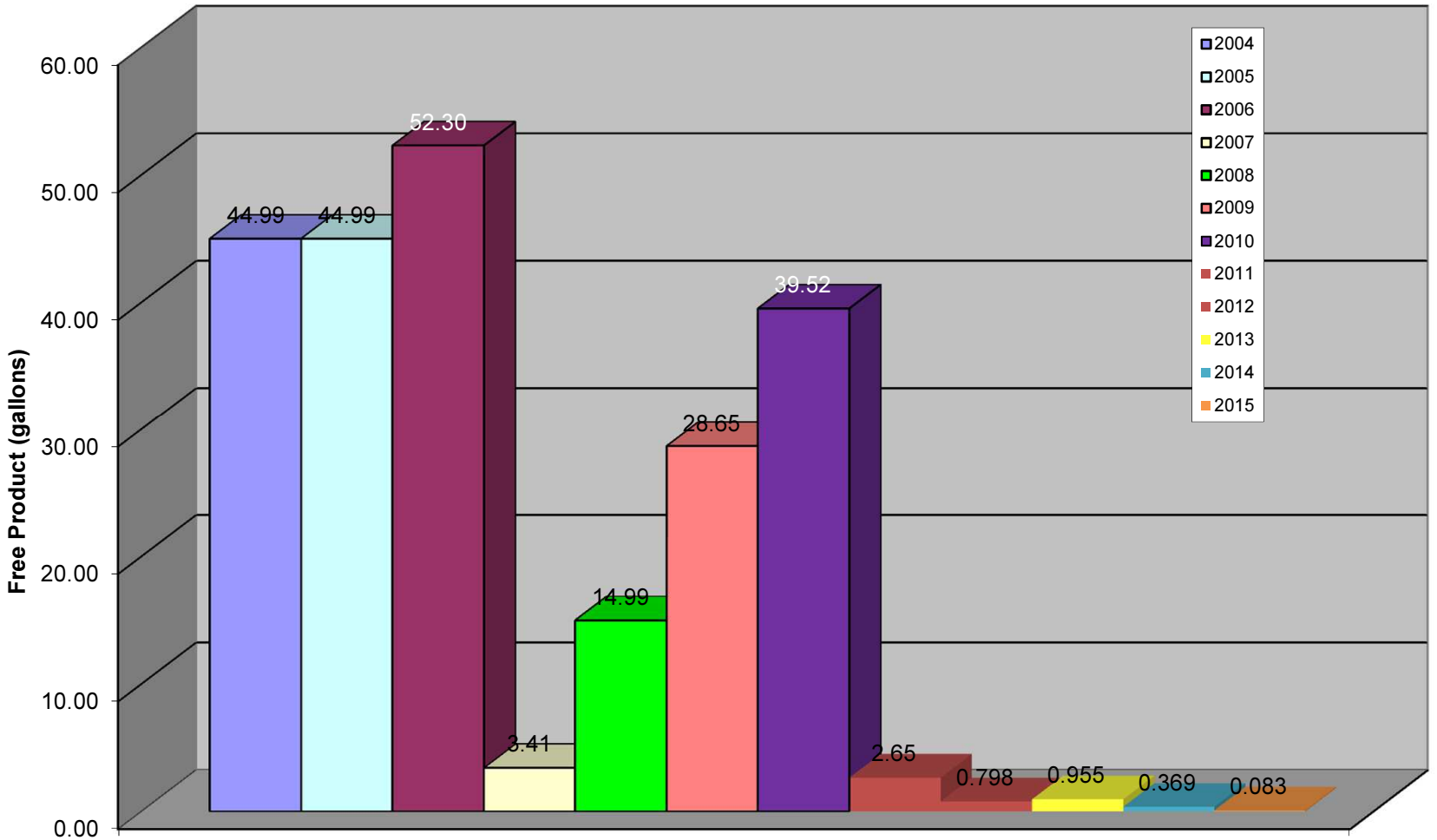
Surfactants are designed to change the interfacial tension between the water and NAPL and desorb the residual LNAPLs entrained in the soil matrix by micro-emulsifying the organic particles, and forming a micelle. In the case of weathered LNAPLs, surfactants have been used to decrease the viscosity of 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® supplied by Enviro Clean Services, LLC. EnviroClean® is described the manufacturer as a non-flammable, non-toxic, water-based, proprietary blend of non-toxic, non-ionic ethoxylated octylphenolic surfactants that has been specifically engineered as a cleanup/mitigation agent for a wide range of hydrocarbon products. EnviroClean® product information is included in Appendix F. A working solution of 4% EnviroClean® was mixed per manufacturer recommendations using clean water. Approximately 5 gallons of the solution was introduced each well using a funnel. 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® 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.

The most recent 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. 2 gallons of a 10% mixture and 5 gallons of a 15% solution was introduced into wells MW-10 and NMW-3 respectively, and swabbed.

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



## SEPTEMBER 2014 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 surfactant injection in early September 2014.

Stellar Environmental conducted both passive and active product removal events during the 4 days prior (March 31 and April 1, 2015) to the groundwater sampling event (September 30) to determine the recharge rate of free product in wells. A total of approximately 1,100 gallons of groundwater yielding approximately 0.123 gallons (Table 3) of free product were removed during this first 2015 active product removal event.

**Table 3**
**Active Product Extraction – March 31 and April 1, 2015**
**6400 Christie Avenue, Emeryville, California**

| Well | Total Gallons of Product Removed | Well | Total Gallons of Product Removed |
|---|---|---|---|
| MW-3 | 0 | MW-17 | 0 |
| MW-4 | 0 | MW-18 | 0 |
| MW-5 | 0 | MW-E | 0.0078 |
| MW-6 | 0 | RW-1 | 0.0078 |
| MW-7 | 0 | TA-E | 0.031 |
| MW-8 | 0 | TA-M | 0.0228 |
| MW-9 | 0 | TA-W | 0.0228 |
| MW-10 | 0.031 | TB-E | 0 |
| MW-11 | 0 | TB-M | 0 |
| MW-12 | 0 | TB-W | 0 |
| MW-13 | 0 | TC-E | 0 |
| MW-14 | 0 | TC-M | 0 |
| MW-15 | 0 | TC-W | 0 |
| MW-16 | 0 | | |
| | | **First 2015 Event Total** | **0.123** |

Notes:

NP = not purged

Product removal estimates are based on the total amount of free product measured in the purge drum after pumping each well

The removal activities for March 26 and 27, 2015 can be summarized as follows:

- Stellar Environmental removed a total 525 gallons of groundwater from TA-W, TA-E and TA-M along with an estimated 0.07 gallons of product. Stellar Environmental removed a total of 70 gallons of water from trench wells TB-W, TB-E and TB-M with no measurable free product. Approximately 160 gallons of water was pumped from trench wells TC-W, TC-E and TC-M with a trace of free product recovered.
- Stellar Environmental removed a total of 75 gallons of groundwater from recovery well RW-1 along with an estimated 0.0078 gallons (1 oz) of product.
- A total of approximately 0.031 gallons (4 oz) of petroleum product was removed along with the 450 gallons of liquid that was pumped from all of the monitoring wells. Well MW-10 yielded the free product, with some of the remaining wells containing a trace of free product that was not measurable.
- All of the purge water and free product extracted during these events was contained onsite in the 1,100-gallon AST located in the northeastern gated area of the garage. On April 21, 2015, Safety Kleen Corporation, Inc. vacuumed and transported the water to a recycling facility in Redwood City, California. The waste manifest and recycling certificate are included in Appendix F.

## 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. Since 2011, the skimmers have 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 and 0.369 gallons in 2014 indicating that the active pumping of site wells to be an effective means of product removal as compared to the passive skimmer system. Differences in recovery can be attributed to fluctuations in groundwater levels and to an overall reduction of free product as active pumping continues year to year.

For the current monitoring event, 12 of 15 wells in which TVHg is historically detected showed an increase of that compound as compared to March 2014. Twelve of 17 wells that have historically contained diesel range hydrocarbons showed an increase in TEHd concentrations compared to March 2014. The observed increase of TVHg and TEHd for the current monitoring event compared to the March 2014 sampling event is likely be due to LNAPL becoming at least partially emulsified, as intended. The reduction of LNAPL by active extraction, which has since 2013 been combined with surfactant injections in selected wells, is a necessary step prior to planned, in-situ bio-remedial efforts that will be proposed for the second half of 2015. Inconsistent trends in the hydrocarbon concentrations, particularly the upward spike in gasoline and diesel concentrations observed in well MW-3 and MW-8 since the surfactant injection in and/or near that wells may show more consistent trend lines after such bio-remedial efforts are conducted (see Section 6).

In addition to the above factors, the increase of gasoline and diesel concentrations observed in well MW-18 is likely due to the surfactant introduced into that well in February 2015 for that purpose, to reduce the LNAPL and increase the dissolved hydrocarbon concentrations so as to recover them from that well. 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. More active remediation, including introduction of bio-remedial enhancing products into selected wells as mentioned above, may be useful to reduce the concentrations to levels acceptable to the regulatory community and to achieve eventual regulatory closure. If the surfactant applications at the site can continue to reduce the degraded product present, particularly in wells MW-3, NMW-8, MW-9, MW-10, MW-12, MW-13 and MW-14, then application of such bio-remedial remedies can better be considered.

The outward effect of the surfactant injection based on observations made during product removal for the current monitoring event, has been a marked reduction in the viscous hydrocarbon substance in site wells. A significant increase in water yield from wells that received surfactant was not observed. The total measured recovery volume of product (in gallons) from the 18 wells for the March 2014 monitoring event, compared to the current monitoring event, decreased from 0.338 gallons to 0.123 gallons which is likely attributable to the emulsification of LNAPL in the wells receiving the surfactant.

# 6.0 SUMMARY, CONCLUSIONS, AND PROPOSED ACTIONS

**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 semiannual frequency in 2009.
- The site currently contains 17 monitoring wells, 1 recovery well, and 9 product extraction trench wells. The current event is the 23rd 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 southwest. Some mounding is evident in the area of MW-4 which is likely due to water accumulating from landscape irrigation leaks (MW-4 well box full of water).
- Construction dewatering that had occurred during the 2012-2013 time period at the construction site across 64th Street that was influencing the groundwater flow direction towards that site, was discontinued in February 2014.
- Groundwater elevations during the March 30 and April 3, 2015 event ranged from 7.03 feet amsl (RW-1) to 9.19 feet amsl (MW-6). The average groundwater gradient was 0.007 foot/foot.

- The injection of a (non-hazardous) surfactant into selected site monitoring wells and into the nine trench wells over five 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 6 of 27 for the current monitoring period.
- Surfactant injections into the A and C trench wells and wells MW-3, MW-8, MW-10, MW-12, MW-13, MW-14 and 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 wells as compared to the March 2014 monitoring event. The elimination of viscous LNAPL from site wells will allow introduction of bio-remedial, oxygen enhancing products into the trench wells to begin breaking down the dissolved concentrations of hydrocarbon contaminants on site.
- Current contaminants of concern include TPHg, TPHd, and BTEX. Current groundwater concentrations exceeded the ESLs for these contaminants.
- MTBE was detected 4 wells during the current monitoring event, but was not detected above the ESL of 1,800 µg/L in any of the monitoring wells. MTBE was detected in MW-7, MW-11, MW-12 and MW-17.
- The highest concentrations of TVHg (36,000 µg/L in MW-8) and TEHd (20,000 µg/L in MW-8) for the current event can be compared to concentrations of 23,000 µg/L TVHg in MW-8 and 19,000 µg/L TEHd observed in well MW-13 in March 2014. Concentrations of hydrocarbons in well MW-13 have decreased steadily since the September 2012 sampling event, with TVHg decreasing from 60,000 µg/L to 14,000 µg/L, and TEHd decreasing from 7,200,000 µg/L in 2012 to the current 11,000 µg/L. Concentrations of hydrocarbons in well MW-8 increased since the March 2012 sampling event, with TVHg increasing from 380 µg/L in 2012 to 36,000 µg/L for the current event, and TEHd increasing from 9,800 µg/L in 2012 to the current 20,000 µg/L.
- Increases in March 30 and April 3, 2015 TVHg concentrations compared to the March 2014 monitoring event were observed in wells MW-3, MW-6, MW-8, MW-9, MW-10, MW-12, MW-14, MW-15, MW-16, MW-17 and RW-1. This represents eleven wells exhibiting an increase in TVHg as compared to five wells for the March 2014 sampling event. The remaining wells either remained below laboratory detection limits (in well MW-5) or exhibited a decrease in TVHg concentrations.
- Gasoline was detected in MW-3, MW-7, MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-17, MW-E and RW-1 above the ESL where groundwater is not a likely drinking water resource (500 micrograms per liter [µg/L]). Gasoline was also detected

in MW-6, MW-9, MW-16, MW-18 and RW-1, but at concentrations below the ESL. MW-4 was inaccessible, so not sampled.

- Diesel was detected in all site wells (except MW-4) above the ESL of 640 µg/L (where groundwater is not a likely drinking water resource), but showed a decrease in concentration in 4 of the 18 wells sampled as compared to 16 of 18 wells in the March 2014 sampling event.
- In monitoring wells MW-7, MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-17, and MW-E concentrations of benzene exceeded the ESL of 46 µg/L where groundwater is not a drinking water resource. Comparing March 2014 results to the current results showed a decrease in benzene in 7 of the 18 site wells sampled. An increase in benzene was detected in 9 of the 18 wells. Benzene was detected in wells MW-3, MW-6, MW-9, MW-16, MW-18 and RW-1, but at concentrations below the ESL. Perimeter wells MW-5 and MW-6, which in March 2014 contained concentrations of benzene at <0.05 µg/L and 0.81 µg/L benzene respectively, remain stable at < 0.5 µg/L and 0.87 µg/L respectively for the current event.
- Toluene was detected at or above the ESL of 130 µg/L in monitoring wells MW-8, MW-14 and MW-17. Toluene was also detected in wells MW-3, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, 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-12, MW-13, MW-14, MW-15, MW-17 and MW-E. Ethylbenzene was also detected in MW-3, MW-7, MW-11, MW-16, and RW-1 but at levels below the ESL.
- Total xylene concentrations in wells MW-7, MW-8, MW-12, MW-13, MW-14, MW-15, MW-17 and MW-E were above the 100-µg/L ESL where groundwater is not a likely drinking water resource. Total xylenes were detected in MW-3, MW-10, MW-11, MW-16 and RW-1 but below the ESL.
- Significantly, well MW-3 has shown a decrease in TVHg and TEHd concentrations for the current monitoring event as compared to the November 2014 event, which may be a continued reflection of the cessation of the dewatering pumping that occurred at the construction site across 64$^{th}$ Street during 2012-2013.
- 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. No oil was recovered from the nine skimmers for the September 2014 monitoring event, and only a total of 0.07 gallons of oil

was recovered from the nine trench wells for the current monitoring event, which is not enough to accumulate in skimmer equipment, and is more easily extracted through the semiannual extraction events as are currently being conducted.

- Stellar Environmental conducted active product removal on the trench wells, source area wells, recovery well, and select monitoring wells during the March 2015 extraction event. A total of approximately 1,050 gallons of groundwater that includes approximately 0.123 gallons of free-floating petroleum product from all the wells was removed with the estimate based on free-product accumulation in the extraction drum after pumping each well.

**RECOMMENDATIONS**

- Conduct a field study using Trench C to apply an aerobic bioremediation compound TersOx™, or similar. TersOx™ is a specially formulated calcium hydroxide that produces a controlled-release of molecular oxygen designed to assist in the aerobic bioremediation of hydrocarbons in soil and groundwater. TersOx™ stimulates natural degradation of petroleum hydrocarbons such as benzene, toluene, ethylbenzene and xylenes (BTEX). This is not a chemical oxidation product. The high ratio of $O_2$ in TersOx™ (>16.6% by weight) provides a long-term oxygen source for up to 12 months upon hydration under ideal conditions. This sustained release of oxygen is designed to stimulate indigenous bacteria, accelerate bioactivity, and promote increased contaminant degradation. The two other Trenches will not have bioremediation product introduced, acting as controls. The nearby wells to Trench C where the bioremediation product is to be introduced have a wide range of contaminant concentrations, and these will be monitored. This will allow for a bioremediation effectiveness evaluation. The timing of this work would occur after in June or July to allow for it to potentially impact the September Monitoring event.
- Groundwater monitoring should be continued on a semiannual basis to document contaminant concentrations over time.
- 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.
- Complete follow-on evaluation of the TersOx™ introduction and its efficacy for scaling upward to move the site toward full regulatory site closure.
- 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

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

## 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 | 8,600 | 940 | 250 | 570 | NA |
| 2 | May-89 | 130 | 24,000 | NA | 16,000 | 2,100 | 300 | 1,200 | NA |
| 3 | Feb-91 | <10 | 22,000 | NA | 6,800 | 3,500 | 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 | 250 | 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 | 230 | 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 | 13 | 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 |

| 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 | 730 | <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 |

| MW-5 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sampling Event No.** | **Date Sampled** | **TEH-d** | **TVH-g** | **TEH-mo** | **Benzene** | **Toluene** | **Ethylbenzene** | **Total Xylenes** | **MTBE** |
| 1 | Dec-88 | 530 | 890 | 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 |

| 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 | NA |
| 2 | May-89 | 140 | 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 | 56 | 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 |

| 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 | 3,100 | NA | 640 | 28 | 48 | 231 | <10 |
| 4 | Mar-08 | 7,000 | 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 | 620 | NA | 310 | 9.5 | 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 | 1,700 | NA | 660 | 35 | 32 | 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 | 7,700 | 900 | NA | 260 | 13 | 8.8 | 47.8 | 7.1 |

| 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 | 3,300 | <50 |
| 2 | Dec-06 | 2,400 | 29,000 | <380 | 13,000 | <100 | 640 | 500 | <200 |
| 3 | Dec-07 | 5,900 | 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 | 358 | <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 | 13,000 | 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 | 65 | 300 | 100 | 0 |
| 20 | Mar-15 | 20,000 | 36,000 | NA | 8,200 | 150 | 910 | 160 | < 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 | 5,900 | 98 | 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 | <50 |
| 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 | 0.73 | 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 |

| 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 | 4,700 | 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 | <20 |
| 8 | Mar-09 | 6,200 | 8,200 | NA | 890 | 46 | 78 | 130 | <20 |
| 9 | Sep-09 | 6,100 | 1,400 | NA | 1,200 | 35 | 19 | 31 | <20 |
| 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 | 36 | 0 |
| 20 | Mar-15 | 7,300 | 6,500 | NA | 640 | 53 | 44 | 22 | <67 |

| 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 | 6,900 | 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 | 7,100 | 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 | 1300 | 22 | 9.6 | 19.9 | <2.0 |
| 12 | Sep-11 | 4,400 | 3,600 | NA | 1200 | 36 | 16 | 39.1 | <2.0 |
| 13 | Mar-12 | 4,600 | 5,700 | NA | 2100 | 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 | 89 | 0 | 6 | 14.4 | 0.0 |
| 19 | Mar-15 | 7,900 | 1,600 | NA | 140 | 14 | 5.3 | 15.5 | 61.0 |

| 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 | 3,600 | 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 | 124 | <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 | 59.9 | 0 |
| 19 | Mar-15 | 3,500 | 14,000 | NA | 3,800 | 120 | 82 | 73 | 66 |

| 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 | <400 |
| 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 | 12,000 | 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 | 330,000 | 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 | 21,000 | 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 | 1900 | 850 | <2.0 |
| 13 | Mar-12 | 1,100,000 | 260,000 | NA | 23,000 | 1500 | 5700 | 4100 | <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 | 1,080 | <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 |

| 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 | 630 | 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 | 740 | 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 |

| 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 | 230 | 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 | 7,600 | 95 | 300 | 84.2 | <50 |
| 7 | Mar-09 | 3,400 | 17,000 | NA | 7,200 | 91 | 170 | 60 | <50 |
| 8 | Sep-09 | 2,700 | 2,300 | 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 | 2,200 | 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 | 3,300 | 9,500 | NA | 2,600 | 110 | 22 | 46.7 | 0 |
| 19 | Mar-15 | 8,500 | 16,000 | NA | 3,400 | 66 | 93 | 29 | <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 | 60 | 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 | 74 | 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 | 5,900 | 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 |

| 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 | 2,900 | 7,200 | 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 | 2,200 | NA | 120 | 3.1 | 11 | 1.6 | <2.0 |
| 9 | Mar-10 | 3,400 | 5,000 | 1,900 | 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 | 2,900 | 7,200 | 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 |

| 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 | 6,400 | 1,800 | NA | 2200 | 45 | 64.0 | 78.0 | <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 |

| MW-E | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sampling Event No.** | **Date Sampled** | **TEH-d** | **TVH-g** | **TEH-mo** | **Benzene** | **Toluene** | **Ethylbenzene** | **Total Xylenes** | **MTBE** |
| 1 | Dec-88 | 100 | 5,400 | 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 | 1,900 | <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 | 37.2 | <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 | 6,800 | NA | 1,800 | 55 | 86 | 87 | 0 |
| 23 | Mar-15 | 12,000 | 6,800 | NA | 2,200 | 70 | 140 | 131 | <67 |

| RW-1 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **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 | 1.6 | <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 | 1,100,000 | 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 | 8.8 |
| 16 | Sep-11 | 440 | 230 | 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 | 4,700 | 410 | NA | 1.3 | 1.0 | 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 |

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

## Groundwater Monitoring
## Field Data Sheets

# WELL GAUGING DATA

Project # 150330-MW1 Date 3/30/15 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 | 1105 | 2 | ODOR THICK | 9.35 | | | 9.40 | — | | BLACK STICKY SPH |
| MW-4 | 0920 | 2 | | — | | | 8.42 | 24.92 | | |
| MW-5 | 0927 | 2 | | — | | | 9.59 | 24.90 | | |
| MW-6 | 0934 | 2 | | — | | | 7.63 | 23.35 | | |
| MW-7 | 0945 | 3/4 | | — | | | 10.57 | 19.87 | | |
| MW-8 | 1030 | 3/4 | | 9.47 | 0.24 | | 9.71 | — | | |
| MW-9 | 0948 | 3/4 | | — | | | 9.98 | 19.68 | | |
| MW-10 | 1037 | 3/4 | ODOR SHEEN | 9.16 | 0.03 | | 9.19 | — | | DARK BROWN |
| MW-11 | 0955 | 3/4 | ODOR SHEEN | 10.39 | 0.01 | | 10.40 | 19.70 | | |
| MW-12 | 1002 | 3/4 | ODOR | — | | | 9.18 | 19.01 | | |
| MW-13 | 1044 | 3/4 | ODOR SHEEN | 9.12 | 0.01 | | 9.13 | — | | |
| MW-14 | 1051 | 3/4 | | — | | | 8.93 | 19.52 | | |
| MW-15 | 1058 | 3/4 | ODOR | 9.33 | 0.01 | | 9.34 | 18.89 | | BROWN STICKY |
| MW-16 | 1009 | 3/4 | | — | | | 9.56 | 19.08 | | |
| MW-17 | 0941 | 3/4 | | — | | | 9.51 | 19.50 | | |
| MW-18 | 1019 | 3/4 | | — | | | 8.51 | 19.56 | | |
| MW-E | 1023 | 2 | ODOR | — | | | 10.15 | 47.41 | | |

# WELL GAUGING DATA

Project # 150830-WW1 Date 3/30/15 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| RW-1 | 1112 | 10 | ODOR | VERY THICK | | | 9.67 | — | ↓ | VERY THICK SPM |
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# WELLHEAD INSPECTION CHECKLIST



Client STELLAR Date 3/30/15

Site Address 6900 CHRISTIE AVE, EMERYVILLE, CA

Job Number 150530 WW1 Technician WW

| Well ID | Well Inspected - No Corrective Action Required | Water Bailed From Wellbox | Wellbox Components Cleaned | Cap Replaced | Lock Replaced | Other Action Taken (explain below) | Well Not Inspected (explain below) | Repair Order Submitted |
|---|---|---|---|---|---|---|---|---|
| MW-3 | X | | | | | | | |
| MW-4 | X | | | | | | | |
| MW-5 | X | | | | | | | |
| MW-6 | X | | | | | | | |
| MW-7 | X | | | | | | | |
| MW-8 | X | | | | | | | |
| MW-9 | | | | | | X | | |
| MW-10 | X | | | | | | | |
| MW-11 | X | | | | | | | |
| MW-12 | X | | | | | | | |
| MW-13 | X | | | | | | | |
| MW-14 | X | | | | | | | |
| MW-15 | | | | | | X | | |
| MW-16 | X | | | | | | | |
| MW-17 | | | | | | | | |
| MW-18 | X | | | | | | | |

NOTES: MW-15: -2/2 BOLTS (9/16") MW-16: -1/2 BOLTS (9/16"). MW-9: -1/2 BOLTS (9/16") RW-1: -1/2 BOLTS (3/4").

# WELLHEAD INSPECTION CHECKLIST



Client STELLAR Date 3/30/15

Site Address 6400 CHRISTIE AVE, EMERYVILLE, CA

Job Number 150830-WW1 Technician WW

| Well ID | Well Inspected - No Corrective Action Required | Water Bailed From Wellbox | Wellbox Components Cleaned | Cap Replaced | Lock Replaced | Other Action Taken (explain below) | Well Not Inspected (explain below) | Repair Order Submitted |
|---|---|---|---|---|---|---|---|---|
| MW-E | | | | | | P | | |
| RW-1 | | | | | | P | | |
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NOTES: MW-E: -2 1/2 SCREWS.

# TEST EQUIPMENT CALIBRATION LOG

DAY CTR. APTS.

| PROJECT NAME | STELLAR @ BRIDGE WATER APTS 6400 CHRISTIE AVE, EMERYVILLE CA | PROJECT NUMBER | 150330-WW1 |
|---|---|---|---|

| EQUIPMENT NAME | EQUIPMENT NUMBER | DATE/TIME OF TEST | STANDARDS USED | EQUIPMENT READING | CALIBRATED TO: OR WITHIN 10%: | TEMP. | INITIALS |
|---|---|---|---|---|---|---|---|
| MYRON L ULTRAMETER 2 | 6214213 | 3/30/15 0625 | PH: 4, 7, 10 cond: 3900 µs | PH: 4, 7, 10 cond: 3900 µs | yes | 17.2 °C | WW |
| MYRON L ULTRAMETER 2 | 6207755 | 3/30/15 1230 | PH: 4, 7, 10 cond: 3900 µs | PH: 7.00, 10.00, 4.00 cond: 3900 µs | yes | 61.9 °F | WW |
| MYRON L ULTRAMETER 2 | 6214213 | 4/3/15 0810 | PH: 4, 7, 10 cond: 3900 µs | PH: 7.00, 10.00 4.00 cond: 3900 µs | yes | 16.5 °C | WW |
| | | | | | | | |
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# WELL MONITORING DATA SHEET

| | |
|---|---|
| Project #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: WW | Date: 4/3/15 |
| Well I.D.: MW-3 | Well Diameter: (2) 3 4 6 8 ____ |
| Total Well Depth (TD): — | Depth to Water (DTW): 9.40 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) 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)

_____(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 | radius² * 0.163 |

| Time | Temp (°F or °C) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1122 | started purge @ | | 100mL | /min | | 9.40 TO ~~SOFT~~ WATER 9.35 TO SOFT |
| 1128 | stopped ~~purging~~ purge | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) ~~Gallons~~ actually evacuated: 600 mL

Sampling Date: 4/3/15 Sampling Time: 1130 Depth to Water: 9.49

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 |

# WELL MONITORING DATA SHEET

| | |
|---|---|
| Project #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: WW | Date: ~~3/31/15~~ 4/1/15 |
| Well I.D.: MW- 4 | Well Diameter: ② 3 4 6 8 |
| Total Well Depth (TD): 24.82 | Depth to Water (DTW): 8.42 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 11.70 | |

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: _____

| 2.6 (Gals.) X | 3 | = | 7.8 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 | radius² * 0.163 |

| Time | Temp (°F or (°C)) | pH | Cond. (mS or (µS)) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| *UNABLE TO ACCESS | | | | | ~~2.6~~ ⓦ | |
| PARKED OVER BY SAME VEHICLE... | | | | | | |
| | | | | | | |
| —NO SAMPLE TAKEN | | | | | | |
| | | | | | | |

Did well dewater? Yes No Gallons actually evacuated:

Sampling Date: ~~3/31/15~~ 4/1/15 Sampling Time: Depth to Water:

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 |

# WELL MONITORING DATA SHEET

| | |
|---|---|
| Project #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: C. Peters | Date: 3/30/15 |
| Well I.D.: MW- 5 | Well Diameter: (2) 3 4 6 8 ____ |
| Total Well Depth (TD): 24.90 | Depth to Water (DTW): 9.59 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 15.80 | |

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: ____

2.5 (Gals.) X 3 = 7.5 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 | radius² * 0.163 |

| Time | Temp (°F or °C) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1219 | 68.3 | 8.75 | 2290 | >1000 | 2.5 | odor |
| 1225 | 65.4 | 8.47 | 2163 | >1000 | 5.0 | odor |
| 1233 | 64.9 | 8.48 | 2165 | 686 | 6.0 | |
| | well | Dewatered | @ | | 6.0 | |
| 1330 | 62.9 | 9.85 | 2161 | 670 | Grab | |

Did well dewater? Yes No — Gallons actually evacuated: 6.0

Sampling Date: 3/30/15 — Sampling Time: 1325 — Depth to Water: 11.62

Sample I.D.: MW- 5 — 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 #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: C. Peters | Date: 3/30/15 |
| Well I.D.: MW- 6 | Well Diameter: (2) 3 4 6 8 ____ |
| Total Well Depth (TD): 23.35 | Depth to Water (DTW): 7.63 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 10.77 | |

Purge Method: Bailer (6) Waterra
Disposable Bailer Peristaltic
Positive Air Displacement Extraction Pump
Electric Submersible Other_____

Sampling Method: Bailer
(Disposable Bailer)
Extraction Port
Dedicated Tubing
Other: _____

| 1 Case Volume | | Specified Volumes | | Calculated Volume |
|---|---|---|---|---|
| 2.5 | (Gals.) X | 3 | = | 7.5 Gals. |

| Well Diameter | Multiplier | Well Diameter | Multiplier |
|---|---|---|---|
| 1" | 0.04 | 4" | 0.65 |
| 2" | 0.16 | 6" | 1.47 |
| 3" | 0.37 | Other | radius² * 0.163 |

| Time | Temp (°F or °C) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1257 | 60.3 | 11.58 | 1371 | 44 | 2.5 | odor |
| 1302 | 59.8 | 12.48 | 1442 | 27 | 5.0 | odor |
| 1306 | 59.7 | 12.60 | 1445 | 20 | 7.5 | odor |
| | | | | | | |
| | | ~~11.59~~ | | | | 0 |

Did well dewater? Yes (No) Gallons actually evacuated: 7.5

Sampling Date: 3/30/15 Sampling Time: 1312 Depth to Water: 7.72

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 #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: ww | Date: 3/30/15 |
| Well I.D.: MW- 7 | Well Diameter: 2 3 4 6 8 (3/4) |
| Total Well Depth (TD): 19.87 | Depth to Water (DTW): 10.57 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 12.43 | |

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

3/4" 0.02

| 1 Case Volume | Specified Volumes | Calculated Volume |
|---|---|---|
| 0.2 (Gals.) X | 3 | = 0.6 Gals. |

| Well Diameter | Multiplier | Well Diameter | Multiplier |
|---|---|---|---|
| 1" | 0.04 | 4" | 0.65 |
| 2" | 0.16 | 6" | 1.47 |
| 3" | 0.37 | Other | radius² * 0.163 |

| Time | Temp (°F or (°C)) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1231 | 18.9 | 8.27 | 12.03 | 239 | 0.2 | brown |
| 1234 | 18.1 | 8.27 | 12.13 | 242 | 0.4 | " |
| WELL DEWATERED @ 0.4 GALS | | | | | | |
| | | | | | | |
| 1500 | 15.9 | 8.19 | 11.38 | 155 | — | brown |

Did well dewater? (Yes) No Gallons actually evacuated: 0.4

Sampling Date: 3/30/15 Sampling Time: 1500 Depth to Water: 11.42

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 |

# WELL MONITORING DATA SHEET

| | |
|---|---|
| Project #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: WW | Date: 4/3/15 ~~3/31/15~~ |
| Well I.D.: MW- 8 | Well Diameter: 2 3 4 6 8 (3/4) |
| Total Well Depth (TD): — | Depth to Water (DTW): 9.71 |
| Depth to Free Product: 9.47 | Thickness of Free Product (feet): 0.24 |
| Referenced to: (PVC) 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)

_____(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 | radius² * 0.163 |

| Time | Temp (°F or °C) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 0912 | started purge @ 150 | | | mL/min | | UNABLE TO RECORD WL DURING PURGE. |
| 0918 | stopped purge | | | | | WILL NOT FIT AT SAME TIME. |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) mL ~~Gallons~~ actually evacuated: 900mL

Sampling Date: 4/3/15 ~~3/31/15~~ Sampling Time: 0920 Depth to Water: 12.02

Sample I.D.: MW- 8 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 #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: MW | Date: 3/30/15 |
| Well I.D.: MW-9 | Well Diameter: 2 3 4 6 8 (3/4) |
| Total Well Depth (TD): 19.68 | Depth to Water (DTW): 9.98 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 11.92 | |

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)

| 1 Case Volume | | Specified Volumes | | Calculated Volume |
|---|---|---|---|---|
| 0.2 | (Gals.) X | 3 | = | 0.6 Gals. |

| Well Diameter | Multiplier | Well Diameter | Multiplier |
|---|---|---|---|
| 1" | 0.04 | 4" | 0.65 |
| 2" | 0.16 | 6" | 1.47 |
| 3" | 0.37 | Other | radius² * 0.163 |

| Time | Temp (°F or (°C)) | pH | Cond. (mS or (µS)) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1243 | 16.5 | 9.34 | 2702 | 123 | 0.2 | brown |
| 1244 | 16.3 | 9.39 | 2677 | 132 | 0.4 | " |
| 1245 | 16.2 | 9.43 | 2652 | 138 | 0.6 | " |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) Gallons actually evacuated: 0.6

Sampling Date: 3/30/15 Sampling Time: 1250 Depth to Water: 11.00

Sample I.D.: MW-9 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 #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: MW | Date: 4/3/15 ~~3/31/15~~ |
| Well I.D.: MW- 10 | Well Diameter: 2 3 4 6 8 (3/4) |
| Total Well Depth (TD): — | Depth to Water (DTW): 9.19 |
| Depth to Free Product: 9.16 | Thickness of Free Product (feet): 0.03 |
| Referenced to: (PVC) 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

_____(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 | radius² * 0.163 |

| Time | Temp (°F or ~~°C~~) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 0933 | started purge | | | 100 mL/min | | UNABLE TO GAUGE WL AT SAME TIME WITH TUBING IN WELL |
| 0939 | stopped purge | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) ~~Gallons~~ actually evacuated: 600 mL

Sampling Date: ~~3/31/15~~ 4/3/15 Sampling Time: 0940 Depth to Water: 9.59

Sample I.D.: MW-10 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 #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: MW | Date: 3/30/15 |
| Well I.D.: MW- 11 | Well Diameter: 2 3 4 6 8 (3/4) |
| Total Well Depth (TD): 19.70 | Depth to Water (DTW): 10.40 |
| Depth to Free Product: 10.39 | Thickness of Free Product (feet): 0.01 |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 12.26 | |

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)

_____(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 | radius² * 0.163 |

| Time | Temp (°F or °C) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1300 | START | PURGE | @ 100 mL/min | | | 10.72 |
| 1306 | STOP PURGE | | | | | (1307) 12.87 |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) Gallons actually evacuated: 600 mL

Sampling Date: 3/30/15 Sampling Time: 1310 Depth to Water: 11.07

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 |

# WELL MONITORING DATA SHEET

| | |
|---|---|
| Project #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: MW | Date: 3/30/15 |
| Well I.D.: MW- 12 | Well Diameter: 2 3 4 6 8 (3/4) |
| Total Well Depth (TD): 19.01 | Depth to Water (DTW): 9.18 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 11.15 | |

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)

| 1 Case Volume | | Specified Volumes | | Calculated Volume |
|---|---|---|---|---|
| 0.2 | (Gals.) X | 3 | = | 0.6 Gals. |

| Well Diameter | Multiplier | Well Diameter | Multiplier |
|---|---|---|---|
| 1" | 0.04 | 4" | 0.65 |
| 2" | 0.16 | 6" | 1.47 |
| 3" | 0.37 | Other | radius² * 0.163 |

| Time | Temp (°F or (°C)) | pH | Cond. (mS or (µS)) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1332 | 15.7 | 7.80 | 1114 | 48 | 0.2 | odor, gray |
| 1333 | 15.6 | 7.55 | 1113 | 38 | 0.4 | " " |
| 1334 | 15.5 | 7.45 | 1112 | 29 | 0.6 | " " |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) Gallons actually evacuated: 0.6

Sampling Date: 3/30/15 Sampling Time: 1340 Depth to Water: 9.18

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 #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: MW | Date: 4/3/15 ~~3/31/15~~ |
| Well I.D.: MW- 13 | Well Diameter: 2 3 4 6 8 (3/4) |
| Total Well Depth (TD): — | Depth to Water (DTW): 9.13 |
| Depth to Free Product: 9.12 | Thickness of Free Product (feet): 0.01 |
| Referenced to: (PVC) 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

_____(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 | radius² * 0.163 |

| Time | Temp (°F or °C) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 0951 | started purge | | | @100mL/min | | UNABLE TO GAUGE WL AT SAME TIME |
| 0957 | stopped purge | | | | | WITH TUBING IN WELL. |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) ~~Gallons~~ actually evacuated: 600 mL

Sampling Date: 4/3/15 Sampling Time: 1000 Depth to Water: 9.50

Sample I.D.: MW- 13 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 #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: MM | Date: 4/3/15 |
| Well I.D.: MW- 14 | Well Diameter: 2 3 4 6 8 (3/4) |
| Total Well Depth (TD): 19.52 | Depth to Water (DTW): 8.93 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 11.05 | |

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): new tubing

| 1 Case Volume | Specified Volumes | Calculated Volume |
|---|---|---|
| 0.2 (Gals.) | X 3 | = 0.6 Gals. |

| Well Diameter | Multiplier | Well Diameter | Multiplier |
|---|---|---|---|
| 1" | 0.04 | 4" | 0.65 |
| 2" | 0.16 | 6" | 1.47 |
| 3" | 0.37 | Other | radius² * 0.163 |

| Time | Temp (°F or (°C)) | pH | Cond. (mS or (µS)) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1010 | 15.5 | 7.66 | 1145 | 113 | 0.2 | odor |
| 1012 | 15.6 | 7.44 | 1143 | 147 | 0.4 | " |
| 1013 | 15.6 | 7.34 | 1142 | 185 | 0.6 | " |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) Gallons actually evacuated: 0.6

Sampling Date: 4/3/15 Sampling Time: 1015 Depth to Water: 10.08

Sample I.D.: MW- 14 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 #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: MW | Date: 4/3/15 |
| Well I.D.: MW-15 | Well Diameter: 2 3 4 6 8 (3/4) |
| Total Well Depth (TD): 19.89 | Depth to Water (DTW): 9.74 |
| Depth to Free Product: 9.33 | Thickness of Free Product (feet): 0.01 |
| Referenced to: (PVC) 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

_____(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 | radius² * 0.163 |

| Time | Temp (°F or (°C)) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1030 | started purge | | | @100mL/min | | UNABLE TO GAUGE WL AT SAME TIME |
| 1036 | stopped purge | | | | | WILL NOT FIT. |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) ~~Gallons~~ actually evacuated: 600mL

Sampling Date: 4/3/15 Sampling Time: 1040 Depth to Water: 10.72

Sample I.D.: MW-15 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 #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: MW | Date: 3/30/15 |
| Well I.D.: MW- 16 | Well Diameter: 2 3 4 6 8 (3/4) |
| Total Well Depth (TD): 19.08 | Depth to Water (DTW): 9.52 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 11.46 | |

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)

0.2 (Gals.) X 3 = 0.6 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 | radius² * 0.163 |

| Time | Temp (°F or (°C)) | pH | Cond. (mS or uS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1354 | 15.9 | 9.95 | 3153 | 91 | 0.2 | brown, color |
| 1355 | 16.0 | 9.99 | 3223 | 102 | 0.4 | " |
| 1356 | 16.0 | 10.03 | 3292 | 110 | 0.6 | " |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) Gallons actually evacuated: 0.6

Sampling Date: 3/30/15 Sampling Time: 1400 Depth to Water: 9.82

Sample I.D.: MW- 16 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 #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: C Peters | Date: 3/30/15 |
| Well I.D.: MW-17 | Well Diameter: 2 3 4 6 8 3/4 |
| Total Well Depth (TD): 19.50 | Depth to Water (DTW): 9.51 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 11.51 | |

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

0.02

| 1 Case Volume | Specified Volumes | Calculated Volume |
|---|---|---|
| 0.25 (Gals.) | X 3 | = 0.75 Gals. |

| Well Diameter | Multiplier | Well Diameter | Multiplier |
|---|---|---|---|
| 1" | 0.04 | 4" | 0.65 |
| 2" | 0.16 | 6" | 1.47 |
| 3" | 0.37 | Other | radius² * 0.163 |

| Time | Temp (°F or °C) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1349 | 62.6 | 8.71 | 969.5 | 62 | 0.25 | |
| 1350 | 61.9 | 8.47 | 843.9 | 51 | 0.50 | |
| 1351 | 61.8 | 8.39 | 815.2 | 42 | 0.75 | |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) Gallons actually evacuated: 0.75

Sampling Date: 3/30/15 Sampling Time: 1353 Depth to Water: 9.52

Sample I.D.: MW-17 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 #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: MW | Date: 3/30/15 |
| Well I.D.: MW- 18 | Well Diameter: 2 3 4 6 8 (3/4) |
| Total Well Depth (TD): 19.56 | Depth to Water (DTW): 8.51 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 10.72 | |

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)

| 0.2 (Gals.) X | 3 | = 0.6 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 | radius² * 0.163 |

| Time | Temp (°F or (°C)) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1445 | 15.8 | 7.05 | 6818 | 127 | 0.2 | gray |
| 1446 | 15.7 | 7.04 | 6725 | 640 | 0.4 | " |
| 1447 | 15.8 | 6.96 | 6742 | >1000 | 0.6 | " |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) Gallons actually evacuated: 0.6

Sampling Date: 3/30/15 Sampling Time: 1450 Depth to Water: 10.72

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 |

# WELL MONITORING DATA SHEET

| | |
|---|---|
| Project #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: WW | Date: 4/3 / 15 |
| Well I.D.: MW- E | Well Diameter: (2) 3 4 6 8 ___ |
| Total Well Depth (TD): 47.41 | Depth to Water (DTW): 10.15 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) Grade | D.O. Meter (if req'd): YSI HACH |
| DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 17.60 | |

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)

6.0 (Gals.) X 3 = 18.0 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 | radius² * 0.163 |

| Time | Temp (°F or (°C)) | pH | Cond. (mS or (µS)) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 0844 | 16.5 | 8.01 | 2813 | 706 | 6 | color |
| WELL | DEWATERED @ 9 GALS | | | | | |
| | | | | | | |
| 1245 | 16.1 | 7.66 | 2870 | 29 | — | |
| | | | | | | |

Did well dewater? (Yes) No — Gallons actually evacuated: 9

Sampling Date: ~~4/3~~ 4/3/15 — Sampling Time: 1245 — Depth to Water: 10.24

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

# WELL MONITORING DATA SHEET

| | |
|---|---|
| Project #: 150330-WW1 | Client: Stellar Environmental Solutions @ Bay Center Apts |
| Sampler: WW | Date: 4/3/15 |
| Well I.D.: ~~MW-~~ RW-1 | Well Diameter: 2 3 4 6 8 (10) |
| Total Well Depth (TD): — | Depth to Water (DTW): 9.67 |
| Depth to Free Product: | Thickness of Free Product (feet): |
| Referenced to: (PVC) 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

_____(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 | radius² * 0.163 |

| Time | Temp (°F or °C) | pH | Cond. (mS or µS) | Turbidity (NTUs) | Gals. Removed | Observations |
|---|---|---|---|---|---|---|
| 1147 | started purge @ | | | 100 mL/min | | VERY THICK SPH UNABLE TO GAUGE |
| 1153 | stopped purge | | | | | SPH or WL ACCURATELY |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Did well dewater? Yes (No) ~~Gallons~~ actually evacuated: 600 mL

Sampling Date: 4/3/15 Sampling Time: 1155 Depth to Water: UNABLE TO GAUGE ACCURATELY

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

## 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 265799**
**ANALYTICAL REPORT**

| | |
|---|---|
| Stellar Environmental Solutions | Project : 2007-65 |
| 2198 6th Street | Location : Bay Center Apts |
| Berkeley, CA 94710 | Level : II |

| Sample ID | Lab ID |
|---|---|
| MW-3 | 265799-001 |
| MW-8 | 265799-002 |
| MW-10 | 265799-003 |
| MW-13 | 265799-004 |
| MW-14 | 265799-005 |
| MW-15 | 265799-006 |
| RW-1 | 265799-007 |
| MW-E | 265799-008 |

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

Signature: Tracy Babjar Date: 04/10/2015

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

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

# CASE NARRATIVE

| | |
|---|---|
| Laboratory number: | **265799** |
| Client: | **Stellar Environmental Solutions** |
| Project: | **2007-65** |
| Location: | **Bay Center Apts** |
| Request Date: | **04/03/15** |
| Samples Received: | **04/03/15** |

This data package contains sample and QC results for eight water samples, requested for the above referenced project on 04/03/15. The samples were received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):**
Low recoveries were observed for gasoline C7-C12 in the MS/MSD for batch 221970; the parent sample was not a project sample, the LCS was within limits, and the associated RPD was within limits. High surrogate recoveries were observed for bromofluorobenzene (FID) in the MS/MSD for batch 221970; the parent sample was not a project sample. Many 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):**
MW-8 (lab # 265799-002) was diluted due to the dark and viscous nature of the sample extract. No other analytical problems were encountered.

265799

# Chain of Custody Record

Lab job no. _____
Date 4/3/15
Page 1 of 1

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

Project Owner _____
Site Address 6400 CHRISTIE AVE.
BERKELEY, CA
Project Name BAY CENTER APARTMENTS
Project Number 2007-65

Method of Shipment HAND DELIVERY or LAB COURIER
Shipment No. _____
Airbill No. _____
Cooler No. _____
Project Manager R. MAKDISI
Telephone No. (510) 644-3123
Fax No. (510) 644-3859
Samplers: (Signature)

| Field Sample Number | Location/ Depth | Date | Time | Sample Type | Type/Size of Container | Preservation: Cooler | Preservation: Chemical | Filtered | No. of Containers | TEH-D (8015M) | TPH-G, M/BTEX | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-3 | | 4/3/15 | 1130 | GRAB | 40mL VOA / 1L AGB | | HCl / NP | | 4 | X | X | |
| MW-8 | | | 0920 | | | | | | 4 | X | X | |
| MW-10 | | | 0940 | | | | | | 4 | X | X | |
| MW-13 | | | 1000 | | | | | | 4 | X | X | |
| MW-14 | | | 1015 | | | | | | 4 | X | X | |
| MW-15 | | | 1040 | | | | | | 4 | X | X | |
| RW-1 | | | 1155 | | | | | | 4 | X | X | |
| MW-E | | | 1245 | | | | | | 4 | X | X | |

| Relinquished by: | Date | Received by: | Date |
|---|---|---|---|
| Signature | 4/3/15 | Signature | 4/3/15 |
| Printed WILLIAM WONG | Time 1340 | Printed ISABELLE CHOY | Time 1340 |
| Company BLAINE TECH SERVICES | | Company C&T | |

| Relinquished by: | Date | Received by: | Date |
|---|---|---|---|
| Signature | | Signature | |
| Printed | Time | Printed | Time |
| Company | | Company | |

| Relinquished by: | Date | Received by: | Date |
|---|---|---|---|
| Signature | | Signature | |
| Printed | Time | Printed | Time |
| Company | | Company | |

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

2000-00-01

★ Stellar Environmental Solutions

2198 Sixth Street #201, Berkeley, CA 94710

**COOLER RECEIPT CHECKLIST**

Curtis & Tompkins, Ltd.

Login # 265799 Date Received 4/3/15 Number of coolers 1
Client SES Project 2007-65

Date Opened 4/3 By (print) [illegible] (sign) [illegible]
Date Logged in [illegible] By (print) [illegible] (sign) [illegible]

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)

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

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

8. Were Method 5035 sampling containers present? YES (NO)
If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? YES NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? YES NO
12. Are sample labels present, in good condition and complete? YES NO
13. Do the sample labels agree with custody papers? YES NO
14. Was sufficient amount of sample sent for tests requested? YES NO
15. Are the samples appropriately preserved? YES NO N/A
16. Did you check preservatives for all bottles for each sample? YES NO N/A
17. Did you document your preservative check? 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

Rev 10, 9/12

Curtis & Tompkins, Ltd.

# Detections Summary for 265799

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 : 265799-001

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 580 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 5030B |
| Benzene | 29 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Toluene | 2.7 | C | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 12 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 2.9 | C | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| o-Xylene | 1.5 | C | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 11,000 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-8 Laboratory Sample ID : 265799-002

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 36,000 | | 4,200 | ug/L | As Recd | 83.33 | EPA 8015B | EPA 5030B |
| Benzene | 8,200 | | 42 | ug/L | As Recd | 83.33 | EPA 8021B | EPA 5030B |
| Toluene | 150 | | 42 | ug/L | As Recd | 83.33 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 910 | | 42 | ug/L | As Recd | 83.33 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 160 | | 42 | ug/L | As Recd | 83.33 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 20,000 | | 250 | ug/L | As Recd | 5.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-10 Laboratory Sample ID : 265799-003

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 6,500 | | 1,700 | ug/L | As Recd | 33.33 | EPA 8015B | EPA 5030B |
| Benzene | 640 | | 17 | ug/L | As Recd | 33.33 | EPA 8021B | EPA 5030B |
| Toluene | 53 | | 17 | ug/L | As Recd | 33.33 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 44 | | 17 | ug/L | As Recd | 33.33 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 22 | | 17 | ug/L | As Recd | 33.33 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 7,300 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-13 Laboratory Sample ID : 265799-004

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 14,000 | | 2,500 | ug/L | As Recd | 50.00 | EPA 8015B | EPA 5030B |
| Benzene | 2,200 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| Toluene | 76 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 430 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 160 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 11,000 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Curtis & Tompkins, Ltd.

Client Sample ID : MW-14 Laboratory Sample ID : 265799-005

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 14,000 | | 2,500 | ug/L | As Recd | 50.00 | EPA 8015B | EPA 5030B |
| Benzene | 2,900 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| Toluene | 390 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 210 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 170 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| o-Xylene | 52 | C | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 11,000 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-15 Laboratory Sample ID : 265799-006

| 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 | 3,400 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| Toluene | 66 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 93 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 29 | | 25 | ug/L | As Recd | 50.00 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 8,500 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : RW-1 Laboratory Sample ID : 265799-007

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 710 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 5030B |
| Benzene | 100 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Toluene | 3.8 | C | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 6.6 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 1.9 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| o-Xylene | 0.65 | C | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 2,300 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-E Laboratory Sample ID : 265799-008

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 8,400 | | 1,700 | ug/L | As Recd | 33.33 | EPA 8015B | EPA 5030B |
| Benzene | 2,200 | | 17 | ug/L | As Recd | 33.33 | EPA 8021B | EPA 5030B |
| Toluene | 70 | | 17 | ug/L | As Recd | 33.33 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 140 | | 17 | ug/L | As Recd | 33.33 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 100 | | 17 | ug/L | As Recd | 33.33 | EPA 8021B | EPA 5030B |
| o-Xylene | 31 | | 17 | ug/L | As Recd | 33.33 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 12,000 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

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

Curtis & Tompkins, Ltd.

# Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265799 | Location: | Bay Center Apts |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | | |
| Matrix: | Water | Sampled: | 04/03/15 |
| Units: | ug/L | Received: | 04/03/15 |
| Batch#: | 221970 | | |

| | | | |
|---|---|---|---|
| Field ID: | MW-3 | Diln Fac: | 1.000 |
| Type: | SAMPLE | Analyzed: | 04/06/15 |
| Lab ID: | 265799-001 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 580 | 50 | EPA 8015B |
| MTBE | ND | 2.0 | EPA 8021B |
| Benzene | 29 | 0.50 | EPA 8021B |
| Toluene | 2.7 C | 0.50 | EPA 8021B |
| Ethylbenzene | 12 | 0.50 | EPA 8021B |
| m,p-Xylenes | 2.9 C | 0.50 | EPA 8021B |
| o-Xylene | 1.5 C | 0.50 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 104 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 94 | 71-141 | EPA 8021B |

| | | | |
|---|---|---|---|
| Field ID: | MW-8 | Diln Fac: | 83.33 |
| Type: | SAMPLE | Analyzed: | 04/06/15 |
| Lab ID: | 265799-002 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 36,000 | 4,200 | EPA 8015B |
| MTBE | ND | 170 | EPA 8021B |
| Benzene | 8,200 | 42 | EPA 8021B |
| Toluene | 150 | 42 | EPA 8021B |
| Ethylbenzene | 910 | 42 | EPA 8021B |
| m,p-Xylenes | 160 | 42 | EPA 8021B |
| o-Xylene | ND | 42 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 111 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 100 | 71-141 | EPA 8021B |

| | | | |
|---|---|---|---|
| Field ID: | MW-10 | Diln Fac: | 33.33 |
| Type: | SAMPLE | Analyzed: | 04/06/15 |
| Lab ID: | 265799-003 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 6,500 | 1,700 | EPA 8015B |
| MTBE | ND | 67 | EPA 8021B |
| Benzene | 640 | 17 | EPA 8021B |
| Toluene | 53 | 17 | EPA 8021B |
| Ethylbenzene | 44 | 17 | EPA 8021B |
| m,p-Xylenes | 22 | 17 | EPA 8021B |
| o-Xylene | ND | 17 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 110 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 99 | 71-141 | EPA 8021B |

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

Curtis & Tompkins, Ltd.

# Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265799 | Location: | Bay Center Apts |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | | |
| Matrix: | Water | Sampled: | 04/03/15 |
| Units: | ug/L | Received: | 04/03/15 |
| Batch#: | 221970 | | |

| | | | |
|---|---|---|---|
| Field ID: | MW-13 | Diln Fac: | 50.00 |
| Type: | SAMPLE | Analyzed: | 04/06/15 |
| Lab ID: | 265799-004 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 14,000 | 2,500 | EPA 8015B |
| MTBE | ND | 100 | EPA 8021B |
| Benzene | 2,200 | 25 | EPA 8021B |
| Toluene | 76 | 25 | EPA 8021B |
| Ethylbenzene | 430 | 25 | EPA 8021B |
| m,p-Xylenes | 160 | 25 | EPA 8021B |
| o-Xylene | ND | 25 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 113 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 98 | 71-141 | EPA 8021B |

| | | | |
|---|---|---|---|
| Field ID: | MW-14 | Diln Fac: | 50.00 |
| Type: | SAMPLE | Analyzed: | 04/06/15 |
| Lab ID: | 265799-005 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 14,000 | 2,500 | EPA 8015B |
| MTBE | ND | 100 | EPA 8021B |
| Benzene | 2,900 | 25 | EPA 8021B |
| Toluene | 390 | 25 | EPA 8021B |
| Ethylbenzene | 210 | 25 | EPA 8021B |
| m,p-Xylenes | 170 | 25 | EPA 8021B |
| o-Xylene | 52 C | 25 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 111 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 95 | 71-141 | EPA 8021B |

| | | | |
|---|---|---|---|
| Field ID: | MW-15 | Diln Fac: | 50.00 |
| Type: | SAMPLE | Analyzed: | 04/06/15 |
| Lab ID: | 265799-006 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 16,000 | 2,500 | EPA 8015B |
| MTBE | ND | 100 | EPA 8021B |
| Benzene | 3,400 | 25 | EPA 8021B |
| Toluene | 66 | 25 | EPA 8021B |
| Ethylbenzene | 93 | 25 | EPA 8021B |
| m,p-Xylenes | 29 | 25 | EPA 8021B |
| o-Xylene | ND | 25 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 113 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 96 | 71-141 | EPA 8021B |

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

Curtis & Tompkins, Ltd.

# Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265799 | Location: | Bay Center Apts |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | | |
| Matrix: | Water | Sampled: | 04/03/15 |
| Units: | ug/L | Received: | 04/03/15 |
| Batch#: | 221970 | | |

| | | | |
|---|---|---|---|
| Field ID: | RW-1 | Diln Fac: | 1.000 |
| Type: | SAMPLE | Analyzed: | 04/07/15 |
| Lab ID: | 265799-007 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 710 | 50 | EPA 8015B |
| MTBE | ND | 2.0 | EPA 8021B |
| Benzene | 100 | 0.50 | EPA 8021B |
| Toluene | 3.8 C | 0.50 | EPA 8021B |
| Ethylbenzene | 6.6 | 0.50 | EPA 8021B |
| m,p-Xylenes | 1.9 | 0.50 | EPA 8021B |
| o-Xylene | 0.65 C | 0.50 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 115 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 97 | 71-141 | EPA 8021B |

| | | | |
|---|---|---|---|
| Field ID: | MW-E | Diln Fac: | 33.33 |
| Type: | SAMPLE | Analyzed: | 04/07/15 |
| Lab ID: | 265799-008 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 8,400 | 1,700 | EPA 8015B |
| MTBE | ND | 67 | EPA 8021B |
| Benzene | 2,200 | 17 | EPA 8021B |
| Toluene | 70 | 17 | EPA 8021B |
| Ethylbenzene | 140 | 17 | EPA 8021B |
| m,p-Xylenes | 100 | 17 | EPA 8021B |
| o-Xylene | 31 | 17 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 105 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 99 | 71-141 | EPA 8021B |

| | | | |
|---|---|---|---|
| Type: | BLANK | Diln Fac: | 1.000 |
| Lab ID: | QC783162 | Analyzed: | 04/06/15 |

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

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 104 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 91 | 71-141 | EPA 8021B |

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

Batch QC Report

## Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265799 | 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: | QC783159 | Batch#: | 221970 |
| Matrix: | Water | Analyzed: | 04/06/15 |
| Units: | ug/L | | |

| Analyte | Spiked | Result | %REC | Limits |
|---|---|---|---|---|
| Gasoline C7-C12 | 1,000 | 890.7 | 89 | 80-120 |

| Surrogate | %REC | Limits |
|---|---|---|
| Bromofluorobenzene (FID) | 94 | 80-132 |

Curtis & Tompkins, Ltd.

Batch QC Report

## Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265799 | Location: | Bay Center Apts |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | Analysis: | EPA 8021B |
| Matrix: | Water | Batch#: | 221970 |
| Units: | ug/L | Analyzed: | 04/06/15 |
| Diln Fac: | 1.000 | | |

Type: BS Lab ID: QC783160

| Analyte | Spiked | Result | %REC | Limits |
|---|---|---|---|---|
| MTBE | 10.00 | 8.884 | 89 | 74-137 |
| Benzene | 10.00 | 10.78 | 108 | 80-120 |
| Toluene | 10.00 | 11.47 | 115 | 80-120 |
| Ethylbenzene | 10.00 | 11.03 | 110 | 80-120 |
| m,p-Xylenes | 10.00 | 10.79 | 108 | 80-120 |
| o-Xylene | 10.00 | 11.07 | 111 | 80-120 |

| Surrogate | %REC | Limits |
|---|---|---|
| Bromofluorobenzene (PID) | 91 | 71-141 |

Type: BSD Lab ID: QC783161

| Analyte | Spiked | Result | %REC | Limits | RPD | Lim |
|---|---|---|---|---|---|---|
| MTBE | 10.00 | 8.483 | 85 | 74-137 | 5 | 37 |
| Benzene | 10.00 | 10.82 | 108 | 80-120 | 0 | 20 |
| Toluene | 10.00 | 10.85 | 109 | 80-120 | 6 | 20 |
| Ethylbenzene | 10.00 | 9.557 | 96 | 80-120 | 14 | 20 |
| m,p-Xylenes | 10.00 | 9.564 | 96 | 80-120 | 12 | 20 |
| o-Xylene | 10.00 | 9.229 | 92 | 80-120 | 18 | 20 |

| Surrogate | %REC | Limits |
|---|---|---|
| Bromofluorobenzene (PID) | 87 | 71-141 |

RPD= Relative Percent Difference

Batch QC Report

## Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265799 | Location: | Bay Center Apts |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Field ID: | ZZZZZZZZZZ | Batch#: | 221970 |
| MSS Lab ID: | 265813-006 | Sampled: | 04/03/15 |
| Matrix: | Water | Received: | 04/03/15 |
| Units: | ug/L | Analyzed: | 04/06/15 |
| Diln Fac: | 1.000 | | |

Type: MS Lab ID: QC783163

| Analyte | MSS Result | Spiked | Result | %REC | Limits |
|---|---|---|---|---|---|
| Gasoline C7-C12 | 2,127 | 2,000 | 3,561 | 72 * | 76-120 |

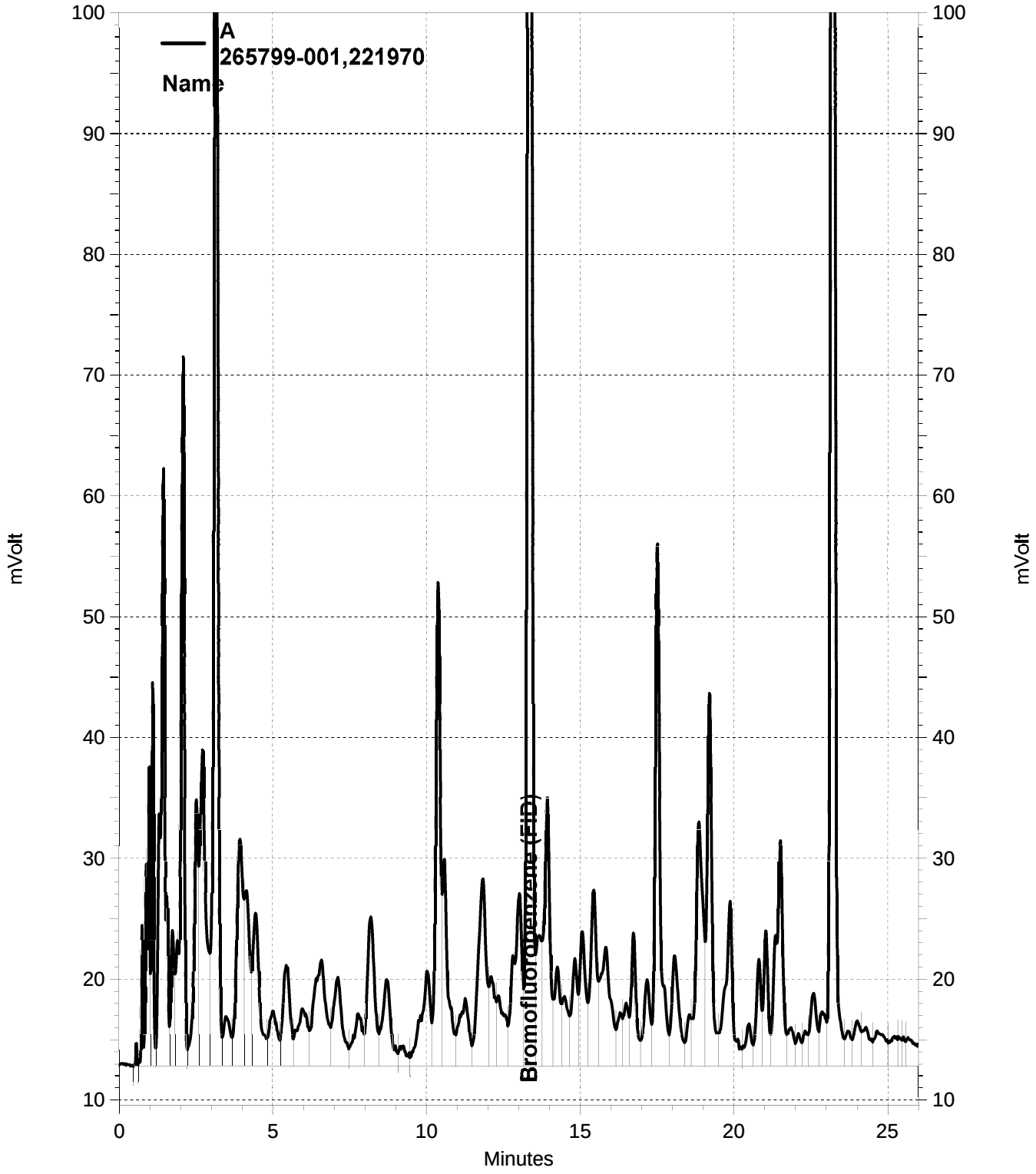
| Surrogate | %REC | Limits |
|---|---|---|
| Bromofluorobenzene (FID) | 237 * | 80-132 |

Type: MSD Lab ID: QC783164

| Analyte | Spiked | Result | %REC | Limits | RPD | Lim |
|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 2,000 | 3,581 | 73 * | 76-120 | 1 | 20 |

| Surrogate | %REC | Limits |
|---|---|---|
| Bromofluorobenzene (FID) | 237 * | 80-132 |

*= Value outside of QC limits; see narrative
RPD= Relative Percent Difference

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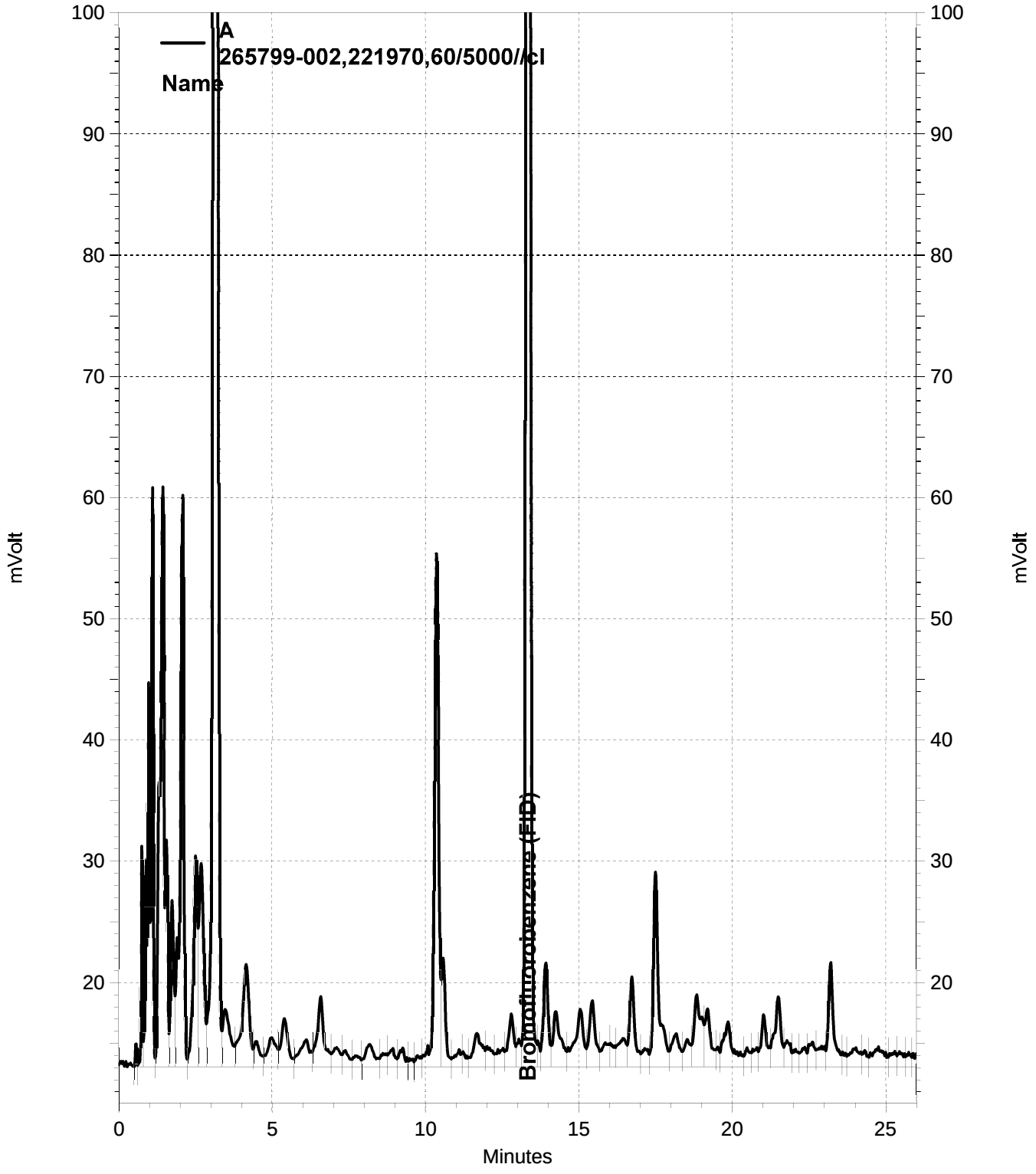


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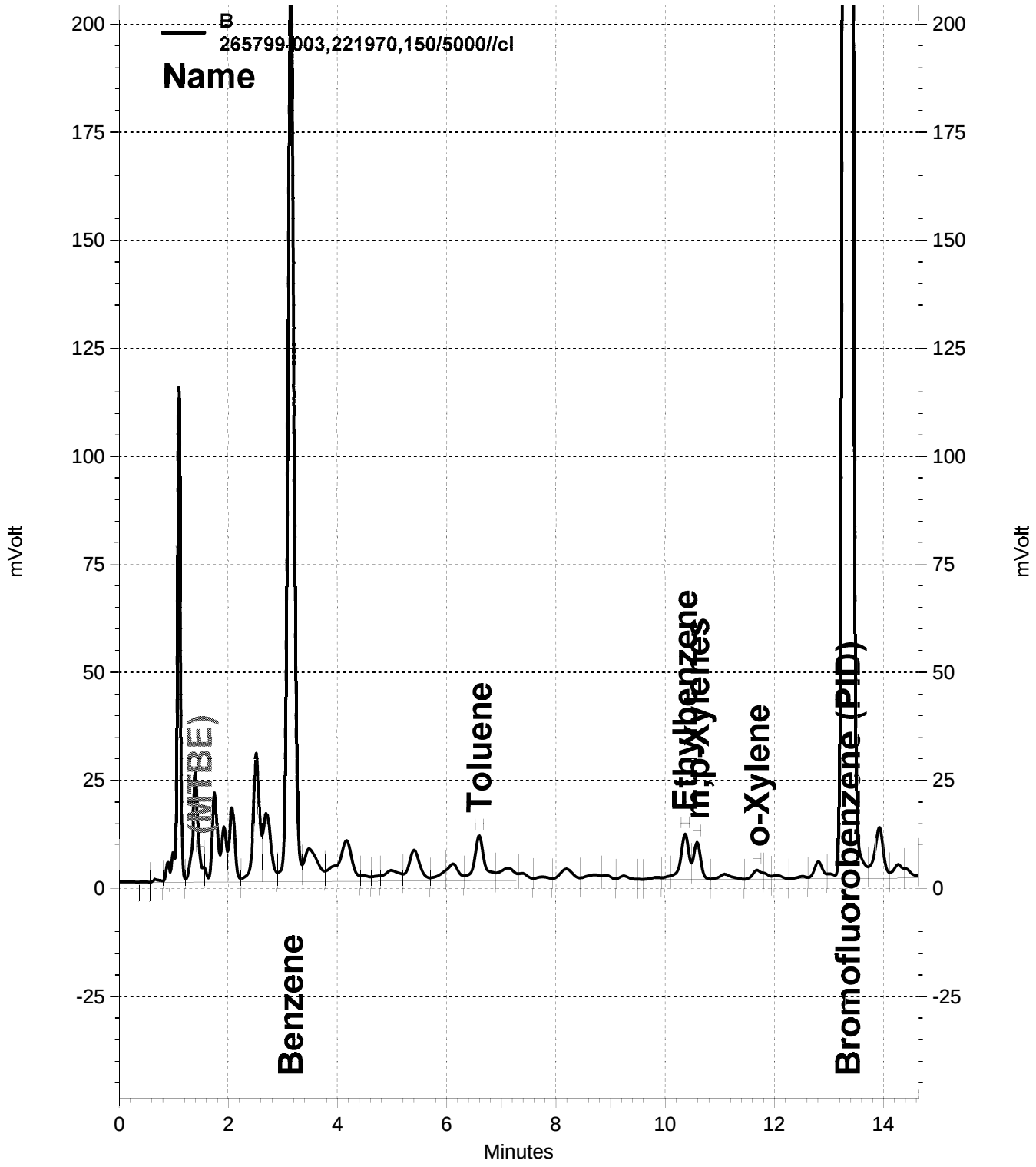
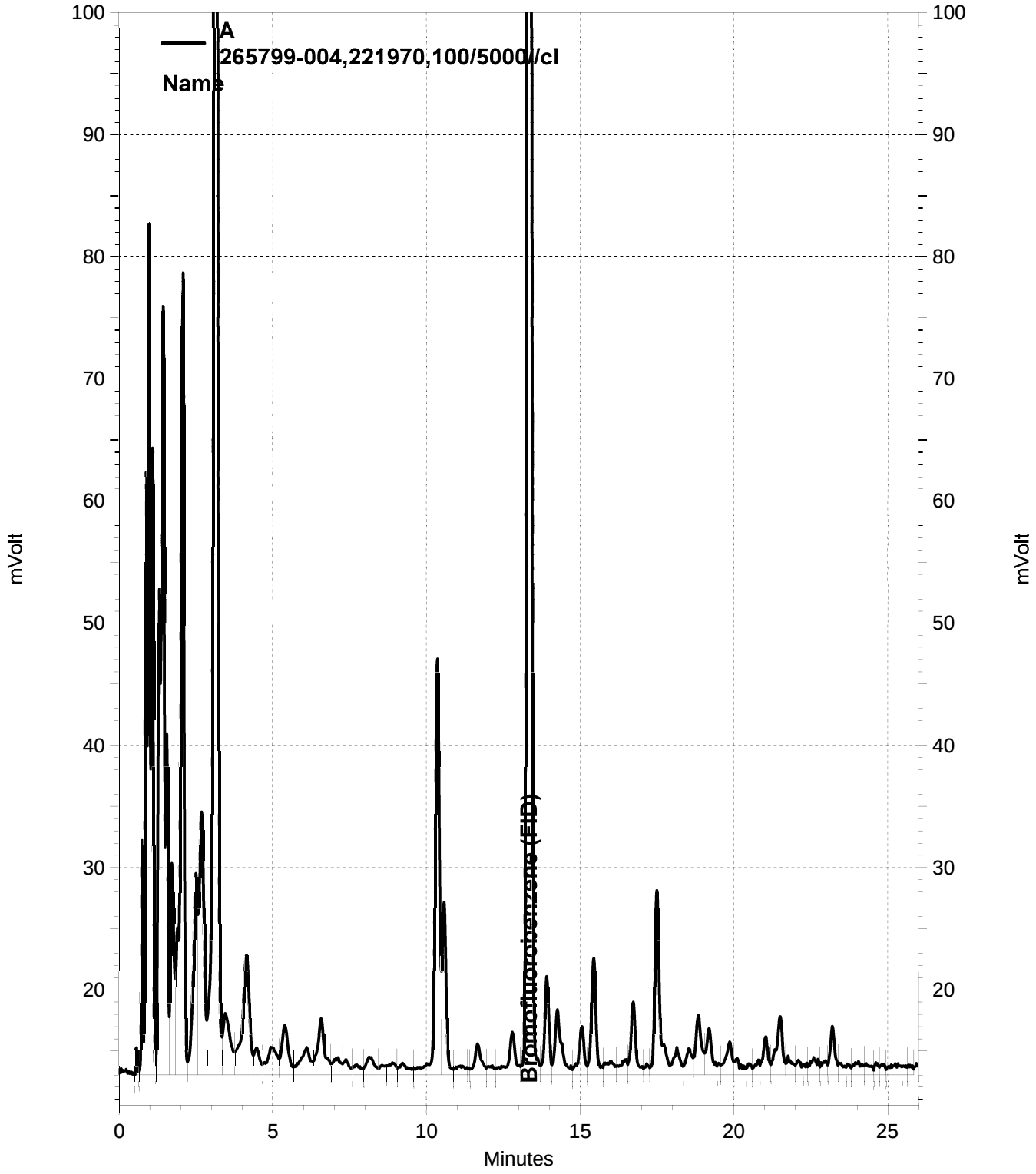

B
265799-003,221970,150/5000//cl
Name
mVolt
mVolt
Minutes
(MTBE)
Benzene
Toluene
Ethylbenzene
m,p-Xylenes
o-Xylene
Bromofluorobenzene (PID)
\\Lims\gdrive\ezchrom\Projects\GC05\Data\096-019, B

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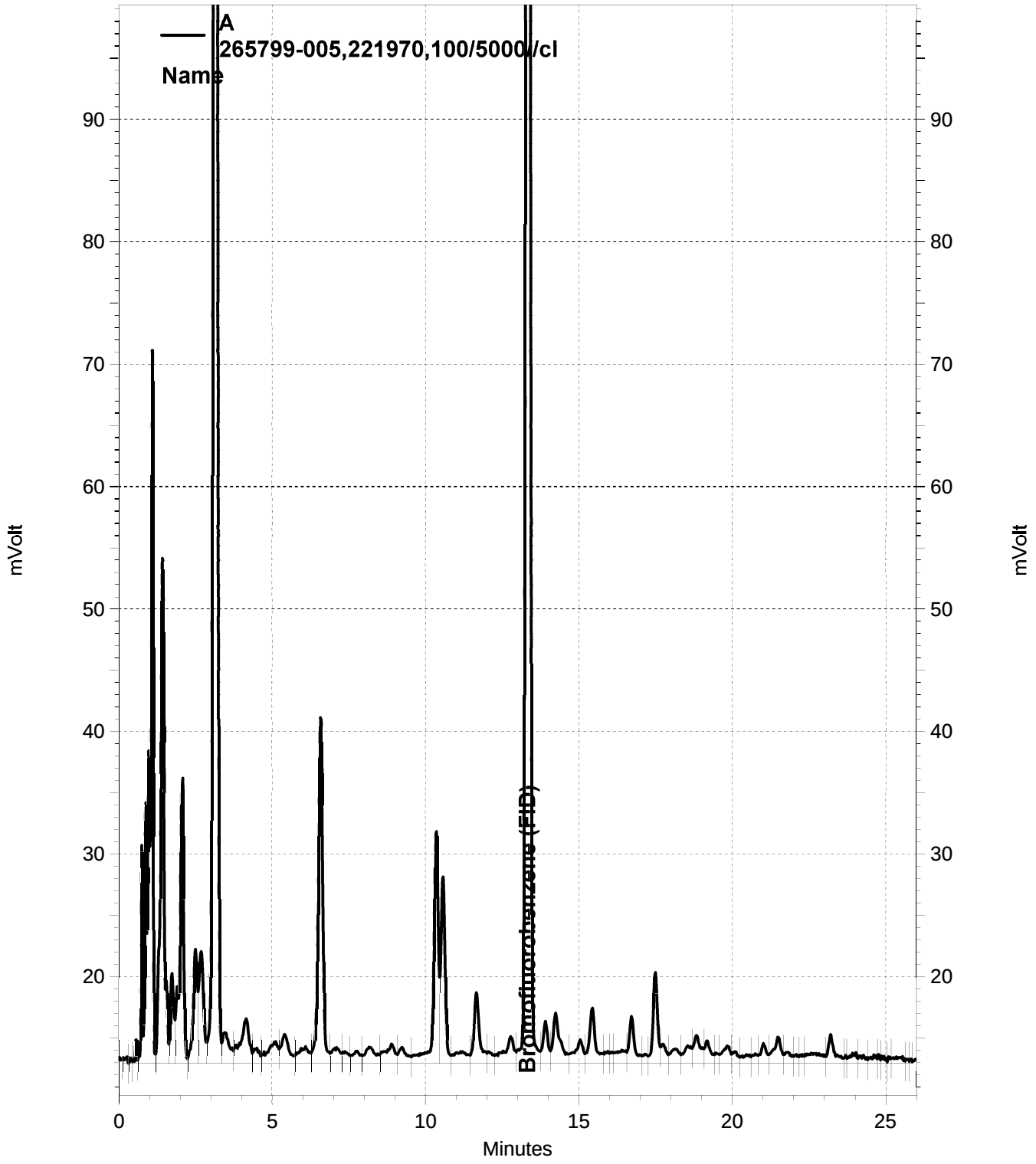
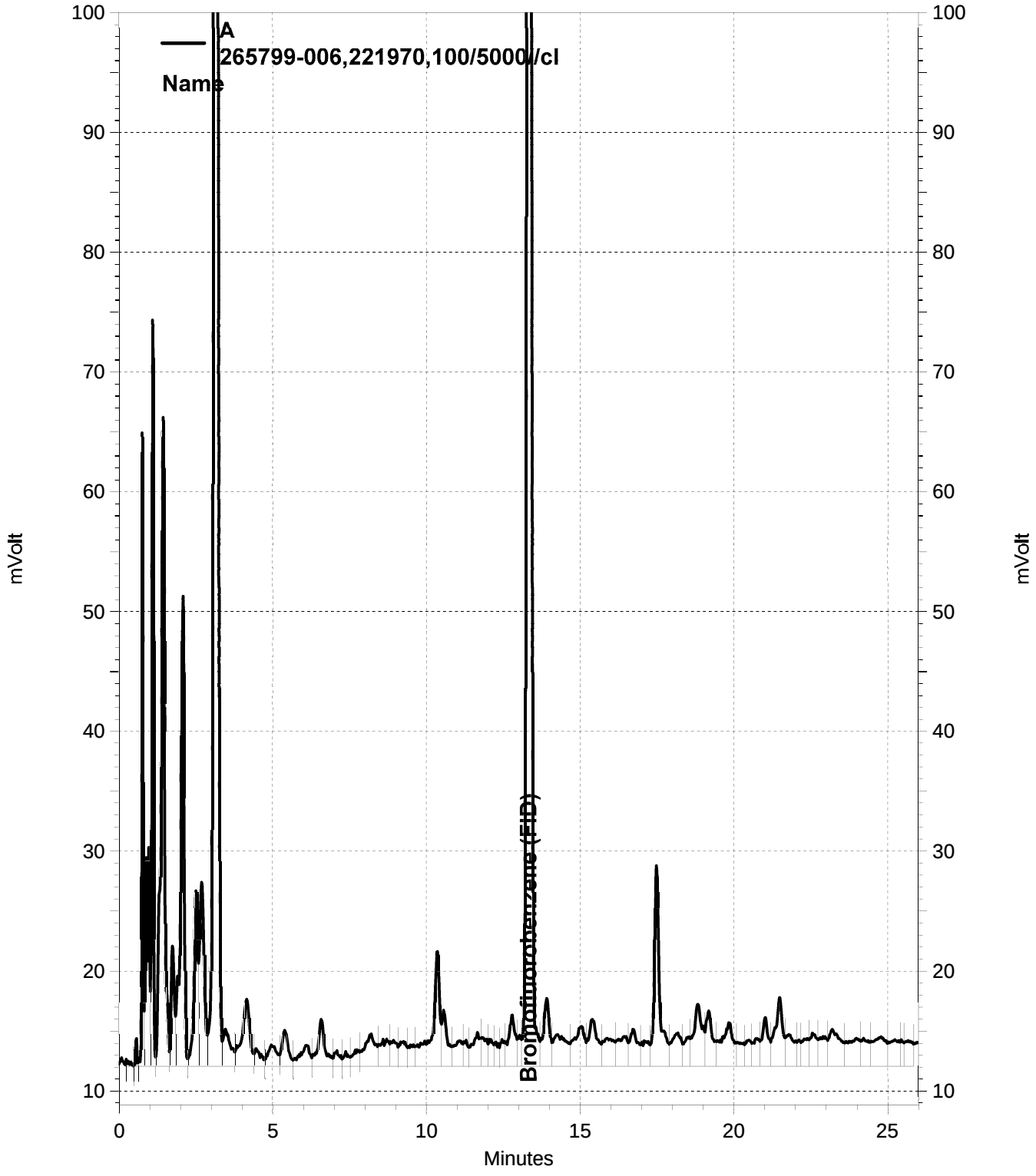

A
265799-005,221970,100/5000/cl
Name
mVolt
mVolt
90
80
70
60
50
40
30
20
0
5
10
15
20
25
Minutes
Bromofluorobenzene (FID)
\\Lims\gdrive\ezchrom\Projects\GC05\Data\096-021, A

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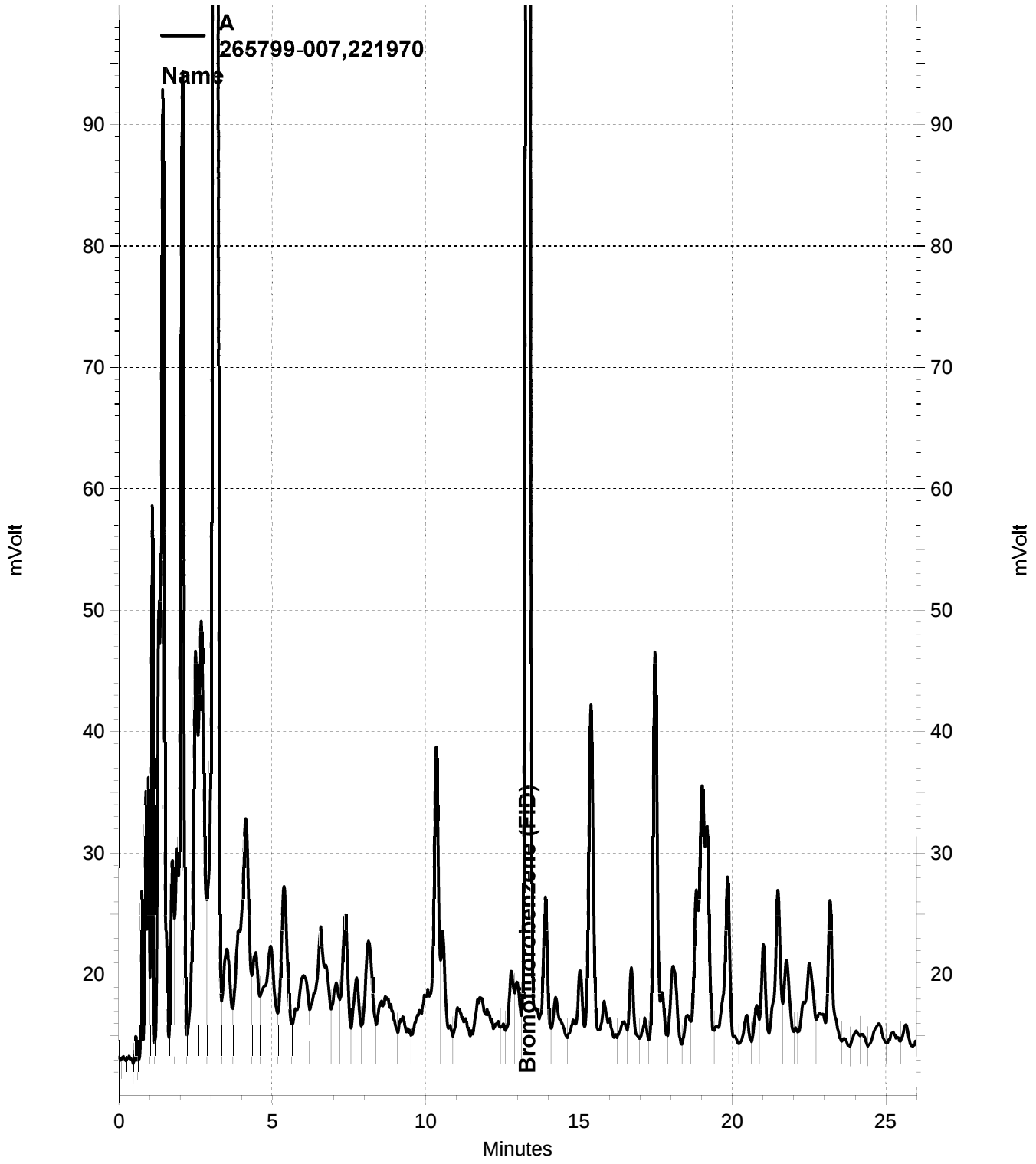
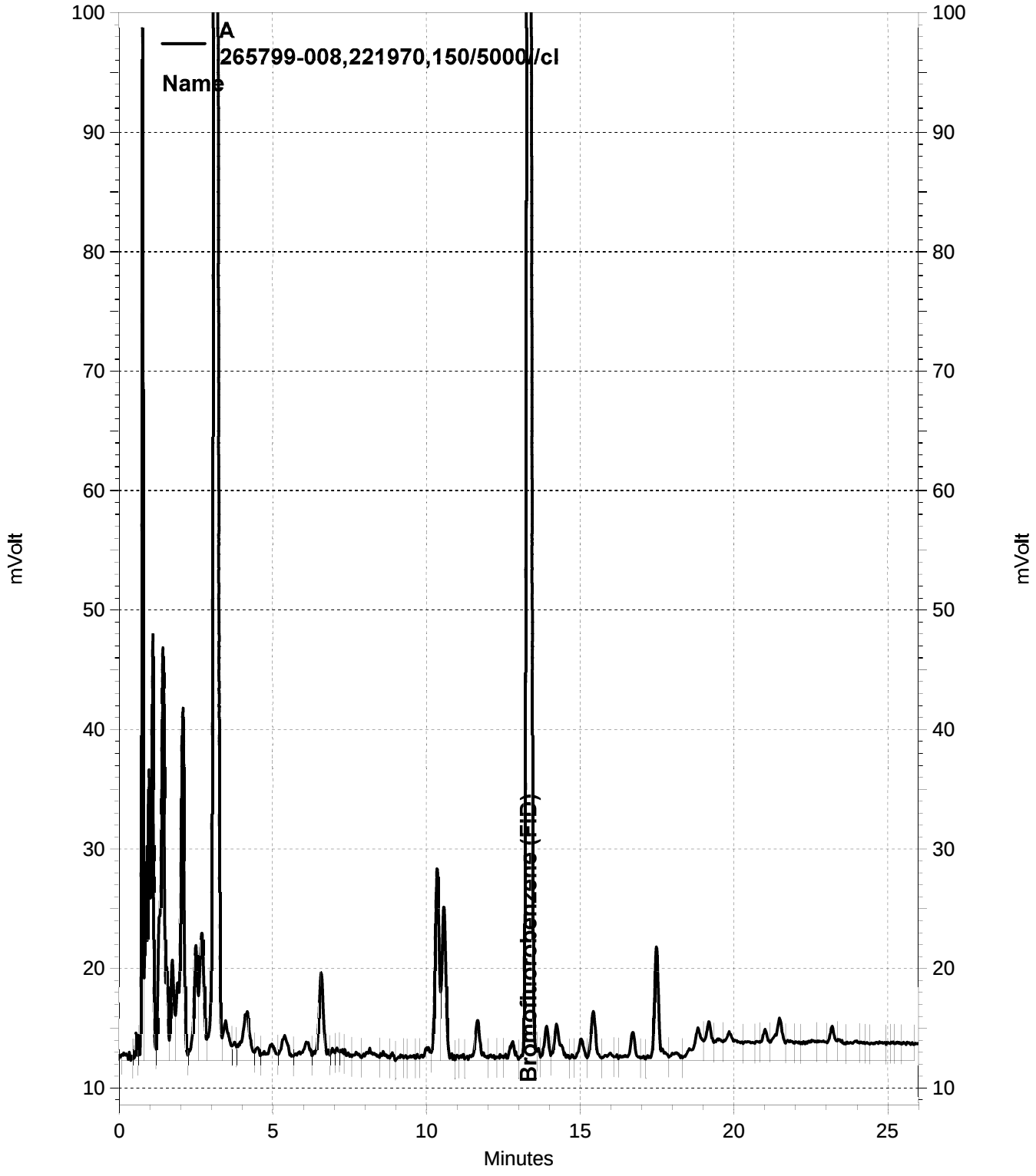

A
265799-007,221970
Name
mVolt
mVolt
90
80
70
60
50
40
30
20
0
5
10
15
20
25
Minutes
Bromofluorobenzene (FID)
\\Lims\gdrive\ezchrom\Projects\GC05\Data\096-023, A

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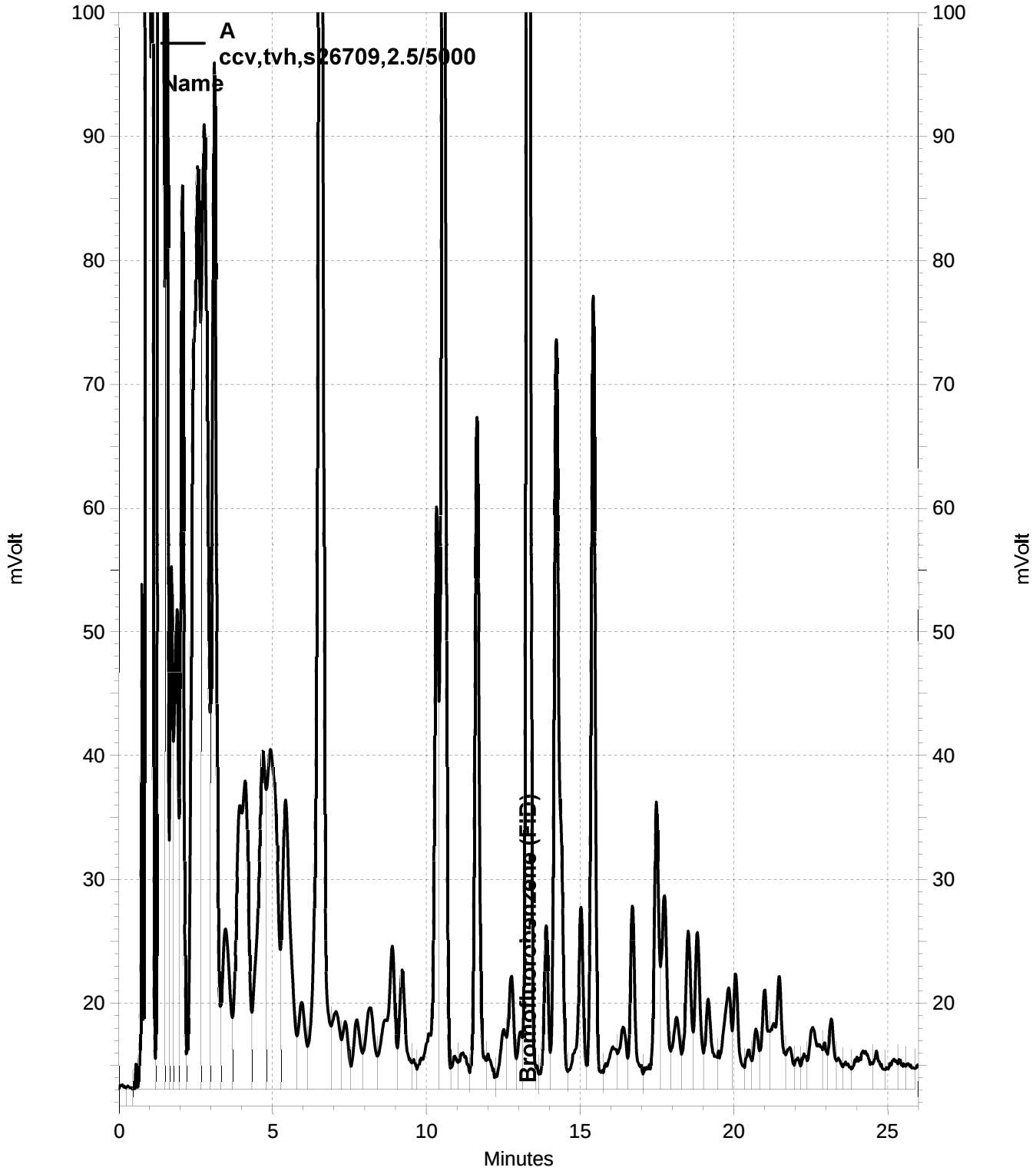
A
ccv,tvh,s26709,2.5/5000
Name
Bromofluorobenzene (FID)
mVolt
mVolt
Minutes
100
90
80
70
60
50
40
30
20
0
5
10
15
20
25
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Curtis & Tompkins, Ltd.

# Total Extractable Hydrocarbons

| | | | |
|---|---|---|---|
| Lab #: | 265799 | Location: | Bay Center Apts |
| Client: | Stellar Environmental Solutions | Prep: | EPA 3520C |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Matrix: | Water | Received: | 04/03/15 |
| Units: | ug/L | Prepared: | 04/06/15 |
| Batch#: | 221969 | Analyzed: | 04/07/15 |
| Sampled: | 04/03/15 | | |

Field ID: MW-3 Lab ID: 265799-001
Type: SAMPLE Diln Fac: 1.000

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 11,000 | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 134 | 67-136 |

Field ID: MW-8 Lab ID: 265799-002
Type: SAMPLE Diln Fac: 5.000

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 20,000 | 250 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 112 | 67-136 |

Field ID: MW-10 Lab ID: 265799-003
Type: SAMPLE Diln Fac: 1.000

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 7,300 | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 95 | 67-136 |

Field ID: MW-13 Lab ID: 265799-004
Type: SAMPLE Diln Fac: 1.000

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 11,000 | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 92 | 67-136 |

Field ID: MW-14 Lab ID: 265799-005
Type: SAMPLE Diln Fac: 1.000

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 11,000 | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 119 | 67-136 |

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

## Total Extractable Hydrocarbons

| | | | |
|---|---|---|---|
| Lab #: | 265799 | Location: | Bay Center Apts |
| Client: | Stellar Environmental Solutions | Prep: | EPA 3520C |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Matrix: | Water | Received: | 04/03/15 |
| Units: | ug/L | Prepared: | 04/06/15 |
| Batch#: | 221969 | Analyzed: | 04/07/15 |
| Sampled: | 04/03/15 | | |

Field ID: MW-15 Lab ID: 265799-006
Type: SAMPLE Diln Fac: 1.000

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 8,500 | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 101 | 67-136 |

Field ID: RW-1 Lab ID: 265799-007
Type: SAMPLE Diln Fac: 1.000

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 2,300 | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 105 | 67-136 |

Field ID: MW-E Lab ID: 265799-008
Type: SAMPLE Diln Fac: 1.000

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 12,000 | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 98 | 67-136 |

Type: BLANK Diln Fac: 1.000
Lab ID: QC783165

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | ND | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 107 | 67-136 |

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

## Total Extractable Hydrocarbons

| | | | |
|---|---|---|---|
| Lab #: | 265799 | Location: | Bay Center Apts |
| Client: | Stellar Environmental Solutions | Prep: | EPA 3520C |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Type: | LCS | Diln Fac: | 1.000 |
| Lab ID: | QC783166 | Batch#: | 221969 |
| Matrix: | Water | Prepared: | 04/06/15 |
| Units: | ug/L | Analyzed: | 04/07/15 |

| Analyte | Spiked | Result | %REC | Limits |
|---|---|---|---|---|
| Diesel C10-C24 | 2,500 | 2,588 | 104 | 60-121 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 107 | 67-136 |

Curtis & Tompkins, Ltd.

Batch QC Report

## Total Extractable Hydrocarbons

| | | | |
|---|---|---|---|
| Lab #: | 265799 | Location: | Bay Center Apts |
| Client: | Stellar Environmental Solutions | Prep: | EPA 3520C |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Field ID: | ZZZZZZZZZZ | Batch#: | 221969 |
| MSS Lab ID: | 265813-006 | Sampled: | 04/03/15 |
| Matrix: | Water | Received: | 04/03/15 |
| Units: | ug/L | Prepared: | 04/06/15 |
| Diln Fac: | 1.000 | Analyzed: | 04/07/15 |

Type: MS Cleanup Method: EPA 3630C
Lab ID: QC783167

| Analyte | MSS Result | Spiked | Result | %REC | Limits |
|---|---|---|---|---|---|
| Diesel C10-C24 | 345.7 | 2,500 | 2,860 | 101 | 55-122 |

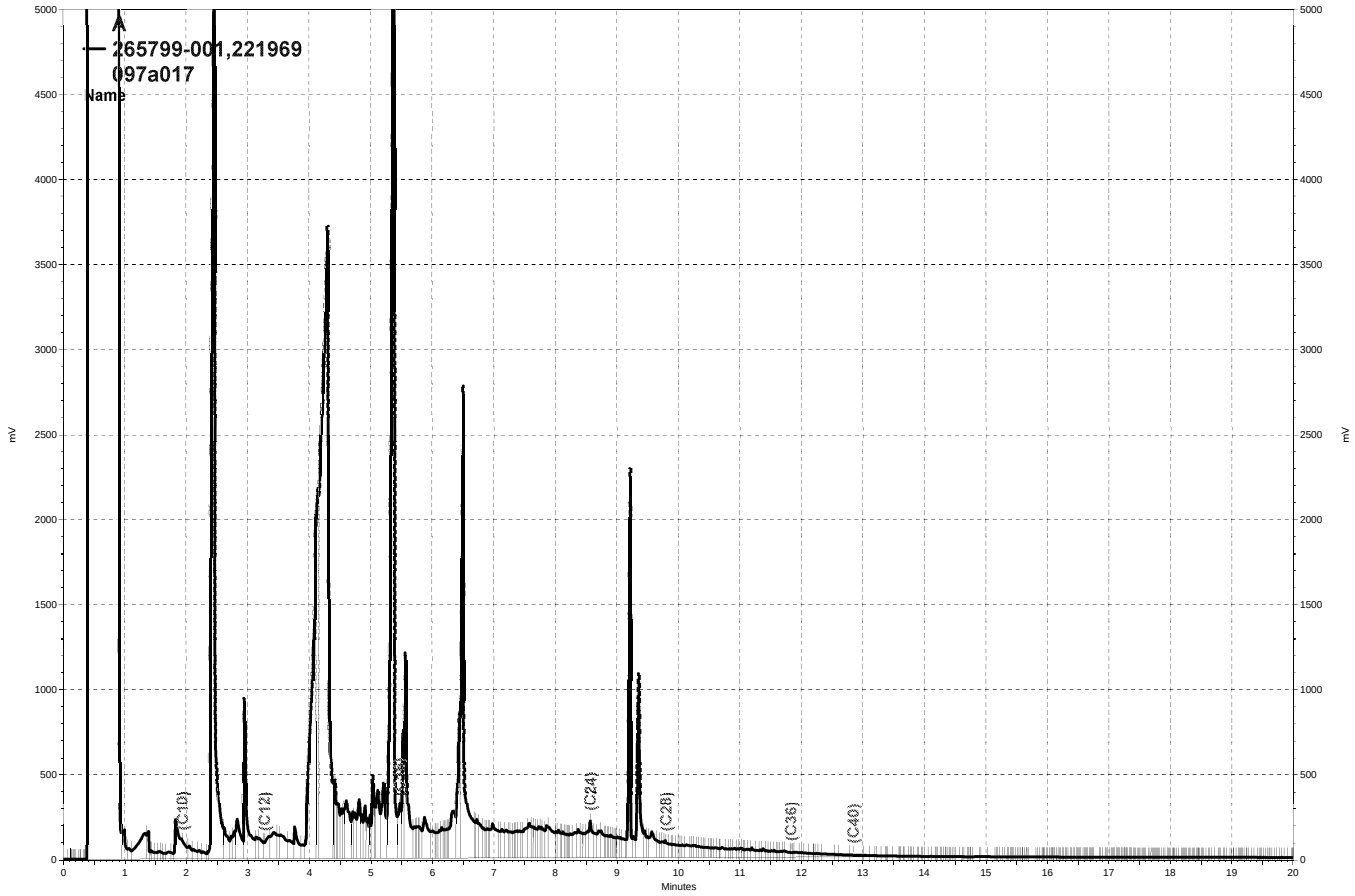
| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 96 | 67-136 |

Type: MSD Cleanup Method: EPA 3630C
Lab ID: QC783168

| Analyte | Spiked | Result | %REC | Limits | RPD | Lim |
|---|---|---|---|---|---|---|
| Diesel C10-C24 | 2,500 | 2,783 | 98 | 55-122 | 3 | 53 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 94 | 67-136 |

RPD= Relative Percent Difference

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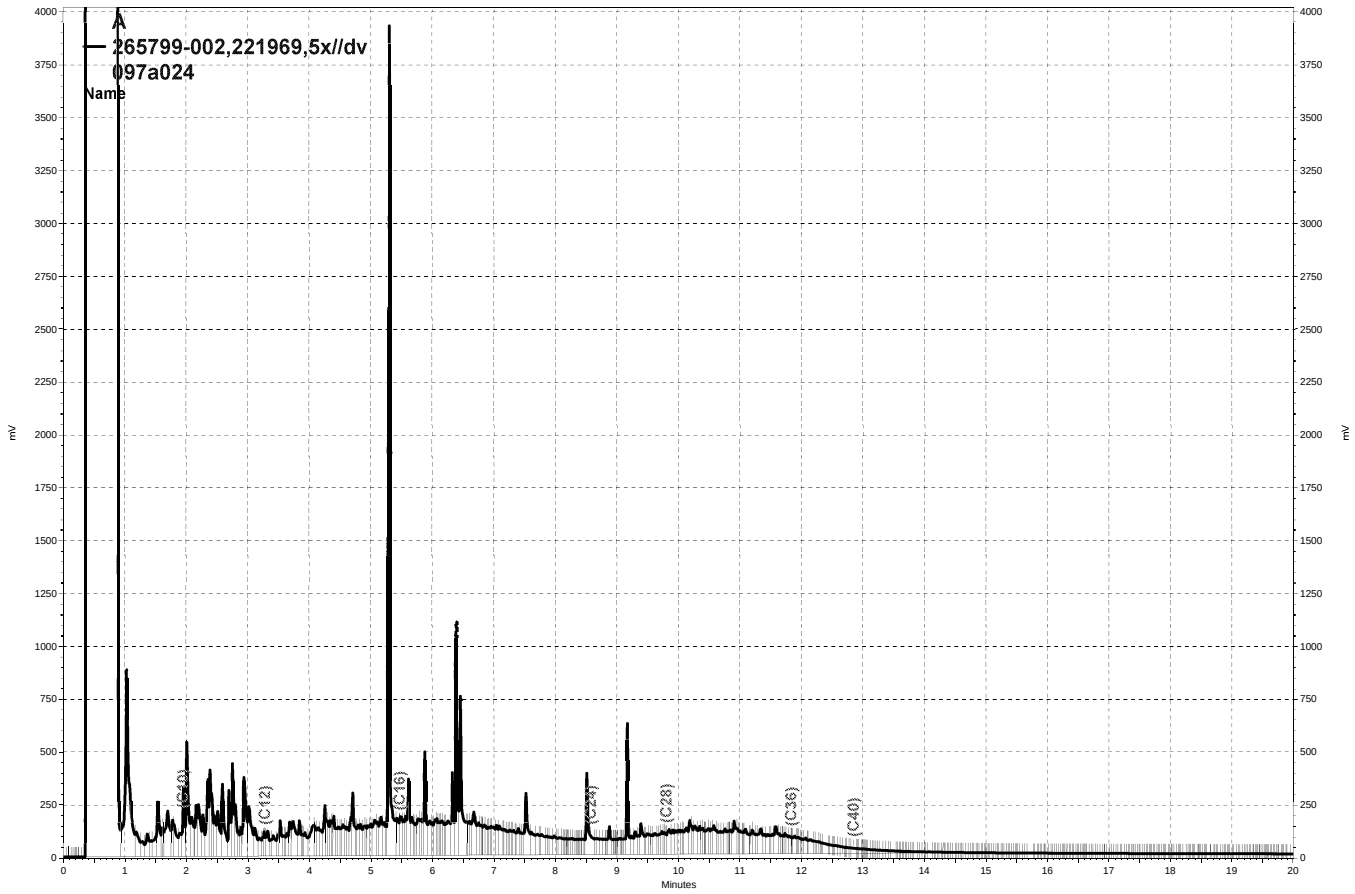


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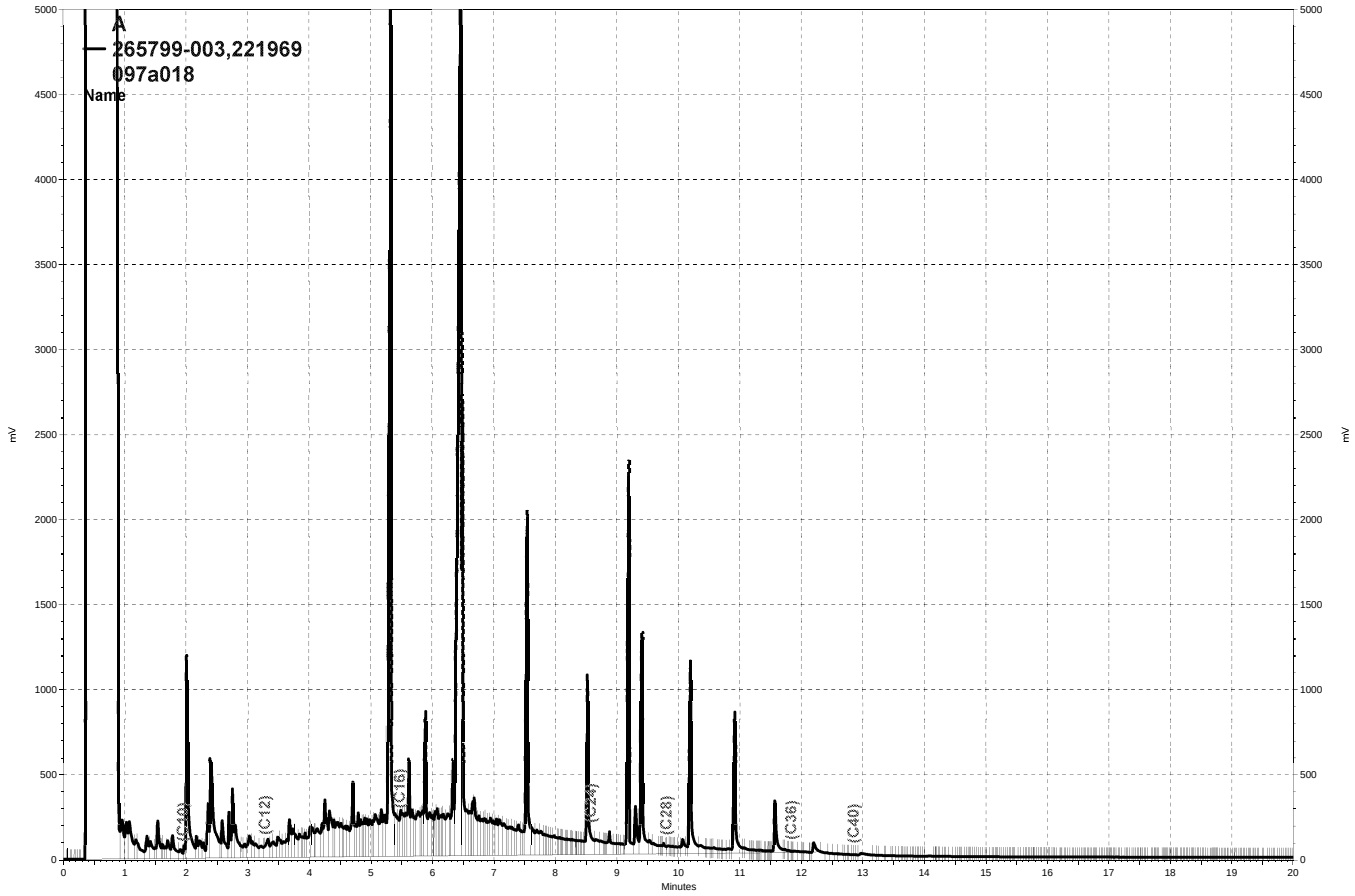


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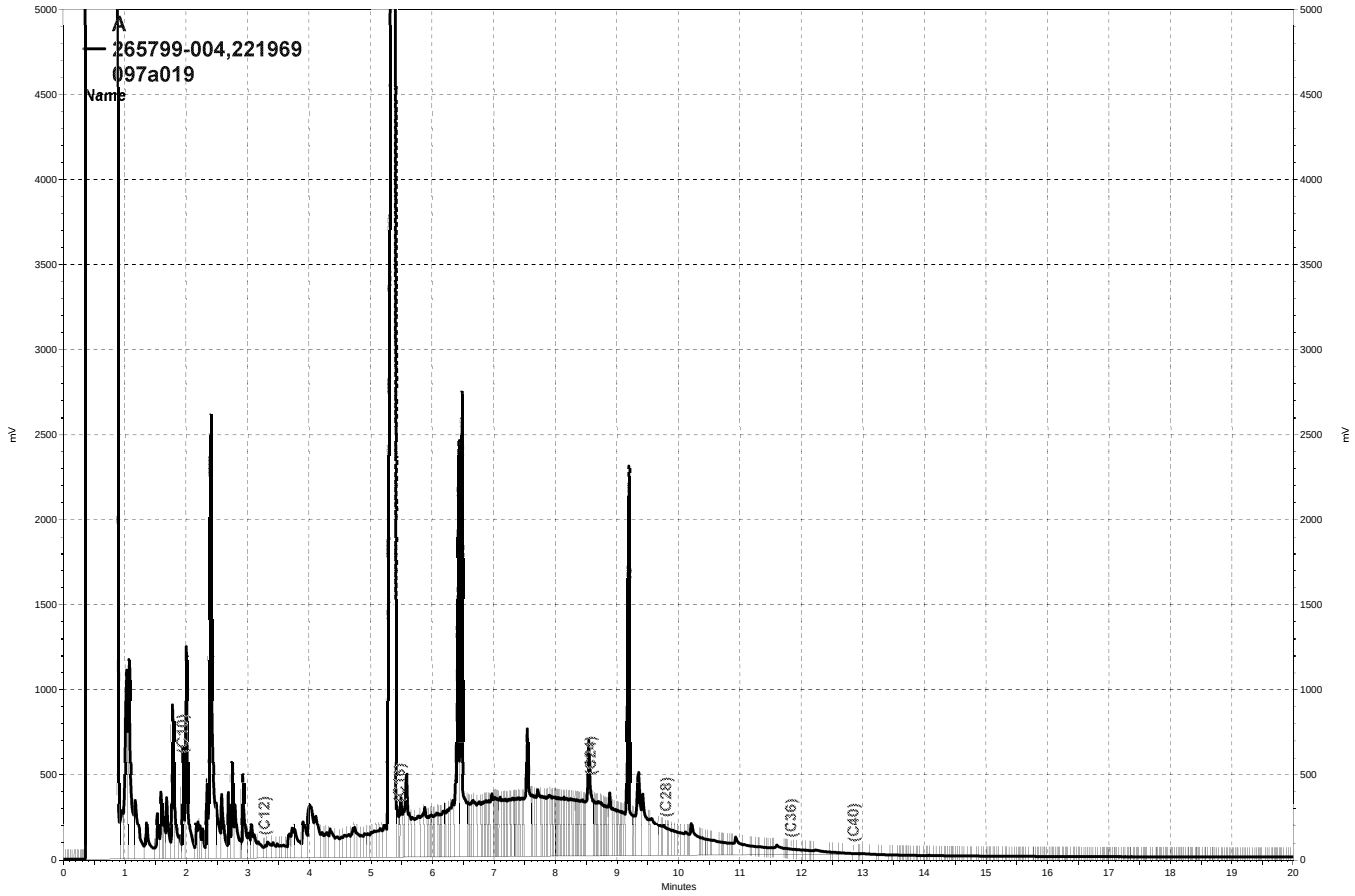


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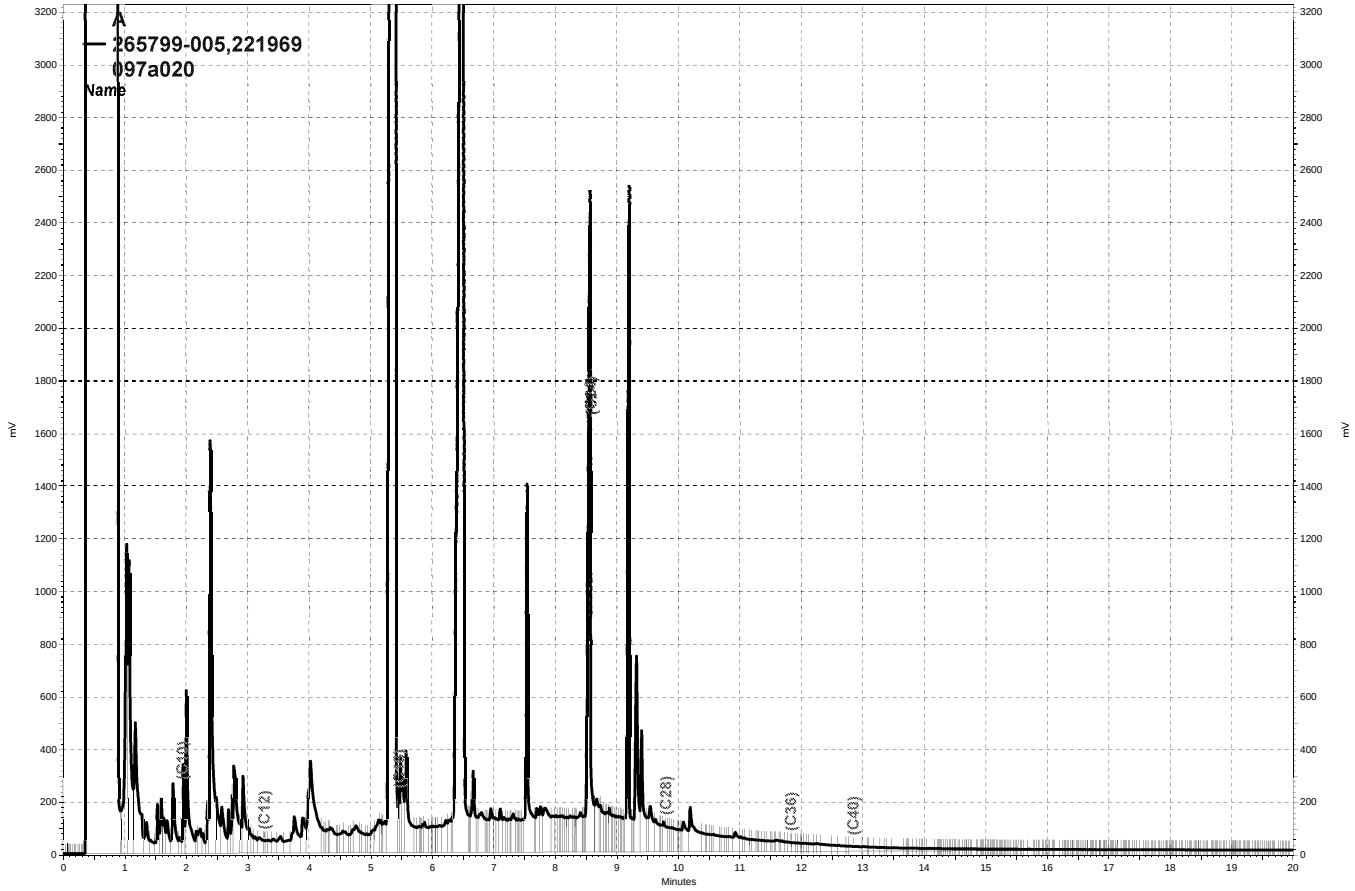


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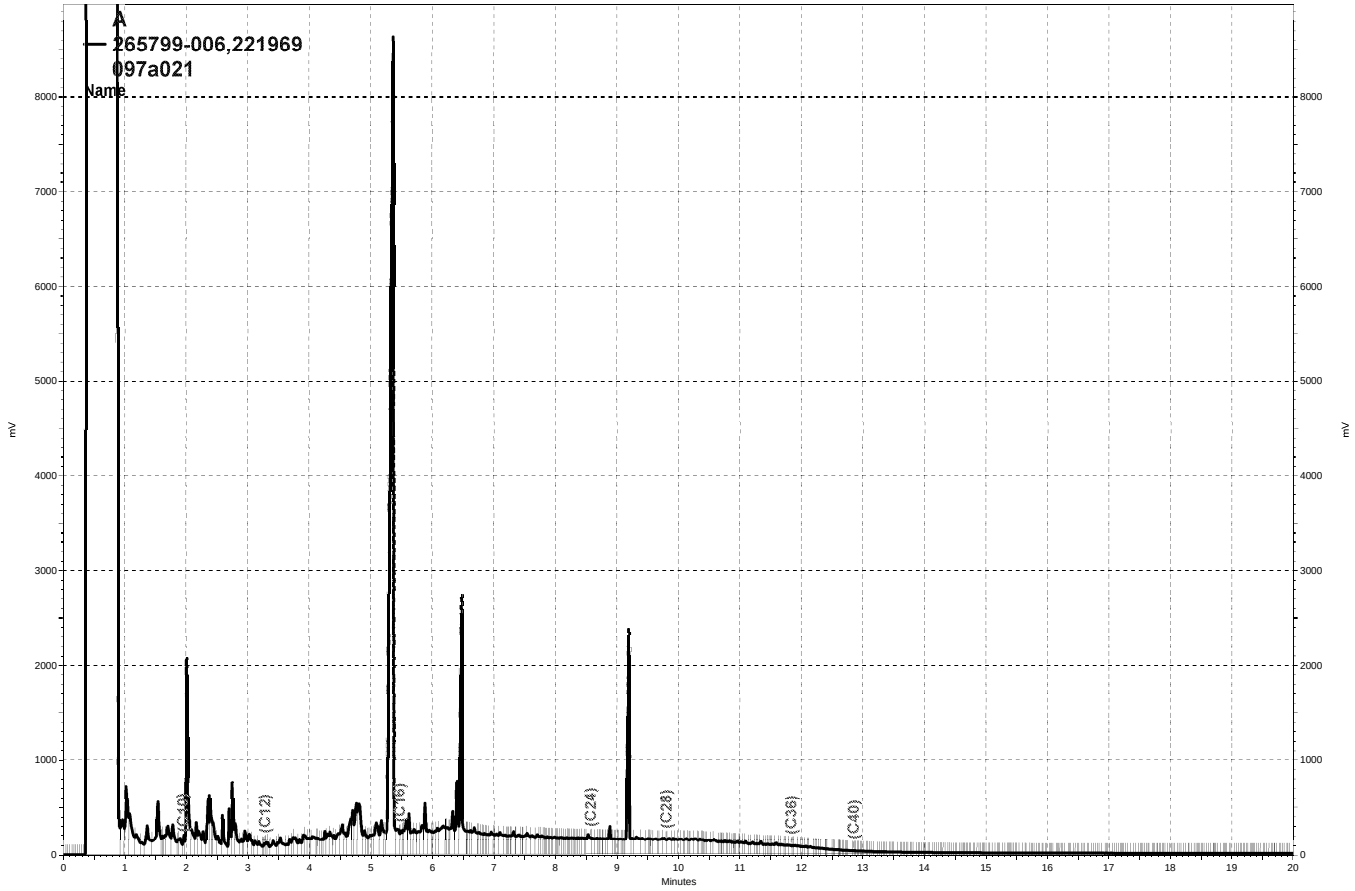


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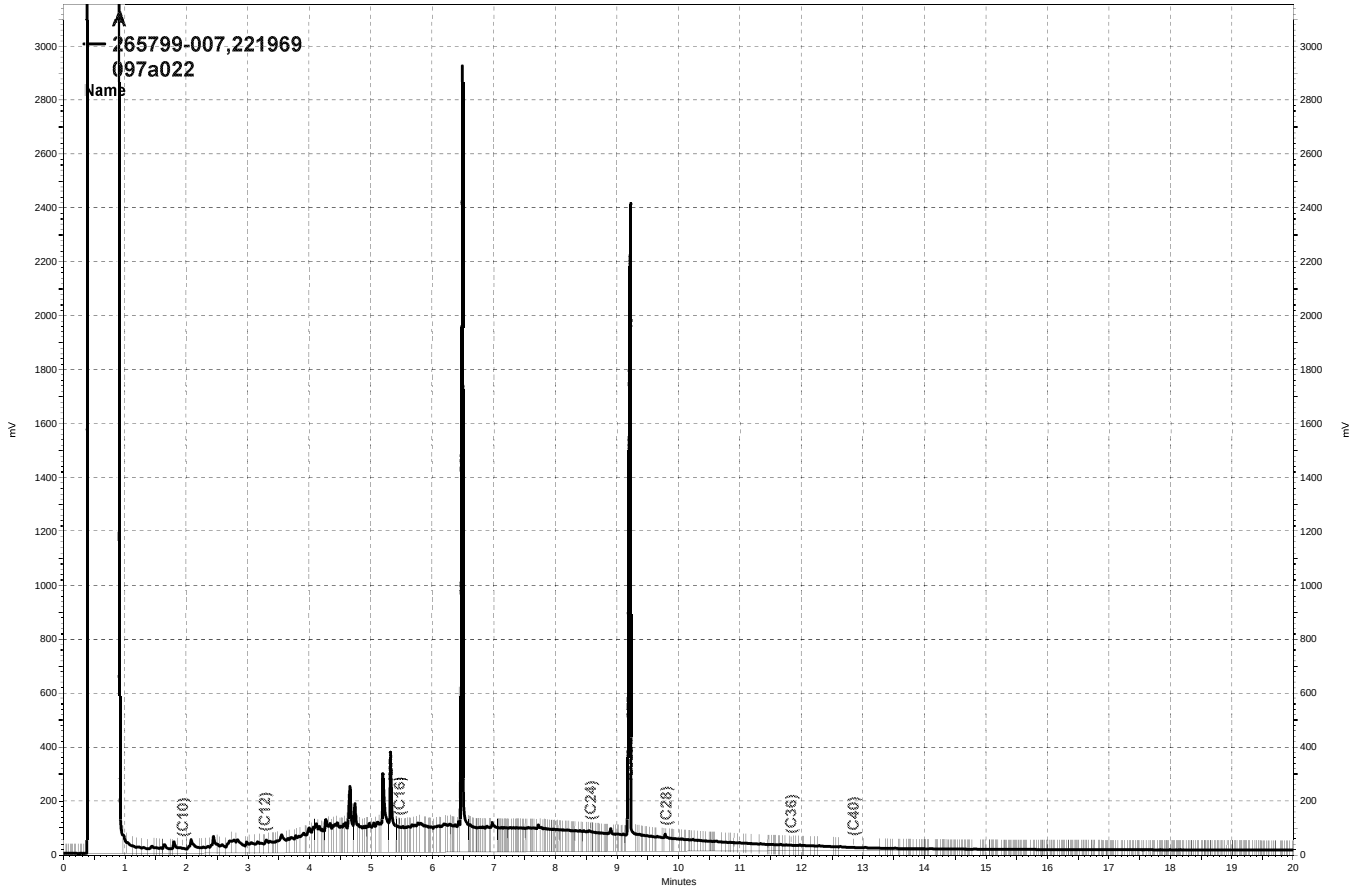


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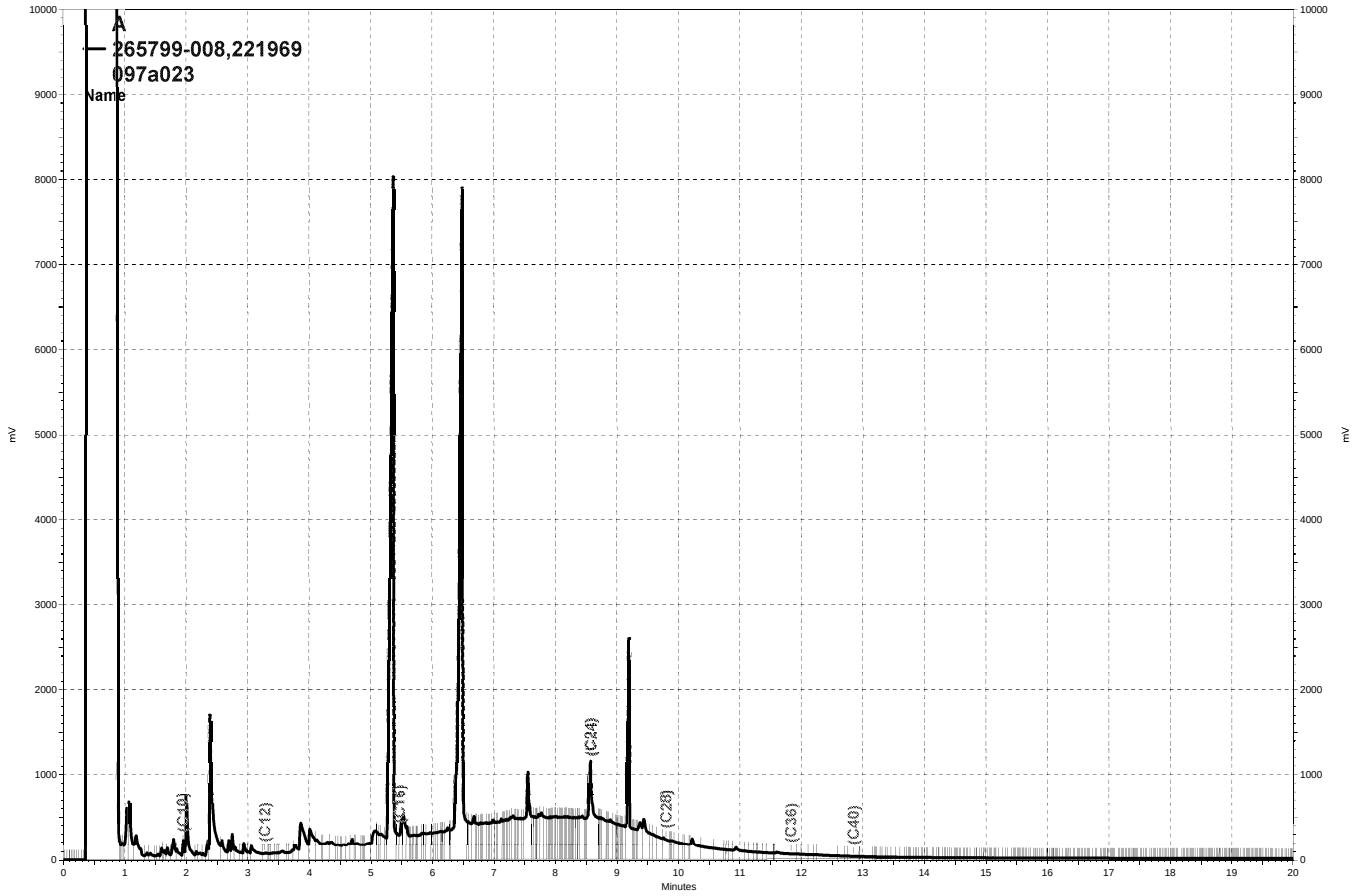


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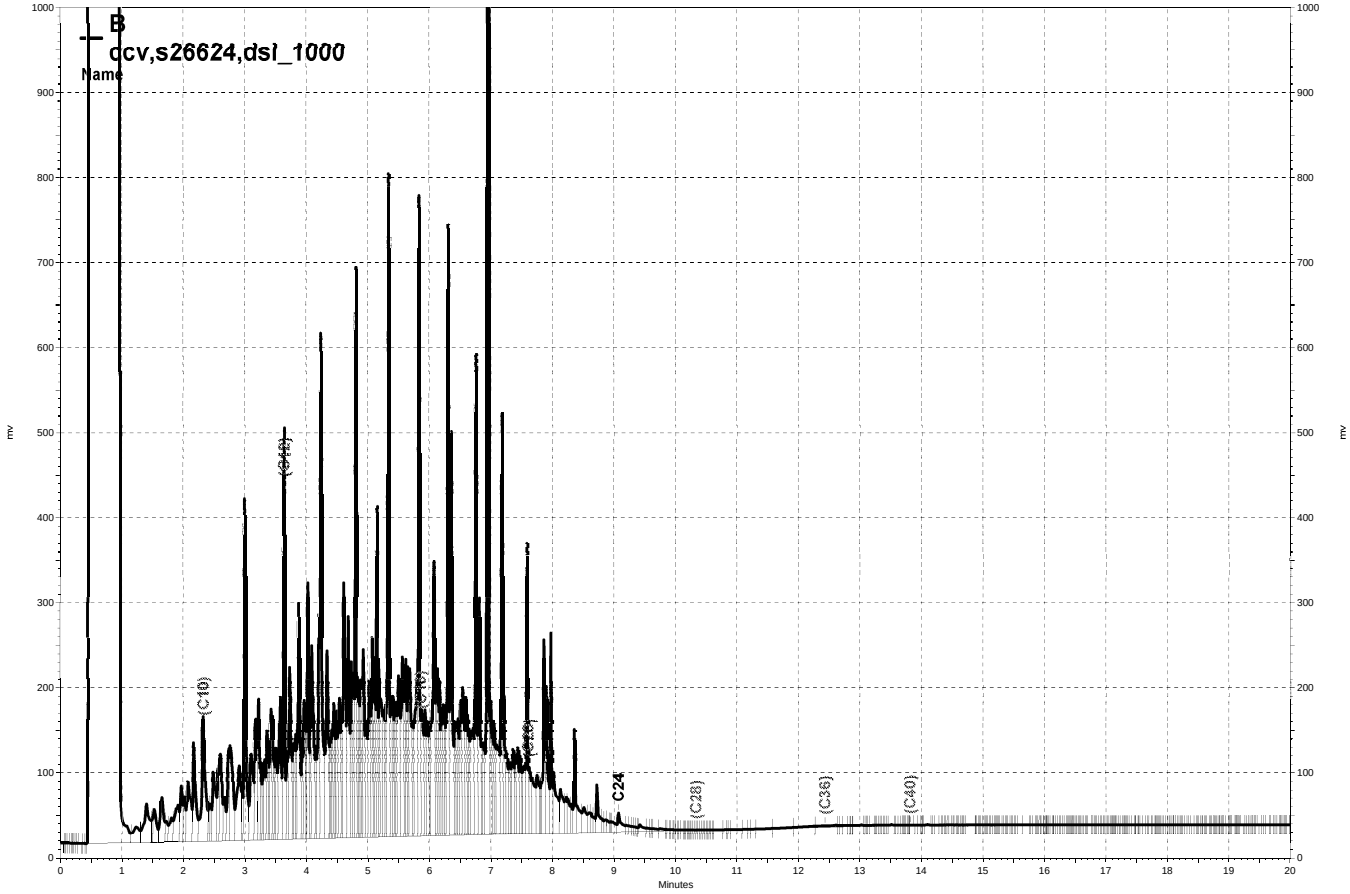


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Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

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

**Laboratory Job Number 265685**
**ANALYTICAL REPORT**

| | |
|---|---|
| Stellar Environmental Solutions | Project : 2007-65 |
| 2198 6th Street | Location : Bay Center Apartment |
| Berkeley, CA 94710 | Level : II |

| Sample ID | Lab ID |
|---|---|
| MW-5 | 265685-001 |
| MW-6 | 265685-002 |
| MW-7 | 265685-003 |
| MW-9 | 265685-004 |
| MW-11 | 265685-005 |
| MW-12 | 265685-006 |
| MW-16 | 265685-007 |
| MW-17 | 265685-008 |
| MW-18 | 265685-009 |

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

Signature: Tracy Babjar Date: 04/09/2015

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

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

# CASE NARRATIVE

| | |
|---|---|
| Laboratory number: | **265685** |
| Client: | **Stellar Environmental Solutions** |
| Project: | **2007-65** |
| Location: | **Bay Center Apartment** |
| Request Date: | **03/30/15** |
| Samples Received: | **03/30/15** |

This data package contains sample and QC results for nine water samples, requested for the above referenced project on 03/30/15. The samples were received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):**
No analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**
MW-18 (lab # 265685-009) was diluted due to the dark and viscous nature of the sample extract. No other analytical problems were encountered.

265685

# Chain of Custody Record

Lab job no. _____
Date 3/30/15
Page 1 of 1

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

Project Owner _____
Site Address 6400 CHRISTIE AVE.
BERKELEY, CA
Project Name BAY CENTER APARTMENT
Project Number 2007-65

Method of Shipment HAND DELIVERY or LAB COURIER
Shipment No. _____
Airbill No. _____
Cooler No. _____
Project Manager R. MAKDISI
Telephone No. (510) 644-3123
Fax No. (510) 644-3859
Samplers: (Signature)

| | Field Sample Number | Location/ Depth | Date | Time | Sample Type | Type/Size of Container | Preservation: Cooler | Preservation: Chemical | Filtered | No. of Containers | Analysis Required: TEH-D (8015M) | Analysis Required: TPH-G/M/BTEX | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MW-5 | | 3/30/15 | 1325 | GRAB | 3 VOAs (40mL) / 1L-AGB | | HCl / NP | | | X | X | |
| 2 | MW-6 | | | 1312 | | | | | | | X | X | |
| 3 | MW-7 | | | 1500 | | | | | | | X | X | |
| 4 | MW-9 | | | 1250 | | | | | | | X | X | |
| 5 | MW-11 | | | 1310 | | | | | | | X | X | |
| 6 | MW-12 | | | 1340 | | | | | | | X | X | |
| 7 | MW-16 | | | 1400 | | | | | | | X | X | |
| 8 | MW-17 | | | 1353 | | | | | | | X | X | |
| 9 | MW-18 | | | 1450 | | | | | | | X | X | |

| Relinquished by: | Date | Received by: | Date |
|---|---|---|---|
| Signature WILLIAM | 3/30/15 | Signature Pat Gonzalez | 3/30/15 |
| Printed WILLIAM | Time 1626 | Printed Pat Gonzalez | Time 1626 |
| Company BLAINE TECH SERVICES | | Company CTT | |

| Relinquished by: | Date | Received by: | Date |
|---|---|---|---|
| Signature | | Signature | |
| Printed | Time | Printed | Time |
| Company | | Company | |

| Relinquished by: | Date | Received by: | Date |
|---|---|---|---|
| Signature | | Signature | |
| Printed | Time | Printed | Time |
| Company | | Company | |

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

2000-00-01

★ Stellar Environmental Solutions

2198 Sixth Street #201, Berkeley, CA 94710

## COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 265685 Date Received 3/30/15 Number of coolers 1
Client Stellar Environmental Solutions Project Bay Center Apartments

Date Opened 3/30 By (print) BL (sign) [signature]
Date Logged in [signature] By (print) [signature] (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) 4.9

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

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

8. Were Method 5035 sampling containers present? _____ YES ~~NO~~
   If YES, what time were they transferred to freezer? _____
9. Did all bottles arrive unbroken/unopened? _____ ~~YES~~ NO
10. Are there any missing / extra samples? _____ YES ~~NO~~
11. Are samples in the appropriate containers for indicated tests? _____ ~~YES~~ NO
12. Are sample labels present, in good condition and complete? _____ ~~YES~~ NO
13. Do the sample labels agree with custody papers? _____ ~~YES~~ NO
14. Was sufficient amount of sample sent for tests requested? _____ ~~YES~~ NO
15. Are the samples appropriately preserved? _____ YES NO ~~N/A~~
16. Did you check preservatives for all bottles for each sample? _____ YES NO ~~N/A~~
17. Did you document your preservative check? _____ 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

_____
_____
_____
_____
_____
_____

Rev 10, 9/12

Curtis & Tompkins, Ltd.

# Detections Summary for 265685

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

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

Client Sample ID : MW-5 Laboratory Sample ID : 265685-001

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Diesel C10-C24 | 4,200 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-6 Laboratory Sample ID : 265685-002

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 61 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 5030B |
| Benzene | 0.87 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Toluene | 0.62 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 1,200 | Y | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-7 Laboratory Sample ID : 265685-003

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 900 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 5030B |
| MTBE | 7.1 | | 2.0 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Benzene | 250 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Toluene | 13 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 8.8 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 40 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| o-Xylene | 7.8 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 7,700 | Y | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-9 Laboratory Sample ID : 265685-004

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 310 | Y | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 5030B |
| Benzene | 8.7 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Toluene | 0.75 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 0.55 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| o-Xylene | 0.70 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 9,000 | Y | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Curtis & Tompkins, Ltd.

Client Sample ID : MW-11 Laboratory Sample ID : 265685-005

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 1,600 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 5030B |
| MTBE | 61 | C | 2.0 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Benzene | 140 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Toluene | 14 | C | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 5.3 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 11 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| o-Xylene | 4.5 | C | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 7,900 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-12 Laboratory Sample ID : 265685-006

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 14,000 | | 1,300 | ug/L | As Recd | 25.00 | EPA 8015B | EPA 5030B |
| MTBE | 66 | C | 50 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| Benzene | 3,800 | | 13 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| Toluene | 120 | | 13 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 82 | | 13 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 60 | | 13 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| o-Xylene | 13 | C | 13 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 3,500 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-16 Laboratory Sample ID : 265685-007

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 200 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 5030B |
| Benzene | 34 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Toluene | 2.4 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 2.5 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 1.2 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| o-Xylene | 0.62 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 9,500 | Y | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-17 Laboratory Sample ID : 265685-008

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 9,800 | | 1,300 | ug/L | As Recd | 25.00 | EPA 8015B | EPA 5030B |
| MTBE | 57 | C | 50 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| Benzene | 1,600 | | 13 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| Toluene | 220 | | 13 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| Ethylbenzene | 120 | | 13 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| m,p-Xylenes | 96 | | 13 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| o-Xylene | 40 | | 13 | ug/L | As Recd | 25.00 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 3,200 | | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 3520C |

Client Sample ID : MW-18 Laboratory Sample ID : 265685-009

| Analyte | Result | Flags | RL | Units | Basis | IDF | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 69 | Y | 50 | ug/L | As Recd | 1.000 | EPA 8015B | EPA 5030B |
| Benzene | 6.0 | | 0.50 | ug/L | As Recd | 1.000 | EPA 8021B | EPA 5030B |
| Diesel C10-C24 | 10,000 | Y | 250 | ug/L | As Recd | 5.000 | 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, Ltd.

# Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | | |
| Matrix: | Water | Sampled: | 03/30/15 |
| Units: | ug/L | Received: | 03/30/15 |
| Batch#: | 221819 | | |

| | | | |
|---|---|---|---|
| Field ID: | MW-5 | Diln Fac: | 1.000 |
| Type: | SAMPLE | Analyzed: | 03/31/15 |
| Lab ID: | 265685-001 | | |

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

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 99 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 82 | 71-141 | EPA 8021B |

| | | | |
|---|---|---|---|
| Field ID: | MW-6 | Diln Fac: | 1.000 |
| Type: | SAMPLE | Analyzed: | 04/01/15 |
| Lab ID: | 265685-002 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 61 | 50 | EPA 8015B |
| MTBE | ND | 2.0 | EPA 8021B |
| Benzene | 0.87 | 0.50 | EPA 8021B |
| Toluene | 0.62 | 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) | 94 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 80 | 71-141 | EPA 8021B |

C= Presence confirmed, but RPD between columns exceeds 40%
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

# Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | | |
| Matrix: | Water | Sampled: | 03/30/15 |
| Units: | ug/L | Received: | 03/30/15 |
| Batch#: | 221819 | | |

Field ID: MW-7 Diln Fac: 1.000
Type: SAMPLE Analyzed: 04/01/15
Lab ID: 265685-003

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 900 | 50 | EPA 8015B |
| MTBE | 7.1 | 2.0 | EPA 8021B |
| Benzene | 250 | 0.50 | EPA 8021B |
| Toluene | 13 | 0.50 | EPA 8021B |
| Ethylbenzene | 8.8 | 0.50 | EPA 8021B |
| m,p-Xylenes | 40 | 0.50 | EPA 8021B |
| o-Xylene | 7.8 | 0.50 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 80 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 75 | 71-141 | EPA 8021B |

Field ID: MW-9 Diln Fac: 1.000
Type: SAMPLE Analyzed: 04/01/15
Lab ID: 265685-004

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 310 Y | 50 | EPA 8015B |
| MTBE | ND | 2.0 | EPA 8021B |
| Benzene | 8.7 | 0.50 | EPA 8021B |
| Toluene | 0.75 | 0.50 | EPA 8021B |
| Ethylbenzene | ND | 0.50 | EPA 8021B |
| m,p-Xylenes | 0.55 | 0.50 | EPA 8021B |
| o-Xylene | 0.70 | 0.50 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 92 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 86 | 71-141 | EPA 8021B |

C= Presence confirmed, but RPD between columns exceeds 40%
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

# Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | | |
| Matrix: | Water | Sampled: | 03/30/15 |
| Units: | ug/L | Received: | 03/30/15 |
| Batch#: | 221819 | | |

| | | | |
|---|---|---|---|
| Field ID: | MW-11 | Diln Fac: | 1.000 |
| Type: | SAMPLE | Analyzed: | 04/01/15 |
| Lab ID: | 265685-005 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 1,600 | 50 | EPA 8015B |
| MTBE | 61 C | 2.0 | EPA 8021B |
| Benzene | 140 | 0.50 | EPA 8021B |
| Toluene | 14 C | 0.50 | EPA 8021B |
| Ethylbenzene | 5.3 | 0.50 | EPA 8021B |
| m,p-Xylenes | 11 | 0.50 | EPA 8021B |
| o-Xylene | 4.5 C | 0.50 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 106 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 93 | 71-141 | EPA 8021B |

| | | | |
|---|---|---|---|
| Field ID: | MW-12 | Diln Fac: | 25.00 |
| Type: | SAMPLE | Analyzed: | 04/01/15 |
| Lab ID: | 265685-006 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 14,000 | 1,300 | EPA 8015B |
| MTBE | 66 C | 50 | EPA 8021B |
| Benzene | 3,800 | 13 | EPA 8021B |
| Toluene | 120 | 13 | EPA 8021B |
| Ethylbenzene | 82 | 13 | EPA 8021B |
| m,p-Xylenes | 60 | 13 | EPA 8021B |
| o-Xylene | 13 C | 13 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 107 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 98 | 71-141 | EPA 8021B |

C= Presence confirmed, but RPD between columns exceeds 40%
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

# Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | | |
| Matrix: | Water | Sampled: | 03/30/15 |
| Units: | ug/L | Received: | 03/30/15 |
| Batch#: | 221819 | | |

Field ID: MW-16 Diln Fac: 1.000
Type: SAMPLE Analyzed: 04/01/15
Lab ID: 265685-007

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 200 | 50 | EPA 8015B |
| MTBE | ND | 2.0 | EPA 8021B |
| Benzene | 34 | 0.50 | EPA 8021B |
| Toluene | 2.4 | 0.50 | EPA 8021B |
| Ethylbenzene | 2.5 | 0.50 | EPA 8021B |
| m,p-Xylenes | 1.2 | 0.50 | EPA 8021B |
| o-Xylene | 0.62 | 0.50 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 98 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 98 | 71-141 | EPA 8021B |

Field ID: MW-17 Diln Fac: 25.00
Type: SAMPLE Analyzed: 04/01/15
Lab ID: 265685-008

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 9,800 | 1,300 | EPA 8015B |
| MTBE | 57 C | 50 | EPA 8021B |
| Benzene | 1,600 | 13 | EPA 8021B |
| Toluene | 220 | 13 | EPA 8021B |
| Ethylbenzene | 120 | 13 | EPA 8021B |
| m,p-Xylenes | 96 | 13 | EPA 8021B |
| o-Xylene | 40 | 13 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 110 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 103 | 71-141 | EPA 8021B |

C= Presence confirmed, but RPD between columns exceeds 40%
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

# Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | | |
| Matrix: | Water | Sampled: | 03/30/15 |
| Units: | ug/L | Received: | 03/30/15 |
| Batch#: | 221819 | | |

| | | | |
|---|---|---|---|
| Field ID: | MW-18 | Diln Fac: | 1.000 |
| Type: | SAMPLE | Analyzed: | 04/01/15 |
| Lab ID: | 265685-009 | | |

| Analyte | Result | RL | Analysis |
|---|---|---|---|
| Gasoline C7-C12 | 69 Y | 50 | EPA 8015B |
| MTBE | ND | 2.0 | EPA 8021B |
| Benzene | 6.0 | 0.50 | EPA 8021B |
| Toluene | ND | 0.50 | EPA 8021B |
| Ethylbenzene | ND | 0.50 | EPA 8021B |
| m,p-Xylenes | ND | 0.50 | EPA 8021B |
| o-Xylene | ND | 0.50 | EPA 8021B |

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 102 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 96 | 71-141 | EPA 8021B |

| | | | |
|---|---|---|---|
| Type: | BLANK | Diln Fac: | 1.000 |
| Lab ID: | QC782593 | Analyzed: | 03/31/15 |

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

| Surrogate | %REC | Limits | Analysis |
|---|---|---|---|
| Bromofluorobenzene (FID) | 99 | 80-132 | EPA 8015B |
| Bromofluorobenzene (PID) | 89 | 71-141 | EPA 8021B |

C= Presence confirmed, but RPD between columns exceeds 40%
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Batch QC Report

## Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265685 | 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: | QC782592 | Batch#: | 221819 |
| Matrix: | Water | Analyzed: | 03/31/15 |
| Units: | ug/L | | |

| Analyte | Spiked | Result | %REC | Limits |
|---|---|---|---|---|
| Gasoline C7-C12 | 1,000 | 957.5 | 96 | 80-120 |

| Surrogate | %REC | Limits |
|---|---|---|
| Bromofluorobenzene (FID) | 107 | 80-132 |

Batch QC Report

## Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Field ID: | MW-5 | Batch#: | 221819 |
| MSS Lab ID: | 265685-001 | Sampled: | 03/30/15 |
| Matrix: | Water | Received: | 03/30/15 |
| Units: | ug/L | Analyzed: | 03/31/15 |
| Diln Fac: | 1.000 | | |

Type: MS Lab ID: QC782594

| Analyte | MSS Result | Spiked | Result | %REC | Limits |
|---|---|---|---|---|---|
| Gasoline C7-C12 | 48.67 | 2,000 | 1,699 | 83 | 76-120 |

| Surrogate | %REC | Limits |
|---|---|---|
| Bromofluorobenzene (FID) | 99 | 80-132 |

Type: MSD Lab ID: QC782595

| Analyte | Spiked | Result | %REC | Limits | RPD | Lim |
|---|---|---|---|---|---|---|
| Gasoline C7-C12 | 2,000 | 1,799 | 88 | 76-120 | 6 | 20 |

| Surrogate | %REC | Limits |
|---|---|---|
| Bromofluorobenzene (FID) | 106 | 80-132 |

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

## Curtis & Tompkins Laboratories Analytical Report

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 5030B |
| Project#: | 2007-65 | Analysis: | EPA 8021B |
| Matrix: | Water | Diln Fac: | 1.000 |
| Units: | ug/L | Batch#: | 221819 |

Type: BS Analyzed: 03/31/15
Lab ID: QC782596

| Analyte | Spiked | Result | %REC | Limits |
|---|---|---|---|---|
| MTBE | 10.00 | 8.626 | 86 | 74-137 |
| Benzene | 10.00 | 10.15 | 101 | 80-120 |
| Toluene | 10.00 | 9.781 | 98 | 80-120 |
| Ethylbenzene | 10.00 | 9.851 | 99 | 80-120 |
| m,p-Xylenes | 10.00 | 9.890 | 99 | 80-120 |
| o-Xylene | 10.00 | 9.611 | 96 | 80-120 |

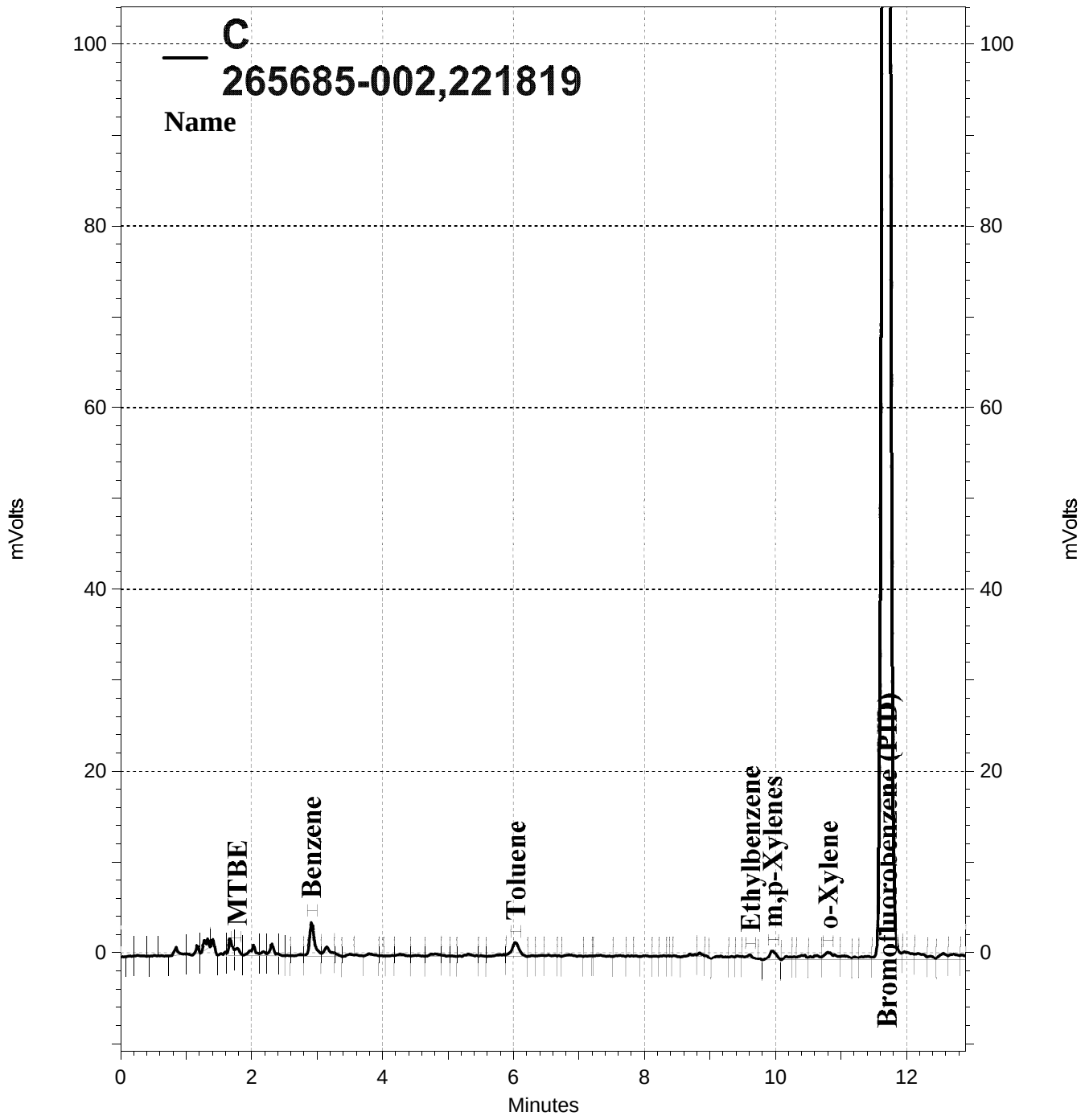
| Surrogate | %REC | Limits |
|---|---|---|
| Bromofluorobenzene (PID) | 92 | 71-141 |

Type: BSD Analyzed: 04/01/15
Lab ID: QC782597

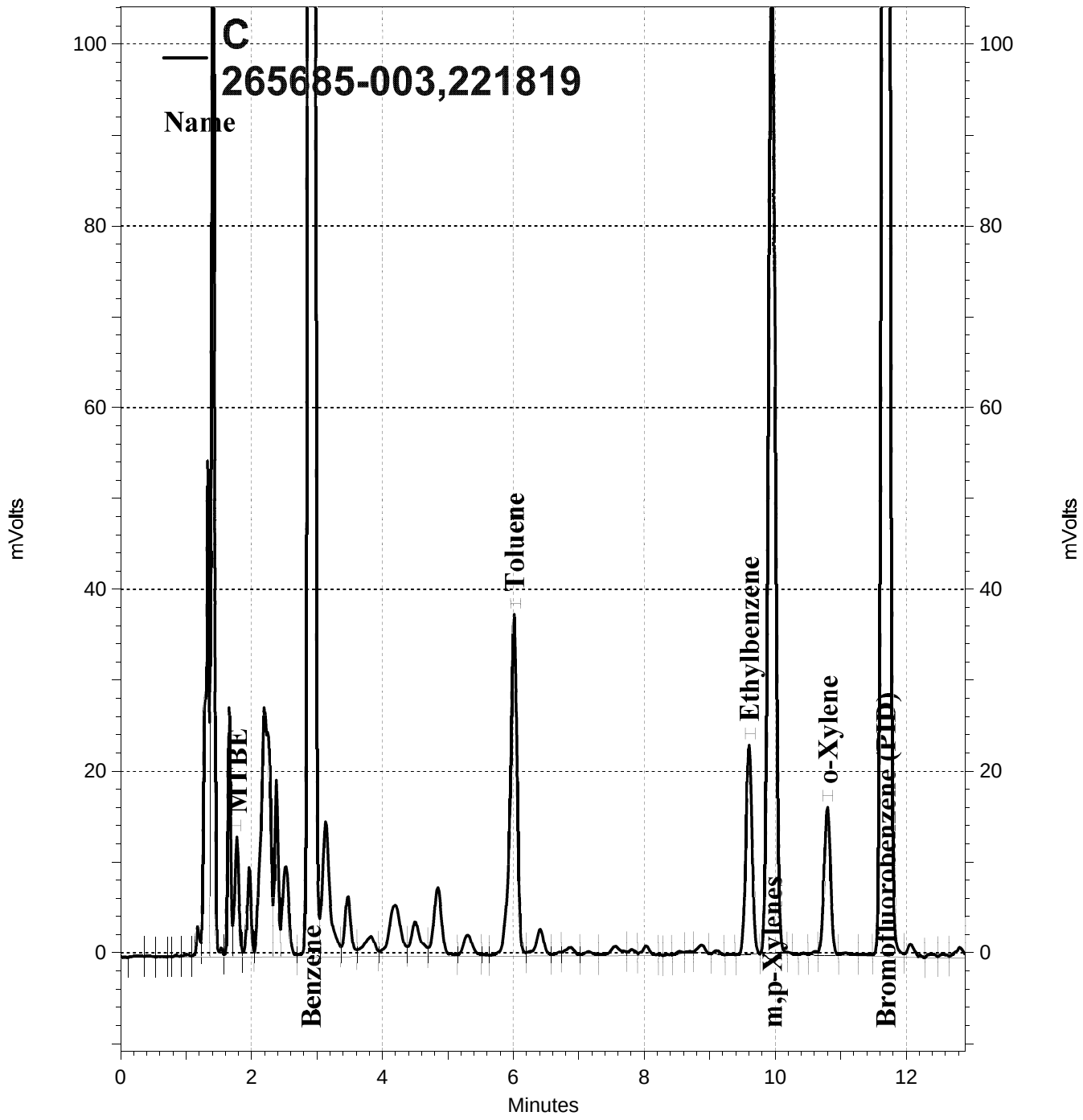
| Analyte | Spiked | Result | %REC | Limits | RPD | Lim |
|---|---|---|---|---|---|---|
| MTBE | 30.00 | 25.25 | 84 | 74-137 | 2 | 37 |
| Benzene | 30.00 | 30.41 | 101 | 80-120 | 0 | 20 |
| Toluene | 30.00 | 28.69 | 96 | 80-120 | 2 | 20 |
| Ethylbenzene | 30.00 | 29.81 | 99 | 80-120 | 1 | 20 |
| m,p-Xylenes | 30.00 | 28.93 | 96 | 80-120 | 3 | 20 |
| o-Xylene | 30.00 | 28.34 | 94 | 80-120 | 2 | 20 |

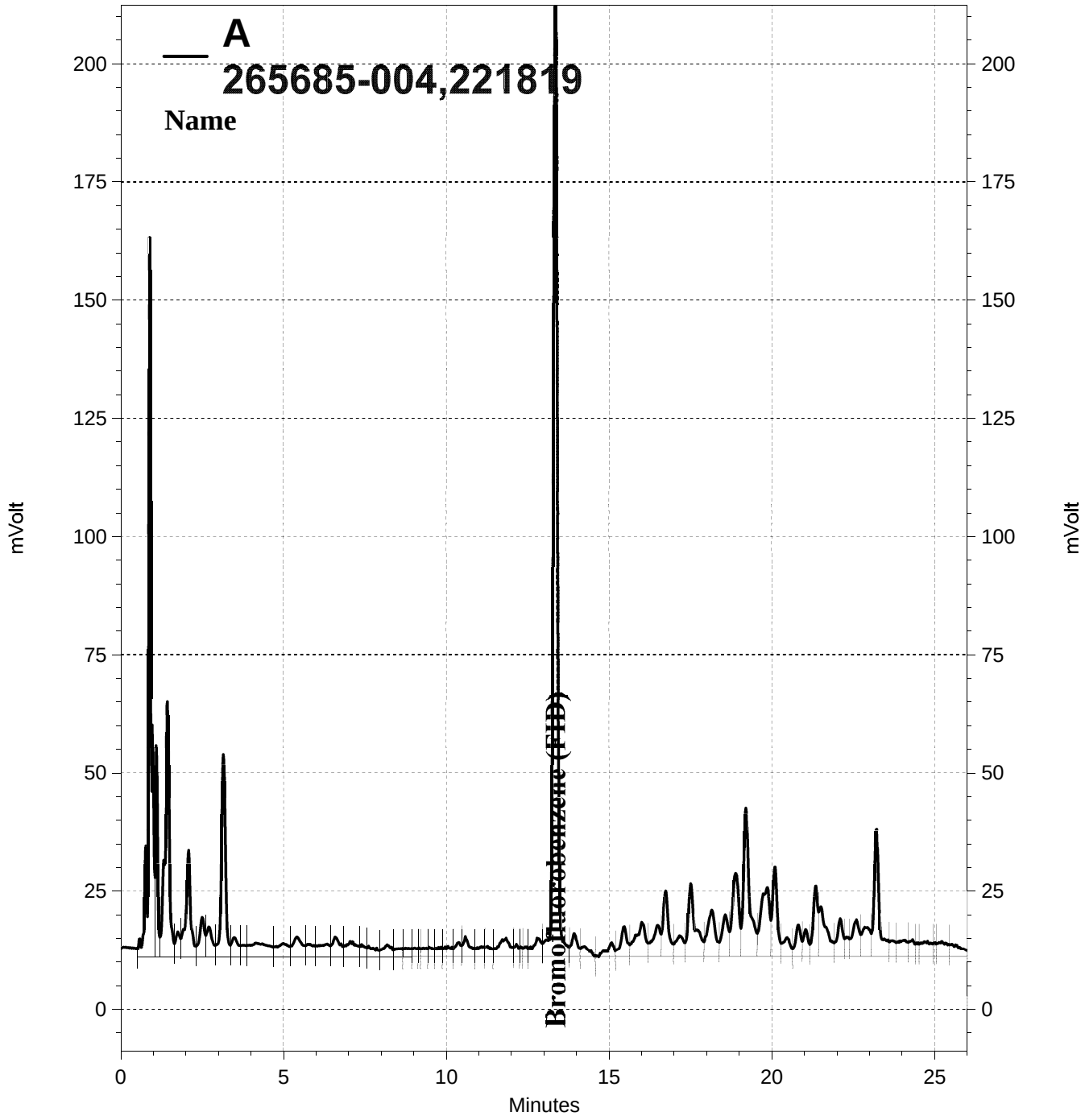
| Surrogate | %REC | Limits |
|---|---|---|
| Bromofluorobenzene (PID) | 88 | 71-141 |

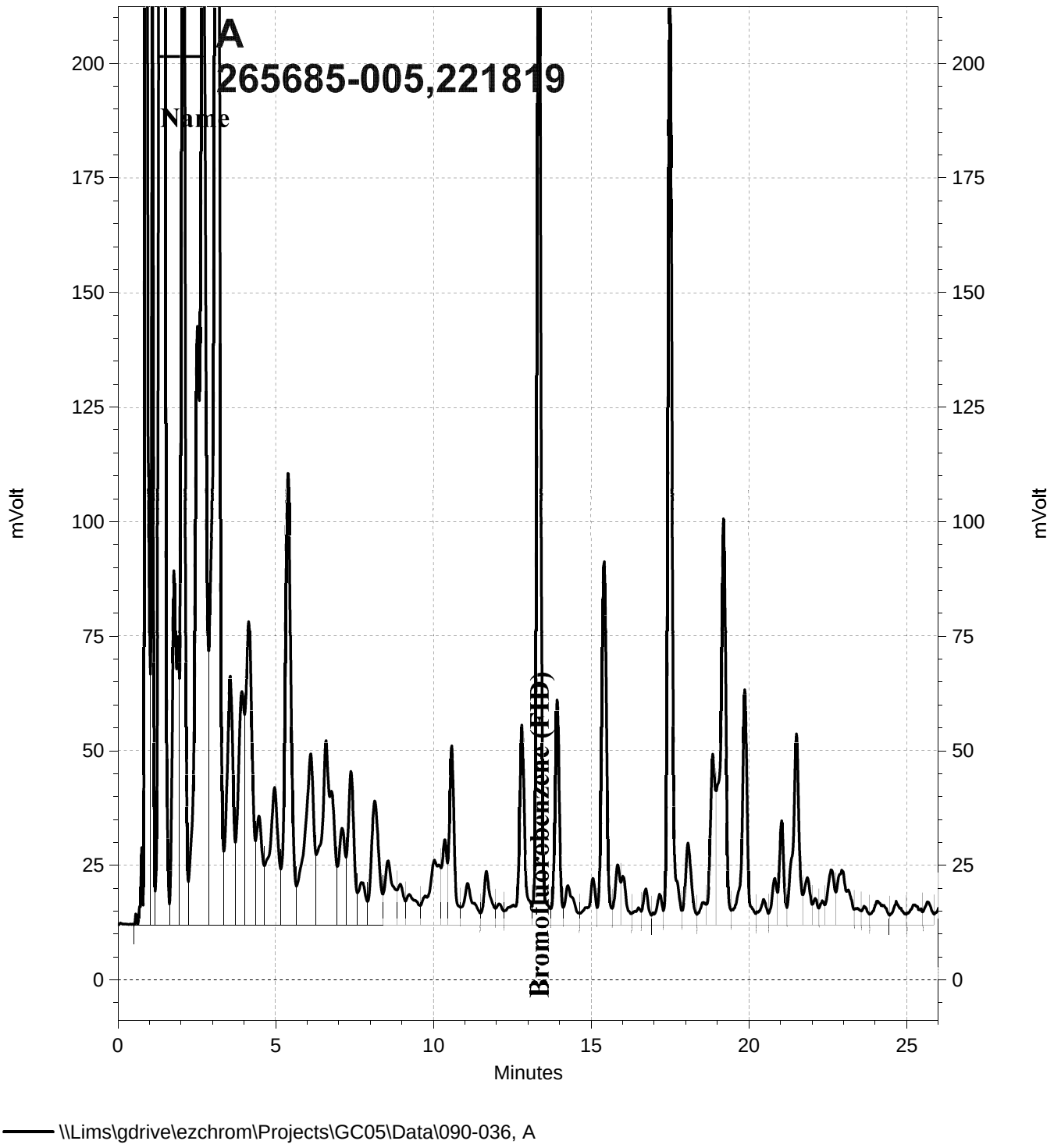
RPD= Relative Percent Difference

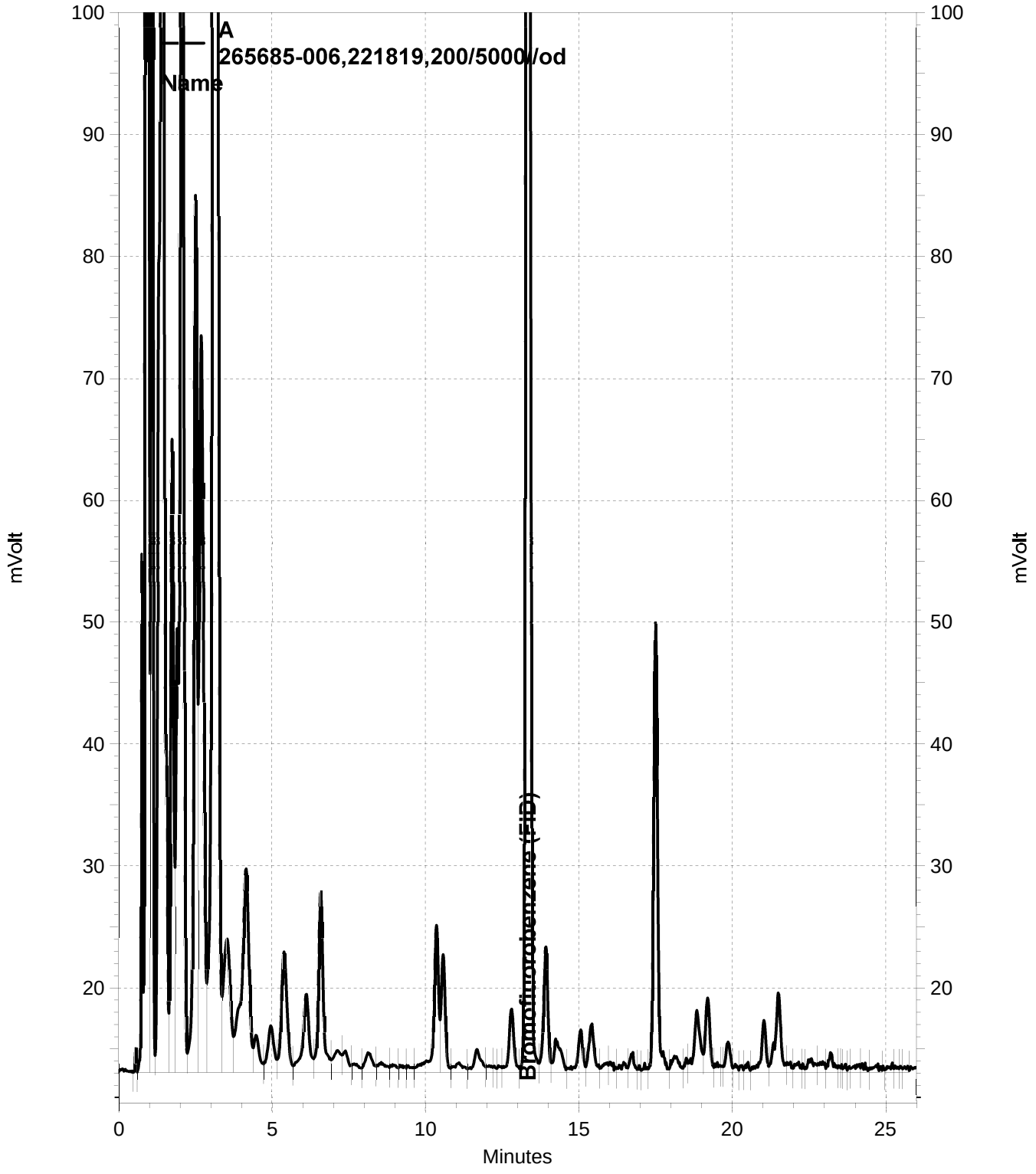



\\Lims\gdrive\ezchrom\Projects\GC05\Data\090-033, C


C
265685-003,221819
Name
mVolts
mVolts
Minutes
MTBE
Benzene
Toluene
Ethylbenzene
m,p-Xylenes
o-Xylene
Bromofluorobenzene (PID)
\\Lims\gdrive\ezchrom\Projects\GC05\Data\090-034, C


A
265685-004,221819
Name
Bromofluorobenzene (FID)
mVolt
mVolt
Minutes
0
5
10
15
20
25
0
25
50
75
100
125
150
175
200
\\Lims\gdrive\ezchrom\Projects\GC05\Data\090-035, A


A
265685-005,221819
Name
Bromofluorobenzene (FID)
mVolt
mVolt
Minutes
0
5
10
15
20
25
0
25
50
75
100
125
150
175
200
\\Lims\gdrive\ezchrom\Projects\GC05\Data\090-036, A

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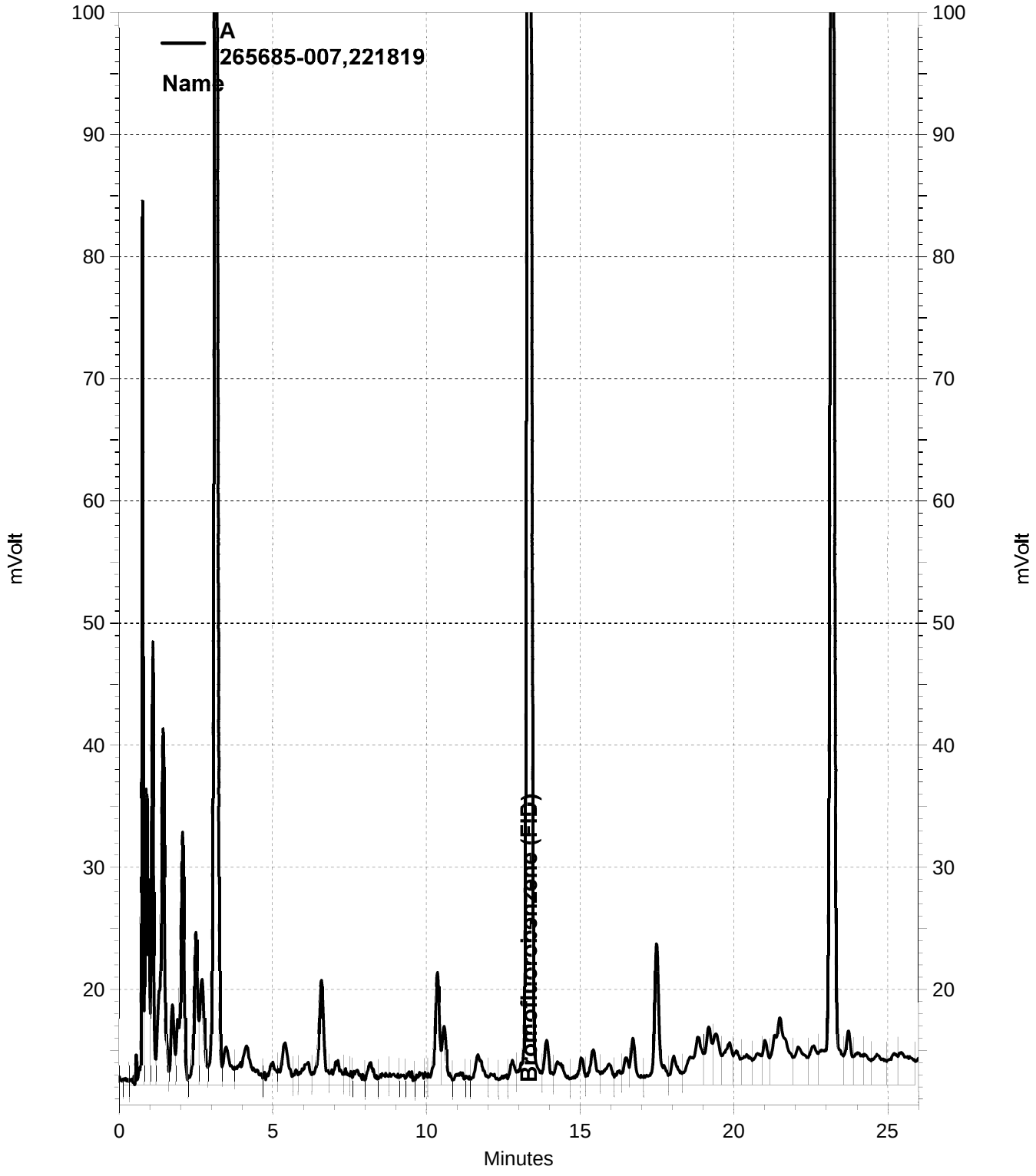


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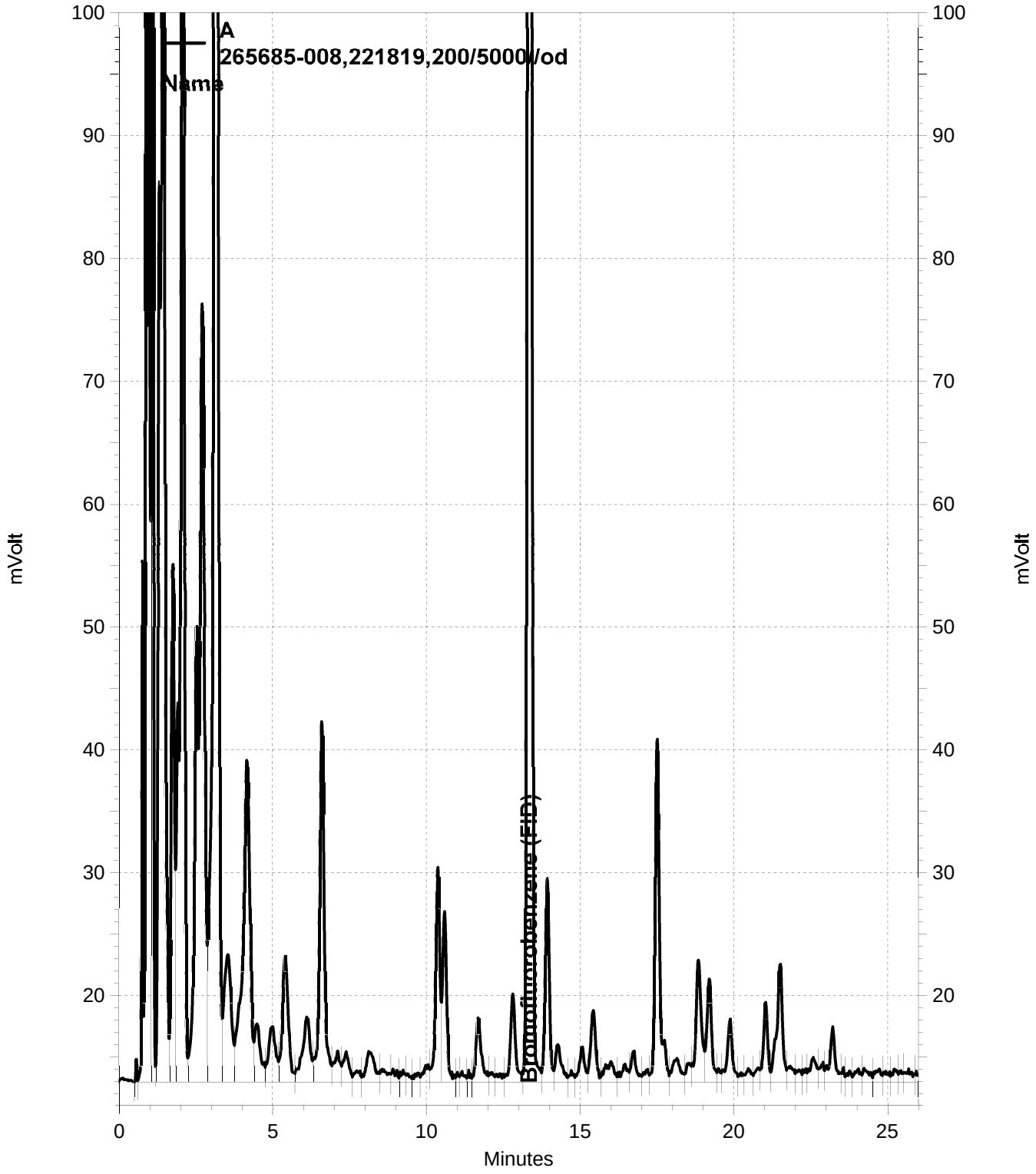


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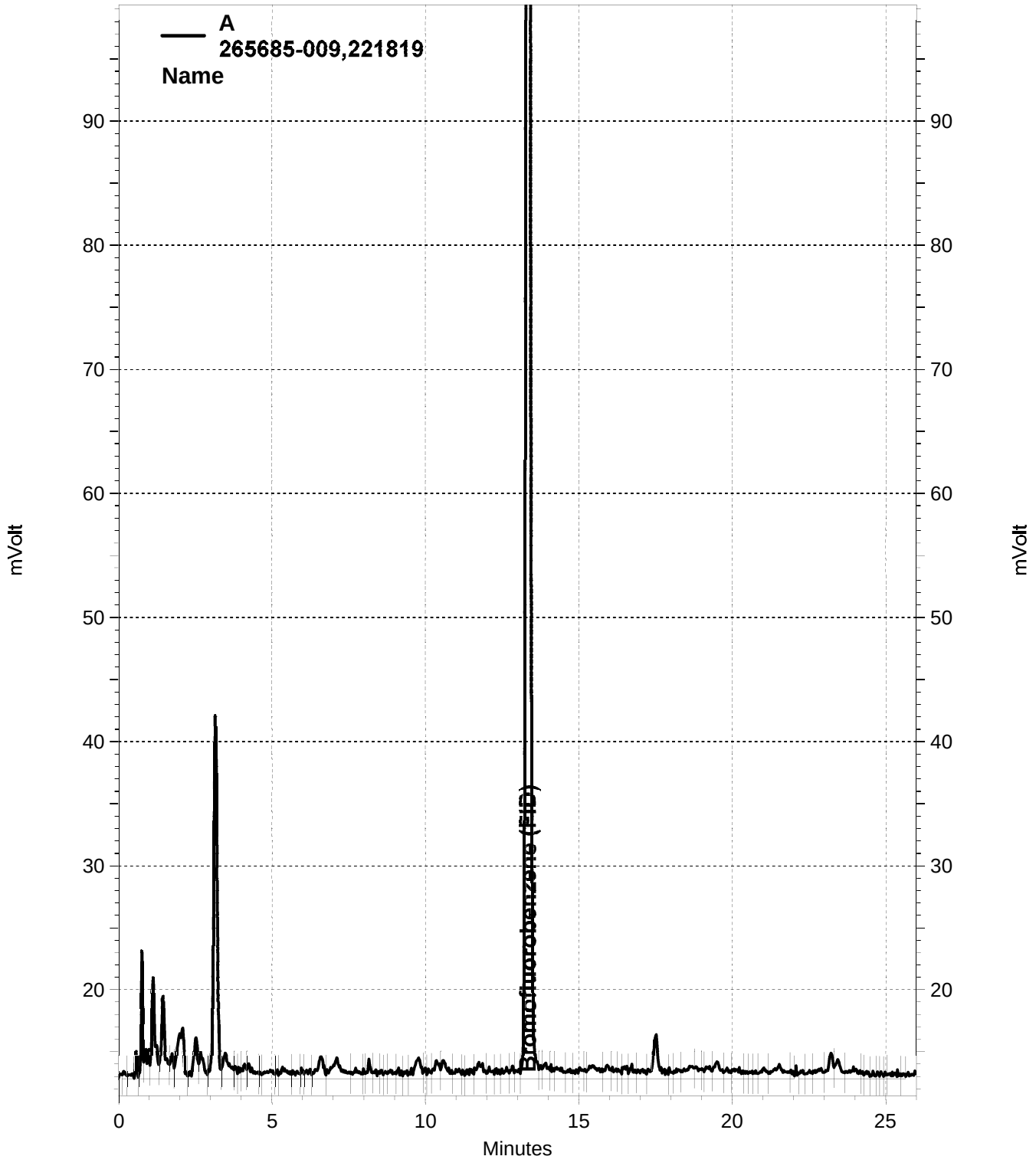
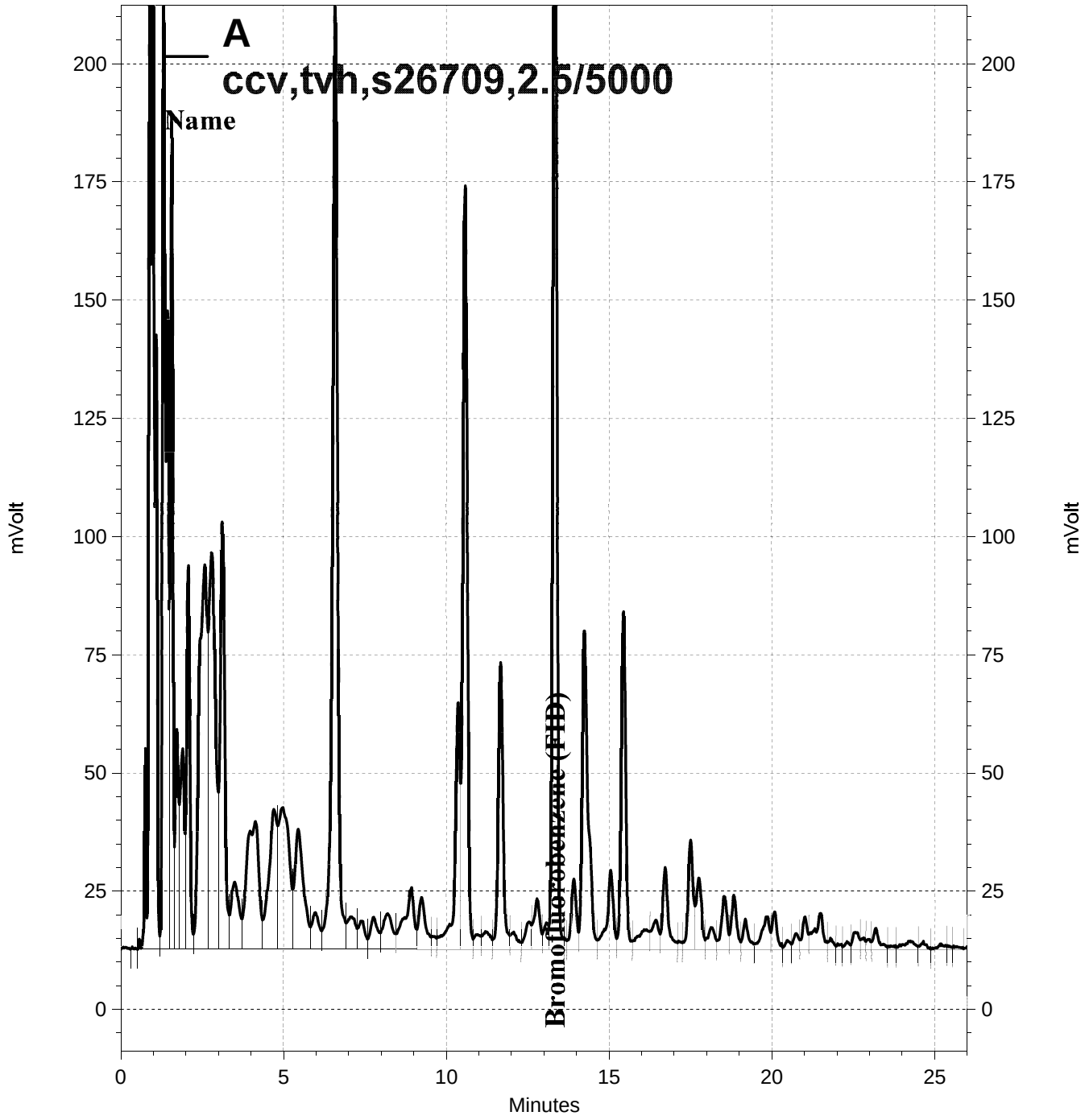

A
265685-009,221819
Name
mVolt
mVolt
90
80
70
60
50
40
30
20
0
5
10
15
20
25
Minutes
Bromofluorobenzene (FID)
\\Lims\gdrive\ezchrom\Projects\GC05\Data\090-040, A

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Curtis & Tompkins, Ltd.

# Total Extractable Hydrocarbons

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 3520C |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Matrix: | Water | Sampled: | 03/30/15 |
| Units: | ug/L | Received: | 03/30/15 |

| | | | |
|---|---|---|---|
| Field ID: | MW-5 | Batch#: | 221863 |
| Type: | SAMPLE | Prepared: | 04/01/15 |
| Lab ID: | 265685-001 | Analyzed: | 04/02/15 |
| Diln Fac: | 1.000 | | |

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 4,200 | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 110 | 67-136 |

| | | | |
|---|---|---|---|
| Field ID: | MW-6 | Batch#: | 221969 |
| Type: | SAMPLE | Prepared: | 04/07/15 |
| Lab ID: | 265685-002 | Analyzed: | 04/08/15 |
| Diln Fac: | 1.000 | | |

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 1,200 Y | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 106 | 67-136 |

| | | | |
|---|---|---|---|
| Field ID: | MW-7 | Batch#: | 221863 |
| Type: | SAMPLE | Prepared: | 04/01/15 |
| Lab ID: | 265685-003 | Analyzed: | 04/03/15 |
| Diln Fac: | 1.000 | | |

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 7,700 Y | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 77 | 67-136 |

| | | | |
|---|---|---|---|
| Field ID: | MW-9 | Batch#: | 221863 |
| Type: | SAMPLE | Prepared: | 04/01/15 |
| Lab ID: | 265685-004 | Analyzed: | 04/03/15 |
| Diln Fac: | 1.000 | | |

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 9,000 Y | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 102 | 67-136 |

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

Curtis & Tompkins, Ltd.

## Total Extractable Hydrocarbons

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 3520C |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Matrix: | Water | Sampled: | 03/30/15 |
| Units: | ug/L | Received: | 03/30/15 |

| | | | |
|---|---|---|---|
| Field ID: | MW-11 | Batch#: | 221863 |
| Type: | SAMPLE | Prepared: | 04/01/15 |
| Lab ID: | 265685-005 | Analyzed: | 04/03/15 |
| Diln Fac: | 1.000 | | |

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 7,900 | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 114 | 67-136 |

| | | | |
|---|---|---|---|
| Field ID: | MW-12 | Batch#: | 221863 |
| Type: | SAMPLE | Prepared: | 04/01/15 |
| Lab ID: | 265685-006 | Analyzed: | 04/03/15 |
| Diln Fac: | 1.000 | | |

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 3,500 | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 102 | 67-136 |

| | | | |
|---|---|---|---|
| Field ID: | MW-16 | Batch#: | 221863 |
| Type: | SAMPLE | Prepared: | 04/01/15 |
| Lab ID: | 265685-007 | Analyzed: | 04/03/15 |
| Diln Fac: | 1.000 | | |

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 9,500 Y | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 100 | 67-136 |

| | | | |
|---|---|---|---|
| Field ID: | MW-17 | Batch#: | 221863 |
| Type: | SAMPLE | Prepared: | 04/01/15 |
| Lab ID: | 265685-008 | Analyzed: | 04/03/15 |
| Diln Fac: | 1.000 | | |

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 3,200 | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 102 | 67-136 |

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

Curtis & Tompkins, Ltd.

# Total Extractable Hydrocarbons

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 3520C |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Matrix: | Water | Sampled: | 03/30/15 |
| Units: | ug/L | Received: | 03/30/15 |

| | | | |
|---|---|---|---|
| Field ID: | MW-18 | Batch#: | 221863 |
| Type: | SAMPLE | Prepared: | 04/01/15 |
| Lab ID: | 265685-009 | Analyzed: | 04/03/15 |
| Diln Fac: | 5.000 | | |

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | 10,000 Y | 250 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 94 | 67-136 |

| | | | |
|---|---|---|---|
| Type: | BLANK | Batch#: | 221863 |
| Lab ID: | QC782769 | Prepared: | 04/01/15 |
| Diln Fac: | 1.000 | Analyzed: | 04/03/15 |

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | ND | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 109 | 67-136 |

| | | | |
|---|---|---|---|
| Type: | BLANK | Batch#: | 221969 |
| Lab ID: | QC783165 | Prepared: | 04/06/15 |
| Diln Fac: | 1.000 | Analyzed: | 04/07/15 |

| Analyte | Result | RL |
|---|---|---|
| Diesel C10-C24 | ND | 50 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 107 | 67-136 |

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

Curtis & Tompkins, Ltd.

Batch QC Report

## Total Extractable Hydrocarbons

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 3520C |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Matrix: | Water | Batch#: | 221863 |
| Units: | ug/L | Prepared: | 04/01/15 |
| Diln Fac: | 1.000 | Analyzed: | 04/02/15 |

Type: BS Cleanup Method: EPA 3630C
Lab ID: QC782770

| Analyte | Spiked | Result | %REC | Limits |
|---|---|---|---|---|
| Diesel C10-C24 | 2,500 | 1,886 | 75 | 60-121 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 86 | 67-136 |

Type: BSD Cleanup Method: EPA 3630C
Lab ID: QC782771

| Analyte | Spiked | Result | %REC | Limits | RPD | Lim |
|---|---|---|---|---|---|---|
| Diesel C10-C24 | 2,500 | 1,832 | 73 | 60-121 | 3 | 32 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 82 | 67-136 |

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

## Total Extractable Hydrocarbons

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 3520C |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Type: | LCS | Diln Fac: | 1.000 |
| Lab ID: | QC783166 | Batch#: | 221969 |
| Matrix: | Water | Prepared: | 04/06/15 |
| Units: | ug/L | Analyzed: | 04/07/15 |

| Analyte | Spiked | Result | %REC | Limits |
|---|---|---|---|---|
| Diesel C10-C24 | 2,500 | 2,588 | 104 | 60-121 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 107 | 67-136 |

Curtis & Tompkins, Ltd.

Batch QC Report

## Total Extractable Hydrocarbons

| | | | |
|---|---|---|---|
| Lab #: | 265685 | Location: | Bay Center Apartment |
| Client: | Stellar Environmental Solutions | Prep: | EPA 3520C |
| Project#: | 2007-65 | Analysis: | EPA 8015B |
| Field ID: | ZZZZZZZZZZ | Batch#: | 221969 |
| MSS Lab ID: | 265813-006 | Sampled: | 04/03/15 |
| Matrix: | Water | Received: | 04/03/15 |
| Units: | ug/L | Prepared: | 04/06/15 |
| Diln Fac: | 1.000 | Analyzed: | 04/07/15 |

Type: MS
Lab ID: QC783167
Cleanup Method: EPA 3630C

| Analyte | MSS Result | Spiked | Result | %REC | Limits |
|---|---|---|---|---|---|
| Diesel C10-C24 | 345.7 | 2,500 | 2,860 | 101 | 55-122 |

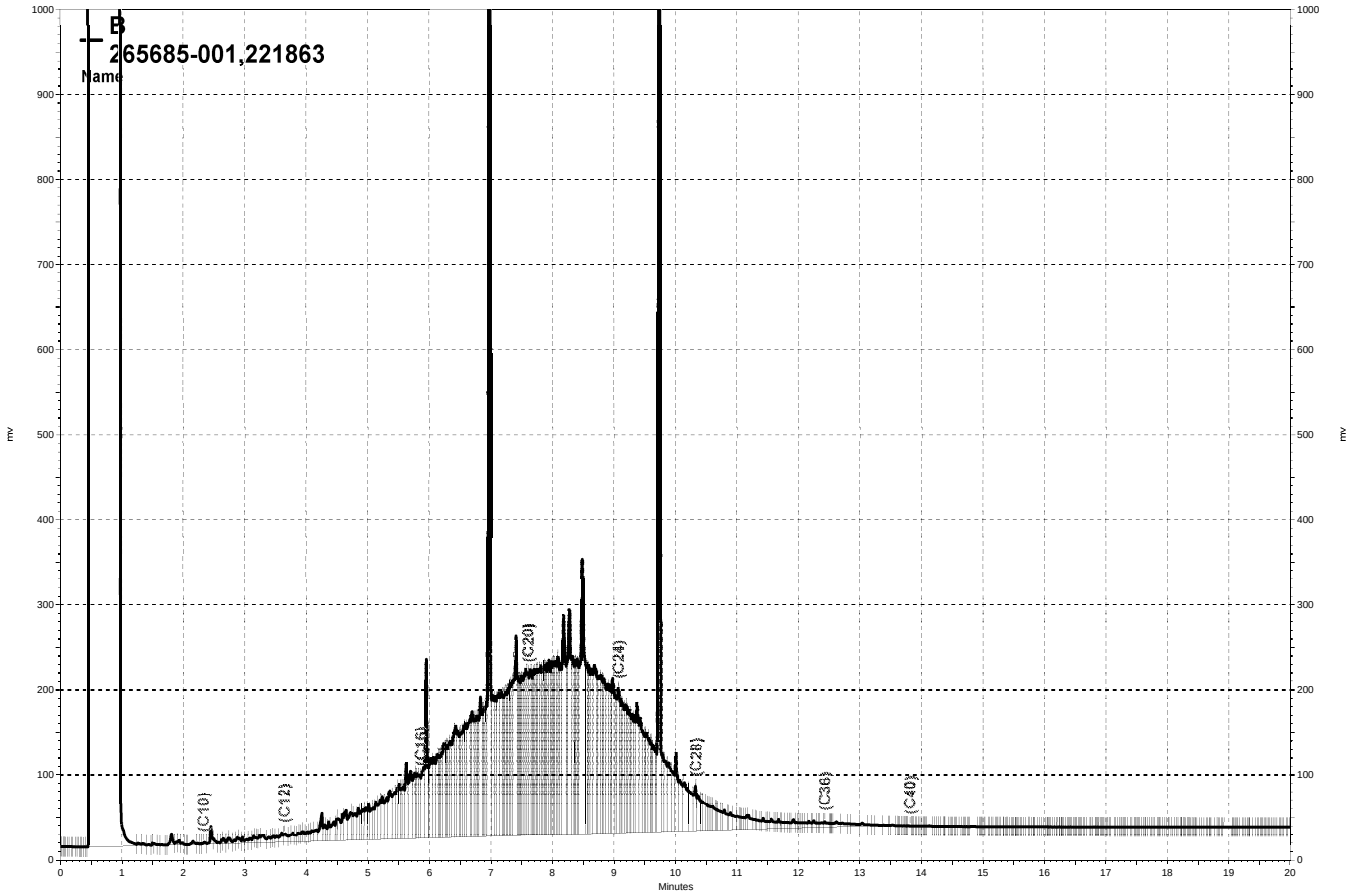
| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 96 | 67-136 |

Type: MSD
Lab ID: QC783168
Cleanup Method: EPA 3630C

| Analyte | Spiked | Result | %REC | Limits | RPD | Lim |
|---|---|---|---|---|---|---|
| Diesel C10-C24 | 2,500 | 2,783 | 98 | 55-122 | 3 | 53 |

| Surrogate | %REC | Limits |
|---|---|---|
| o-Terphenyl | 94 | 67-136 |

RPD= Relative Percent Difference

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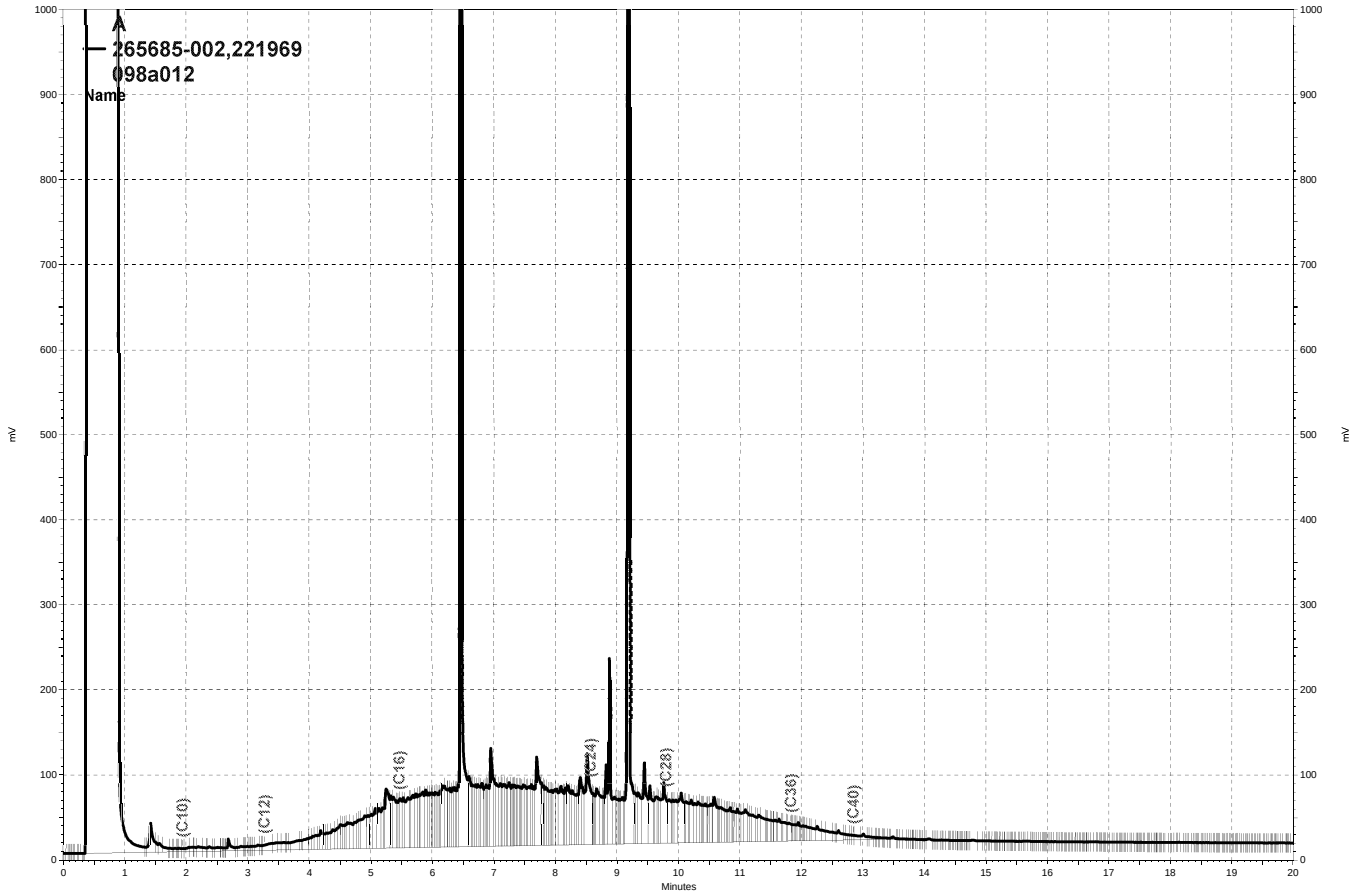


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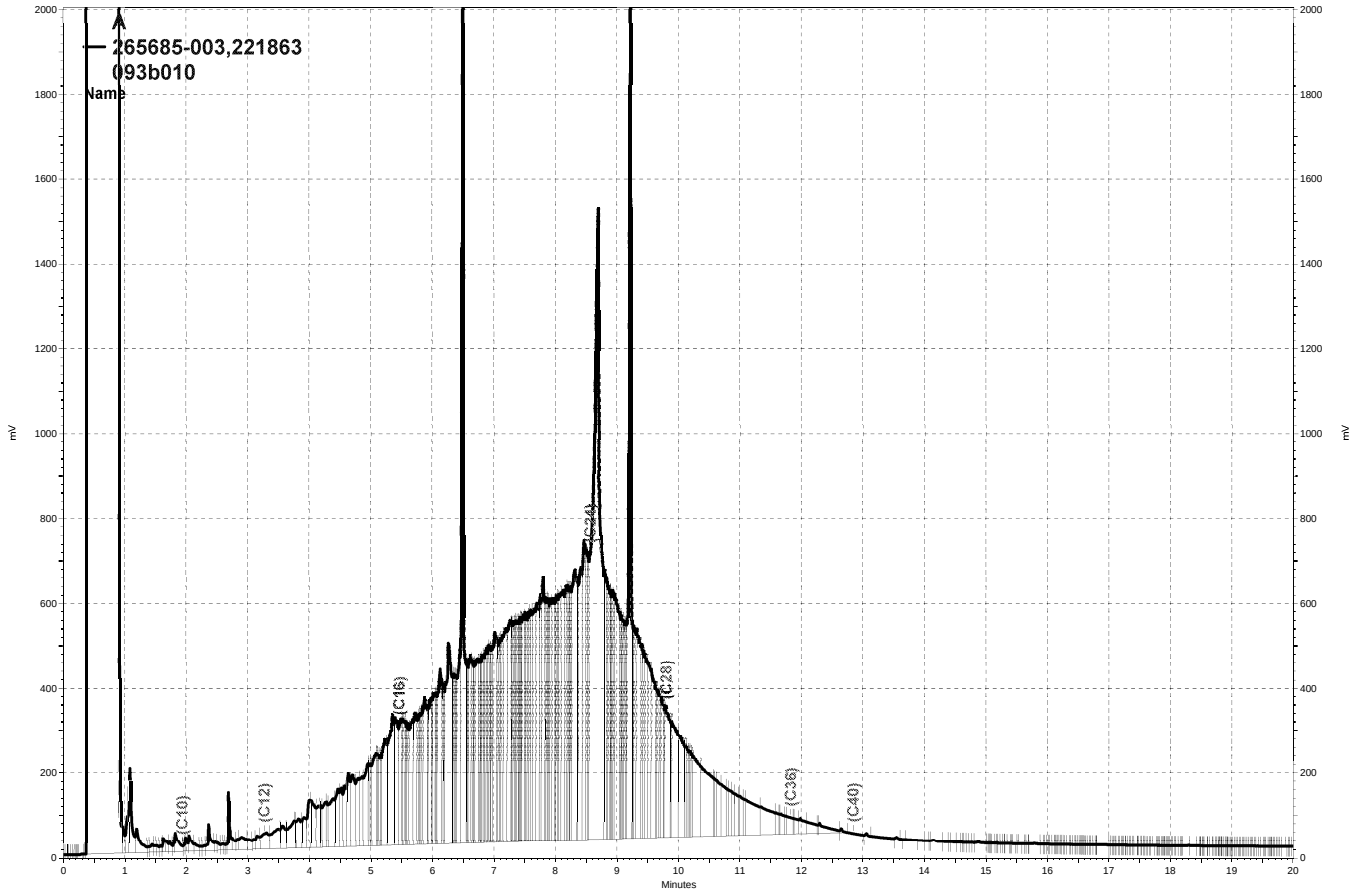


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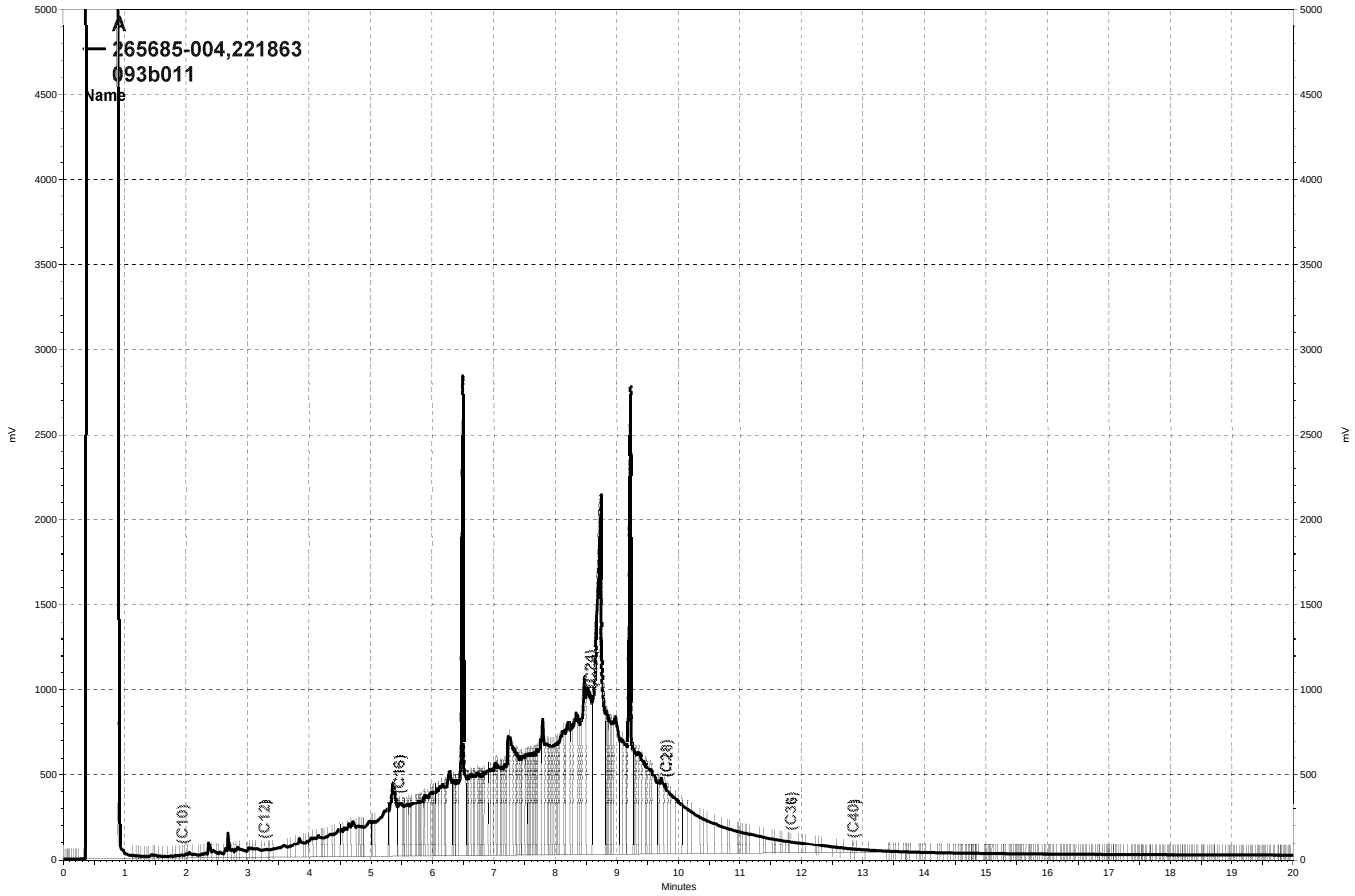
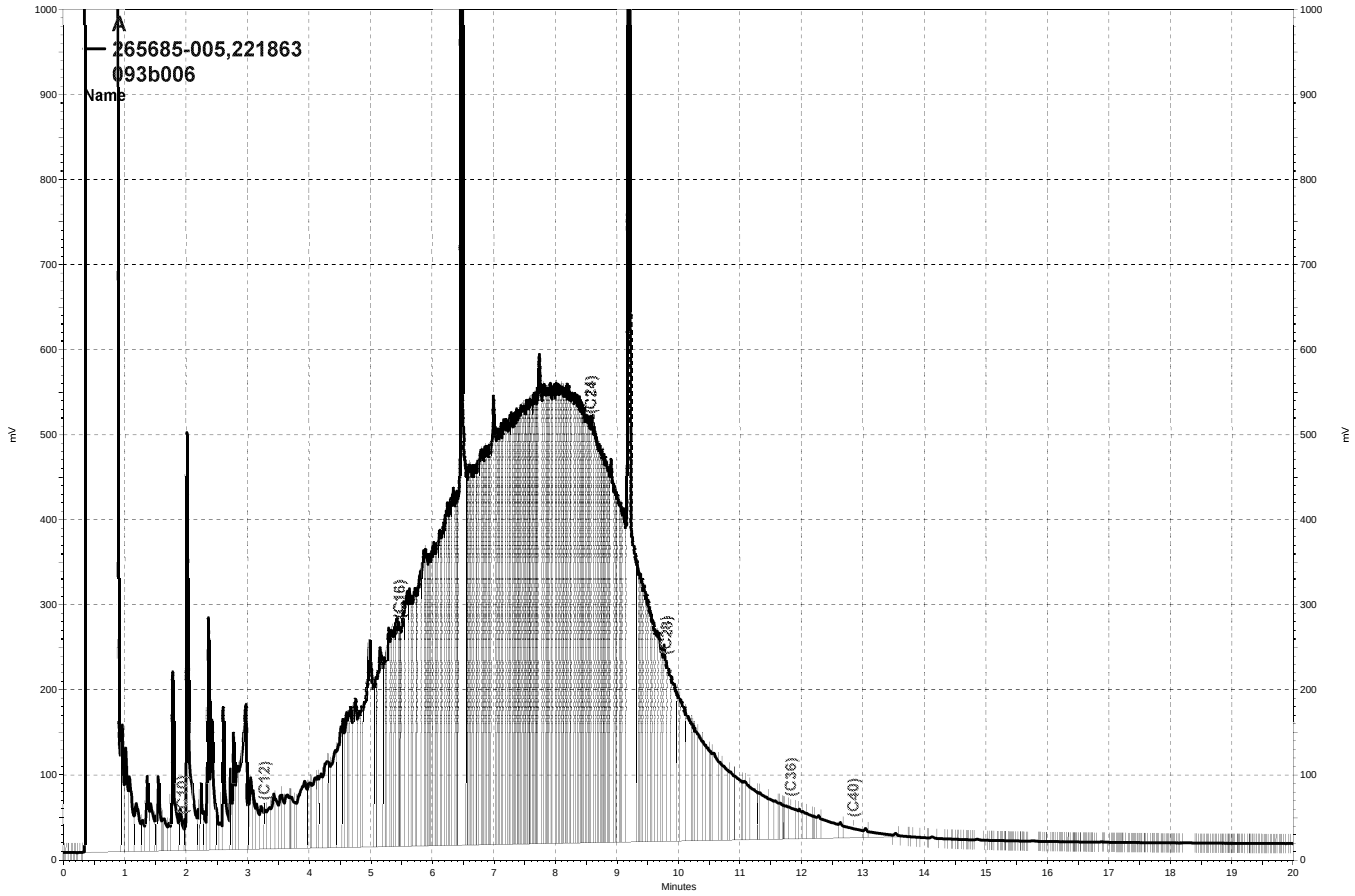
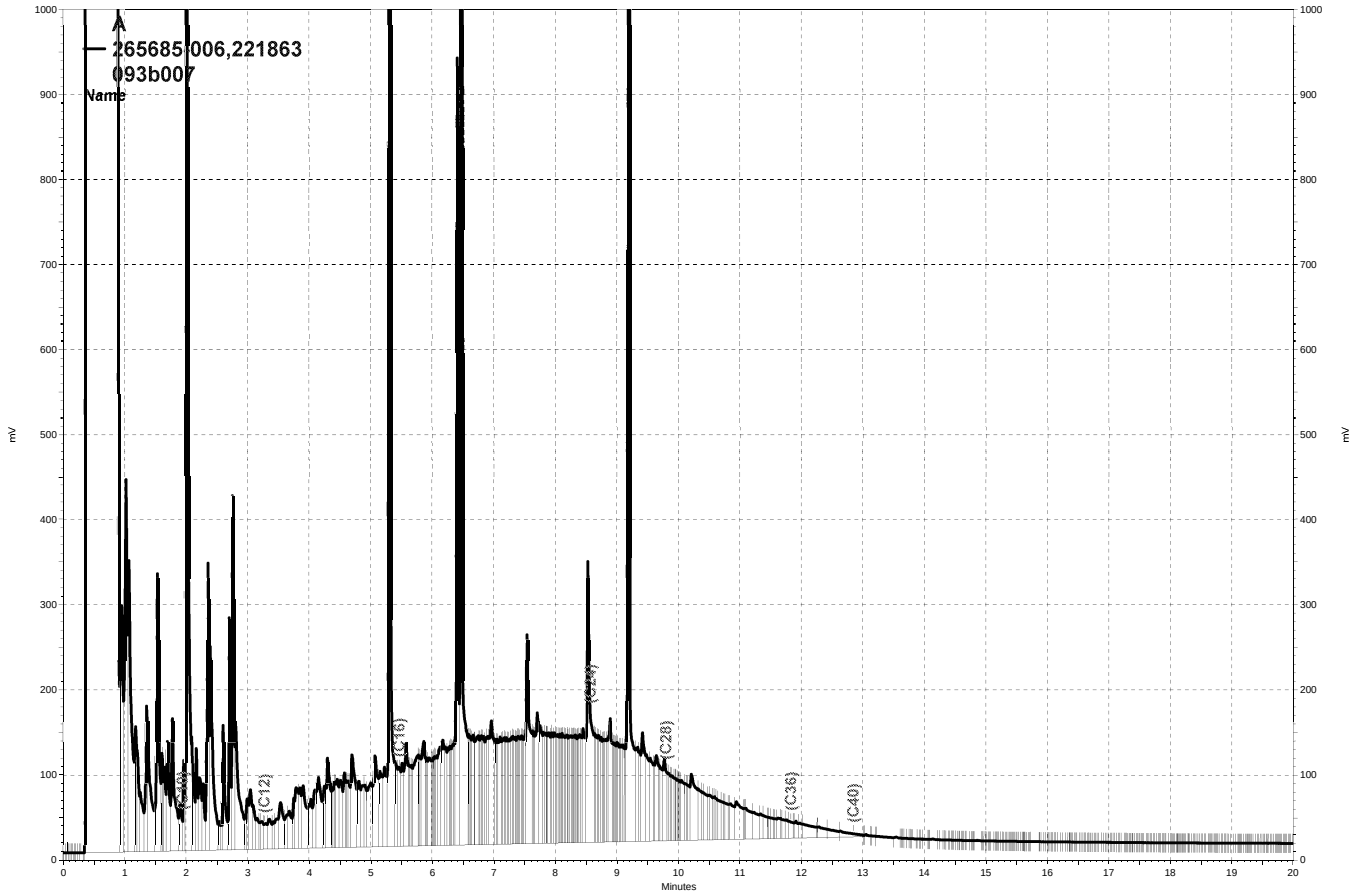


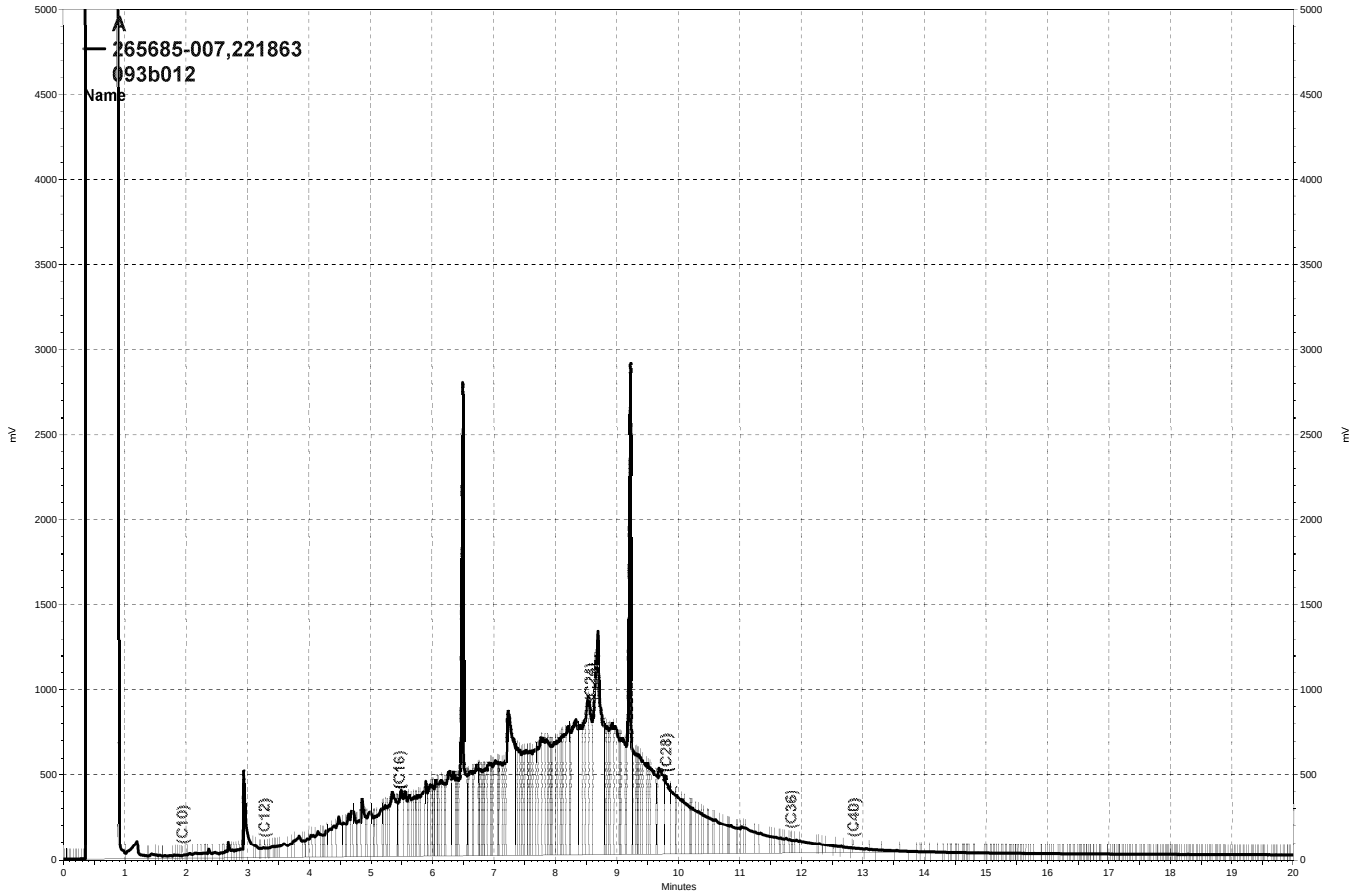

\\Lims\gdrive\ezchrom\Projects\GC17A\Data\093b011, A



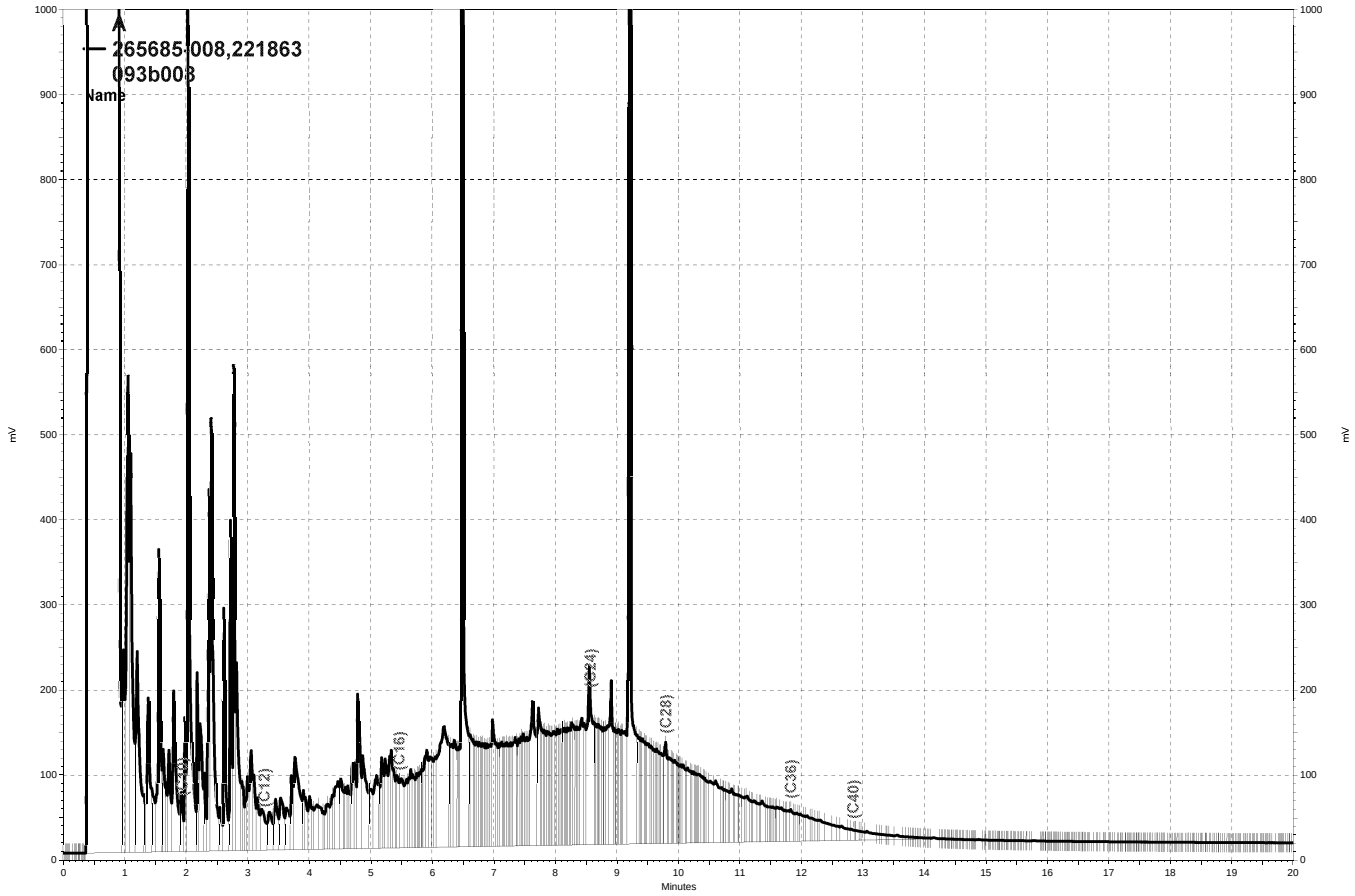

\\Lims\gdrive\ezchrom\Projects\GC17A\Data\093b006, A



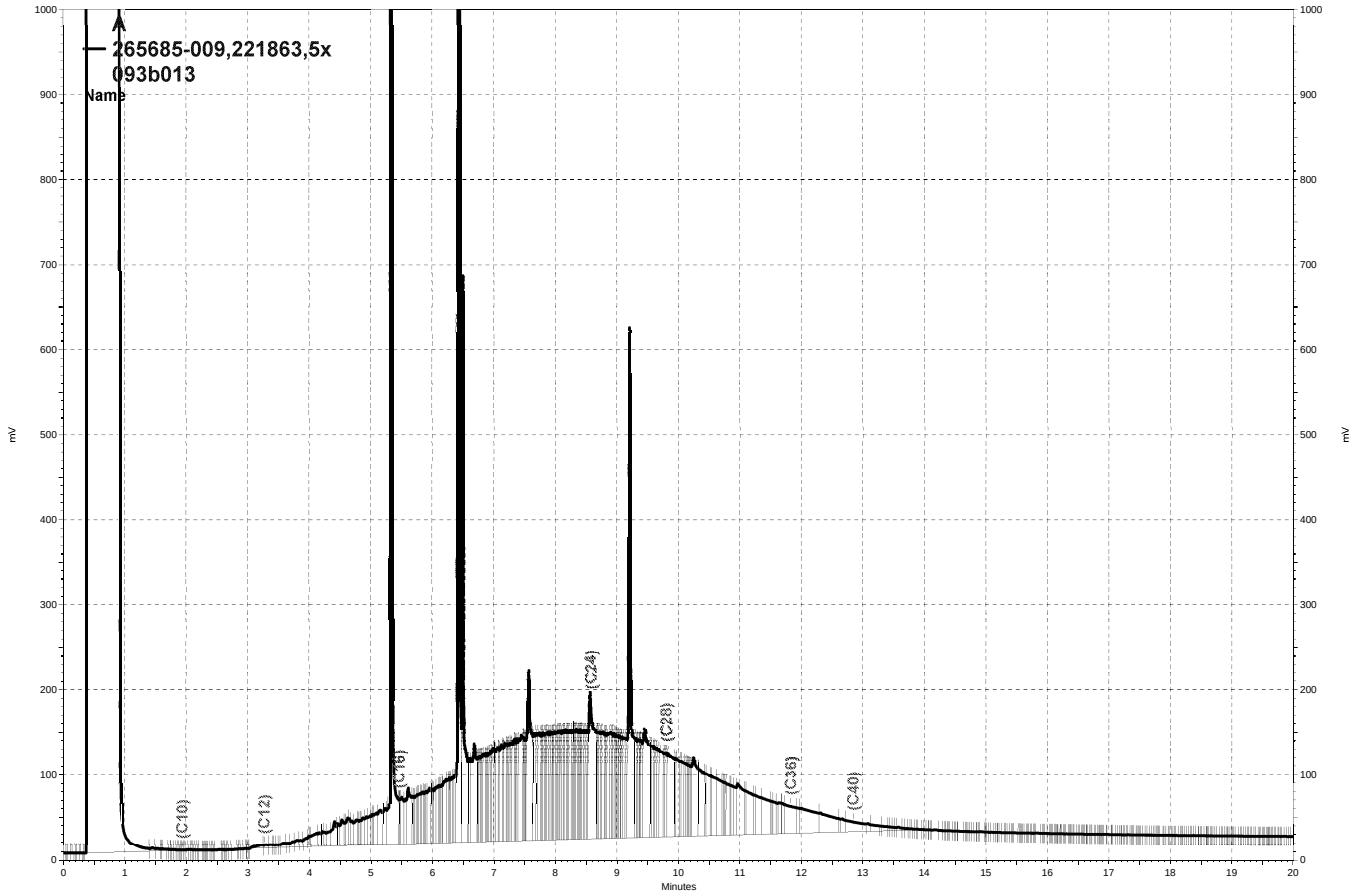

\\Lims\gdrive\ezchrom\Projects\GC17A\Data\093b007, A



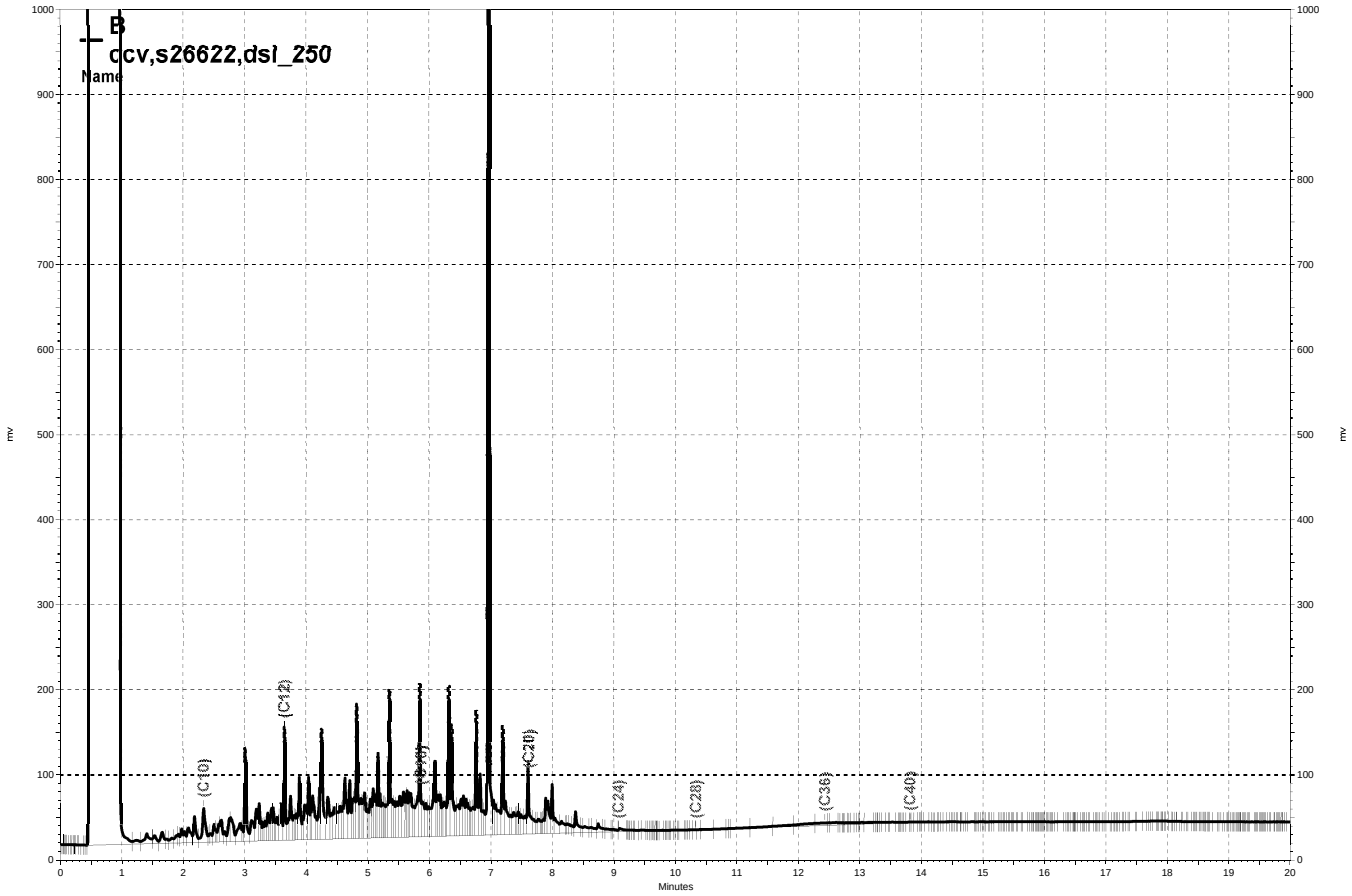

\\Lims\gdrive\ezchrom\Projects\GC17A\Data\093b012, A




\\Lims\gdrive\ezchrom\Projects\GC17A\Data\093b008, A




\\Lims\gdrive\ezchrom\Projects\GC17A\Data\093b013, A




\\Lims\gdrive\ezchrom\Projects\GC15B\Data\092b016, B

# APPENDIX D

# 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[a] | 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[a] | 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[a] | 8.69 | NP | 5.74 |
| 3 | Feb-91 | 14.43 | 8.31 | NP | 6.12 |
| 4 | Mar-04 | 16.96[b] | 9.47 | NP | 7.49 |
| 5 | Dec-06 | NA | NA | NA | NA |
| 6 | Dec-07 | 16.65[c] | 7.76 [e] | 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 [e] | 8.08 | 8.57 |
| 14 | Sep-10 | 16.65 | 8.68 [e] | 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 |

| 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[a] | 7.75 | NP | 6.37 |
| 3 | Feb-91 | 14.12 | 8.04 | NP | 6.08 |
| 4 | Mar-04 | 16.74[b] | 6.90 | NP | 7.49 |
| 5 | Dec-06 | NA | NA | NA | NA |
| 6 | Dec-07 | 16.29[c] | 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 |

| 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[a] | 9.29 | NP | 5.27 |
| 3 | Feb-91 | 14.56 | 10.04 | NP | 4.52 |
| 4 | Mar-04 | 17.11[b] | 9.10 | NP | 8.01 |
| 5 | Dec-06 | NA | NA | NA | NA |
| 6 | Dec-07 | 16.72[c] | 9.66 | NA | 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 |

| 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[a] | 7.58 | NP | 7.09 |
| 3 | Feb-91 | 14.67 | 7.05 | NP | 7.62 |
| 4 | Mar-04 | 17.22[b] | 6.51 | NP | 10.71 |
| 5 | Dec-06 | NA | NA | NA | NA |
| 6 | Dec-07 | 16.82[c] | 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 | 330/2015 | 16.82 | 7.63 | NP | 9.19 |

| 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[c] | 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 |

| 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[d] | 16.96 | 10.59 | NP | 6.37 |
| 3 | Dec-07 | 17.84[c] | 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 [e] | 8.55 | 9.29 |
| 10 | Mar-10 | 17.84 | 9.02 [e] | 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 |

| 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[c] | 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 |

| 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[c] | 8.98 [e] | 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 |

| MW-11 | | | | | |
|---|---|---|---|---|---|
| **Sampling Event No.** | **Date** | **TOC Elevation** | **DTW** | **DTP** | **GW Elevation** |
| **Installed May 2004** | | | | | |
| 1 | Nov-06[d] | 17.76[c] | 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 |

| MW-12 | | | | | |
|---|---|---|---|---|---|
| **Sampling Event No.** | **Date** | **TOC Elevation** | **DTW** | **DTP** | **GW Elevation** |
| **Installed between 2004-2006** | | | | | |
| 1 | Nov-06[d] | 17.83[c] | 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 |

| MW-13 | | | | | |
|---|---|---|---|---|---|
| **Sampling Event No.** | **Date** | **TOC Elevation** | **DTW** | **DTP** | **GW Elevation** |
| **Installed between 2004-2006** | | | | | |
| 1 | Dec-06 | 17.66[c] | 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[e] | 9.72 | 7.75 |
| 9 | Mar-10 | 17.66 | 9.22[e] | 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 |

| MW-14 | | | | | |
|---|---|---|---|---|---|
| **Sampling Event No.** | **Date** | **TOC Elevation** | **DTW** | **DTP** | **GW Elevation** |
| **Installed between 2004-2006** | | | | | |
| 1 | Nov-06[d] | 17.60[c] | 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 |

| MW-15 | | | | | |
|---|---|---|---|---|---|
| **Sampling Event No.** | **Date** | **TOC Elevation** | **DTW** | **DTP** | **GW Elevation** |
| **Installed between 2004-2006** | | | | | |
| 1 | Dec-06 | 17.80[c] | 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[f] | 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 [e] | 9.22 | 8.08 |
| 9 | Mar-10 | 17.80 | 8.81 [e] | 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 | 8.18 |

| 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[c] | 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 |

| 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[c] | 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 |

| 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[c] | 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 |

| 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[d] | 17.80 | 10.22 | NP | 7.58 |
| 6 | Dec-07 | 17.47[c] | 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 |

| 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[d] | 18.32 | 9.15 | 9.11 | 9.17 |
| 6 | Dec-07 | 16.70[c] | 9.53 [e] | 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[c] | NM[c] | NM[c] |
| 10 | Dec-08 | 16.70 | NM | NM | NM |
| 11 | Mar-09 | 16.70 | 9.06 [e] | 9.06 | 7.64 |
| 12 | Sep-09 | 16.70 | 9.45 [e] | 9.45 | 7.25 |
| 13 | Mar-10 | 16.70 | 8.93 [e] | 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 |

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

[a] Wells resurveyed in May 1989

[b] New elevation recorded by PES. Date of survey unclear.

[c] Wells resurveyed by PES in April 2007

[d] no water level data available for the December 2006 sampling event

[e] Thickness of product interfered with determining oil/water interface.

[f] Depth to groundwater = depth to free product as difference could not be determined

# APPENDIX E

## Historical Product Extraction Data Table

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

| | Well or Trench Location | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **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 |
| **2004 Total** | | | | | | | | | | | | | | | | | | | | | | | | | | | | **44.99** |
| 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 |
| **2006 Total** | | | | | | | | | | | | | | | | | | | | | | | | | | | | **52.30** |
| 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 |
| **2007 Total** | | | | | | | | | | | | | | | | | | | | | | | | | | | | **3.41** |
| 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 |
| **2008 Total** | | | | | | | | | | | | | | | | | | | | | | | | | | | | **14.99** |
| 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 | 1.1 | 19.46 |
| Dec-09 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0 | 0.9 | 0.06 | --- | --- | --- | 0 | --- | --- | 0.96 |
| **2009 Total** | | | | | | | | | | | | | | | | | | | | | | | | | | | | **28.65** |
| 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 |
| **2010 Total** | | | | | | | | | | | | | | | | | | | | | | | | | | | | **39.52** |
| 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 |
| **2011 Total** | | | | | | | | | | | | | | | | | | | | | | | | | | | | **2.65** |
| 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 |
| **2012 Total** | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0.798** |
| 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 |
| **2013 Total** | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0.955** |
| 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 |
| **2014 Total** | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0.369** |
| Mar-15 | -- | -- | -- | -- | -- | -- | -- | 0.031 | -- | -- | -- | -- | -- | -- | -- | -- | 0.0078 | 0.0078 | 0.031 | 0.0228 | 0.0228 | -- | -- | -- | -- | -- | -- | 0.123 |
| **2015 Total** | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0.123** |
| **Total Extracted** | **1.74** | **0.20** | **0.45** | **0.52** | **0.04** | **3.75** | **0.03** | **4.61** | **0.33** | **2.83** | **1.81** | **0.66** | **2.70** | **0.28** | **2.03** | **0.07** | **0.26** | **76.84** | **22.03** | **25.96** | **28.80** | **2.55** | **3.08** | **2.37** | **4.83** | **3.08** | **3.08** | **194.93** |

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

# APPENDIX F

## Groundwater Disposal Documentation

## EnviroClean MSDS

# BILL OF LADING/MANIFEST

1. Shipper's US EPA ID No. (If Applicable): CAL000374146 | Document No.: 48039 | 2. Page 1 of 1

3. Shipper's Name and Mailing Address: Bay Center Apartments
6400 Christie Ave
Emeryville CA 94608-1009

4. Shipper's Phone ( 510-)594-2050

| 5. Transporter 1 Company Name | 6. US EPA ID Number | A. Transporter's Phone |
|---|---|---|
| SAFETY-KLEEN SYSTEMS, INC. | TXR000081205 | 972-265-2000 |
| 7. Transporter 2 Company Name | 8. US EPA ID Number | B. Transporter's Phone |
| | | |
| 9. Designated Facility Name and Site Address: SE2605<br>SEAPORT REFINING & ENVIRONMENTAL, LLC<br>700 SEAPORT BLVD.<br>REDWOOD CITY CA 94063 | 10. US EPA ID Number<br>CAL000311135 | C. Facility's Phone<br>650-364-1024 |

SHIPPER

| | HM | 11. Shipping Name and Description | 12. Containers No. | 12. Containers Type | 13. Total Quantity | 14. Unit Wt/Vol |
|---|---|---|---|---|---|---|
| a. | | NON-REGULATED LIQUID (VAC-OIL, WATER, SLUDGE) (NOT USDOT/NOT USEPA REGULATED) (NOT CA REGULATED) | 001 | TT | 01050 | G |
| b. | | | | | | |
| c. | | | | | | |
| d. | | | | | | |

15. Special Handling Instruction and Additional Information: 215940039
SK SHIP# ~~215938836~~ BA28005

24 HR EMERGENCY #1-800-468-1760 (SAFETY-KLEEN)
SK AUTHORIZED TO RETAIN LICENSED SUBSEQUENT CARRIERS AS NECESSARY

DOT/PRFL A. 3299/156097 B. C. D.
A) NONE B) C) D)

USE 16A OR 16B

16a. US DOT HAZARDOUS MATERIALS SHIPPER'S CERTIFICATION: "This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Printed/Typed Name | Signature required here if US DOT regulated | Month | Day | Year

16b. NON-REGULATED SHIPPER'S CERTIFICATION: I certify the materials described above on this form are not subject to federal regulations for Transportation or Disposal.

Printed/Typed Name: Steve Bittman | Sign here if material is not DOT regulated | Month: 04 | Day: 21 | Year: 15

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Craig Pacheco | Signature | Month: 04 | Day: 21 | Year: 15

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month | Day | Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of materials covered by this form except as noted in Item 19.

Printed/Typed Name | Signature | Month | Day | Year

**24 HR EMERGENCY # 800-468-1760**
**(SAFETY-KLEEN-CONTRACT #94138)**

GENERATOR'S COPY

FORM NO. 01-90291 (04/11)

# MATERIAL SAFETY DATA SHEET

Product Name: ENVIROCLEAN

## SECTION 1 MATERIAL IDENTIFICATION

PRODUCT NAME/DESCRIPTION: ENVIROCLEAN

DISTRIBUTED / MANUFACTURED BY:
ENVIRO CLEAN SERVICES, L.L.C.
PO BOX 721090
OKLAHOMA CITY, OK 73172

DATE: 5/27/2008
PHONE: 405-373-4545
EMERGENCY PHONE: 405-373-4548

## SECTION 2 HAZARDOUS COMPONENTS

| | | | OSHA (ACGIH) EXPOSURE LIMIT | | | | |
|---|---|---|---|---|---|---|---|
| | | | TLVs(ACGIH) | | | | |
| | | | TWA | | STEEL | | |
| CHEMICAL NAME | %W/W | CAS NUMBER | ppm | mg/m3 | ppm | mg/m3 | Other1 |
| Proprietary Blend Of Ethoxylated Octylphenolic Surfactants | | | | | | | |
| Non-ionic water based liquid blend, concentrate | | | | | | | |

This product does not contain any hazardous ingredients
as defined by CERCLA, and California's Prop. 65.

## SECTION 3 HEALTH HAZARDS

**IRRITATION**
- ☑ SKIN ☐ SEVERE ☑ MODERATE
- ☑ EYE ☐ SEVERE ☑ MODERATE ☐ MILD (TRANSIENT)

**CORROSIVITY**
- ☐ SKIN ☐ 4HRS. (DOT) ☐ 24 HRS. (CPSC
- ☐ EYE ☐ MAY CAUSE BLINDNESS

**SENSITIZATION** ☐ SKIN ☐ RESPIRATORY ☐ ALLERGEN OTHER: None Known

**INHALATION EFFECTS** ☐ NARCOTIC EFFECT ☐ CYANOSIS ☐ ASPHYXIANT OTHER: None Known

**LUNG EFFECTS (SPECIFY):**

None Known

**OTHER (SPECIFY):**

☐ REPEATED CONTACT SKIN DEFATTER

OTHER (SPECIFY): Pre-existing skin and eye disorders may be aggravated by contact with this product.

## SECTION 4 FIRST AID

**INGESTION**

☐ INDUCE VOMITING ☐ DON'T INDUCE VOMITING ☐ GIVE PLENTY OF WATER ☑ GET MEDICAL ATTENTION

☑ NEVER GIVE ANYTHING TO AN UNCONSCIOUS PERSON

**DERMAL**

☑ FLUSH WITH SOAP AND WATER ☑ GET MEDICAL ATTENTION ☑ CONTAMINATED CLOTHING - REMOVED AND LAUNDER ☐ CONTAMINATED SHOE - DESTROY

OTHER (SPECIFY):

None Known

**EYE CONTACT**

☑ FLUSH WITH WATER FOR 15 MINUTES ☑ GET MEDICAL ATTENTION

OTHER (SPECIFY):

Life and separate eyelids to aid in rinsing

**INHALATION**

☐ REMOVE TO FRESH AIR ☐ IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION ☐ GIVE OXYGEN ☑ GET MEDICAL ATTENTION

OTHER (SPECIFY):

None considered necessary.

## SECTION 5 FIRE AND EXPLOSION DATA

CHARACTERISTICS:

| | |
|---|---|
| FLASH POINT | >200 deg F |
| FLASH POINT METHOD(S) | NA |
| UPPER EXPLOSION LIMIT (UEL) | NA |
| LOWER EXPLOSION LIMIT (UEL) | NA |
| AUTOIGNITION TEMPERATURE | NA |
| FIRE HAZARD CLASSIFICATION (OSHA/NFPA) | 0 |

**EXTINGUISHING MEDIA**

☐ WATER SPRAY ☐ WATER FOG ☐ WATER STREAM ☐ CO2 ☐ DRY CHEMICAL ☐ ALCOHOL FOAM

☐ FOAM ☐ EARTH OR SAND ☑ AS REQUIRED FOR FIRE BEING FOUGHT

**SPECIAL FIRE FIGHTING PROCEDURES**

☐ DON'T ENTER BUILDING ☐ ALLOW FIRE TO BURN ☑ WATER MAY CAUSE FROTHING ☐ DON'T USE WATER ☑ USE SELF-CONTAINED BREATHING APPRATUS

OTHER (SPECIFY): None Known

**SPECIAL FIRE FIGHTING PROCEDURES**

☐ DUST EXPLOSION HAZARD ☐ SENSITIVE TO SHOCK ☐ CONTAMINATION ☐ TEMPERATURE

OTHER (SPECIFY): None Known

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**STEP TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED**

☑ FLUSH WITH WATER ☑ ABSORB WITH SAND OF INERT MATERIAL ☐ NEUTRALIZE ☐ SWEEP OR SCOOP UP AND REMOVE

☐ KEEP UPWIND ☑ PREVENT SPILLS ☑ DISPOSE OF PROMTLY

OTHER (SPECIFY): Remove with vacuum truck or pump to storage/salvage vessel.

## SECTION 7 HANDLING AND STORAGE

**PRECAUTIONARY LABELING**

- [x] WASH AFTER HANDLING
- [x] DON'T GET IN EYES, SKIN, CLOTHING
- [x] DON'T BREATHE DUST, VAPOR, GAS
- [x] KEEP CONTAINTER CLOSED
- [ ] KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAMES
- [x] STORE IN TIGHTLY CLOSED CONTAINERS
- [ ] DON'T STORE NEAR COMBUSTIBLES
- [x] KEEP FROM CONTACT WITH CLOTHING
- [ ] EMPTY CONTAINER MAY CONTAIN HAZARDOUS RESIDUE
- [ ] USE EXPLOSION PROOF EQUIPMENT

OTHER (SPECIFY):

Keep this and all chemicals out of reach of children.

**OTHER HANDLING AND STORAGE CONDITIONS**

Storage: 35 - 120 deg F Shelf Life: Unlimited unopened

## SECTION 8 PERSONAL PROTECTION/EXPOSURE CONTROLS

**VENTILATION REQUIREMENTS - ALWAYS KEEP EXPOSURE BELOW PERMISSIBLE EXPOSURE LIMITS**

- [ ] CONSULT AN INDUSTRIAL HYGIENIST
- [x] LOCAL EXHAUST
- [ ] USE ADEQUATE VENTILATION
- [ ] CHECK FOR AIR CONTAMINANT

OTHER (SPECIFY): Not Known

**EYE**

- [ ] FACE SHIELD AND GOGGLES
- [x] SAFTEY GLASSES
- [ ] GOGGLES

**HAND**

- [ ] BUTYL RUBBER
- [x] POLYVINYL ALCHOHOL
- [x] POLYVINYL CHLORIDE
- [ ] POLY-ETHYLENE
- [x] NATURAL RUBBER
- [ ] NEOPRENE

OTHER (SPECIFY): None Known

**RESPIRATORY**

- [ ] SELF-CONTAINED
- [ ] SUPPLIED AIR
- [ ] CAN OR CARTRIDGE GAS OR VAPOR
- [ ] FILTER-DUST, FUME, MIST

OTHER (SPECIFY): Not required for normal use

**OTHER PROTECTIVE EQUIPMENT**

- [ ] RUBBER BOOTS
- [ ] APRON

OTHER (SPECIFY): Eye wash

## SECTION 9 PERSONAL PROTECTION/EXPOSURE CONTROLS

| | |
|---|---|
| **PHYSICAL FORM** | Clear Liquid |
| **COLOR** | Colorless unless dyed |
| **ODOR** | Nil (unless fragranced) |
| **PH** | 8.5 +/- .25 |
| **VAPOR PRESSURE (mm Hg)** | NA |
| **VAPOR DENSITY (AIR = 1)** | NA |
| **BOILING POINT** | NE |
| **FREEZING/MELTING POINT** | NE |
| **SOLUBILITY IN WATER** | 100% |
| **SPECIFIC GRAVITY (WATER = 1)** | 1.028 +/- .01 |
| **EVAPORATION RATE (BUTYLACETATE = 1)** | >1 as compared to water |
| **VISCOSITY (CPS)** | 9 CP |
| **MOLECULAR WEIGHT** | NE |

NA = NOT APPLICABLE NE = NOT ESTABLISHED

## SECTION 10 STABILITY AND REACTIVITY

**STABILITY** ☑ STABLE ☐ UNSTABLE

**CONDITIONS CONTRIBUTING TO INSTABILITY**

☐ THERMAL DECOMPOSITION ☐ PHOTO DEGRADATION ☐ POLYMERIZATION ☐ CONTAMINATION

OTHER (SPECIFY): None known

**INCOMPATIBILITY - AVOID CONTACT WITH**

☐ STRONG ACIDS ☐ STRONG ALKALIS ☐ STRONG OXIDIZERS

OTHER (SPECIFY): None Known

**HAZARDOUS DECOMPOSITION PRODUCTS - THERMAL AND OTHER (LIST)**

None Known

**CONDITIONS TO AVOID**

☐ HEAT ☐ OPEN FLAMES ☐ SPARKS ☐ IGNITION SOURCES

OTHER (SPECIFY): None Known

## SECTION 11 TOXICOLOGICAL PROPERTIES

**ACUTE TOXICITY EFFECTS DATA**

Eyes: Moderate irritation

Skin: May aggravate pre-existing skin and/or eye disorders or conditions.

Ingestion: Moderate Irritation

Inhalation: None known

**IRRITATION EFFECTS DATA**

None Known

**OTHER ACUTE EFFECTS**

None Known

**CHRONIC/SUBCHRONIC DATA**

None Known

## SECTION 12 ECOLOGICAL INFORMATION

**ECOTOXICITY**

None Known

**ENVIRONMENTAL FATE**

Not Known

**ADDITION INFORMATION**

None Known

## SECTION 13 DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD**

IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

## SECTION 14 TRANSPORT INFORMATION

NON-HAZARDOUS

## SECTION 15 REGULATORY INFORMATION

**SARA (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT):**

**SARA 302 EXTREMELY HAZARDOUS SUBSTANCES LIST:**

NA

**SARA 312 HAZARD CATEGORY:**

NA

**SARA 313 TOXIC CHEMICALS LIST:**

NA

**CERCLA (COMPREHENSIVE ENVIROMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT:**

NA

**RCRA (RESOURCE CONSERVATION AND RECOVERY ACT) LISTED HAZARDOUS WASTES:**

NA

**CWA (CLEAN WATER ACT) LISTED SUBSTANCES:**

NA

**FDA (FOOD AND DRUG ADMINISTRATION):**

NA

**TOXIC SUBSTANCES CONTROL ACT (TSCA):**

All ingredients are listed

**NFPA HAZARD INFORMATION SIGN**

**0 HEALTH HAZARD (BLUE DIAMOND)**

4 - DEADLY
3 - EXTREME DANGER
2 - HAZARDOUS
1 - SLIGHTLY HAZARDOUS
0 - NORMAL MATERIAL

**0 REACTIVITY HAZARD (YELLOW DIAMOND)**

4 - MAY DETONATE
3 - SHOCK AND HEAT MY DETONATE
2 - VIOLENT CHEMICAL CHANGE
1 - UNSTABLE IF HEATED
0 - STABLE

**0 FIRE HAZARD (RED DIAMOND)**

FLASH POINTS:
4 - BELOW 73 F
3 - BELOW 100 F
2 - BELOW 200 F
1 - ABOVE 200 F
0 - WILL NOT BURN

**SPECIFIC HAZARD (WHITE DIAMOND)**

| | |
|---|---|
| OXY | OXIDIZER |
| ACID | ACID |
| ALK | ALKALI |
| COR | CORROSIVE |
| W | USE NO WATER |

## SECTION 16 INTERNATIONAL REGULATIONS

**CANADA**

**DSL:**

NA

**WHMIS HAZARD CLASSIFICATIONS:**

NA

**WHMIS TRADE SECRET REGISTRY NUMBER(S):**

NA

**WHMIS HAZARDOUS INGREDIENTS:**

NA

**WHMIS SYMBOLS:**

NA

**EUROPEAN ECONOMIC COMMUNITY (EEC)**

**EINECS MASTER INVENTORY:**

NA

**EEC PRIMARY RISK SYMBOL:**

NA

**EEC RISK AND SAFETY PHRASES:**

NA

THIS INFORMATION IS OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EXPRESSED OR IMPLIED, IS HEREBY MADE. THE RECOMMENDED INDUSTRIAL HYGIENE AND SAFE HOLDING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTEXT OF THE INTENDED USE AND DETERMINE WHETHER THEY ARE APPROPRIATE.

**PREPARED BY:** Jeff Schulhoff

# EnviroClean
# Degassing/Hydrocarbon Removal/Remediation Chemistry

Contents



PHYSICAL PROPERTIES

| | |
|---|---|
| Product Name | EnviroClean |
| Physical Form | Clear Liquid |
| Color | Colorless unless dyed |
| Specific Gravity (Water = 1) | 1.028 +/- .01 |
| Solubility in Water | 100% |
| Freezing/Melting Point | NE |
| Flash Point ($^0$F) | >200$^0$ F |
| pH | 8.5 +/- .25 |
| Reportable Quantity (RQ) | None |

Complete information on health hazards, protective equipment, handling precautions, environmental hazards and disposal is listed in the current EnviroClean Material Safety Data Sheet (MSDS) for this product.

## SUMMARY


EnviroClean is a non-flammable, non-toxic, water-based, proprietary blend of non-ionic ethoxylated octylphenolic surfactants that has been specifically engineered as a cleanup/mitigation agent for a wide range of hydrocarbon products. EnviroClean has been shown to be effective for quickly and effectively suppressing or completely eliminating VOCs, LEL's, benzene and low levels of $H_2S$ and mercaptans in open or confined spaces.

EnviroClean has been used for cleanup of hydrocarbon spills and soil remediation. In these applications, EnviroClean effectively conditions (physically) the hydrocarbon such that the microbes that naturally occur can more readily consume it. It turns hydrocarbons into a nutrient source for the microbes. When sufficiently mixed with hydrocarbon and water, the EnviroClean forms a homogeneous solution of hydrocarbon, EnviroClean and water, which is very stable.

EnviroClean is a concentrated product that readily biodegrades.

EnviroClean is commercially available in 5-gallon units, 55-gallon drums, 275 and 330-gallon totes and bulk from Oklahoma City, Oklahoma, Wappingers Falls, New York, and Houston, Texas.


## FLUID DESIGN

EnviroClean is a proprietary blend of surfactants that needs to be diluted to be effective and it is very safe to workers and the environment. EnviroClean does **not** contain caustic, therefore does not have the common harmful side effects associated with caustic based products. The product is designed for use as a degassing agent and a cleaner/degreaser for remediation. The product does not contain any enzymes or biomass itself. It works by conditioning the hydrocarbon so that the naturally occurring microbes (bacteria) are able to readily consume it. Through the application of the appropriate dilution and mixing, the EnviroClean will capture the hydrocarbon and tie it up in a solution that is very stable. The formation of this solution results in extremely small particles that will not recoalesce. It is important to note that if EnviroClean reaches its saturation point the oversaturated hydrocarbon will breakout of solution very quickly. This will allow for easy removal or reclamation of any hydrocarbon that is not preconditioned for remediation.

In addition to tying up the hydrocarbon in solution, the product is very effective when contacted with hydrocarbon vapors at suppressing volatile organic vapors, gases, and odors. Once combustible and flammable hydrocarbon vapors are tied up in the resultant solution, the solution will be very difficult to ignite. It also accelerates the biodegradation process of the hydrocarbon, thereby enhancing recycling or reclamation of water.

EnviroClean has been demonstrated to be effective on gas, oil, lube oil, hydraulic oil, most petroleum-based products, animal and vegetable oils, fats, and tallow oils. EnviroClean cleans the heavy tar build-up, asphaltenes or oily residue from inside of tanks and vessels. Furthermore, once a surface has been cleaned with EnviroClean, the cleaned surface will resist the deposition of oily materials.

EnviroClean can be used to cleanup oil spills whether in/on soil or hard surfaces. The first step in this process is to remove as much of the free oil as possible. This step is followed by contacting the contaminated surface appropriately with the proper dilution of EnviroClean and water. The treatment solution will contact the hydrocarbon molecules and change their behavior such that they are now essentially water soluble. The large increase in interfacial surface area creates conditions that are favorable to degradation and consumption by bacteria and microbes. The product converts hydrocarbons into a very good nutrient source for bacteria and microbes.

EnviroClean is typically fed at concentrations between 1% and 6%, depending on the nature of the hydrocarbon contamination problem. It can be diluted with most types of water – hard, soft or brackish water. The product has an unlimited shelf life when unopened. EnviroClean is effective at ambient temperatures. However, the **effectiveness will increase as the temperature of the application is increased**. EnviroClean does not require the use of steam, but has been shown to be very effective when injected into the steam (vapor) phase.

## FIELD MIXING PROCEDURES

### Mixing Concentrates

EnviroClean is usually delivered as a concentrate and **must** be diluted with water to work properly. Cleaning solutions can be formulated by premixing or eduction. It is not necessary to provide high shear agitation when preparing a batch of cleaning solution since EnviroClean is 100% soluble in water. It is recommended that when preparing the cleaning solution you first add the water into the mix container and then follow by the addition of EnviroClean. This will minimize foaming as the EnviroClean and water form a homogeneous solution.

For premixing, the following procedure may be used:

1. Add the correct amount of water to the container.
2. Depending on the desired strength, add the correct amount of EnviroClean to the container.
3. If the final solution is not a consistent pink color, mild agitation may be required until a consistent pink color is achieved.

### Quality Control Testing

There is no easy field testing procedure to monitor the concentration of active ingredients in the EnviroClean formulation. Visually the color changes from rose color to lighter pink as the product is further diluted. Effectiveness can also be predicted by quantifying the amount of hydrocarbon that is to be picked up. By observing the effluent from the use of EnviroClean, an adjustment in the cleaning solution concentration can be made. If it is observed that free oil is floating on the effluent solution, then the concentration should be increased.

## MATERIAL REQUIREMENTS

For specific protocols and application rates, please refer to the available **Product Usage Guide**, product label, or consult with the manufacturer or authorized distributor for additional guidance.

### Equipment Cleaning & Parts Washing

EnviroClean is very effective for equipment cleaning applications. EnviroClean is used at light dilutions and has a significant “life of batch” as well as low foaming tendencies. The surfactants in EnviroClean desorb and micro-emulsify grease and oil contamination and separate it from solids (metal shavings, grit, etc.) allowing them to settle without accumulating oily sludges. These factors make EnviroClean ideal for spray wash systems as well as dip/agitating equipment. Some agitation or circulation of the fluid is required for thorough cleaning. For

equipment cleaning applications, EnviroClean is normally diluted to a 3% - 6% solution with water.

## Soil Remediation

Calculate the volume of hydrocarbon contained in the contaminated area. It is important to determine accurately the depth of oil penetration into the soil. It will be important to agitate the soil to just below the depth of penetration. Once the estimate of hydrocarbon is known, the amount of the normal dilution of EnviroClean for soil remediation is 32 parts water to 1 part EnviroClean (3% solution). The EnviroClean solution will use the naturally occurring bacteria in the soil and begin to consume the hydrocarbon, which has been put into a form that can be quickly consumed. The remediation process normally occurs over 4 to 12 weeks.

***The following step-by-step procedure can be used for soil remediation using EnviroClean:***

1. If contaminated soil is deeper than 12", excavate the soil and spread at the surface to a depth of 10" – 12" and then proceed with this protocol. If contaminated soil is 12" in depth or less, thoroughly mix and aerate the soil in place utilizing a roto-tiller or similar equipment. If soil is extremely oily or gummy, mix clean soil with oily soil to expedite clean up and to make it easier to work with.

2. Utilizing local soil or rock, build a small berm surrounding the treatment area to prevent rain water run off from the site.

3. To determine treatment volumes of EnviroClean, measure the square footage area of the treatment cell and divide that number by 27 to find cubic yards per foot of depth (i.e. treatment area is 100' x 50': 100 x 50 ÷ 27 = 185). Multiply that number x .06 to determine the amount of EnviroClean to utilize in the treatment (i.e. 185 x .06 = 11 gallons EnviroClean). Dilute the EnviroClean to approximately a 3% solution (32 to 1 or 352 gallons water to 11 gallons EnviroClean). Spray the 3% EnviroClean solution over the entire treatment cell.

4. If, after a week, little to no rainfall has fallen, water the site thoroughly.

5. Wait another week and repeat steps 1 and 3, if needed.

6. Monitor and continue the treatment protocol until desired clean up levels are reached.

Samples can be taken and analyzed for Total Petroleum Hydrocarbons (TPH) to track the progress of the remediation. If the TPH were to appear to stabilize and not continue to decline, a second application of EnviroClean may be required.

***Note*:** It can be helpful, but not required, to add a highly soluble, high nitrogen fertilizer such as Miracle Grow or Sam's Choice to the first 3% EnviroClean solution.

The addition of bacteria is not typically required. The EnviroClean solution will stimulate the activity level of the naturally occurring bacteria.

In the fall and winter, it helps to expedite the job if the treatment cell is covered with plastic between treatments. This tends to hold in heat and generate additional moisture.

Keeping the soil moist is an integral part of the clean up.

## Emergency Response & Spill Cleanup

**Small Spill Cleanup**: Dilute EnviroClean to a 10% solution. On small spills apply with 2 ½ gallon pressure sprayer or similar device. Cover the entire spill working in a circular motion from outside perimeter toward the center of the spill. After application of EnviroClean has been completed, agitate spill area with forcible stream of water or broom and rinse thoroughly. EnviroClean helps to reduce or eliminate any VOC concerns associated with the cleanup by micro-emulsifying the hydrocarbon on contact drastically reducing the LEL levels in a very short time frame. EnviroClean also eliminates sheens.

**On Roadways & Pavement**: EnviroClean can be applied with a pressure sprayer or applied through a foam eductor at a 6% setting. EnviroClean will instantly stop the deterioration of asphalt by diesel or gas and eliminate slippery conditions. Dispose in accordance with local rules and regulations.

***Note*:** For use with absorbents, EnviroClean will increase effectiveness by allowing the contaminate to more easily penetrate into the absorbent.

## Degassing & Cleaning of Tanks & Equipment

EnviroClean is effective for the degassing and cleaning of all types of petroleum storage tanks. For small tanks of less than 50,000 gallons,

EnviroClean should be utilized through a power washer at dilutions between 2% and 6% depending on the type of product within the vessel and the degree of contamination. Typically for flammables, a 6% solution is utilized to completely agitate the tank residue and to scour the wall of the vessel prior to and during pump out. Lower dilutions may be utilized for products not representing a vapor hazard. EnviroClean is also effective for reducing H2S, Benzene and other VOC's.

## Tank Bed Remediation

A common and effective means of mitigating the vapor hazard and remediating the tank bedding is to utilize a "flushing and recovery" technique with a diluted solution of EnviroClean. Typically a 3% to 6% solution of EnviroClean and water is utilized in a batch process to treat the impacted portions of the tank floor area. Simply perforating the affected area with a "buster" or hole saw and allowing the EnviroClean solution to flood the affected bedding will eliminate immediate, and future, recurrences of vapor generation. The process also serves to remediate the contamination by flushing entrained hydrocarbon out of the bedding for recovery and disposal, or re-processing. If necessary, the entire sub-floor area may be treated by saturating the zone of contamination and flushing the fluid to the sump, or other collection point, and recovering the rinsate for disposal. Depending upon the severity of the leak, and the resultant degree of subfloor contamination, the EnviroClean solution can be applied so as to simply saturate the bedding material, or it can be injected so as to flush and recover gross quantities of hydrocarbon.

## Chemical Pipeline Pigging

As a general guideline, pump a slug of 3% to 6% solution and chase with water.

## VOC Vapor Mitigation & Odor Control

EnviroClean is typically applied at a concentration of 3 – 6% for vapor and/or odor control. Circulate the solution through a manway cannon or other device in order to provide sufficient saturation of the vapor space of the vessel that is being degassed. Check the vapor level of the tank before circulation begins. Circulate for about 2 hours and let the tank settle for about 2 hours. Check the vapor level in the tank. More than one circulation may be required for complete vapor suppression. The holding capacity of EnviroClean may require sweetening or circulation with a fresh batch of product, depending on the amount of hydrocarbon vapors originally contained in the vessel.

Dilute EnviroClean to a 3% to 6% solution. Coverage is normally at 3 to 4 square yards of surface area per gallon. Heavy contamination or mercaptan type odors may require a stronger solution of EnviroClean.

Typically, 1 gallon of EnviroClean concentrate diluted to a 3% to 6% solution will render up to 6 gallons of petroleum product nonflammable when properly applied.

## Hard Surface Cleaning & Decontamination

**For heavy soiled oil and grease on hard surfaces**: Mix a 6% solution of concentrate with clean water in quantity sufficient to cover contaminated area. Apply generous amounts with spray applicator, or equivalent and allow reasonable time for the surfactants in EnviroClean to penetrate and break down the hydrocarbon and grime. Once applied, solution may be scrubbed or brushed in for stubborn soiling. Next, apply EnviroClean at a 1% - 2% solution through a power washer (heated power wash system will expedite the process). Flush residue to containment and dispose of as local rules apply.

**For lightly soiled or freshly oiled surfaces**:
EnviroClean may be used through any power washer or steam jenny currently available. Operating temperatures of 140 degrees F. will maximize effectiveness. Solution strengths of 1 – 2% may be used for lighter decontamination duties. For small applications, a 5% solution (16 oz. EnviroClean concentrate to 2.5 gallons water) may be applied with a small pump sprayer and scrubbed or brushed into surface.

## Insitu Free Product Recovery Enhancement

EnviroClean is effective for the insitu solubilization and recovery enhancement of entrained Free Product Hydrocarbon in the subsurface to facilitate recovery or biodegradation. Dilutions of 2% v/v are typical for light ends (i.e. gasoline) while concentrations of 3% to 6% are effective for Diesel Range Organic (DRO's) and heavier oils. Applications vary, however the EnviroClean solution is injected into the contaminated zone followed typically by a recovery event.

## Soil Flushing and Recovery

EnviroClean is effective for the insitu solubilization and recovery enhancement of entrained Free Product Hydrocarbon in surface and sub-surface soil to facilitate recovery or biodegradation. Dilutions of 2% v/v are typical for light ends (i.e. gasoline) while concentrations of 3% to 6% are effective for Diesel Range Organic (DRO's) and heavier oils. Applications vary, however the EnviroClean solution is injected into or flushed through the contaminated zone.

## Surface Washing & Shoreline Cleanup

Dilute EnviroClean to a 2% solution. On small spills apply with 2.5 gallon pressure sprayer or similar device. Cover entire spill, working in a circular motion, from outside perimeter toward the center of the spill. After application of EnviroClean has been completed, agitate spill area with forcible stream of water or broom and rinse thoroughly.

On larger spills, specific applications and protocols should be developed taking into account local risks and considerations.

***Note*:** EnviroClean is listed on the U.S. E.P.A. NCP Product Schedule as a Surface Washing Agent (listed SW #31). This listing does *not* mean that U.S. E.P.A. approves, licenses, certifies, or authorizes the use of EnviroClean on an oil discharge. This listing means only that data have been submitted to EPA as required by subpart J of the National Contingency Plan § 300.915.

## Fire Fighting for Class A & B Fires

| | |
|---|---|
| Proportioning Rate: | 6% |
| GPM Flow Rate: | 95 – 110 |
| PSI at Eductor: | 200 or MFG's recommendations |
| Hose Length: | As per MFG's suggestion |
| Nozzle Type: | Standard adjustable or automatic |
| Coverage: | 0.2 gpm per square foot |
| Nozzle Pattern: | Hard cone to coarse stream |
| Application: | Starting from the outside perimeter, using a stirring, mixing action. |

## Contaminated Soil Excavation

In most cases a 3% solution of EnviroClean will be adequate to keep vapor emissions within acceptable limits. Dilute EnviroClean concentrate with water at a ratio of 1 part EnviroClean to 32 parts water to make a 3% solution. The EnviroClean solution should be applied evenly to the soil surface in sufficient quantity to dampen the surface well. As a general rule, 1 gallon of solution will cover approximately 4 sq. yd. of soil surface area.