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SECOND SEMIANNUAL 2016 GROUNDWATER AND PERMEABLE REACTIVE BARRIER MONITORING AND ANNUAL SUMMARY REPORT

REDWOOD REGIONAL PARK
SERVICE YARD
OAKLAND, CALIFORNIA

Prepared for:

EAST BAY REGIONAL PARK DISTRICT
OAKLAND, CALIFORNIA

December 2016

STELLAR
ENVIRONMENTAL SOLUTIONS, INC.
GEOSCIENCE & ENGINEERING CONSULTING

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Prepared by:

STELLAR ENVIRONMENTAL SOLUTIONS, INC.
2198 SIXTH STREET
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December 1, 2016

Project No. 2016-02

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December 1, 2016

Ms. Anne Jurek
Hazardous Materials Specialist
Local Oversight Program
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Subject: Second Semiannual 2016 Groundwater and Permeable Reactive Barrier Monitoring, and Annual Summary Report Redwood Regional Park Service Yard Site – Oakland, California (ACEH Fuel Leak Case No. RO0000246)

Dear Ms. Jurek:

Attached is the referenced report for the underground fuel storage tank (UFST) site at the Redwood Regional Park Service Yard, located at 7867 Redwood Road, Oakland, California. This project is being conducted for the East Bay Regional Park District (EBRPD), and follows previous site investigation and remediation activities (conducted since 1993) associated with former leaking UFSTs. The key regulatory agencies for this investigation are the Alameda County Department of Environmental Health, the Regional Water Quality Control Board, and the California Department of Fish and Game.

This report summarizes the Second Semiannual 2016 groundwater and surface water monitoring activities conducted on September 6, 2016 and summarizes the annual trends. In addition to the activities typically conducted during the monitoring event, the water quality parameters including oxygen demand, dissolved oxygen and oxygen reduction potential were collected to assess the effectiveness of the permeable reactive barrier (PRB) that was installed in November 2013.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge. If you have any questions regarding this report, please contact either Mr. Matt Graul of the EBRPD or me at 510-644-3123.

Sincerely,

Richard S. Makdisi, P.G., R.E.A.
Principal Geochemist/President

Matt Graul, Stewardship Manager
East Bay Regional Park District

cc: State of California GeoTracker database
Alameda County Department of Environmental Health 'ftp' system

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1.0 INTRODUCTION

PROJECT BACKGROUND

The subject property is the East Bay Regional Park District (EBRPD) Redwood Regional Park Service Yard located at 7867 Redwood Road in Oakland, Alameda County, California. The site has undergone extensive site investigations and remediation since 1993 to address subsurface contamination caused by leakage from one or both former underground fuel storage tanks (UFSTs) that contained gasoline and diesel fuel. The Alameda County Department of Environmental Health (ACEH) has provided regulatory oversight of the investigation since its inception (ACEH Fuel Leak Case No. RO0000246). Other regulatory agencies with historical involvement in site review include the Regional Water Quality Control Board (Water Board) and the California Department of Fish and Game (CDFG). This report presents the results of the second semiannual 2016 groundwater monitoring activities along with the annual trend analyses and recommendations for future work.

Figure 1 shows the location of the project site. Figure 2 presents the site plan.

OBJECTIVES AND SCOPE OF WORK

The overall objective of site monitoring and the latest remedial action is to continue trying to reduce the site residual hydrocarbons. Historical remedial efforts have shown that residual hydrocarbons entrained in subsurface material and/or stratigraphic traps are continuing to release significant amounts of hydrocarbons into the groundwater. This report discusses the following activities conducted/coordinated by Stellar Environmental Solutions, Inc. (Stellar Environmental) for the second 2016 semiannual period from July 1, 2016 to December 31, 2016:

- Collecting water levels in all 12 site wells to determine shallow groundwater flow direction.
- Collecting post-purge groundwater samples for contaminant analysis as well as the water quality parameters pH, temperature, conductivity, dissolved oxygen (DO), and turbidity.
- Collecting surface water samples from Redwood Creek for contaminant analysis.
- Continue post-purge measurement of DO and redox to evaluate the effect of the permeable reactive barrier (PRB) that was installed across the distal contaminant plume. In addition, wells MW-7, MW-9 and MW-12, located directly downgradient of the PRB, were analyzed for alternate electron acceptors including nitrates, sulfates, biological oxygen

demand (BOD), and chemical oxygen demand (COD) to evaluate the effect of PRB after installation.

HISTORICAL CORRECTIVE ACTIONS AND INVESTIGATIONS

Other Stellar Environmental reports have discussed previous site remediation and investigations, site geology and hydrogeology, residual site contamination, conceptual model for contaminant fate and transport, and hydrochemical trends and plume stability. The References section of this report lists all technical reports for the site.

The general phases of site work included:

- An October 2000 Feasibility Study report for the site, submitted to ACEH, which provided detailed analyses of the regulatory implications of the site contamination and an assessment of viable corrective actions (Stellar Environmental, 2000d).
- Two instream bioassessment events, conducted in April 1999 and January 2000, to evaluate potential impacts to stream biota associated with the site contamination. No impacts were documented.
- Additional monitoring well installations and corrective action by ORC™ injection—proposed by Stellar Environmental and approved by ACEH in its January 8, 2001 letter to the EBRPD. Two phases of ORC™ injection were conducted: in September 2001 and July 2002.
- A total of 58 groundwater monitoring events have been conducted since project inception (February 1994). A total of 10 groundwater monitoring wells are currently available for monitoring.
- A bioventing pilot test conducted in September and October 2004 to evaluate the feasibility of this corrective action strategy, and installation of the full-scale bioventing system in November and December 2005. Bioventing well VW-3 was decommissioned, and two additional bioventing wells (VW-4 and VW-5) were installed on March 4, 2008. Bioventing activities conducted to date have been discussed in bioventing-specific technical reports, and updates were provided in groundwater monitoring progress reports as they relate to this ongoing program.
- An ORC™ injection pilot test, conducted by Stellar Environmental on March 10, 2009, to control historical high levels of hydrocarbons contamination that began to appear in September 2007 in source well MW-2.
- A Remedial Action Workplan (RAW), dated August 20, 2009, prepared by Stellar Environmental in response to a letter from ACEH. ACEH approved the RAW in a letter (dated October 2, 2009) to the EBRPD.

- An ORC™ injection conducted over the full footprint of plume during First Quarter 2010 (on February 1-2), followed by 30-day post-injection monitoring and sampling of key site wells (on March 2).
- Conversion of surface and groundwater monitoring frequency from quarterly to semiannual by ACEH at the request of Stellar Environmental on behalf of Park District occurred in June 2011.
- In concurrence with ACEH, the site bioventing system having accomplished its design purpose, was discontinued on July 18, 2011.
- The November 2011 Stellar Environmental PRB RAW, was approved by ACEH and installed in November 2013. While the initial results appeared promising the subsequent drought conditions resulted in the PRB being less then optimally effective and 3 years after its installation its effectiveness at reducing hydrocarbon impacted groundwater moving through it is absent.

N

SITE LOCATION ON U.S.G.S. TOPOGRAPHIC MAP

Redwood Reg. Park Service Yard, Oakland, CA	By: MJC	OCTOBER 2016
	Figure 1	

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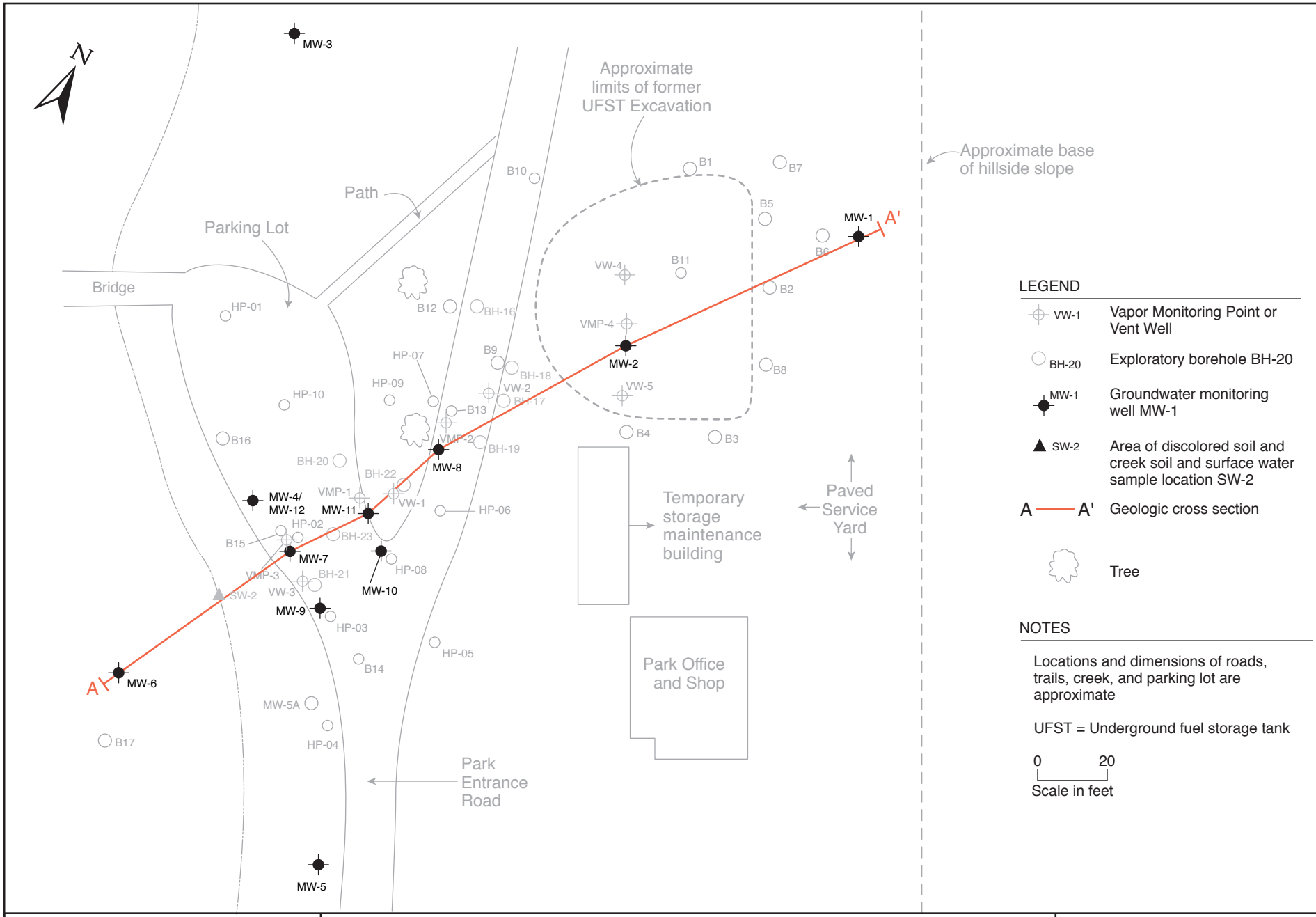
2015-02-01



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SITE PLAN SHOWING HISTORICAL BORINGS, WELLS AND GEOLOGIC CROSS-SECTION LOCATIONS
Redwood Regional Park Service Yard, Oakland, CA

Figure 2

by: MJC | OCTOBER 2016

2016-02-02

2.0 PHYSICAL SETTING

This section discusses the site hydrogeologic conditions based on geologic logging and water level measurements collected at the site since September 1993. Previous Stellar Environmental reports have included detailed discussions of site lithologic and hydrogeologic conditions. In May 2004, ACEH requested, via email, an additional evaluation of site lithology—specifically, the preparation of multiple geologic cross-sections both parallel and perpendicular to the contaminant plume's long axis. Those cross-sections were included in previous monitoring reports from July 2004 through the first semiannual 2014 monitoring event, after which updated geologic cross-section A-A' along the long axis of the groundwater contaminant plume (i.e., along local groundwater flow direction) showing the permeable reactive barrier (PRB) is presented here as Figure 3. The location of cross-section A-A' is shown on Figure 2.

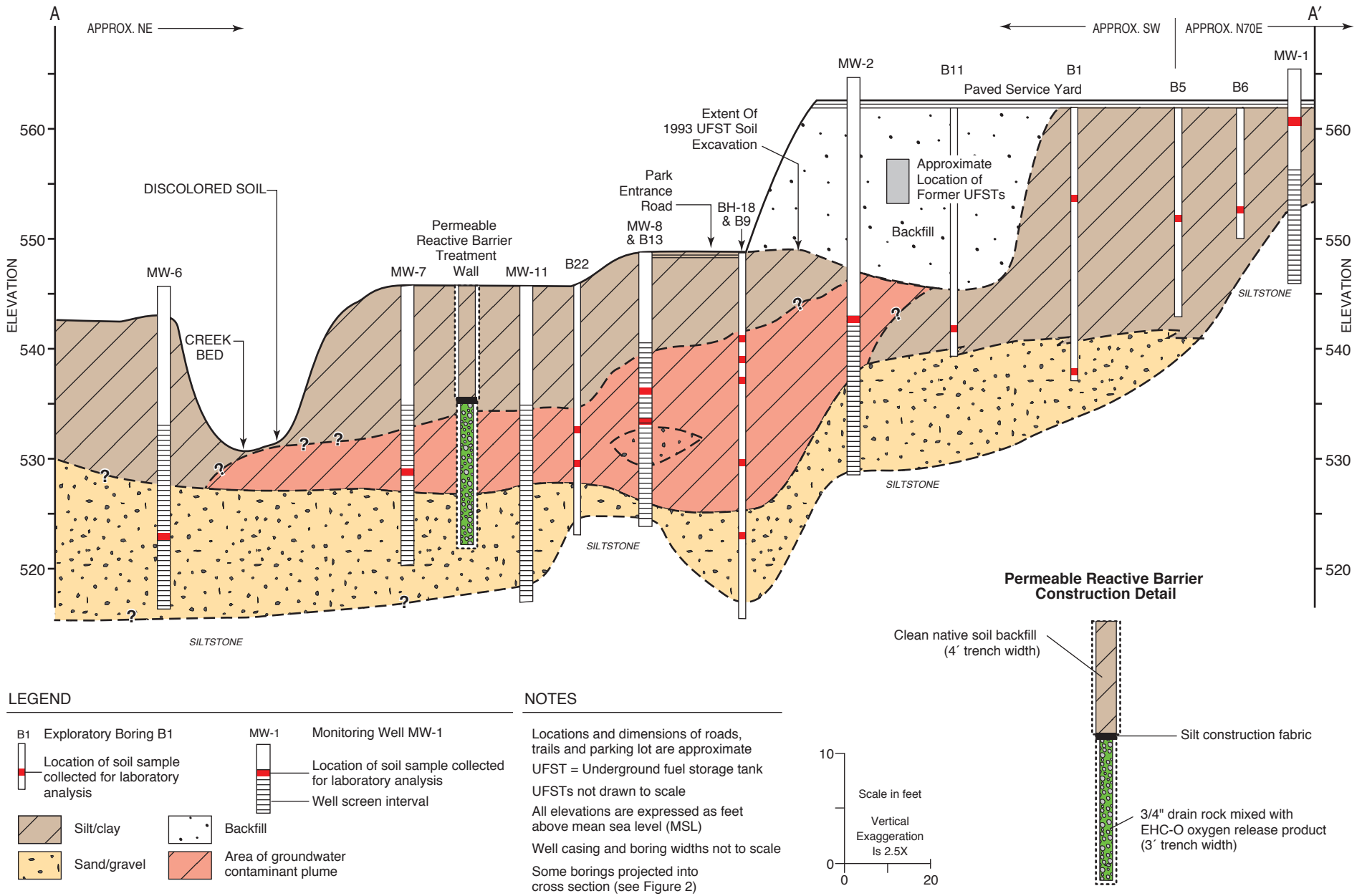
SITE TOPOGRAPHY

The site slopes to the west—from an elevation of approximately 564 feet above mean sea level at the eastern edge of the service yard to approximately 530 feet above mean sea level at Redwood Creek, which defines the approximate western edge of the project site with regard to this investigation.

SITE LITHOLOGY

Shallow soil stratigraphy consists of a surficial 3- to 10-foot-thick clayey silt unit underlain by a 5- to 15-foot-thick silty clay unit. In the majority of boreholes, a 5- to 10-foot-thick clayey coarse-grained sand and clayey gravel unit that laterally grades to a clay or silty clay was encountered. This unit overlies a weathered siltstone at the base of the observed soil profile. Soils in the vicinity of MW-1 are inferred to be landslide debris.

A previous Stellar Environmental report (Stellar Environmental, 2004c) presented a bedrock surface isopleth map (elevation contours for the top of the bedrock surface) in the contaminant plume area. The isopleth map showed the bedrock surface slopes steeply, approximately 0.3 feet/foot from east to west (toward Redwood Creek) in the upgradient portion of the site (from the service yard to under the entrance road), then slopes gently from east to west in the downgradient portion of the site (under the gravel parking area) toward Redwood Creek.



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CROSS SECTION A-A' SHOWING LOCATION OF TREATMENT WALL AND CONSTRUCTION DETAIL
Redwood Regional Park Service Yard, Oakland, CA

Figure 3

by: MJC | OCTOBER 2016

2016-02-07

This general gradient corresponds to the local groundwater flow direction. On the southern side of the plume area, bedrock slopes gently from south to north (the opposite of the general topographic gradient). Bedrock topography on the northern side of the plume cannot be determined from the available data.

In the central and downgradient portions of the groundwater contaminant plume (under the entrance road and the parking area), the bedrock surface has local, fairly steep elevation highs and lows, expressing a hummocky surface. Bedrock elevations vary by up to 10 feet over distances of less than 20 feet in this area. Local bedrock elevation highs are observed at upgradient location BH-13 and at downgradient location B15/HP-02. Intervening elevation lows create troughs that trend north-south in the central portion of the plume and east-west in the downgradient portion of the plume.

The bedrock surface (and overlying unconsolidated sediment lithology) suggests that the bedrock surface may have at one time undergone channel erosion from a paleostream(s) flowing sub-parallel to present-day Redwood Creek. Because groundwater flows in the unconsolidated sediments that directly overlie the bedrock surface, it is likely that the hummocky bedrock surface affects local groundwater depth and flow direction. This is an important hydrogeologic control that should be considered if groundwater-specific corrective action is contemplated.

HYDROGEOLOGY

Groundwater at the site occurs under unconfined and semi-confined conditions, generally within the clayey, silty, sand-gravel zone. The top of this zone varies between approximately 12 and 19 feet below ground surface (bgs); the bottom of the water-bearing zone (approximately 25 to 28 feet bgs) corresponds to the top of the siltstone bedrock unit. Seasonal fluctuations in groundwater depth create a capillary fringe of several feet that is saturated in the rainy period (late fall through early spring) and unsaturated during the remainder of the year. The thickness of the saturated zone plus the capillary fringe varies between approximately 10 and 15 feet in the area of contamination. Local perched water zones have been observed well above the top of the capillary fringe. Consistent with the bedrock isopleth map showing an elevation depression in the vicinity of MW-11, historical groundwater elevations in MW-11 are sporadically lower than in the surrounding area. As discussed in the previous subsection, local groundwater flow direction likely is more variable than expressed by groundwater monitoring well data, due to local variations in bedrock surface topography.

We estimate a site groundwater velocity of 7 to 10 feet per year, using general look-up tables for permeability characteristics for the site-specific lithologic data obtained from site investigations. This velocity estimate is conservatively low, but does meet minimum-distance-traveled criteria from the date when contamination was first observed in Redwood Creek (1993) relative to the

time of the UST installations (late 1970s). Locally, however, the groundwater velocity could vary significantly. Calculating the specific hydraulic conductivity critical to accurately estimating site-specific groundwater velocity would require direct testing of the water-bearing zone through a slug or pumping test.

Redwood Creek, which borders the site to the west, is a seasonal creek known for occurrence of rainbow trout. Creek flow in the vicinity of the site shows significant seasonal variation, with little to no flow during the summer and fall dry season, and vigorous flow with depths exceeding 1 foot during the winter and spring wet season. The creek is a gaining stream (i.e., it is recharged by groundwater seeps and springs) in the vicinity of the site, and discharges into Upper San Leandro Reservoir located approximately 1 mile southeast of the site. During low-flow conditions, the groundwater table is below the creek bed in most locations (including the area of historical contaminated groundwater discharge); consequently, there is little to no observable creek flow at these times.

The following groundwater gradient information is based on the monitoring data contained in Section 4.0 of this report. In the upgradient portion of the site (between well MW-1 and MW-2, in landslide debris and the former UFST excavation backfill) the groundwater gradient was measured at approximately 0.26 feet per foot. Downgradient from (west of) the UFST source area (between MW-2 and Redwood Creek) the groundwater gradient flattens out to approximately 0.074 feet per foot. The average groundwater elevation was 2.77 feet lower than the previous (March 2016) event, with the greatest decrease of 3.81 feet measured in MW-10 and the lowest increase measured in MW-2 of 1.48 feet. The direction of shallow groundwater flow during the current event was to the west-southwest (toward Redwood Creek), which is consistent with historical site groundwater flow direction.

3.0 REGULATORY CONSIDERATIONS AND OVERSIGHT

This section summarizes the regulatory considerations with regard to surface water and groundwater contamination. There are no ACEH or Water Board cleanup orders for the site, although all site work has been conducted under oversight of these agencies.

GROUNDWATER CONTAMINATION

As specified in the Water Board's *San Francisco Bay Region Water Quality Control Plan* (Water Board, 1995), all groundwater are considered potential sources of drinking water unless otherwise approved by the Water Board, and are also assumed to ultimately discharge to a surface water body and potentially impact aquatic organisms. While it is likely that site groundwater would satisfy geology-related criteria for exclusion as a drinking water source (excessive total dissolved solids and/or insufficient sustained yield), Water Board approval for this exclusion has not been obtained for the site. As summarized in Table 2 (in Section 5.0), site groundwater contaminant levels are compared to two sets of criteria: 1) Water Board Tier 1 Environmental Screening Levels (ESLs) for residential sites where groundwater <u>is</u> a current or potential drinking water source; and 2) ESLs for residential sites where groundwater <u>is not</u> a current or potential drinking water source.

As stipulated in the ESL guidance (Water Board, February 2013), the ESLs are not cleanup criteria; rather, they are conservative screening-level criteria designed to be protective of both drinking water resources and aquatic environments in general. The groundwater ESLs are composed of multiple components, including ceiling value, human toxicity, indoor air impacts, and aquatic life protection. Exceedance of ESLs suggests that additional investigation and/or remediation is warranted. While drinking water standards [e.g., Maximum Contaminant Levels (MCLs)] are published for the site contaminants of concern, ACEH has indicated that impacts to nearby Redwood Creek are of primary importance, and that site target cleanup standards should be evaluated primarily in the context of surface water quality criteria.

SURFACE WATER CONTAMINATION

As summarized in Table 3 (in Section 5.0), site surface water contaminant levels are compared to the most stringent screening level criteria published by the State of California, U.S. Environmental Protection Agency, and U.S. Department of Energy. These screening criteria address chronic and acute exposures to aquatic life. As discussed in the ESL document (Water

Board, 2008), benthic communities at the groundwater/surface water interface (e.g., at site groundwater discharge location SW-2) are assumed to be exposed to the full concentration of groundwater contamination prior to dilution/mixing with the surface water). This was also a fundamental assumption in the instream benthic macro-invertebrate bioassessment events, which documented no measurable impacts.

Historical surface water sampling in the immediate vicinity of contaminated groundwater discharge (SW-2) has sporadically documented petroleum contamination, usually in periods of low stream flow, and generally at concentrations several orders of magnitude less than adjacent (within 20 feet) groundwater monitoring well concentrations. It is likely that mixing/dilution between groundwater and surface water precludes obtaining an "instantaneous discharge" surface water sample that is wholly representative of groundwater contamination at the discharge location. Therefore, the most conservative assumption is that surface water contamination at the groundwater/surface water interface is equivalent to the upgradient groundwater contamination (e.g., site downgradient wells MW-7, MW-9, and MW-12).

While site target cleanup standards for groundwater have not been determined, it is likely that no further action will be required by regulatory agencies when groundwater (and surface water) contaminant concentrations are all below their respective ESL criteria. Residual contaminant concentrations in excess of screening level criteria might be acceptable to regulatory agencies if a more detailed risk assessment (e.g., Tier 2 and/or Tier 3) demonstrates that no significant impacts are likely.

REGULATORY OVERSIGHT

The lead regulatory agency for the site investigation and remediation is ACEH (Case No. RO0000246), with oversight of ACEH provided by the Water Board (GeoTracker Global ID T0600100489). The CDFG is also involved with regard to surface water quality impacts to Redwood Creek, however, no surface water quality impacts to aquatic organisms were found. The ACEH-approved revisions to the site monitoring program as of this date include:

- Discontinuing hydrochemical sampling and analysis in wells MW-1, MW-3, MW-5, and MW-6.
- Discontinuing creek surface water sampling at upstream location SW-1.
- Conversion of surface and groundwater monitoring frequency from quarterly to semiannual.
- The bioventing system was discontinued in July 2011.
- Monitoring the effectiveness of the PRB for a period of 3 years after its installation.

The site is in compliance with State Water Resources Control Board's GeoTracker requirements for uploading electronic data and reports. In addition, electronic copies of technical documentation reports published since Second Quarter 2005 have been uploaded to ACEH's file transfer protocol (ftp) system.

The ACEH case officers provide regulatory communication, workplan approvals and review of investigation and corrective action progress have been Mr. Scott O. Seery (1995-2004), Mr. Jerry Wickham, P.G. (2005-2015), and Ms. Anne Jurek (2016-present).

4.0 SECOND SEMIANNUAL 2016 ACTIVITIES

This section presents the creek surface water and groundwater sampling procedures and methods for the groundwater monitoring event (Second Semiannual 2016), conducted on September 6, 2016, along with the analytical results. Groundwater sampling was conducted in accordance with State of California guidelines for sampling dissolved analytes in groundwater associated with leaking UFSTs (State Water Resources Control Board, 1989), and followed the methods and protocols approved by ACEH in the Stellar Environmental workplan (Stellar Environmental, 1998a).

The current monitoring period activities included:

- Measuring static water levels in all 11 site wells;
- Collecting post-purge groundwater samples for laboratory analysis of site contaminants and as well as the water quality parameters pH, temperature, conductivity, and turbidity during purging from wells located within (or potentially within) the groundwater plume (MW-2, MW-7, MW-8, MW-9, MW-10, MW-11, and MW-12);
- Collecting Redwood Creek surface water samples for laboratory analysis from locations SW-2 and SW-3 could not be collected this event as the creek was dry.
- Continued post-purge measurement of dissolved oxygen (DO) and redox to monitor the effect of the permeable reactive barrier (PRB) that was installed on November 20, 2013 across the distal contaminant plume. In addition, Stellar Environmental also analyzed wells MW-7, MW-9 and MW-12, located directly downgradient of the PRB, for alternate electron acceptors including nitrates, sulfates, biological oxygen demand (BOD), and chemical oxygen demand (COD) to evaluate the effect of PRB after installation.

The locations of all site monitoring wells and creek water sampling locations are shown on Figure 2 (in Section 1.0). Appendix A contains historical groundwater elevation data. Appendix B contains the groundwater monitoring field records for the current event.

Well construction information and the September 6, 2016 groundwater elevation data are summarized in Table 1. Figure 4 is a groundwater elevation map constructed from the current event monitoring well groundwater elevation data.

Table 1
Groundwater Monitoring Well Construction
and Groundwater Elevation Data – September 6, 2016

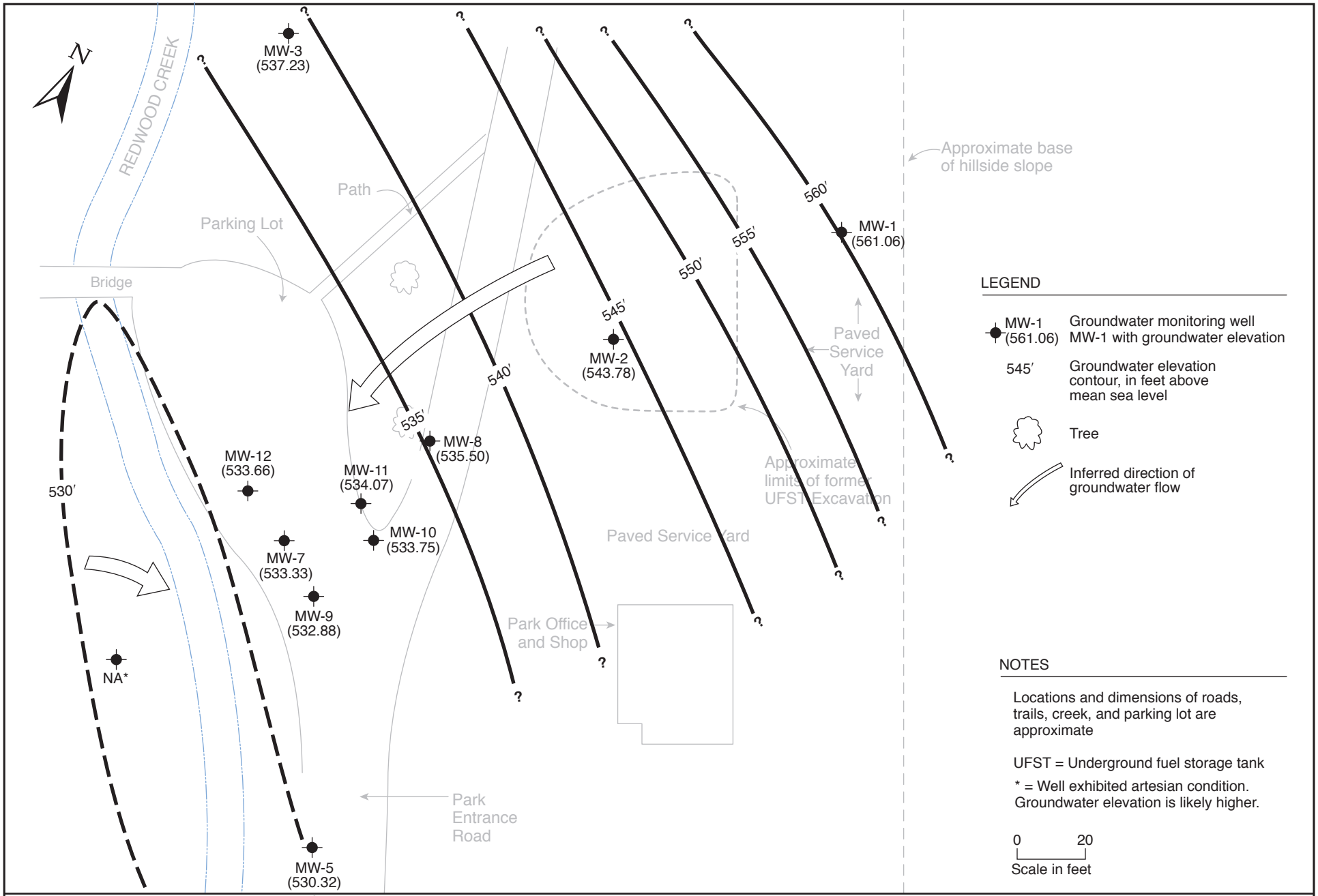
Well	Well Depth	Screened Interval	TOC Elevation	Groundwater Depth (btoc)	Groundwater Elevation
MW-1	18	7 to17	565.83	4.77	561.06
MW-2	36	20 to 35	566.42	22.64	543.78
MW-3	42	7 to 41	560.81	23.58	537.23
MW-5	26	10 to 25	547.41	17.09	530.32
MW-6	26	10 to 25	545.43	NA	NA
MW-7	24	9 to24	547.56	14.23	533.33
MW-8	23	8 to 23	549.13	13.63	535.50
MW-9	26	11 to 26	549.28	16.40	532.88
MW-10	26	11 to 26	547.22	13.47	533.75
MW-11	26	11 to 26	547.75	13.68	534.07
MW-12	25	10 to 25	544.67	11.01	533.66

Notes:
All measurements expressed in feet
TOC = top of casing
bgs = below ground surface
Wells MW-1 through MW-6 are 4-inch diameter; all other wells are 2-inch diameter.
All elevations are expressed in feet above mean sea level. (U.S. Geological Survey)
The PRB inoculated treatment zone is located from 10-22 feet bgs which correlates to an elevation ranging from 525.5 – 537.5 feet amsl
NA = Not assessable for monitoring due to fallen tree

GROUNDWATER MONITORING AND SAMPLING

Groundwater monitoring well water level measurements, purging, sampling, and field measurements were conducted by Blaine Tech Services under the supervision of Stellar Environmental personnel. As the first task of the monitoring event, static water levels were measured using an electric water level indicator. The wells to be sampled for contaminant analyses were then purged (by bailing and/or pumping) of three wetted casing volumes. Aquifer stability parameters (temperature, pH, electrical conductivity and turbidity) were measured after each purged casing volume to ensure that representative formation water would be sampled. To minimize the potential for cross-contamination, wells were purged and sampled in order of increasing contamination (based on the analytical results of the previous event).

The sampling-derived purge water and decontamination rinseate (approximately 65.4 gallons) from the current event was containerized in the onsite above-ground storage tank. Purgewater is accumulated in the onsite tank until it is full, at which time the water is transported offsite for proper disposal.



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GROUNDWATER ELEVATION MAP—SEPTEMBER 6, 2016

Redwood Regional Park Service Yard, Oakland, CA

Figure 4

by: MJC | OCTOBER 2016

2016-02-03

REDWOOD CREEK SURFACE WATER SAMPLING

Surface water sampling usually conducted by Blaine Tech Services under the supervision of Stellar Environmental personnel could not be done this period as the creek was dry at both of the prescribed creek sampling locations: location SW-2 immediately downgradient of the former UFST source area and within the area of documented creek bank soil contamination; and surface water sampling location SW-3 (located approximately 500 feet downstream of the SW-2 location). In accordance with a previous Stellar Environmental recommendation approved by ACEH, upstream sample location SW-1 is no longer part of the surface water sampling program.

At the time of the September 2016 sampling event, the entire stretch of creek was dry with no areas of visible ponded water between location SW-3 and location SW-2. Blaine Tech personnel did not report observing orange algae in the creek bank at location SW-2 or petroleum odors during this event.

GROUNDWATER AND SURFACE WATER ANALYTICAL RESULTS

The September 2016 semiannual field and analytical laboratory results are summarized on Table 2. Figure 5 shows the distribution of the contaminant analytical results and the inferred limits of the gasoline groundwater plume. Appendix C contains the certified analytical laboratory report and chain-of-custody record. Appendix D summarizes the historical groundwater and surface water analytical results.

Second Semiannual 2016 groundwater contaminant concentrations were as follows: The ESLs for residential areas where groundwater is a drinking water resource were exceeded for TEHd in six of the seven wells sampled and for TVHg in five of the seven wells sampled. Benzene was detected in two wells but was exceeded only in well MW-9. Ethylbenzene was detected in four wells and above the ESL in wells MW-7, MW-9 and MW-11. Total xylenes were detected in four wells but only MW-9 showed concentrations above the ESL. Toluene was not detected in any of the seven wells. MTBE was detected in 3 wells but none exceeded the ESL.

Well MW-9 contained both the maximum TVHg and TEHd groundwater with TVHg detected at 120,000 ug/L being the historical highest site detection of this contaminant. MW-7, MW-9 and MW-12 are located in the downgradient central area of the plume, adjacent to Redwood Creek. The northern edge of the downgradient edge of the plume is defined by well MW-12. The southern edge of the plume in the downgradient area is not strictly defined; however, based on historical groundwater data, it appears to be located between well MW-9 and well MW-5. The current event contaminant plume geometry is consistent with historical contaminant distribution.

Surface water sampling could not be conducted this event at either of the prescribed sampling locations; SW-2 or SW-3 due to insufficient creek water for sampling.

Table 2
Groundwater and Surface Water Samples
Analytical Results –September 6, 2016
Redwood Regional Park Corporation Yard, Oakland, California

Location	Dissolved Oxygen	ORP	Contaminant Concentrations						
			TEHd	TVHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
GROUNDWATER SAMPLES									
MW-2	3.45	-126	**400**	**410**	<0.5	<0.5	<0.5	<0.5	2.5
MW-7	0.82	-110	**2,100**	**6,800**	<0.5	<0.5	**69**	5.3	<2.0
MW-8	0.59	-90	**430**	**220**	0.53	<0.5	3.6	5.52	4.5
MW-9	0.59	-93	**6,400**	**120,000**	**550**	<8.3	**7,600**	**490**	**<33**
MW-10	1.05	-40	**120**	63	<0.5	<0.5	<0.5	<0.5	4.4
MW-11	0.62	-73	**1,500**	**1,500**	<0.5	<0.5	**11**	0.62	<2.0
MW-12	0.78	67	58	<50	<0.5	<0.5	<0.5	<0.5	<2.0
Groundwater ESLs [a]	--	--	100	100	1.0	40	13	20	5.0
REDWOOD CREEK SURFACE WATER SAMPLES									
SW-2 (dry this event)	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-3 (dry this event)	NS	NS	NS	NS	NS	NS	NS	NS	NS
Surface Water Screening Levels [b]	--	--	100	100	1.0	40	13	20	5.0

Notes:
[a] ESLs = Water Board Environmental Screening Levels (where groundwater is a potential drinking water resource) (Water Board, 2016).
[b] Water Board Surface Water Screening Levels for freshwater habitats (Water Board, 2008).
Samples in **bold-face type** exceed the ESLs and/or surface water screening levels where groundwater is a potential drinking water resource.
Analytical results shown as < and indicate a non-detection or less than the laboratory detection limit.

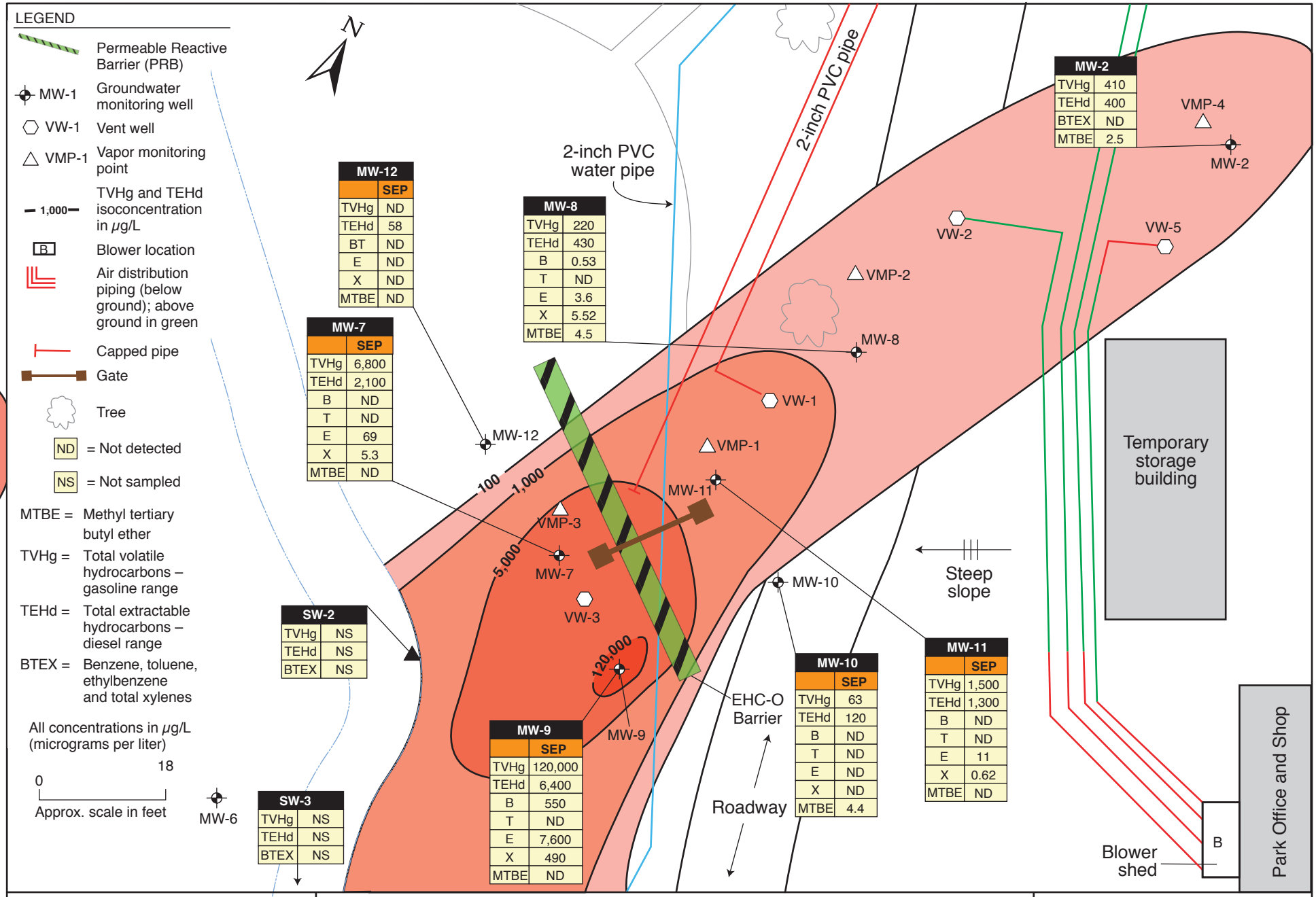
NA = not analyzed
NLP = no level published
NS = not sampled

MTBE = methyl tertiary-butyl ether
TVHg = total volatile hydrocarbons – gasoline range
TEHd = total extractable hydrocarbons – diesel range

All contaminant concentrations are expressed in micrograms per liter (µg/L), equivalent to parts per billion.
Dissolved oxygen concentrations are expressed in milligrams per liter (mg/L); post-purge measurement in all wells.
ORP = redox or oxidation reduction potential measured in millivolts (mV)

Quality Control Sample Analytical Results

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



STELLAR ENVIRONMENTAL SOLUTIONS, INC
GEOSCIENCE & ENGINEERING CONSULTING

PLAN VIEW OF TPH PLUME — SEPT. 6, 2016 (KEY WELLS, ONLY)
7867 Redwood Rd, Oakland, CA

Figure 5

by: MJC | OCTOBER 2016

2016-02-04

PERMEABLE REACTIVE BARRIER (PRB) DESIGN AND BACKGROUND

The PRB was installed on November 20, 2013 and was designed to treat and/or intercept accessible subsurface groundwater hydrocarbon contamination as they migrate in the groundwater flow and before they reach Redwood Creek. The PRB trench was constructed by excavating a trench approximately 40 feet long and 3 feet wide and 22 feet bgs in the distal downgradient contaminated zone. A total of 1,250 pounds of Adventus™ EHC-O oxygen release product was mixed in a relatively more permeable drain rock backfill and emplaced in the trench from 22 to 10 feet bgs as it was backfilled.

The main active ingredient in Adventus EHC-O™ is calcium peroxide. The optimal pH for hydrocarbon reduction is between seven and nine. The groundwater measured in site wells during this event had a pH range of 6.74 to 7.18, mostly within the optimum range. Under these conditions, the Adventus EHC-O™ remedy product will react to release hydrogen peroxide and oxygen. This allows for the initial chemical oxidation to take place; starting the breakup of the contaminants in groundwater as they reach the PRB. The oxygen is then released more slowly, which will assist bioremediation for several years.

The PRB should be effective in reducing the toxicity of the plume by accelerating the biodegradation significantly within the first approximately 6-12 months. The volume of dissolved hydrocarbons within the generalized area is expected to be reduced within the first 12 months by 50 percent or more—according to the manufacturer's data. However, groundwater flow through the reactive wall is needed to trigger the treatment and the until December 2014 rainfall the recent year drought conditions kept the groundwater elevations low.

Permeable Reactive Barrier Monitoring Indicators

Alternate electron acceptors were measured during this monitoring and sampling event in wells MW-7, MW-9 and MW-12, all located downgradient of the PRB location; which included nitrates, sulfates, biological oxygen demand (BOD), and chemical oxygen demand (COD) to track the effect of the oxygen release product (Adventus EHC-O™) utilization. One concern about the use of Adventus EHC-O™ is that other non-hydrocarbon-utilizing microorganisms will use the product as well, without the benefit of hydrocarbon reduction occurring as effectively. The oxygen demand exerted by extraneous oxygen sinks, such as nitrates and sulfates can then be estimated to evaluate its equivalent to the oxygen demand exerted by the contaminants of concern.

Table 3 includes the results of these additional analyses that have been collected in site monitoring wells located immediately downgradient of the proposed PRB.

Table 3
Analytical Results of Electron Acceptors and Oxygen Demand in Downgradient Wells
September 6, 2016

Location	Analytical Concentrations (mg/L)			
	Nitrates	Sulfates	BOD	COD
MW-7	<0.05	6.1	<5.0	15
MW-9	<0.05	3.4	8.7	26
MW-12	<0.05	47	<5.0	14

Notes: COD = Chemical oxygen demand; BOD = biochemical oxygen demand;

Dissolved Oxygen

DO is the most thermodynamically favored electron acceptor used in aerobic biodegradation of hydrocarbons. Active aerobic biodegradation of petroleum hydrocarbon compounds requires at least one to two milligrams per liter (mg/L) of DO in groundwater. During aerobic biodegradation, DO levels are reduced in the hydrocarbon plume as respiration occurs. Therefore, DO levels that vary inversely to hydrocarbon concentrations are consistent with the occurrence of aerobic biodegradation. However, no significant reduction of total hydrocarbons has been recorded so far.

The DO concentrations, downgradient of the PRB, at monitoring wells MW-7, MW-9 and MW-12, of which MW-9 currently shows the highest concentrations of hydrocarbons, ranges from 0.59 – 0.82 mg/L. The DO at well MW-7 is relatively high (0.82 mg/L) suggesting a more active aerobic biodegradation. DO is relatively low in MW-9 (0.59 mg/L) showing an inverse relationship of hydrocarbons that the active aerobic biodegradation the PRB is designed to promote. The average DO in the 7 site wells showed an overall decrease from 3.20 mg/L in September 2015 compared to 1.13 mg/L during this September 2016 event. However, the average DO in the 3 wells (MW-7, MW-9 and MW-12) downgradient of the PRB, showed less of an average decrease in DO from 0. 95 mg/L in March 2016 to 0.73 mg/L this September 2016, suggesting the marginal decrease in DO is less of a function of the effect of the PRB, but more likely attributed to seasonal fluctuations.

Oxidation-Reduction Potential

The oxidation-reduction potential (ORP) of groundwater is a measure of electron activity, and is an indicator of the relative tendency of a solute species to gain or lose electrons. The ORP of groundwater generally ranges from -400 millivolts (mV) to +800 mV. In oxidizing (aerobic) conditions favorable to bioremediation, the ORP of groundwater is typically positive; in reducing (anaerobic) conditions, the ORP is typically negative (or less positive).

Measurement of the baseline ORP during this sampling event ranged from -110 to 67 mV in wells MW-7, MW-9 and MW-12 located within 15 feet downgradient of the PRB, and from -40 to - 73 mV in wells MW-10 and MW-11, respectfully, located within 15 feet upgradient of the PRB, respectfully. As with the DO, the ORP trend will be monitored to evaluate the effectiveness of the PRB in subsequent monitoring events. Measurements collected during the September 2016 monitoring event are included in Table 3.

Chemical and Biochemical Oxygen Demand, Nitrates, and Sulfates

Alternate electron acceptors were measured during this monitoring and sampling event in wells MW-7, MW-9 and MW-12 located downgradient of the PRB location; which included nitrates, sulfates, BOD and COD to track the effect of the oxygen release product (Adventus EHC-O™) utilization.

The presence of sulfates and absence of nitrates in wells MW-7, MW-9 and MW-12 is generally consistent with the DO and ORP data. These results indicate that some degree of aerobic degradation is likely occurring at the site; however there is a slight decrease in sulfates but no discernable trend and/or correlation to hydrocarbon concentration in this event.

PERMEABLE REACTIVE BARRIER EFFECTIVENESS

The PRB has had disappointing results as being an effective reactive barrier that clearly shows a significant and sustained reduction of hydrocarbons at the two of the three key wells; MW-7 and MW-9, downgradient of the PRB. The main active ingredient in Adventus EHC-O™ is calcium peroxide. This initial chemical oxidation to take place starts the breakup of the contaminants in groundwater as they reach and react within the PRB. The oxygen is released slowly but at a high enough level that is designed to assist bioremediation for several years. The optimal pH for hydrocarbon reduction is between seven and nine. The groundwater measured in site wells during this event had a post-purge pH range of 6.24 to 7.21, only partially within the optimum range, however the effective principal reaction timeframe of the EHC-O™ estimated at two to a maximum of 3 years has essentially run out.

The data did not showing any appreciable or significant reduction in the hydrocarbon compounds in two of the three key wells, (MW-7 and MW-9), downgradient of the PRB. The drought over the last two years may be in part responsible for not recharging groundwater in area to the full height of the PRB resulting in less mobilization of the EHC-O™ product. In addition, saturation of the PRB due to the greater than average 2015-2016 rainfall season may have created a hydrologic pressure that mobilized contaminants that resulted in the historical high concentrations of TPH-g and benzene detected in MW-9 this September 2016 event.

5.0 EVALUATION OF HYDROCHEMICAL TRENDS AND PLUME STABILITY

This section evaluates the observed hydrochemical trends with regard to plume stability and migration of the center of contaminant mass toward Redwood Creek. An assessment is made as to the nature of residual contaminated soil that acts as a continued source of groundwater contamination. A conceptual model (incorporating site lithology, hydrogeology, and hydro-chemistry is presented to explain the spatial extent and magnitude of the dissolved hydrocarbon plume.

CONTAMINANT SOURCE ASSESSMENT

Site UFSTs were removed (i.e., discharge was discontinued) in 1993, and some but not all of the source area excavation contaminated soil was removed. That residual hydrocarbon contamination entrained in the soil and capillary fringe has been extremely hard to mitigate, with only partial success achieved through the bioventing and oxygen producing products in-situ injection that has been implemented since 2005. The vadose smear zone is estimated to be 3-4 feet wide based on monitored groundwater elevation and recent observations made in 2013 during excavation trenching for installation of the PRB.

Success at reducing the significant contamination in the mid-field plume area represented by well MW-8 has been achieved along with mitigation of the 2007 timeframe increase at the upper plume area represented by well MW-2. The contaminant plume has historically appeared split into an upper zone of contamination around MW-2 and a lower zone around well MW-7, MW-9 and MW-12 with very low detection, all below the applicable ESLs, surrounding MW-8. The lower plume area represented by the "guard" wells MW-7 and MW-9 were not significantly reduced by the combination of bioventing and March 2010 ORC™ injection. The PRB was installed in November 2013 in an effort to treat the downgradient distal plume area and mitigate against hydrocarbon impact to Redwood Creek.

The September 2014 event showed historical maximum high concentrations of TVHg in wells MW-9 and MW-12 and of benzene in MW-12 immediately downgradient of the PRB and this September 2016 showed historical maximum high TPHg and benzene in MW-9. These historical high concentrations are likely attributed to the effect of saturation of the PRB creating hydrostatic pressure that mobilizes contaminants in this area of distal plume area. This

September 2016 monitoring shows the contaminant mass to be concentrated in the distal area of the plume, however concentrations of TPHd and TPHg in excess of applicable ESLs still persist in the mid-plume and upper source area.

Borehole soil sampling has provided data on the extent and magnitude of soil contamination in the vicinity of the former UFSTs ("source area") and the outlying area (in the capillary fringe above the groundwater plume). Soil contamination appears constrained to the unsaturated zone and the underlying saturated sediments on the weathered bedrock surface. The 2010 ORC™ injection effort was aimed at mitigating the apparent large mass of residual TPH contamination in the unsaturated zone, primarily in the area between the former UFSTs and the park entrance roadway, with the contaminated zone thinning toward Redwood Creek. Seasonal desorption of contamination in this unsaturated zone occurs during the rainy season and during high-water periods, acting as a long-term source of dissolved contamination. Previous ORC™ injection programs—which resulted in permanent reductions at the peripheral plume margins, but were followed by rebound (to pre-injection conditions) within the central portions of the plume—indicate that site conditions support aerobic biodegradation. However, biodegradation is limited by oxygen deficiency in the unsaturated zone.

Based on this conceptual model—and using conservative assumptions for equilibrium partitioning, contaminant geometry, soil moisture, and previous laboratory analytical results for TPH in soil—estimates of TPH mass in soil were calculated based on 2004 and earlier borehole data. Residual TPH in vadose zone soil is estimated at 1,400 to 7,000 pounds (100 to 600 gallons of gasoline), compared to a mass of TPH in groundwater estimated at 1 to 10 pounds (0.1 to 1.0 gallon of gasoline). The hydrocarbon mass in groundwater is likely higher than originally estimated (based on post-2004 data).

Soil and groundwater contamination distribution and site lithologic and hydrogeologic conditions have shown that residual soil contamination, unless abated, will continue to be a source of long-term groundwater contamination via seasonal desorption and migration.

WATER LEVEL TRENDS

Appendix D contains historical groundwater elevation data. Figure 10 shows a trendline of site groundwater elevations in key wells (those within the contaminant plume). The data support the following conclusions:

- Groundwater elevations in all of the monitored site wells showed a seasonal fluctuation in 2015-2016—with an average increase of 4.19 feet (from September 2015 to March 2016) to an average decrease of 1.74 feet (from March 2016 to September 2016). When comparing groundwater elevations from September 2015 and this September monitoring

event, there was an average increase of 2.46 feet in groundwater elevation reflecting the high 2015-2016 rainfall season.

- In all wells, the lowest elevations have generally been observed during the end of the dry season and the highest elevations at the peak of the rainy season. This is a common seasonal trend observed in the upper water-bearing zone in the Bay Area.
- Groundwater elevation trends and magnitudes are similar between wells.
- Overall groundwater flow direction is consistently to the west-southwest (toward Redwood Creek). Localized (on the scale of tens of feet) groundwater flow direction appears to vary within the general flow direction, likely controlled by bedrock surface topography.
- The groundwater gradient varies with the topography across the plume but consistently averages around 0.1 feet/foot from the historical UST source area to Redwood Creek.

HYDROCHEMICAL TRENDS

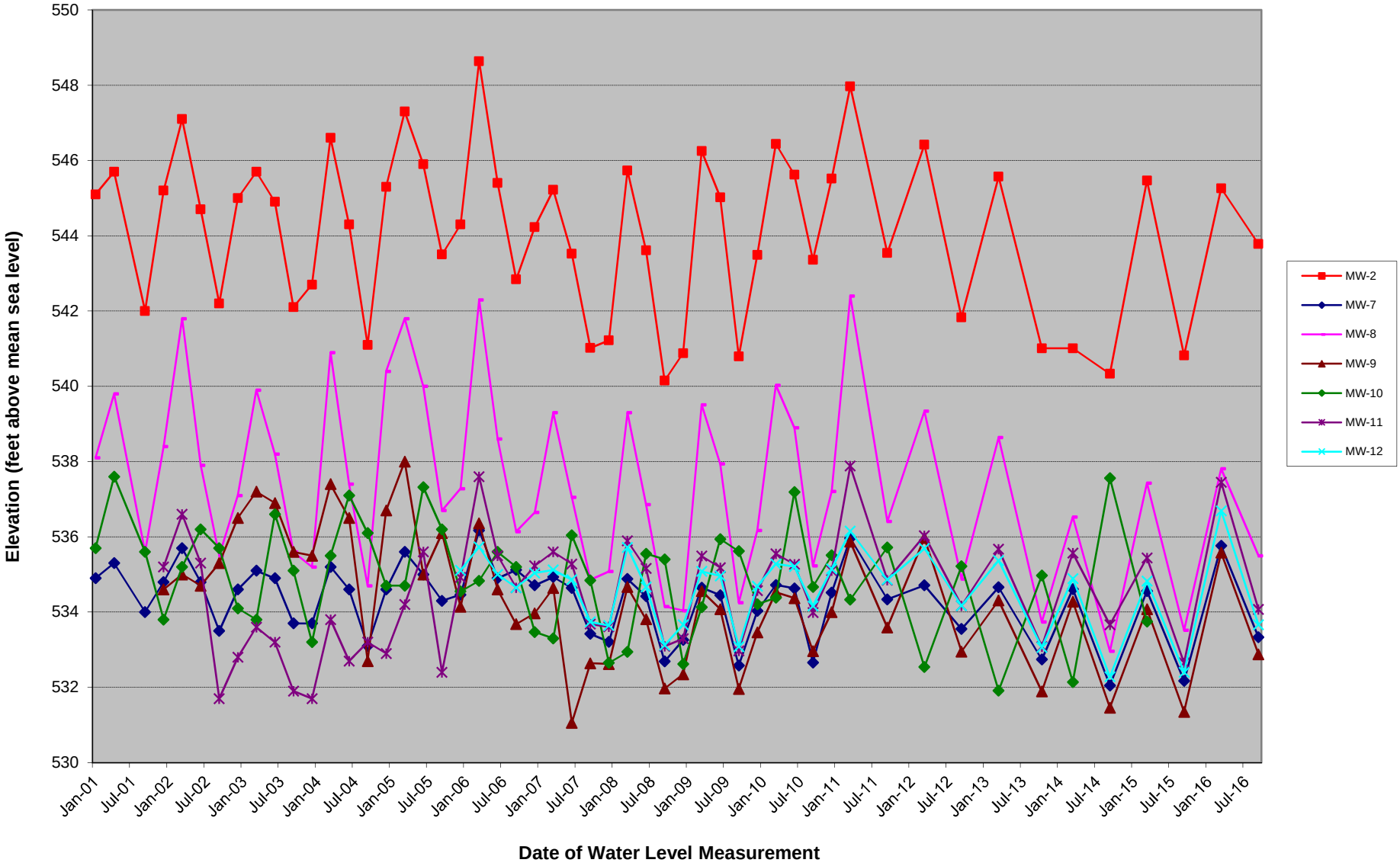
Concentrations of contaminants in an individual well can fluctuate over time for one or more reasons—contaminant migration, seasonal effects due to fluctuating groundwater levels (i.e., desorption from the unsaturated zone and/or dilution of saturated zone contamination), and/or natural attenuation (plus enhancement by active remediation measures such as ORC™ injection, bioventing and the PRB). These hydrochemical trends can result in changes in the lateral extent and magnitude of a dissolved contaminant plume.

The most consistent trend in the wells located within the centerline of the plume has been a seasonal influence of desorption following winter rains, with a resultant increase in dissolved hydrocarbon concentration in the groundwater.

Because the quarter-to-quarter comparisons can be unduly influenced by seasonal effects that mask longer trends, it is useful to compare same-season data over time to determine if concentrations are increasing, decreasing, or remaining stable. Our evaluation of hydrochemical trends focuses on gasoline and diesel, which, when combined, represent the majority of the contaminant mass. To more closely evaluate plume stability differences, the following discussion focuses on four separate portions of the plume relative to the long axis (along the hydraulic gradient): “upgradient” (trailing edge of plume); “mid-plume”; “downgradient”; and “plume fringe.”

Important components of plume stability include: degree of contaminant fluctuations in individual wells over time; changes in the lateral extent of the plume; and changes in the location of the center of contaminant mass within the plume.

Figure 6: Historical Groundwater Elevations in Site Wells
Redwood Regional Park Service Yard - Oakland, California



This September 2016 contaminant plume pattern is observed similar as historically seen where the lowest contaminant concentrations are detected in the mid-plume area represented by well MW-8. In the past this lowering of concentrations in mid-plume area suggested the contaminant plume to have disconnected from the source such that historical downgradient concentrations were higher than upgradient (near the source) concentrations. However, a significant increase in gasoline and diesel concentrations in source area well MW-2 was observed beginning in approximately September 2007. The increase continued, even after individual purging events, into 2010. Stellar Environmental commenced with ORC™ injection near this well and in the general area of the plume in February 2010. Based on that apparent success, in March 2010, a wider ORC™ injection into areas of the plume was initiated. This injection did not result in the same success at reducing concentrations in the lower plume area as it did in the upper and mid-field of the plume. The two guard wells MW-7 and MW-9 historically have comparable TPHg + TEHd, however since there have large differences since 2011. Well MW-7 showed a combined 9,100 µg/L TPHg + TEHd in September 2011 compared with 8,700 µg/L TPHg + TEHd in September 2012, which is pretty comparable. But well MW-9 showed a combined 4,500 µg/L TPHg + TEHd in September 2011 compared with a significant increase to 18,600 µg/L TPHg + TEHd in September 2012 with MW-9 showing the historical highest since site detection of TVHg this September 2016. The contaminants in source area MW-2 have showed a steady decrease since March 2010, with the lower middle and downgradient areas of the plume (MW-7, MW-9, MW-11 and MW-12 exhibiting the highest contaminant concentrations

The permeable reactive barrier (PRB) was installed on November 20, 2013 and was designed to treat and/or intercept accessible subsurface groundwater hydrocarbon contamination as they migrate in the groundwater flow and before they reach Redwood Creek. This September 2016 event, approximately 34 months after installation of the PRB, show the TVHg concentration in wells MW-7, MW-9 and MW-12, immediately downgradient of the PRB to be within historical range with the exception of TVHg in MW-9 which was detected at a historical high and likely attributed to hydrostatic pressure created by the PRB that mobilizes contaminants in this area of distal plume area.

To evaluate plume stability with regard to changes in the center of contaminant mass, we evaluated concentrations of TPH (gasoline and diesel combined) in individual wells over time. The data show no obvious correlation between maximum TPH concentrations and well locations, suggesting high plume instability. Since January 2001, maximum TPH concentrations have been variously detected in upgradient, mid-plume, and downgradient wells. These variations are likely due in large part to differing contaminant mass in unsaturated zone soils at particular locations, resulting in variable amounts of desorbed mass to the plume during high water conditions. The following discusses hydrochemical trends in each of the upgradient, mid-plume, and downgradient portions of the site, as well as at the fringes of the plume.

Upgradient Hydrochemical Trends

MW-2. As described in Section 4.0, this source area well historically has shown low to trace (sometimes non-detectable) contaminant levels. However, starting in the September 2007 monitoring event, the well MW-2 concentrations increased dramatically, suggesting desorption from the original upgradient source area as a result of the drought-induced drop in water levels. In September 2008, a new historic maximum of 40,000 µg/L of gasoline was observed in MW-2 and a new historic maximum of diesel at 37,000 µg/L was observed in March 2009. In March 2010, Stellar Environmental conducted a limited ORC™ injection, which decreased concentrations significantly by the October 2013 event both gasoline and diesel concentrations measured 120 µg/L TPHg and 67 µg/L TPHd. The 2014 and 2015 events showed some marginal increasing TVHg and TPHd concentration followed by the March 2016 event which showed no detection which was likely the result of the above average 2015-2016 rainfall condition. In this September 2016 event TVHg and TPHd returned to within historical (pre 2007-2010) concentration range, with 410 µg/L TPHg and 400 µg/L TPHd, which are above the site ESLs. Figure 7 shows hydrochemical trends for gasoline and diesel in MW-2.

Mid-Plume Trends

MW-8. Concentrations of TVHg in MW-8, located approximately 60 feet downgradient of MW-2, have been generally decreasing since 2005: from a historic high of 33,000 TPHg µg/L observed in June 2005 to the lowest TPHg concentration of 180 µg/L in December 2010 to 1,700 µg/L in this latest event. TEHd concentrations had remained fairly stable until a TEHd spike of 13,000 µg/L was observed in March 2008; decreased to below the applicable ESLs in the September 2014 and 2015 events but was above the ESLs this last September 2016. This fluctuation demonstrates that significant contaminant mass entrained in the soil continues to "feed" the dissolved concentration, as demonstrated by periods of recharge represented during the March 2008 sampling event. As contaminant concentrations decrease in the source area, contaminant concentrations in this well will most likely decrease as the plume migrates downgradient. Both gasoline and diesel concentrations have fluctuated widely but follow a well-established seasonal fluctuation pattern. The strong seasonal effect is visually apparent, with annual maximum concentrations generally occurring in late winter/early spring and annual minimum concentrations generally occurring in the fall/winter.

Figure 8 features gasoline and diesel hydrochemical trends in MW-8.

Figure 8: Gasoline and Diesel Hydrochemical Trends: Well MW-8
Redwood Regional Park Service Yard, Oakland, California

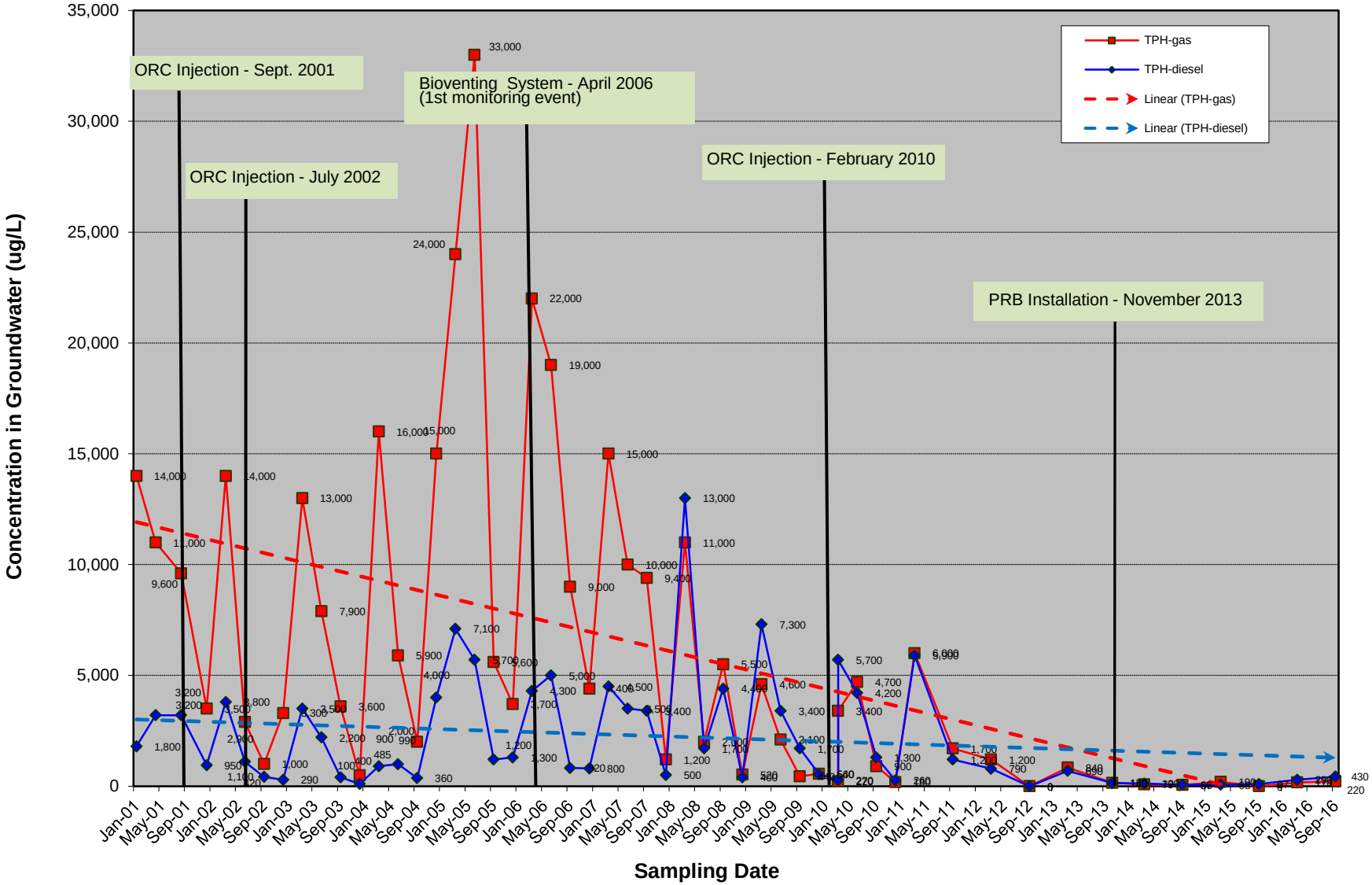


Figure 9: Gasoline and Diesel Hydrochemical Trends: Well MW-11
Redwood Regional Park Service Yard, Oakland, California

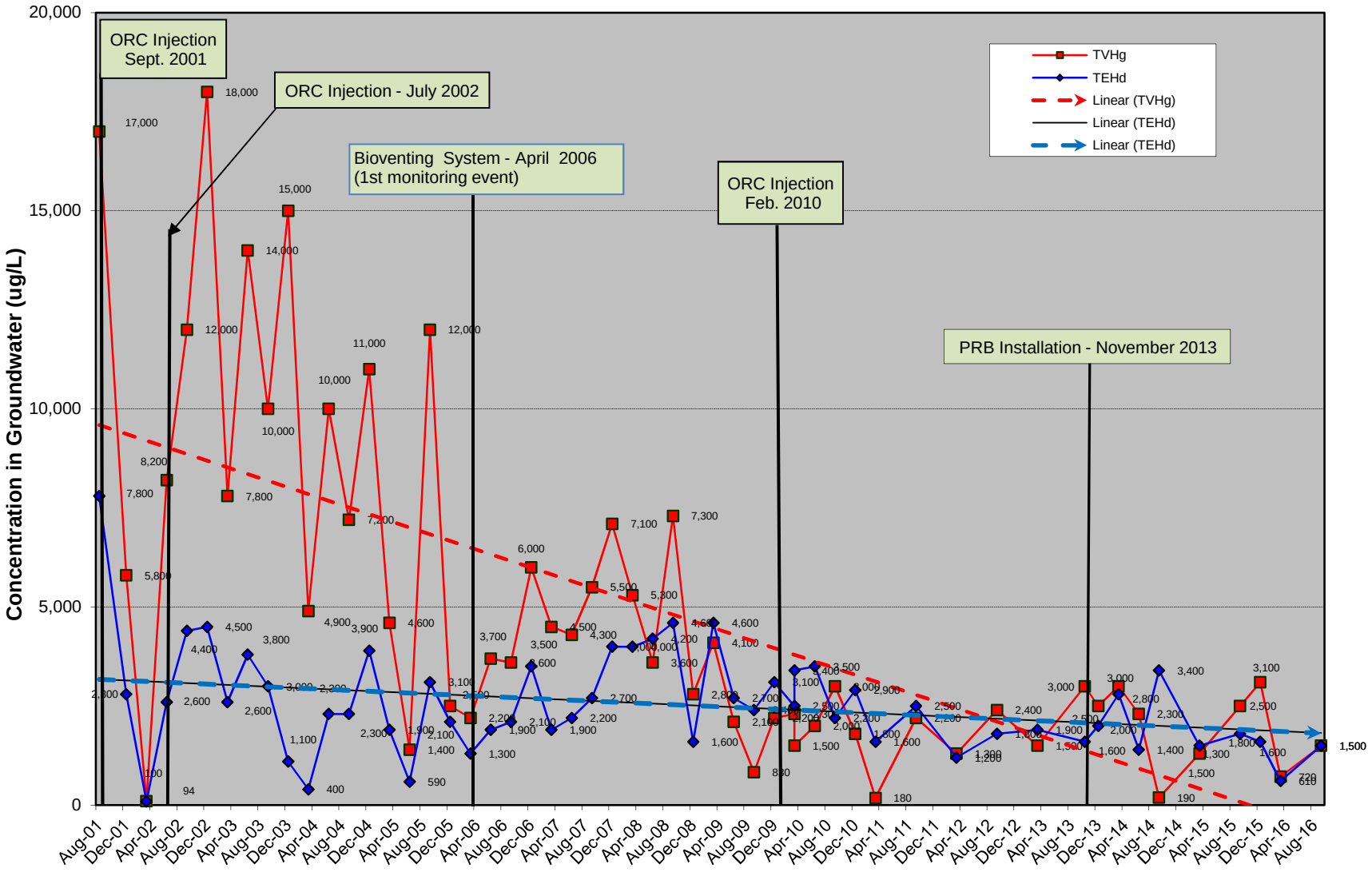
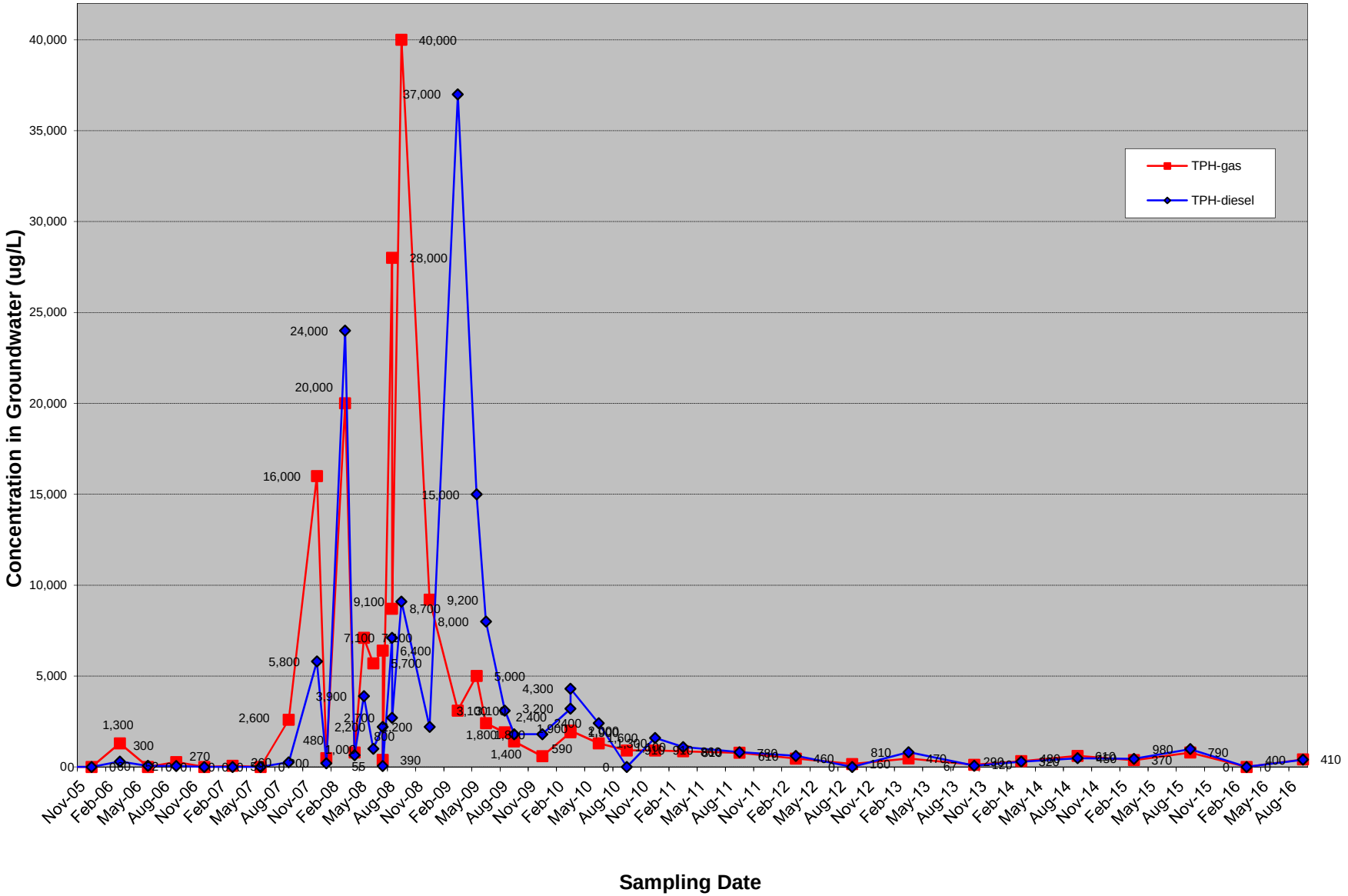


Figure 7: Gasoline and Diesel Hydrochemical Trends: Well MW-2
Redwood Regional Park Service Yard, Oakland, California



MW-11. This well is located in the lower part of the mid plume zone, along the plume centerline, approximately midway between upgradient well MW-8 and downgradient guard well MW-7. Gasoline and diesel concentrations were greatly reduced in 2001, and this was followed by an equally large increase by late 2002. Since that time, concentrations have fluctuated widely, with a strong seasonal effect. However, both diesel and gasoline concentrations in this well demonstrated a generally decreasing trend since 2008 and were within historical range during this event.

Figure 9 features gasoline and diesel hydrochemical trends in MW-11 and Figure 10 shows hydrochemical trends for gasoline and diesel in well MW-7.

Downgradient Hydrochemical Trends

MW-7 and MW-9. These wells represent the high-concentration area of the central plume at the downgradient area approximately 20 feet from Redwood Creek. Well MW-7 shows concentrations of diesel and gasoline within historical ranges through to this September 2015 and a significant drop in both TPHd and TVHg observed in the limited December 2015 monitoring event. Gasoline and diesel concentrations have been generally stable and within historical range since 2008 with no apparent effect from the PRB, however the December 2015 event showed the lowest TPHd in MW-7 since March 2004. Both diesel and gasoline concentrations increased steadily in well MW-9 since December 2013 following the PRB installation with diesel showing a historical high of 17,000 µg/L, but showed a steady decrease in gasoline and diesel concentration to within historical ranges observed in 2015. As discussed previously, this 2014 contaminant spike is attributed to the effect of the installation of the PRB initially releasing hydrocarbons entrained in the soil and concentration spikes in 2015 and this 2016 event are likely due to hydrostatic pressure from the PRB mobilizing contaminants in this area of distal plume area. Figures 10 and 11 show the hydrochemical trends for gasoline and diesel in wells MW-7 and MW-9, respectfully.

Plume Fringe Zone Trends

MW-10. This well is located on the southern edge of the plume, in the mid-plume portion relative to the longitudinal axis. Figure 16 shows hydrochemical trends for gasoline and diesel in this well. Concentrations of gasoline generally remained stable compared to 2009, with only slight increases observed above 100 µg/L and a downward trend in 2013. The diesel concentration trend appears stable with a slightly increasing trend. The historic maximum of 2,100 µg/L diesel was recorded in 2001 and the second highest of 1,200 µg/L diesel was observed during in March 2011. This well had shown no contaminants in excess of the applicable ESLs since December 2013 until the 2016 monitoring year, which is likely attributed to the above normal 2015-2016 rainfall season. Figure 12 shows hydrochemical trends for gasoline and diesel in well MW-10.

MW-4 (former). This well was located on the northern edge of the plume, just upgradient of Redwood Creek. Other than anomalous diesel detection in June 2004, no contamination had been detected in this well since December 2001. The well was destroyed in November 2005 and replaced by well MW-12 (in an adjacent position).

MW-12. The initial sampling of MW-12 showed elevated petroleum concentrations up to 1,300 µg/L TVHg, but those concentrations declined until March 2008 when a spike was observed. Concentrations have fluctuated since then, but are below the historical maximum observed and show a decreasing contaminant trend. The September 2014 event following the PRB installation showed historical maximum high concentration of TVHg (2,500 µg/L), but has remained below ESLs since then. Figure 13 shows hydrochemical trends in well MW-12.

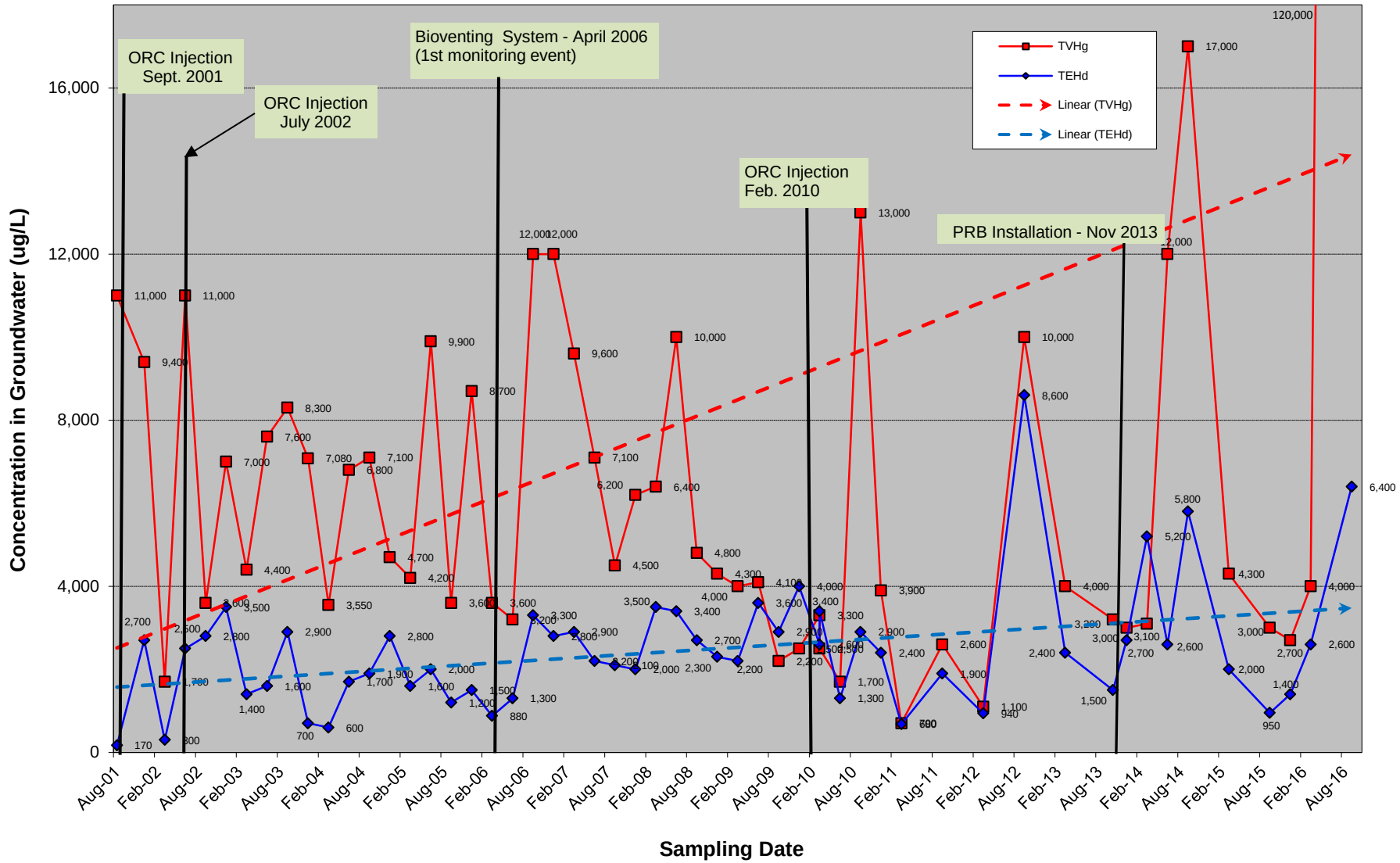
PLUME GEOMETRY AND MIGRATION INDICATIONS

The plume of groundwater contamination above screening levels appears to be approximately 130 feet long and approximately 50 feet wide. The zone of greatest contamination historically fluctuated between the upper portion of the plume (MW-2), the mid-portion of the plume (near MW-8), and the downgradient portion of the plume (at MW-7 and MW-9). The 2015 and 2016 monitoring years showed a decreasing concentration trend in the mid-plume wells (MW-8 and MW-11) and an increasing concentration in the downgradient wells (MW-7, MW-9 and MW-12) with a historical site high concentration of TPH-g and a historical high concentration benzene detected in MW-9 this September 2016 event. The contaminant mass in the distal area of the plume appears to have disconnected and migrated from the source area, however concentration above the applicable ESLs still remain in all areas of the plume.

The plume geometry has not varied substantially over the past years of monitoring, although seasonal fluctuations in contaminant concentrations have been observed. This is exhibited by higher concentrations in downgradient wells in some events, and in mid-plume or upgradient wells in other events.

The October 2013 monitoring event showed the historical highest detection of TEHd detected at surface sampling location SW-2, the most distal point from the source where the plume seeps from the Redwood Creek bank.

Figure 11: TPH-gasoline and TPH-diesel Hydrochemical Trends: 2001-2016
Well MW-9, Redwood Regional Park Service Yard, Oakland, California



Stellar Environmental Solutions, Inc.

Figure 12: Gasoline and Diesel Hydrochemical Trends: 2001-2016
Well MW-10, Redwood Regional Park Service Yard, Oakland California

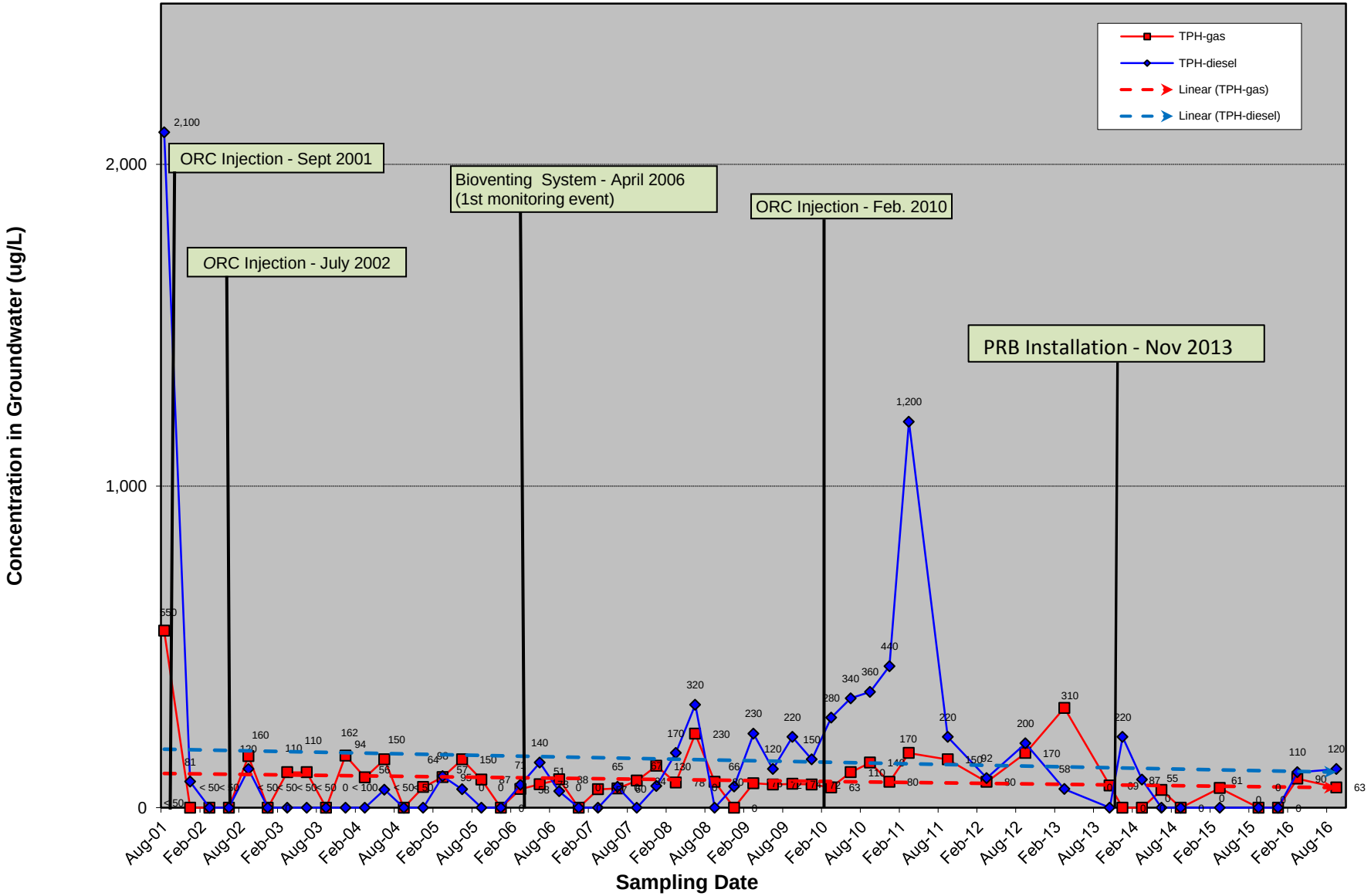


Figure 13: Gasoline and Diesel Hydrochemical Trends: 2005-2016
Well MW-12, Redwood Regional Park Service Yard, Oakland, California

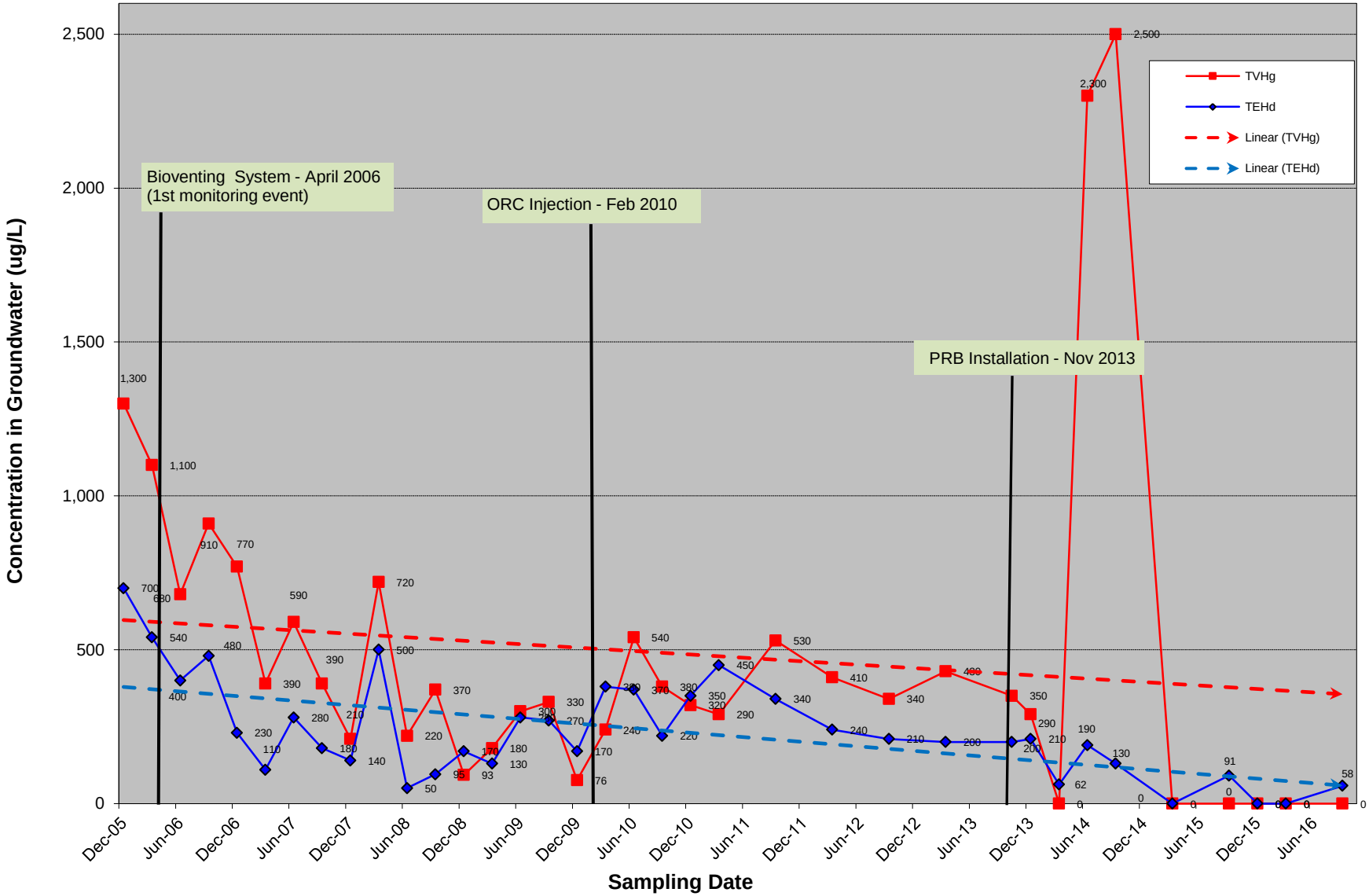
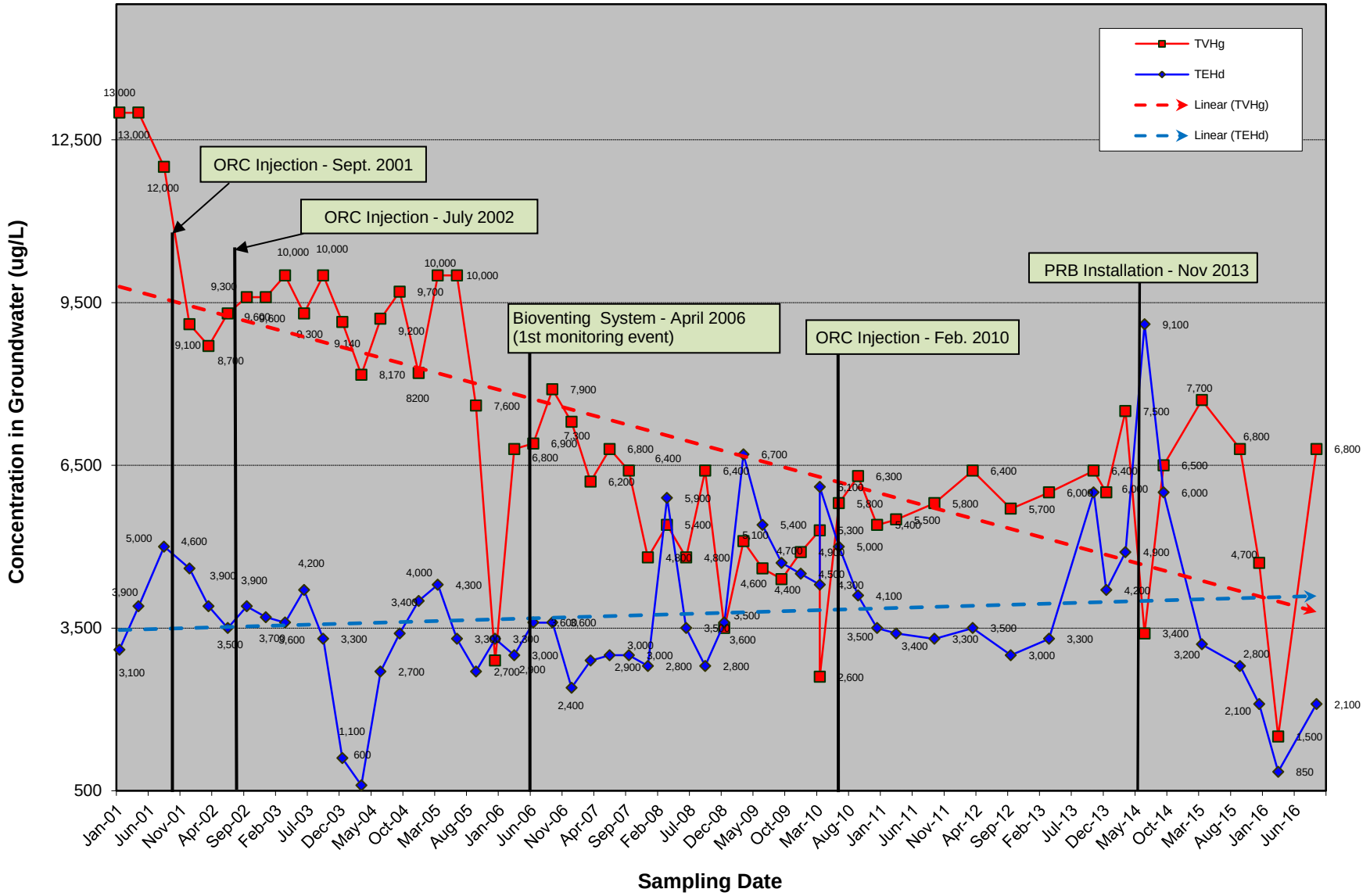


Figure 10: Gasoline and Diesel Hydrochemical Trends: 2001-2016
Well MW-7, Redwood Regional Park Service Yard, Oakland, California



CLOSURE CRITERIA ASSESSMENT AND PROPOSED ACTIONS

The Water Board and ACEH generally require that the following criteria be met before issuing regulatory closure of contaminant cases:

1. ***The contaminant source has been removed (i.e., the source of the discharge and obviously-contaminated soil***). This criterion has not been partially met. While the UFSTs have been removed, along with 600 cubic yards of contaminated soil, borehole soil sampling has shown a substantial mass of residual source area soil contamination that will act as an ongoing source of groundwater contamination. A bioventing system was installed and began operating in December 2005 as a corrective action to reduce gross contaminant mass in soil. The bioventing system resulted in an estimated magnitude drop in soil contaminant concentrations and thus having accomplished its design purpose, was turned off in June 2011. Four remedial product injection events (2002, 2001, 2009 and 2010) have been conducted at the site prior to installation of the PRB in 2013 to prevent contaminants from reaching Redwood Creek. Installation of the PRB appears to have been effectual in lowering contaminant concentrations as observed in MW-12 in 2014 and 2015, however the other wells MW-7 and MW-9 downgradient of the PRB have returned to historical concentrations. The effectiveness of the EHC-O product in the PRB has expired (product effective period estimated to be 2-3 years) and the PRB may have possibly cause mobilization of contaminants, however additional monitoring will be required to evaluate the hydrologic effect of the PRB.

2. ***The groundwater contaminant plume is well characterized, and is stable or reducing in magnitude and extent.*** As discussed above, in our professional opinion, this criterion has not been largely met although drought versus heavier rainfall years can significantly affect the plume stability through the taking hydrocarbon out of solution through sorption into the capillary fringe "smear" zone during drought years and coming back into solution during heavy infiltration years when the groundwater table rises. Continued groundwater monitoring will be needed to demonstrate plume stability.

3. ***If residual contamination (soil or groundwater) exists, there is no reasonable risk to sensitive receptors (i.e., contaminant discharge to surface water or water supply wells) or to site occupants***. This criterion is generally met by conducting a Risk-Based Corrective Action assessment that models the fate and transport of residual contamination in the context of potential impacts to sensitive receptors (e.g., water wells, residential and use). The newly installed PRB corrective action was designed to remedy the magnitude and duration of future contaminated groundwater discharge to Redwood Creek; considered the primary sensitive receptor, however the effectiveness of the PRB has

timed out and elevated contaminant concentrations were detected downgradient of the PRB during this last September 2016 event. Additional monitoring is needed to evaluate the contaminant trend and potential implementation of additional remedial action as discussed in the proposed actions in the last section of this report.

6.0 SUMMARY, CONCLUSIONS AND PROPOSED ACTIONS

The following conclusions and proposed actions are based on the findings of the current event activities, as well as on salient historical data.

SUMMARY AND CONCLUSIONS

- Groundwater sampling has been conducted on an approximately quarterly basis from November 1994 to June 2011 and on a semiannual basis since September 2011. A total of eleven site wells are available for monitoring; seven of the available wells are currently monitored for contamination.
- Site contaminants of concern include TVH-gasoline, TEH-diesel, BTEX, and MTBE. Current groundwater concentrations exceed regulatory screening levels for gasoline, diesel, benzene, ethylbenzene and MTBE in groundwater.
- The primary environmental risk is discharge of contaminated groundwater to the adjacent Redwood Creek. An in-stream bioassessment conducted in 1999 to 2000 concluded that there were no direct impacts to the surface water benthic macro-invertebrate community; however, groundwater contamination is sporadically detected in surface water samples, and there is historical visual evidence of plume discharge at the creek/groundwater interface. Surface water samples have sporadically exceeded surface water ESL criteria for gasoline, diesel, benzene, total xylenes, and ethylbenzene but generally only under low creek flow conditions.
- The existing well layout adequately constrains the lateral extent of groundwater contamination, and the vertical depth limit is very likely the top of the near-surface (25 to 28 feet) siltstone bedrock. The saturated interval extends approximately 12 to 15 feet from top of bedrock through the capillary fringe. Groundwater elevations fluctuate seasonally, creating a capillary fringe that varies seasonally in thickness.
- The plume of groundwater contamination above screening levels appears to be approximately 130 feet long and approximately 50 feet wide. The zone of greatest contamination, greater than 1,000 µg/L of TVHg and TEHd, is currently centered on wells MW-7, MW-9 and MW-11, all of which are in the downgradient area of the plume. However, prior to the ORC™ injection in March 2010, the greatest zone of contamination was observed in MW-2, the historical source area well.

- The ESLs for residential areas where groundwater is a drinking water resource were exceeded for TEHd in six of the seven wells sampled and for TVHg in five of the seven wells sampled. Well MW-9 contained both the maximum TVHg and TEHd groundwater with TVHg detected at 120,000 ug/L being the historical highest site detection of this contaminant. Benzene was detected in only two wells with the ESL being exceeded at a historical high concentration of 550 ug/L in MW-9.
- The contaminant plume has historically appeared neither stable nor reducing, the groundwater contaminant concentrations fluctuate seasonally, and the center of mass of the contaminant plume (represented by maximum concentrations) has alternated between the upgradient, mid-plume, and downgradient wells, however the contaminants in upgradient source area MW-2 have showed a steady decrease since March 2010 but still exist above ESL. The mid and downgradient areas of the plume (MW-7, MW-9 and MW-11) currently exhibit the highest contaminant concentrations with the site historical high concentrations of TPH-g detected in MW-9 this September 2016 event.
- Historical remedial efforts indicate that residual hydrocarbons entrained in subsurface material and/or stratigraphic traps are continuing to release significant amounts of hydrocarbons into the groundwater. The dissolved fraction that results from this release forms a recalcitrant plume that still daylights at the Redwood Creek interface.
- A September 2003 exploratory borehole program confirmed that sorbed-phase contamination in the seasonally unsaturated zone is a primary source of long-term contaminant contribution to the groundwater plume. Reduction/removal of this contamination will be necessary to eliminate continued discharge of contaminated groundwater to Redwood Creek, and to ultimately obtain site closure. The vadose smear zone is estimated to be 3-4 feet wide based on monitored groundwater elevation and recent observations made in 2013 during excavation trenching for installation of the PRB.
- At the time of the September 2016 sampling event, the entire stretch of Redwood Creek was dry with no areas of visible ponded water between location SW-3 and location SW-2. The October 2013 monitoring event showed the historical highest detection of TEHd detected at surface sampling location SW-2, the most distal point from the source where the plume seeps from the Redwood Creek bank.
- The EHC-O™ product activity in the PRB that was installed on November 20, 2013 is estimated at two to a maximum of 3 years and has essentially run out. While the initial results appeared promising the subsequent drought conditions in the 2013-2014 and 2014-2015 rainfall season followed by the 2015-2016 above average rainfall season may have mobilized contaminants resulting in the historical high concentrations of TPH-g and benzene detected in MW-9 this September 2016 event.

- The site historical high concentrations of TPH-g detected in guard well MW-9, downgradient of the PRB during the September 2016 event could be interpreted as evidence that the primary contaminant mass has migrated to the distal area of the plume, however concentrations of this magnitude have never been detected anywhere else in the plume and thus we think this high detection is a result of the PRB and the high 2015-2016 rainfall season. Additional site monitoring would be needed to determine the contaminant trend. Because concentrations in excess of the ESLs remain in all areas of the plume we are advancing the proposal for additional remedial action discussed in the following subsection.

PROPOSED ACTIONS

The EBRPD proposes to implement the following actions to address the current site conditions and regulatory concerns:

- The effectiveness of the PRB has expired, thus we recommend discontinuing analysis for the additional site chemical parameters that was previously conducted to track the effect of the oxygen release product utilization in key wells downgradient of the PRB;
- Develop a workplan, discussed below, to present to new remedial approach to ACEH to address the persistent site-wide elevated concentrations of TPH and related constituents;
- Continue to monitor and sample the site wells and creek on a semiannual frequency;
- Continue to inform regulators of site progress and seek their concurrence with proposed actions; and
- Continue to make the required electronic data and report uploads to the State of California GeoTracker database, and upload an electronic copy of technical reports to ACEH's ftp database.

PROPOSED REMEDIAL ALTERNATIVE

We propose to research and evaluate additional remedial products to mitigate the elevated hydrocarbon concentrations entrained in soil and groundwater to prevent contaminants from reaching Redwood Creek.

The construction and remediation functionality of the existing PRB was sound; however its planned effect was only marginally achieved due to minimal groundwater movement during recent drought conditions and the timed expiration of the oxygenating product. The principal difficulty in more effectively remediating the site is and has always been associated with the manner in which the residual contamination following the original UST excavation left significant hydrocarbons entrained in the soil beneath the service yard slope and roadway leading to the service years that is not feasible to excavate given the operation aspects of the EBRPD

service yard. The Site conceptual model presented in previous reports and summarized again in this one discuss the manner in which the entrained hydrocarbons acts as a secondary source to feed the plume.

We have reviewed remedial technologies, such as excavation, thermal desorption and capture, and additional in-situ injection of oxygen release product. These alternatives are either cost prohibitive or, when effective as in the in-situ application, are effective within the timeframe of the in-situ product activity and following the reduction archived the secondary source feeds the plume again.

We propose preparation of a workplan that would entail either: 1) focused injection in the service yard area upgradient using a recently developed remedial product that immobilizes the contaminant movement with colloidal carbon; and/or 2) to augment the existing PRB such that additional remedial oxygenating product could be periodically introduced into it. This would be accomplished with by trenching down to the top of the PRB (to the depth of the PRB drain rock) and installing a line of standpipe wells through which product solution could be introduced. In addition, in view of persistence contaminants detected above ESLs in all wells across the length of the plume, we also propose installation of a line of standpipe delivery wells situated normal to the plume in the source area, which is in the approximate position of the former UST. In theory, introduced bioremedial solution would migrate along a similar path as the leaked fuel had done. The source area standpipe wells could be used to deliver bioremedial solutions interspersed with additions of water alone that would flush through the entire length of the plume and move contaminants toward the downgradient PRB. Additional product also applied in the PRB standpipe wells would treat those contaminants in soil located downgradient of the PRB and that those that migrate to the PRB from the upgradient plume to protect Redwood Creek. The objective would be to maintain a year round influx and saturation of oxygenating product solution and water to effectively induce biodegradation over the full extent of the vertical thickness and width the contaminant plume. We anticipate that at least four standpipe wells, spaced approximately 10 feet apart in a normal position across the plume would be needed to be installed in a trench excavated above both the existing PRB trench which is 40 feet long and in the source area, This array would ensure treatment coverage across the entire plume width that historical investigations have estimated to be no greater than 50 feet.

Stellar Environmental recommends having a conference or a site meeting with the newly assigned ACEH regulator to discuss alternative remedial options.

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8.0 LIMITATIONS

This report has been prepared for the exclusive use of the East Bay Regional Park District, its authorized representatives, 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 the review of previous investigators' findings at the site, as well as onsite activities conducted by SES since September 1998. This report has been prepared in accordance with generally accepted methodologies and standards of practice. The SES personnel who performed this work 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 present. 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 site characterization and corrective actions completed.

APPENDIX A

Historical Groundwater Monitoring Well Water Level Data

HISTORICAL GROUNDWATER ELEVATIONS IN MONITORING WELLS
REDWOOD REGIONAL PARK SERVICE YARD
7867 REDWOOD ROAD, OAKLAND, CALIFORNIA

Well I.D.	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12
TOC Elevation (a)	565.83	566.42	560.81	548.10	547.41	545.43	547.56	549.13	549.28	547.22	547.75	544.67
Date Monitored	Groundwater Elevations (feet above mean sea level)											
09/18/98	563.7	544.2	540.8	534.5	531.1	531.4						
04/06/99	565.2	546.9	542.3	535.6	532.3	532.9						
12/20/99	562.9	544.7	541.5	534.9	531.2	532.2						
09/28/00	562.8	542.7	538.3	532.2	530.9	532.0						
01/11/01	562.9	545.1	541.7	535.0	531.2	532.3	534.9	538.1				
04/13/01	562.1	545.7	541.7	535.1	531.5	532.4	535.3	539.8				
09/01/01	560.9	542.0	537.7	533.9	530.7	531.8	534.0	535.6				
12/17/01	562.2	545.2	542.2	534.8	531.4	532.4	534.8	538.4	534.6	535.7	535.2	
03/14/02	563.0	547.1	542.2	535.5	532.4	533.3	535.7	541.8	535.0	537.6	536.6	
06/18/02	562.1	544.7	541.1	534.6	531.2	532.2	534.8	537.9	534.7	535.6	535.3	
09/24/02	561.4	542.2	537.3	533.5	530.6	531.8	533.5	535.5	535.3	533.8	531.7	
12/18/02	562.4	545.0	542.0	534.8	531.5	532.5	534.6	537.1	536.5	535.2	532.8	
03/27/03	562.6	545.7	541.7	534.8	531.6	532.4	535.1	539.9	537.2	536.2	533.6	
06/19/03	562.3	544.9	541.5	534.8	531.3	532.3	534.9	538.2	536.9	535.7	533.2	
09/10/03	561.6	542.1	537.9	533.8	530.8	531.9	533.7	535.6	535.6	534.1	531.9	
12/10/03	562.4	542.7	537.6	533.7	530.9	531.9	533.7	535.2	535.5	533.8	531.7	
03/18/04	563.1	546.6	541.9	535.0	531.7	532.4	535.2	540.9	537.4	536.6	533.8	
06/17/04	562.1	544.3	540.7	534.3	531.0	532.1	534.6	537.4	536.5	535.1	532.7	
09/21/04	561.5	541.1	536.5	533.1	530.5	531.6	533.1	534.7	532.7	533.2	533.2	
12/14/04	562.2	545.3	541.7	534.7	531.4	532.2	534.6	540.4	536.7	535.5	532.9	
03/16/05	563.8	547.3	541.7	535.3	532.4	532.8	535.6	541.8	538.0	537.1	534.2	
06/15/05	562.9	545.9	541.6	535.0	531.7	532.5	535.0	540.0	535.0	536.1	535.6	
09/13/05	562.3	543.5	539.7	534.4	530.9	532.2	534.3	536.7	536.1	534.7	532.4	
12/15/05	562.2	544.3	541.4	(b)	531.0	532.2	534.5	537.3	534.1	534.7	534.9	535.1
03/30/06	565.8	548.6	542.7	(b)	533.9	534.4	536.2	542.3	536.4	537.3	537.6	535.7
06/20/06	563.6	545.4	541.6	(b)	531.5	532.5	534.9	538.6	534.6	536.2	535.5	535.0
09/29/06	561.9	542.8	539.0	(b)	530.7	532.1	535.1	536.1	533.7	534.6	534.7	534.7
12/14/06	562.9	544.2	541.5	(b)	531.1	532.3	534.7	536.7	534.0	534.8	535.2	535.0
03/21/07	562.5	545.2	541.7	(b)	531.4	532.4	534.9	539.3	534.6	535.6	535.6	535.1
06/20/07	561.5	543.5	540.8	(b)	531.0	532.4	534.6	537.1	531.1	535.2	535.3	534.9
9/14/2007	560.71	541.02	536.99	(b)	530.46	531.58	533.42	534.86	532.64	533.47	533.68	533.74
12/6/2007	560.62	541.22	536.85	(b)	530.68	531.48	533.21	535.08	532.62	533.3	533.61	533.64
3/14/2008	561.76	545.73	541.63	(b)	531.34	532.30	534.88	539.30	534.67	536.04	535.89	535.72
6/13/2008	560.92	543.61	540.6	(b)	530.83	532.02	534.42	536.86	533.81	534.84	535.16	534.67
9/18/2008	560.43	540.15	536.41	(b)	529.85	531.11	532.69	534.15	531.97	532.65	533.09	533.12
12/17/2008	561.11	540.88	536.77	(b)	530.68	531.67	533.26	534.04	532.35	532.94	533.29	533.66
3/16/2009	561.84	546.25	539.51	(b)	531.63	532.58	534.65	539.51	534.56	535.55	535.49	535.08
6/10/2009	561.05	545.02	541.38	(b)	531.02	532.08	534.45	537.94	534.08	535.40	535.18	534.96
9/25/2009	560.00	540.79	536.33	(b)	529.98	Dry	532.58	534.25	531.96	532.62	532.97	533.08
12/21/2009	560.93	543.49	541.22	(b)	530.96	532.06	534.03	536.17	533.46	534.13	534.57	534.69
3/29/2010	561.48	546.44	541.59	(b)	531.52	532.58	534.72	540.03	534.53	535.94	535.55	535.28
6/22/2010	561.17	545.62	541.40	(b)	531.26	532.41	534.63	538.90	534.37	535.62	535.27	535.21
9/28/2010	560.32	543.36	537.91	(b)	530.6	532.02	532.66	535.23	532.96	534.21	533.99	534.16
12/16/2010	561.33	545.52	541.51	(b)	531.11	532.31	534.52	537.21	534.00	534.38	535.10	535.15
3/23/2011	563.68	547.97	542.49	(b)	532.78	534.43	535.96	542.40	535.87	537.19	537.88	536.15
9/23/2011	561.03	543.54	539.52	(b)	530.81	532.31	534.34	536.41	533.59	534.67	534.85	534.86
3/22/2012	562.25	546.42	542.02	(b)	531.83	533.13	534.71	539.34	535.97	535.51	536.03	535.69
9/19/2012	560.93	541.83	537.53	(b)	530.6	531.91	533.55	534.88	532.95	534.33	534.17	534.17
3/14/2013	561.80	545.57	541.74	(b)	531.01	532.11	534.66	538.64	534.31	535.72	535.67	535.37
10/3/2013	560.95	541.01	536.21	(b)	530.02	531.14	532.74	533.74	531.89	532.54	533.08	533.06
3/10/2014	561.68	541.01	541.67	(b)	531.99	532.02	534.61	536.53	534.28	535.22	535.57	534.89
9/19/2014	560.40	540.33	535.53	(b)	529.31	530.50	532.05	532.96	531.46	531.91	533.66	532.28
3/23/2015	561.41	545.47	541.46	(b)	531.01	532.09	534.56	537.43	534.08	534.97	535.44	534.82
9/24/2015	560.26	540.82	535.79	(b)	529.34	530.39	532.17	533.52	531.35	532.14	532.65	532.4
3/21/2016	563.95	545.26	539.95	(b)	533.22	534.16	535.76	537.81	535.58	537.56	537.45	536.69
9/6/2016	561.06	543.78	537.23	(b)	530.32	NM	533.33	535.50	532.88	533.75	534.07	533.66

TOC = Top of well Casing
(a) TOC Elevations resurveyed on December 15, 2005 in accordance GeoTracker requirements.
(b) Well decomissioned and replaced by MW-12 in December 2005.
NM = not measured

APPENDIX B

Groundwater Monitoring
Field Documentation

WELL GAUGING DATA

Project # 160906-MM1 Date 9-6-16 Client Stellar

Site Redwood Regional Park Service Yard Oakland, 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-1	0831	4					4.77	19.26		
MW-2	0825	4					22.64	37.44		
MW-3	0837	4					23.58 ~~16.40~~	45.06		DTW: 23.58
MW-5	0845	4					17.09	26.98		
MW-6		UNABLE TO ACCESS, FALLEN TREE RESTING ON TOP OF STANDPIPE LID.								
MW-7	0859	2					14.23	25.35		
MW-8	0915	2					13.63	22.25		
MW-9	0909	2	odor				16.40	30.28		
MW-10	0853	2					13.47	28.44		
MW-11	0923	2					13.68	28.76		
MW-12	0905	2					11.01	23.80	↓	

WELL MONITORING DATA SHEET

Project #: 160906-MM1	Client: Stellar
Sampler: MM	Date: 9-6-16
Well I.D.: MW-2	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth (TD): 37.44	Depth to Water (DTW): 22.64
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]: 25.60	

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: _____

9.6 (Gals.) X	3	=	28.8 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
0946	14.7	6.15	812	240	10	
0955	14.9	6.20	809	>1000	20	
	WELL	DEWATERED	AT	22 GAL		
1335	15.2	6.41	782	141	—	

Did well dewater? (Yes) No Gallons actually evacuated: 22

Sampling Date: 9-6-16 Sampling Time: 1335 Depth to Water: 27.92

Sample I.D.: MW-2 Laboratory: Kiff CalScience Other CAT

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:	3.45	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-126	mV

WELL MONITORING DATA SHEET

Project #: 160906-MM1	Client: Stellar
Sampler: MM	Date: 9-6-16
Well I.D.: MW-7	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth (TD): 25.35	Depth to Water (DTW): 14.23
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]: 16.45	

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: _____

1.8 (Gals.) X 3 = 5.4 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

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

Time	Temp (°F or (°C))	pH	Cond. (mS or (µS))	Turbidity (NTUs)	Gals. Removed	Observations
1055	14.9	6.61	1070	112	2	cloudy / odor
1057	14.6	6.52	1084	169	4	↓ ↓
1100	15.0	6.50	1078	180	6	

Did well dewater? Yes (No) Gallons actually evacuated: 6

Sampling Date: 9-6-16 Sampling Time: 1105 Depth to Water: 16.29

Sample I.D.: MW-7 Laboratory: Kiff CalScience Other_____

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:	0.82	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-110	mV

WELL MONITORING DATA SHEET

Project #: 160906-MM1	Client: Shell
Sampler: MM	Date: 9-6-16
Well I.D.: MW-8	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth (TD): 22.25	Depth to Water (DTW): 13.63
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]: 15.35	

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: _____

1.4 (Gals.) X 3 = 4.2 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
1205	17.0	7.04	982	>1000	1.5	cloudy
1208	16.3	6.61	976	>1000	3.0	↓
1210	16.5	6.55	980	>1000	4.5	↓

Did well dewater? Yes (No) Gallons actually evacuated: 4.5

Sampling Date: 9-6-16 Sampling Time: 1300 Depth to Water: 15.02

Sample I.D.: MW-8 Laboratory: Kiff CalScience Other C&T

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:	0.59	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-90	mV

WELL MONITORING DATA SHEET

Project #: 160906-MM1	Client: Keller
Sampler: MM	Date: 9-6-16
Well I.D.: MW-9	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth (TD): 30.28	Depth to Water (DTW): 16.40
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]: 19.17	

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: _____

2.2 (Gals.) X 3 = 6.6 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
1147	15.7	6.42	1006	259	2.2	odor cloudy
1151	15.8	6.58	1047	402	4.4	↓ ↓
1155	15.9	6.60	1059	429	6.6	↓ ↓

Did well dewater? Yes (No) Gallons actually evacuated: 7.0

Sampling Date: 9-6-16 Sampling Time: 1245 Depth to Water: 18.82

Sample I.D.: MW-9 Laboratory: Kiff CalScience Other CAT

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:	0.59	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-93	mV

WELL MONITORING DATA SHEET

Project #: 160906-MM1	Client: Stellar
Sampler: MM	Date: 9-6-16
Well I.D.: MW-10	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth (TD): 28.44	Depth to Water (DTW): 13.47
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]: 16.46	

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: _____

2.4 (Gals.) X 3 = 7.2 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
1035	15.5	7.17	826	112	2.5	cloudy
1039	15.2	7.13	851	149	5.0	↓
1043	15.3	7.15	860	155	7.5	↓

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

Sampling Date: 9-6-16 Sampling Time: 1130 Depth to Water: 16.17

Sample I.D.: MW-10 Laboratory: Kiff CalScience Other CET

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:	1.05 mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-40 mV

WELL MONITORING DATA SHEET

Project #: 160906-MM1	Client: Stellar
Sampler: MM	Date: 9-6-16
Well I.D.: MW-11	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth (TD): 28.76	Depth to Water (DTW): 13.68
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]: 16.69	

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: _____

2.4 (Gals.) X	3	= 7.2 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
1221	16.3	6.53	942	128	2.5	cloudy
1225	15.8	6.49	945	147	5.0	"
1230	15.7	6.47	947	155	7.5	"

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

Sampling Date: 9-6-16 Sampling Time: 1315 Depth to Water: 15.82

Sample I.D.: MW-11 Laboratory: Kiff CalScience Other CET

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:	0.62 mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-73 mV

WELL MONITORING DATA SHEET

Project #: 160906-MM1	Client: Stellar
Sampler: MM	Date: 9-6-16
Well I.D.: MW-12	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth (TD): 23.80	Depth to Water (DTW): 11.01
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]: 13.56	

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 (Gals.) X 3 = 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
1115	15.3	7.19	754	159	2	cloudy
1119	15.1	6.75	750	191	4	↓
1124	15.0	6.71	742	205	6	↓

Did well dewater? Yes (No) Gallons actually evacuated: 6

Sampling Date: 9-6-16 Sampling Time: 1140 Depth to Water: 13.42

Sample I.D.: MW-12 Laboratory: Kiff CalScience Other CET

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:	0.78	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	69	mV

WELL MONITORING DATA SHEET

Project #: 160906-MM1	Client: Stellar
Sampler: MM	Date: 9-6-16
Well I.D.: SW-2	Well Diameter: 2 3 4 6 8 ____
Total Well Depth (TD): —	Depth to Water (DTW): —
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: ____

— (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
	Creek is dry					
	NO SAMPLE TAKEN					

Did well dewater? Yes No Gallons actually evacuated:

Sampling Date: Sampling Time: Depth to Water:

Sample I.D.: Laboratory: Kiff CalScience Other ____

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

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 #: 160906-MM1	Client: Stellar
Sampler: MM	Date: 9-6-16
Well I.D.: SW-3	Well Diameter: 2 3 4 6 8 ___
Total Well Depth (TD): —	Depth to Water (DTW): —
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: ____

____ (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
	Creek is dry					
	NO SAMPLE TAKEN					

Did well dewater? Yes No Gallons actually evacuated:

Sampling Date: Sampling Time: Depth to Water:

Sample I.D.: Laboratory: Kiff CalScience Other ____

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

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

WELLHEAD INSPECTION CHECKLIST

Client Stellar Date 9-6-16

Site Address Redwood Regional Park Service Yard Oakland, CA

Job Number 160906-MM1 Technician MM

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-1						X		
MW 2	X							
MW-3	X							
MW-5	X							
MW-6	X							
MW-7	X							
MW 8		X				X		
MW-9	X							
MW-10						X		
MW-11	X							
MW-12						X		

NOTES: MW-1 Standpipe hinge broken
MW-10 2/2 bolts missing 1/2 tabs broken
MW-12 2/2 bolts missing 1/2 tabs broken
MW-8 -3/3 bolts missing

TEST EQUIPMENT CALIBRATION LOG

PROJECT NAME Stellar Redwood Regional Park SY Oakland CA				PROJECT NUMBER 160906-MM1			
EQUIPMENT NAME	EQUIPMENT NUMBER	DATE/TIME OF TEST	STANDARDS USED	EQUIPMENT READING	CALIBRATED TO: OR WITHIN 10%:	TEMP.	INITIALS
MYRON L ULTRAMETER II	6215733	9-6-16 0620	pH 7.0 10.0 4.0	pH 7.00 10.01 4.03	yes		mm
↓	↓	↓	Cond. 3900	Cond. 3904 µS	yes		mm
↓	↓	↓	ORP 231 mv	ORP 230.2 mv	yes	25 °C	mm
YSI 550	BTS 001	9-6-16 0625	DO 100%	DO 100.8%	yes		mm

Chain of Custody Record

Lab job no. _____
Date 9-6-16
Page 1 of 1

Laboratory: Curtis and Tompkins, Ltd.
Address: 2323 Fifth Street, Berkeley, California 94710, 510-486-0900

Project Owner: East Bay Regional Park District
Site Address: 7867 Redwood Road, Oakland, California

Project Name: Redwood Regional Park
Project Number: 2013-02

Method of Shipment: Hand Delivery
Shipment No.: _____
Airbill No.: _____
Cooler No.: _____

Project Manager: Richard 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: TPH-g / BTEX	Analysis Required: TPH-d	Analysis Required: Nitrate	Analysis Required: Sulfate	Analysis Required: BOD	Analysis Required: COD	Remarks
MW-2		9-6-2016	1335	W	MIX	Y		N	4	X	X					
MW-7			1105						7	X	X	X	X	X	X	
MW-8			1300						4	X	X					
MW-9			1245						7	X	X	X	X	X	X	
MW-10			1130						4	X	X					
MW-11			1315						4	X	X					
MW-12			1140						7	X	X	X	X	X	X	

Relinquished by:	Date	Received by:	Date
Signature:	9-6-2016	Signature:	9/6/16
Printed: Mark McCulloch	Time: 1415	Printed: Dino Ali	Time: 1415
Company: Stellar Environmental		Company: CET	

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

Turnaround Time: 5 Day TAT
Comments: Samples on ice

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

2000-00-01

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 280540
ANALYTICAL REPORT

Stellar Environmental Solutions	Project : 2013-02.
2198 6th Street	Location : Redwood Regional Park
Berkeley, CA 94710	Level : II

Sample ID	Lab ID
MW-2	280540-001
MW-7	280540-002
MW-8	280540-003
MW-9	280540-004
MW-10	280540-005
MW-11	280540-006
MW-12	280540-007

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

Signature: Tracy Babjar Date: 09/14/2016

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

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**280540**
Client:	**Stellar Environmental Solutions**
Project:	**2013-02.**
Location:	**Redwood Regional Park**
Request Date:	**09/06/16**
Samples Received:	**09/06/16**

This data package contains sample and QC results for seven water samples, requested for the above referenced project on 09/06/16. The samples were received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):
MW-9 (lab # 280540-004) was diluted due to client history of high non-target or organic acid interference. MW-9 (lab # 280540-004) was diluted due to high non-target analytes. No other analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B):
No analytical problems were encountered.

Ion Chromatography (EPA 300.0):
No analytical problems were encountered.

Chemical Oxygen Demand (SM5220D):
No analytical problems were encountered.

Biochemical Oxygen Demand (SM5210B):
No analytical problems were encountered.

280540

Chain of Custody Record

Lab job no. _____
Date 9-6-16
Page 1 of 1

Laboratory Curtis and Tompkins, Ltd.
Address 2323 Fifth Street
Berkeley, California 94710
510-486-0900

Method of Shipment Hand Delivery
Shipment No. _____
Airbill No. _____
Cooler No. _____

Project Owner East Bay Regional Park District
Site Address 7867 Redwood Road
Oakland, California

Project Manager Richard Makdisi
Telephone No. (510) 644-3123
Fax No. (510) 644-3859

Project Name Redwood Regional Park
Project Number 2013-02

Samplers: *(Signature)* _____

	Field Sample Number	Location/ Depth	Date	Time	Sample Type	Type/Size of Container	Preservation: Cooler	Preservation: Chemical	Filtered	No. of Containers	TPH-g/MBTEX	TPH-D	Alkalinity	Sulfate	BOD	COD	Remarks
1	MW-2		9-6-2016	1335	W	MIX	Y		N	4	X	X					
2	MW-7			1105						7	X	X	X	X	X	X	
3	MW-8			1300						4	X	X					
4	MW-9			1245						7	X	X	X	X	X	X	
5	MW-10			1130						4	X	X					
6	MW-11			1315						4	X	X					
7	MW-12			1140						7	X	X	X	X	X	X	

Relinquished by:	Date	Received by:	Date	Relinquished by:	Date	Received by:	Date
Signature	9-6-2016	Signature	9/6/16	Signature		Signature	
Printed Mark McCollock	Time 1415	Printed Dino Ali	Time 1415	Printed	Time	Printed	Time
Company Stellar Environmental		Company CET		Company		Company	

Turnaround Time: 5 Day TAT
Comments: Samples on ice

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

2000-00-01

★ Stellar Environmental Solutions

2198 Sixth Street #201, Berkeley, CA 94710

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 280540 Date Received 9/6/16 Number of coolers 1
Client STELLAR Project Redwood Regional Park

Date Opened 9/6 By (print) CB (sign)
Date Logged in 1 By (print) [illegible] (sign)
Date Labeled 1 By (print) CB (sign)

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

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
How many Name Date
2B. Were custody seals intact upon arrival? YES NO (N/A)
3. Were custody papers dry and intact when received? (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) (YES) NO
6. Indicate the packing in cooler: (if other, describe)

☐ Bubble Wrap ☐ Foam blocks ☒ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

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

Type of ice used: ☒ Wet ☐ Blue/Gel ☐ None Temp(°C) 3.9

☐ Temperature blank(s) included? ☐ Thermometer# ☒ IR Gun# B

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

8. Were Method 5035 sampling containers present? YES (NO)
If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? (YES) NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? (YES) NO
12. Are sample labels present, in good condition and complete? (YES) NO
13. Do the sample labels agree with custody papers? (YES) NO
14. Was sufficient amount of sample sent for tests requested? (YES) NO
15. Are the samples appropriately preserved? (YES) NO N/A
16. Did you check preservatives for all bottles for each sample? (YES) NO N/A
17. Did you document your preservative check? (pH strip lot# 80BDH3651) (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

Curtis & Tompkins Sample Preservation for 280540

Sample	pH: <2	>9	>12	Other
-002a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[X]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
-004a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[X]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
-007a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[X]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____

Analyst: CB

Date: 9/6/16

Curtis & Tompkins, Ltd.

Detections Summary for 280540

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

Client : Stellar Environmental Solutions
Project : 2013-02.
Location : Redwood Regional Park

Client Sample ID : MW-2 Laboratory Sample ID : 280540-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	410	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
MTBE	2.5		2.0	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Diesel C10-C24	400	Y	47	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-7 Laboratory Sample ID : 280540-002

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	6,800		50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Ethylbenzene	69		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
o-Xylene	5.3		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Diesel C10-C24	2,100	Y	47	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Sulfate	6.1		0.50	mg/L	TOTAL	1.000	EPA 300.0	METHOD
Chemical Oxygen Demand	28		10	mg/L	TOTAL	1.000	SM5220D	METHOD

Client Sample ID : MW-8 Laboratory Sample ID : 280540-003

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	220		50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
MTBE	4.5		2.0	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Diesel C10-C24	430	Y	47	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-9 Laboratory Sample ID : 280540-004

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	120,000		830	ug/L	As Recd	16.67	EPA 8015B	EPA 5030B
Benzene	550	C	8.3	ug/L	As Recd	16.67	EPA 8021B	EPA 5030B
Ethylbenzene	7,600		13	ug/L	As Recd	25.00	EPA 8021B	EPA 5030B
m,p-Xylenes	350	C	8.3	ug/L	As Recd	16.67	EPA 8021B	EPA 5030B
o-Xylene	140	C	8.3	ug/L	As Recd	16.67	EPA 8021B	EPA 5030B
Diesel C10-C24	6,400	Y	47	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Sulfate	3.4		0.50	mg/L	TOTAL	1.000	EPA 300.0	METHOD
Biochemical Oxygen Demand	25		7.5	mg/L	TOTAL	1.000	SM5210B	METHOD
Chemical Oxygen Demand	79		10	mg/L	TOTAL	1.000	SM5220D	METHOD

Curtis & Tompkins, Ltd.

Client Sample ID : MW-10 Laboratory Sample ID : 280540-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	63	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
MTBE	4.4		2.0	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Diesel C10-C24	120	Y	47	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-11 Laboratory Sample ID : 280540-006

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	1,500	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Ethylbenzene	11		0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
m,p-Xylenes	0.62	C	0.50	ug/L	As Recd	1.000	EPA 8021B	EPA 5030B
Diesel C10-C24	1,500	Y	47	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : MW-12 Laboratory Sample ID : 280540-007

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	58	Y	47	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Sulfate	47		0.50	mg/L	TOTAL	1.000	EPA 300.0	METHOD
Chemical Oxygen Demand	19		10	mg/L	TOTAL	1.000	SM5220D	METHOD

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 #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2013-02.		
Matrix:	Water	Sampled:	09/06/16
Units:	ug/L	Received:	09/06/16

Field ID:	MW-2	Diln Fac:	1.000
Type:	SAMPLE	Batch#:	238850
Lab ID:	280540-001	Analyzed:	09/07/16

Analyte	Result	RL	Analysis
Gasoline C7-C12	410 Y	50	EPA 8015B
MTBE	2.5	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)	107	80-132	EPA 8015B
Bromofluorobenzene (PID)	107	71-141	EPA 8021B

Field ID:	MW-7	Diln Fac:	1.000
Type:	SAMPLE	Batch#:	238850
Lab ID:	280540-002	Analyzed:	09/08/16

Analyte	Result	RL	Analysis
Gasoline C7-C12	6,800	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	69	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	5.3	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Bromofluorobenzene (FID)	125	80-132	EPA 8015B
Bromofluorobenzene (PID)	129	71-141	EPA 8021B

Field ID:	MW-8	Diln Fac:	1.000
Type:	SAMPLE	Batch#:	238850
Lab ID:	280540-003	Analyzed:	09/07/16

Analyte	Result	RL	Analysis
Gasoline C7-C12	220	50	EPA 8015B
MTBE	4.5	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)	105	80-132	EPA 8015B
Bromofluorobenzene (PID)	111	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 #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2013-02.		
Matrix:	Water	Sampled:	09/06/16
Units:	ug/L	Received:	09/06/16

Field ID: MW-9 Lab ID: 280540-004
Type: SAMPLE

Analyte	Result	RL	Diln Fac	Batch#	Analyzed	Analysis
Gasoline C7-C12	120,000	830	16.67	238850	09/07/16	EPA 8015B
MTBE	ND	33	16.67	238850	09/07/16	EPA 8021B
Benzene	550 C	8.3	16.67	238850	09/07/16	EPA 8021B
Toluene	ND	8.3	16.67	238850	09/07/16	EPA 8021B
Ethylbenzene	7,600	13	25.00	238929	09/10/16	EPA 8021B
m,p-Xylenes	350 C	8.3	16.67	238850	09/07/16	EPA 8021B
o-Xylene	140 C	8.3	16.67	238850	09/07/16	EPA 8021B

Surrogate	%REC	Limits	Diln Fac	Batch#	Analyzed	Analysis
Bromofluorobenzene (FID)	130	80-132	16.67	238850	09/07/16	EPA 8015B
Bromofluorobenzene (PID)	126	71-141	16.67	238850	09/07/16	EPA 8021B

Field ID: MW-10 Diln Fac: 1.000
Type: SAMPLE Batch#: 238850
Lab ID: 280540-005 Analyzed: 09/07/16

Analyte	Result	RL	Analysis
Gasoline C7-C12	63 Y	50	EPA 8015B
MTBE	4.4	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)	98	80-132	EPA 8015B
Bromofluorobenzene (PID)	101	71-141	EPA 8021B

Field ID: MW-11 Diln Fac: 1.000
Type: SAMPLE Batch#: 238850
Lab ID: 280540-006 Analyzed: 09/08/16

Analyte	Result	RL	Analysis
Gasoline C7-C12	1,500 Y	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	11	0.50	EPA 8021B
m,p-Xylenes	0.62 C	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Bromofluorobenzene (FID)	118	80-132	EPA 8015B
Bromofluorobenzene (PID)	131	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 #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2013-02.		
Matrix:	Water	Sampled:	09/06/16
Units:	ug/L	Received:	09/06/16

Field ID:	MW-12	Diln Fac:	1.000
Type:	SAMPLE	Batch#:	238850
Lab ID:	280540-007	Analyzed:	09/08/16

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)	103	80-132	EPA 8015B
Bromofluorobenzene (PID)	125	71-141	EPA 8021B

Type:	BLANK	Batch#:	238850
Lab ID:	QC850548	Analyzed:	09/07/16
Diln Fac:	1.000		

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)	96	80-132	EPA 8015B
Bromofluorobenzene (PID)	101	71-141	EPA 8021B

Type:	BLANK	Batch#:	238929
Lab ID:	QC850854	Analyzed:	09/09/16
Diln Fac:	1.000		

Analyte	Result	RL	Analysis
Ethylbenzene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Bromofluorobenzene (FID)	102	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

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2013-02.	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850549	Batch#:	238850
Matrix:	Water	Analyzed:	09/07/16
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,118	112	80-120

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

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2013-02.	Analysis:	EPA 8015B
Field ID:	MW-2	Batch#:	238850
MSS Lab ID:	280540-001	Sampled:	09/06/16
Matrix:	Water	Received:	09/06/16
Units:	ug/L	Analyzed:	09/07/16
Diln Fac:	1.000		

Type: MS Lab ID: QC850550

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	408.4	2,000	2,299	95	76-120

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

Type: MSD Lab ID: QC850551

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,344	97	76-120	2	20

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

RPD= Relative Percent Difference

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2013-02.	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	238850
Units:	ug/L	Analyzed:	09/07/16
Diln Fac:	1.000		

Type: BS Lab ID: QC850552

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	8.884	89	74-137
Benzene	10.00	10.22	102	80-120
Toluene	10.00	10.38	104	80-120
Ethylbenzene	10.00	10.38	104	80-120
m,p-Xylenes	10.00	10.72	107	80-120
o-Xylene	10.00	10.71	107	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	106	71-141

Type: BSD Lab ID: QC850553

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	10.00	9.505	95	74-137	7	37
Benzene	10.00	10.72	107	80-120	5	20
Toluene	10.00	10.85	109	80-120	4	20
Ethylbenzene	10.00	10.83	108	80-120	4	20
m,p-Xylenes	10.00	11.06	111	80-120	3	20
o-Xylene	10.00	11.05	111	80-120	3	20

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	99	71-141

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2013-02.	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	238929
Units:	ug/L	Analyzed:	09/09/16
Diln Fac:	1.000		

Type: BS Lab ID: QC850858

Analyte	Spiked	Result	%REC	Limits
Ethylbenzene	10.00	11.31	113	80-120

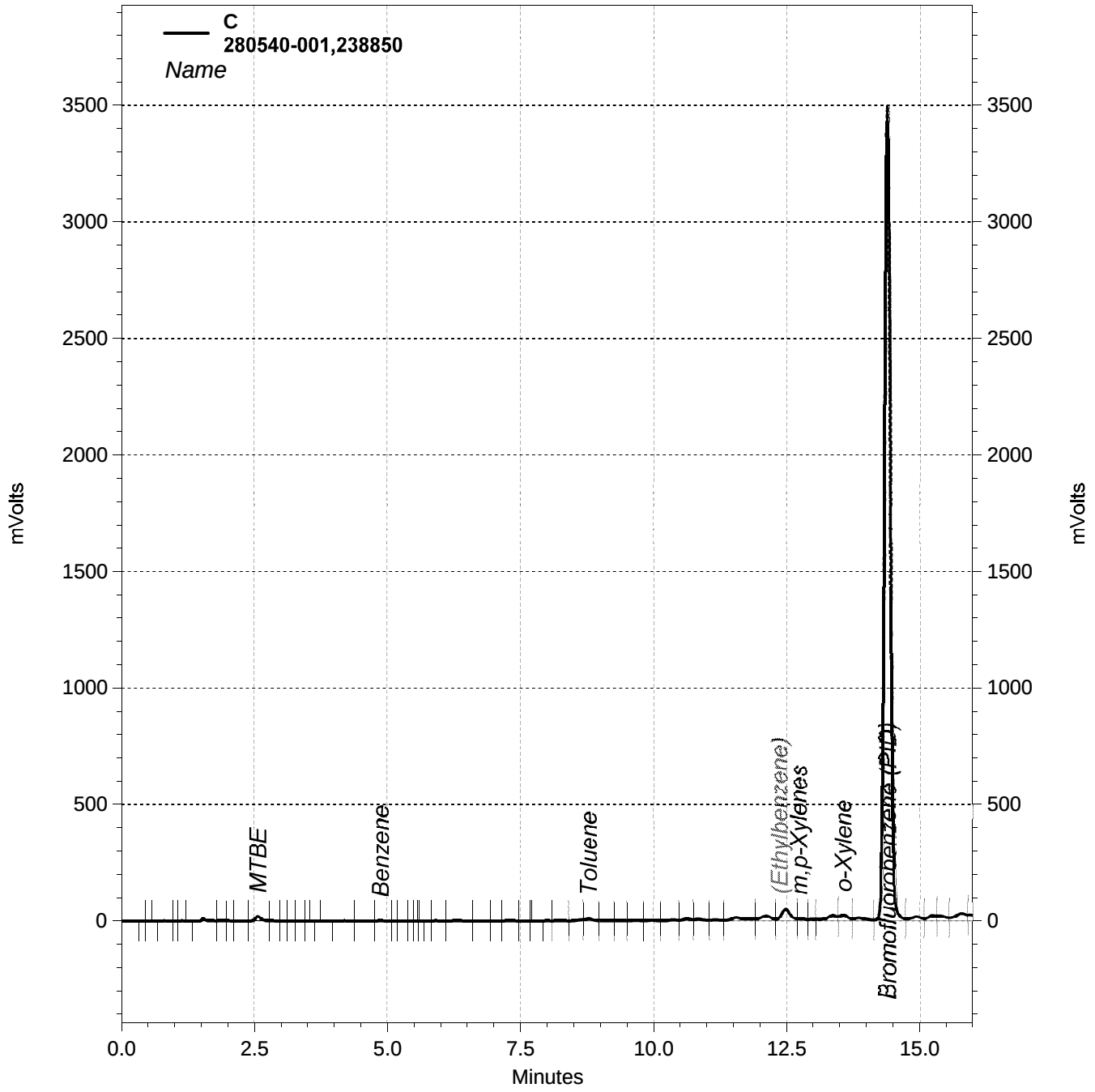
Surrogate	%REC	Limits
Bromofluorobenzene (PID)	99	71-141

Type: BSD Lab ID: QC850859

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Ethylbenzene	10.00	11.04	110	80-120	2	20

Surrogate	%REC	Limits
Bromofluorobenzene (PID)	101	71-141

RPD= Relative Percent Difference



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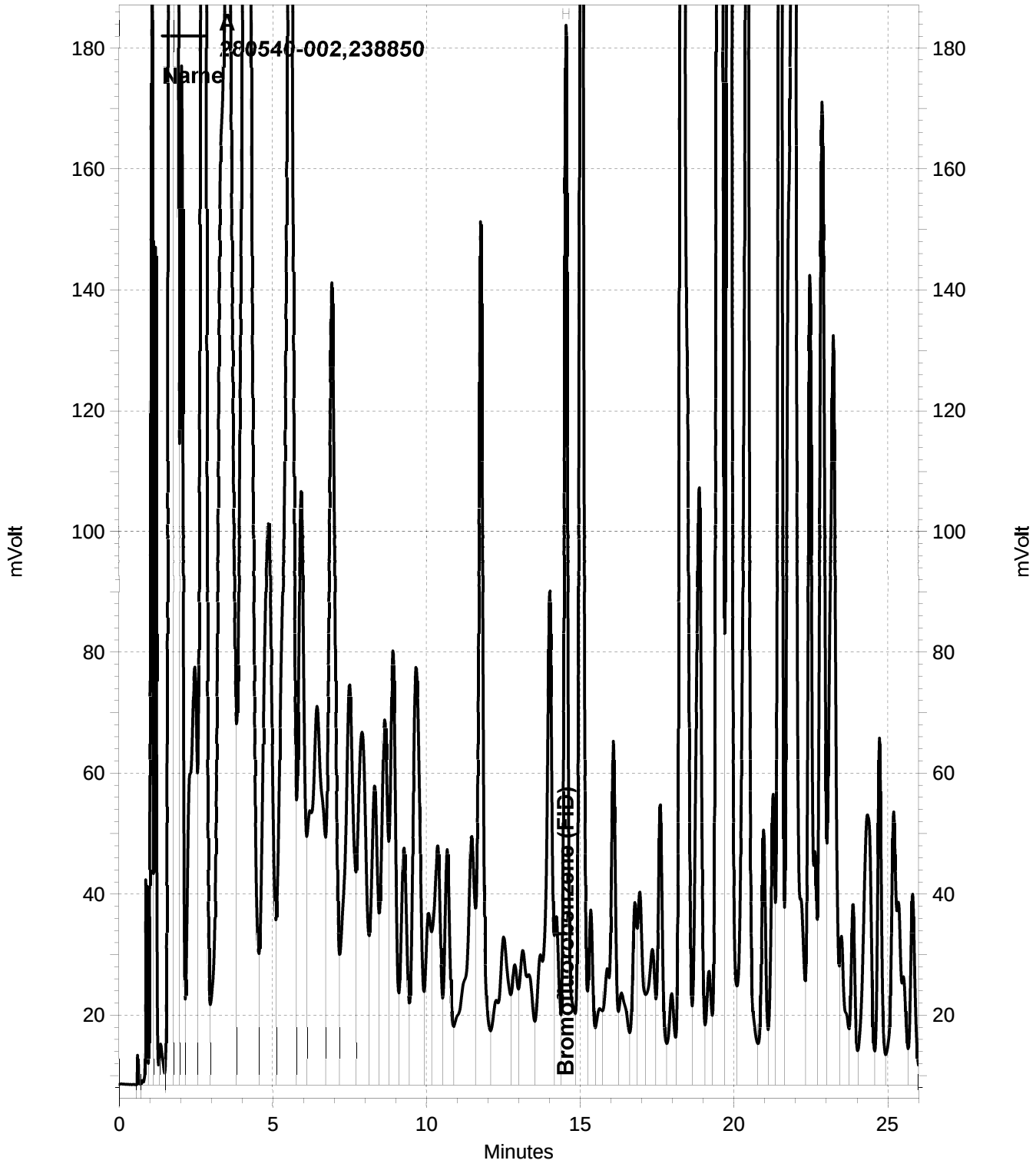
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280540-002,238850
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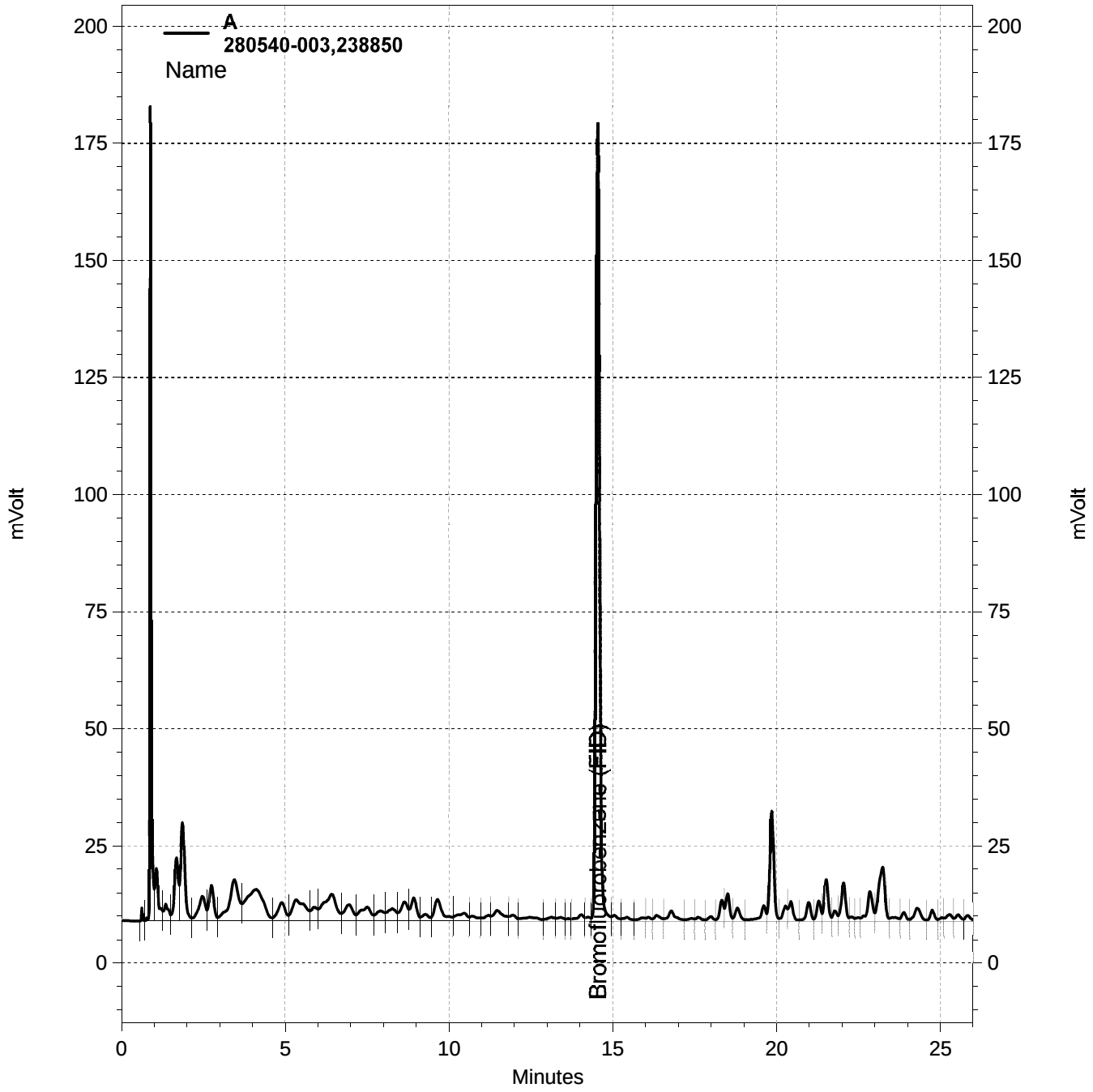
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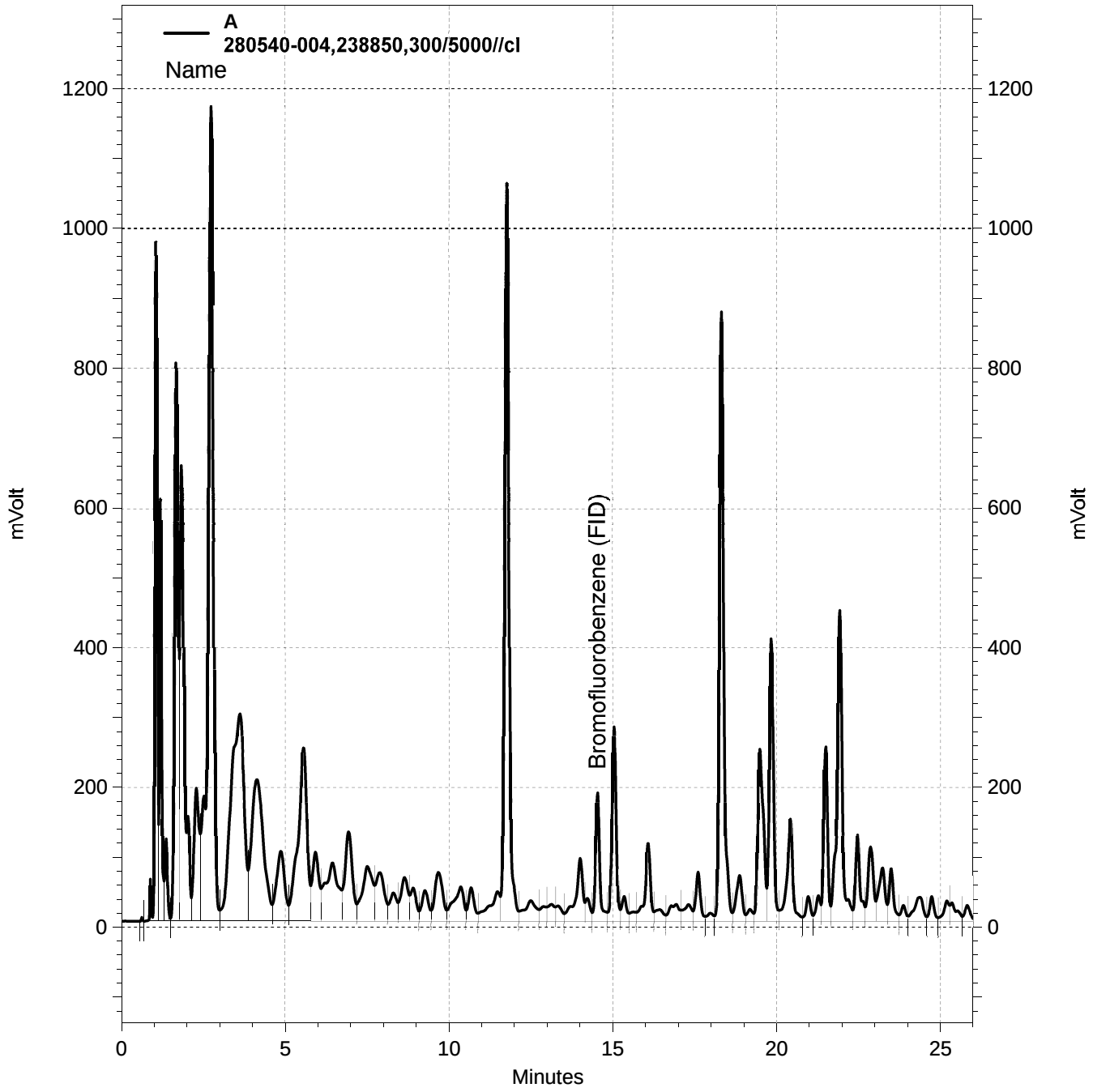
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Bromofluorobenzene (FID)
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15
20
25
Minutes
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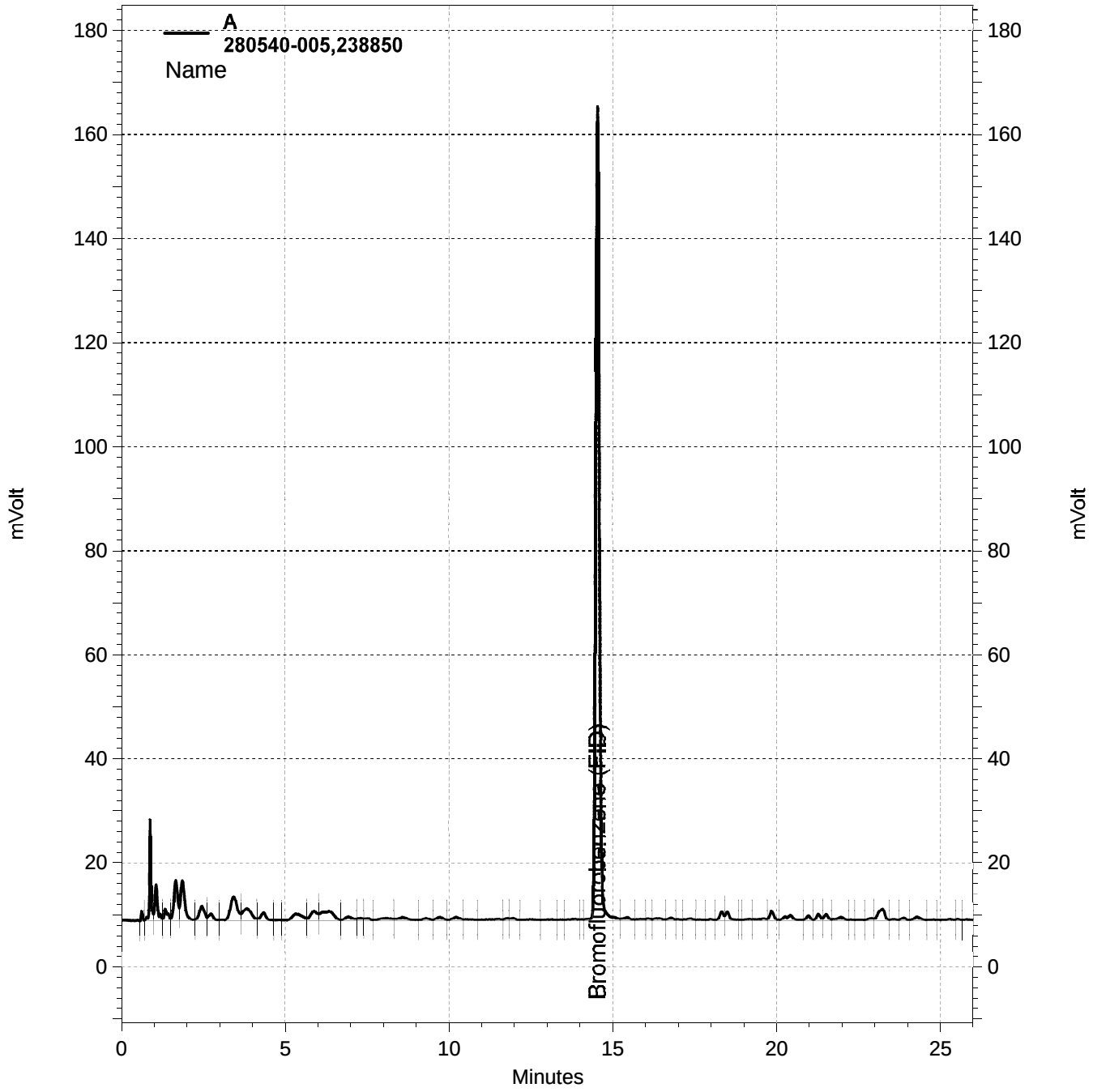
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mVolt
mVolt
Bromofluorobenzene (FID)
Minutes
0
5
10
15
20
25
0
20
40
60
80
100
120
140
160
180
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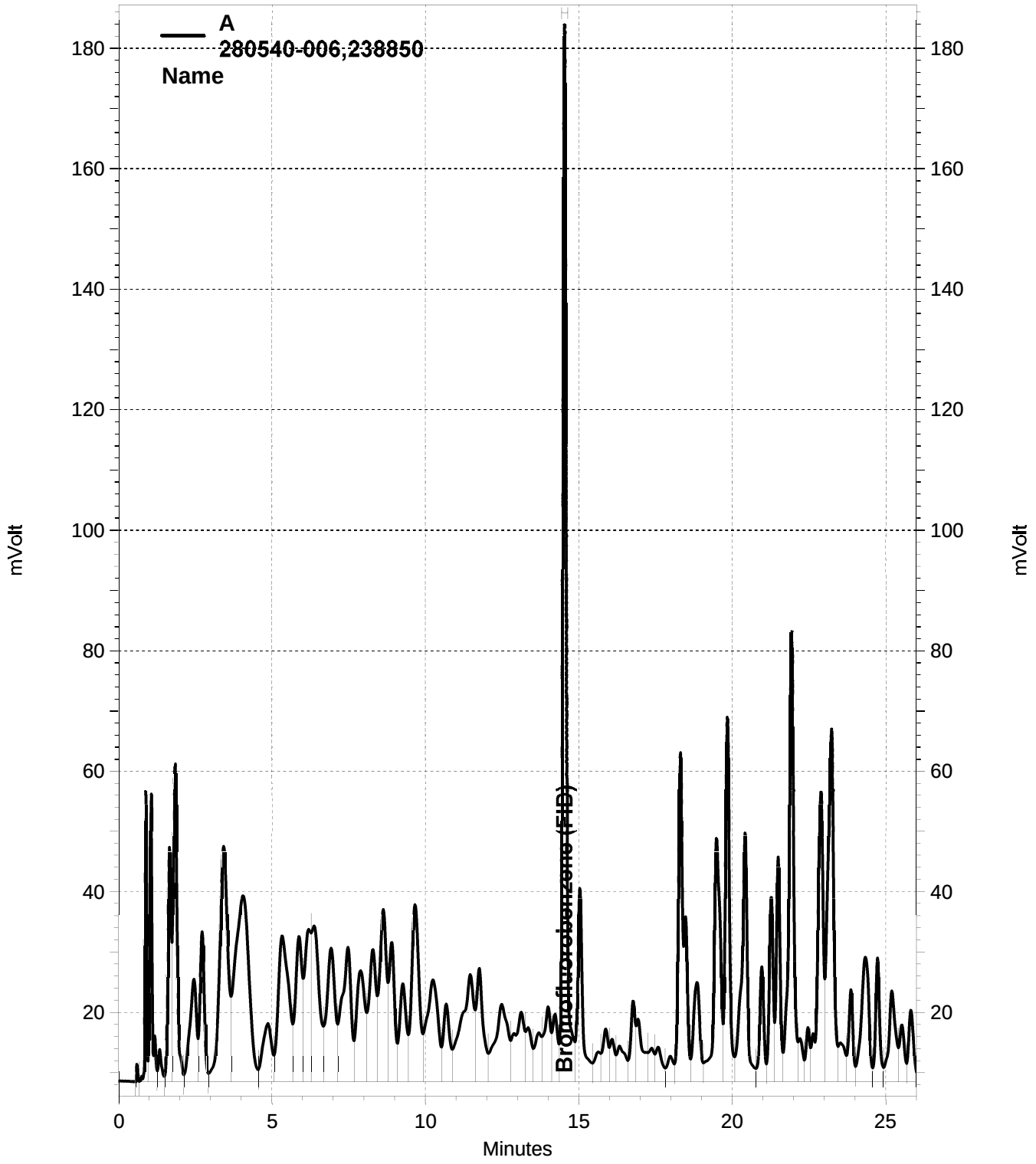
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Bromofluorobenzene (FID)
mVolt
mVolt
Minutes
180
160
140
120
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80
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40
20
0
5
10
15
20
25
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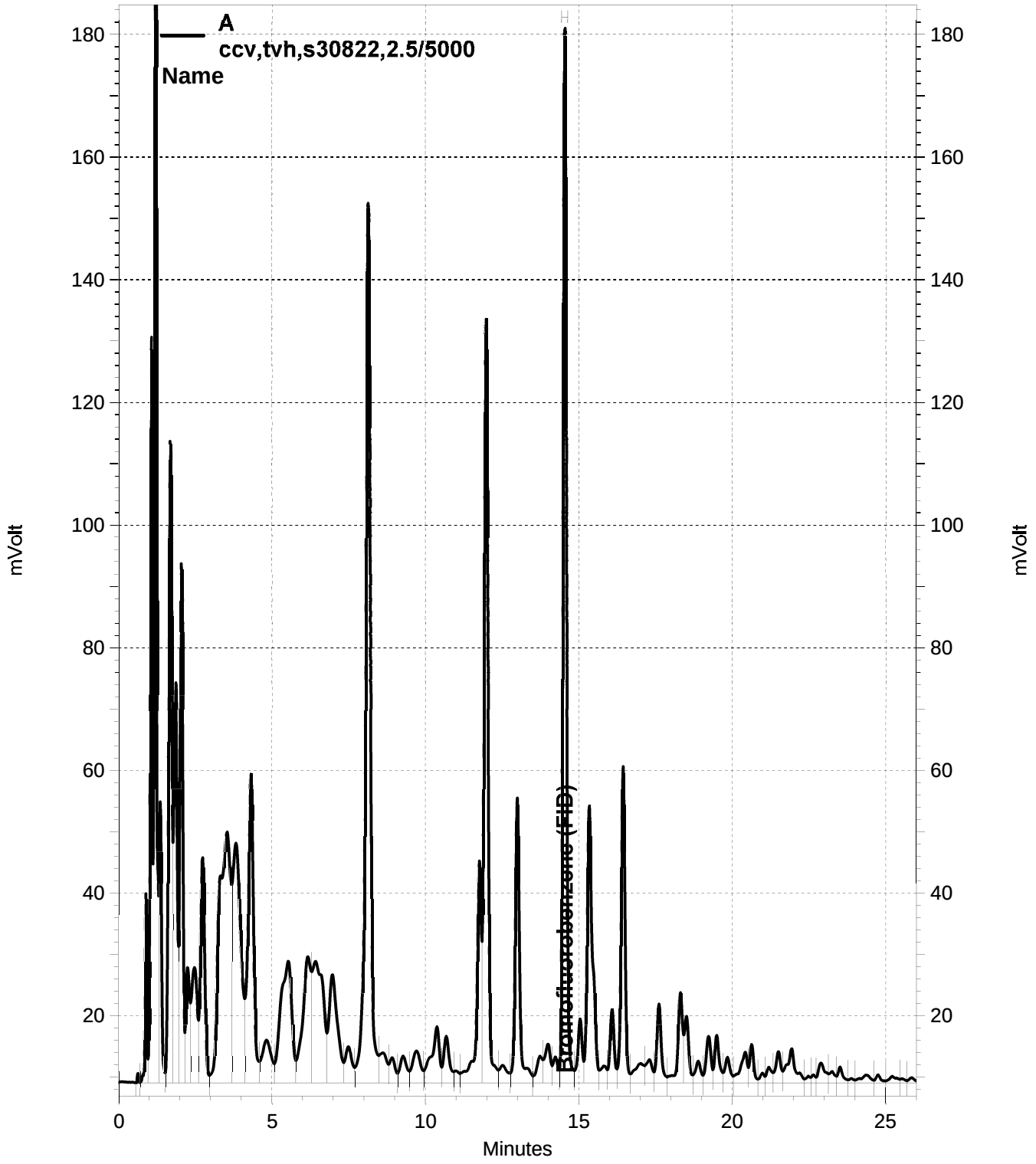

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Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2013-02.	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	238832
Units:	ug/L	Sampled:	09/06/16
Diln Fac:	1.000	Received:	09/06/16

Field ID: MW-2 Prepared: 09/07/16
Type: SAMPLE Analyzed: 09/09/16
Lab ID: 280540-001

Analyte	Result	RL
Diesel C10-C24	400 Y	47

Surrogate	%REC	Limits
o-Terphenyl	107	67-136

Field ID: MW-7 Prepared: 09/07/16
Type: SAMPLE Analyzed: 09/09/16
Lab ID: 280540-002

Analyte	Result	RL
Diesel C10-C24	2,100 Y	47

Surrogate	%REC	Limits
o-Terphenyl	102	67-136

Field ID: MW-8 Prepared: 09/07/16
Type: SAMPLE Analyzed: 09/09/16
Lab ID: 280540-003

Analyte	Result	RL
Diesel C10-C24	430 Y	47

Surrogate	%REC	Limits
o-Terphenyl	104	67-136

Field ID: MW-9 Prepared: 09/07/16
Type: SAMPLE Analyzed: 09/09/16
Lab ID: 280540-004

Analyte	Result	RL
Diesel C10-C24	6,400 Y	47

Surrogate	%REC	Limits
o-Terphenyl	94	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 #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2013-02.	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	238832
Units:	ug/L	Sampled:	09/06/16
Diln Fac:	1.000	Received:	09/06/16

Field ID: MW-10 Prepared: 09/07/16
Type: SAMPLE Analyzed: 09/09/16
Lab ID: 280540-005

Analyte	Result	RL
Diesel C10-C24	120 Y	47

Surrogate	%REC	Limits
o-Terphenyl	112	67-136

Field ID: MW-11 Prepared: 09/07/16
Type: SAMPLE Analyzed: 09/09/16
Lab ID: 280540-006

Analyte	Result	RL
Diesel C10-C24	1,500 Y	47

Surrogate	%REC	Limits
o-Terphenyl	100	67-136

Field ID: MW-12 Prepared: 09/07/16
Type: SAMPLE Analyzed: 09/09/16
Lab ID: 280540-007

Analyte	Result	RL
Diesel C10-C24	58 Y	47

Surrogate	%REC	Limits
o-Terphenyl	113	67-136

Type: BLANK Prepared: 09/06/16
Lab ID: QC850477 Analyzed: 09/07/16

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
o-Terphenyl	88	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 #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2013-02.	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	238832
Units:	ug/L	Prepared:	09/06/16
Diln Fac:	1.000	Analyzed:	09/07/16

Type: BS Lab ID: QC850478

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,233	89	60-121

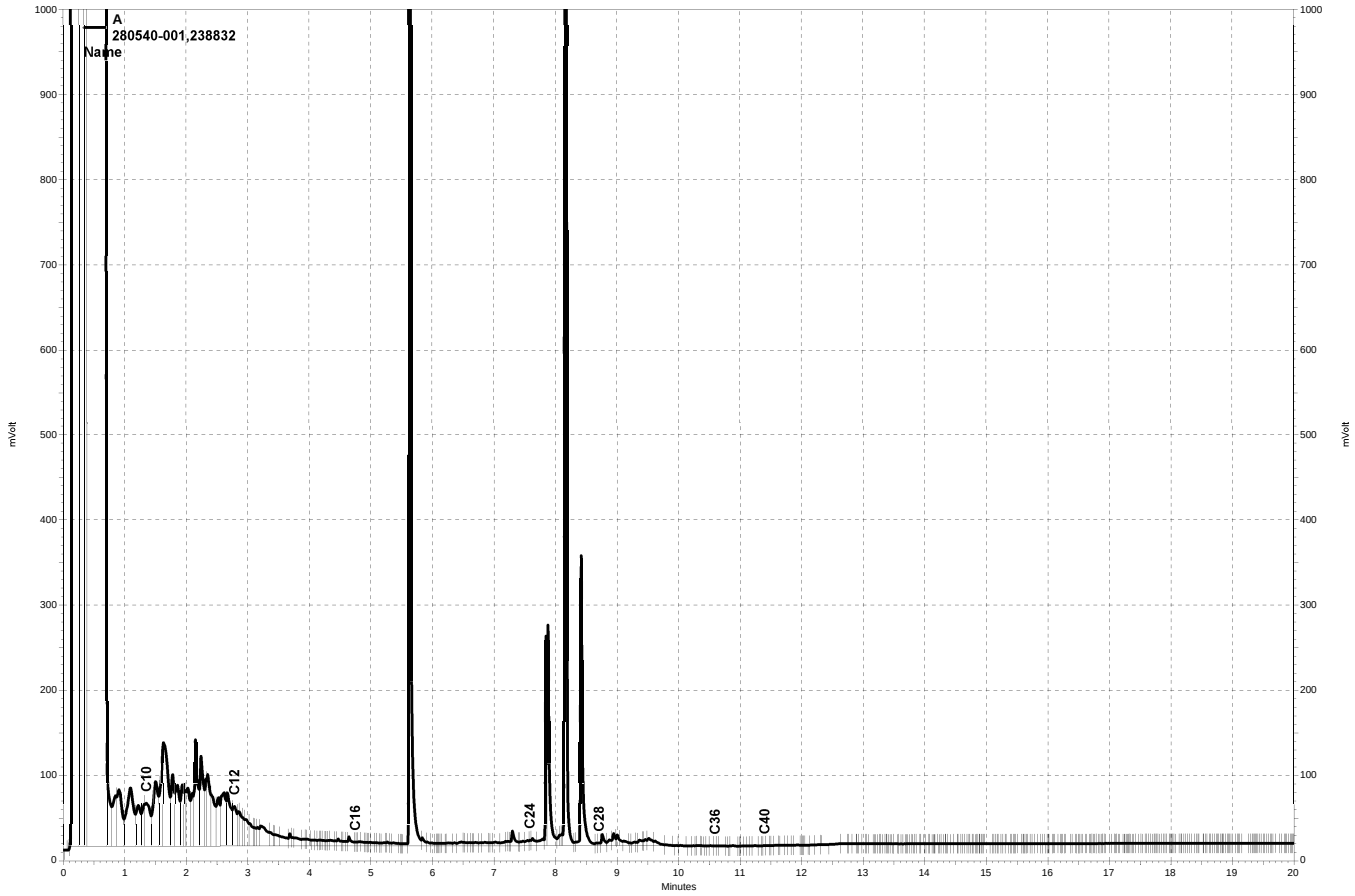
Surrogate	%REC	Limits
o-Terphenyl	102	67-136

Type: BSD Lab ID: QC850479

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	1,860	74	60-121	18	32

Surrogate	%REC	Limits
o-Terphenyl	82	67-136

RPD= Relative Percent Difference



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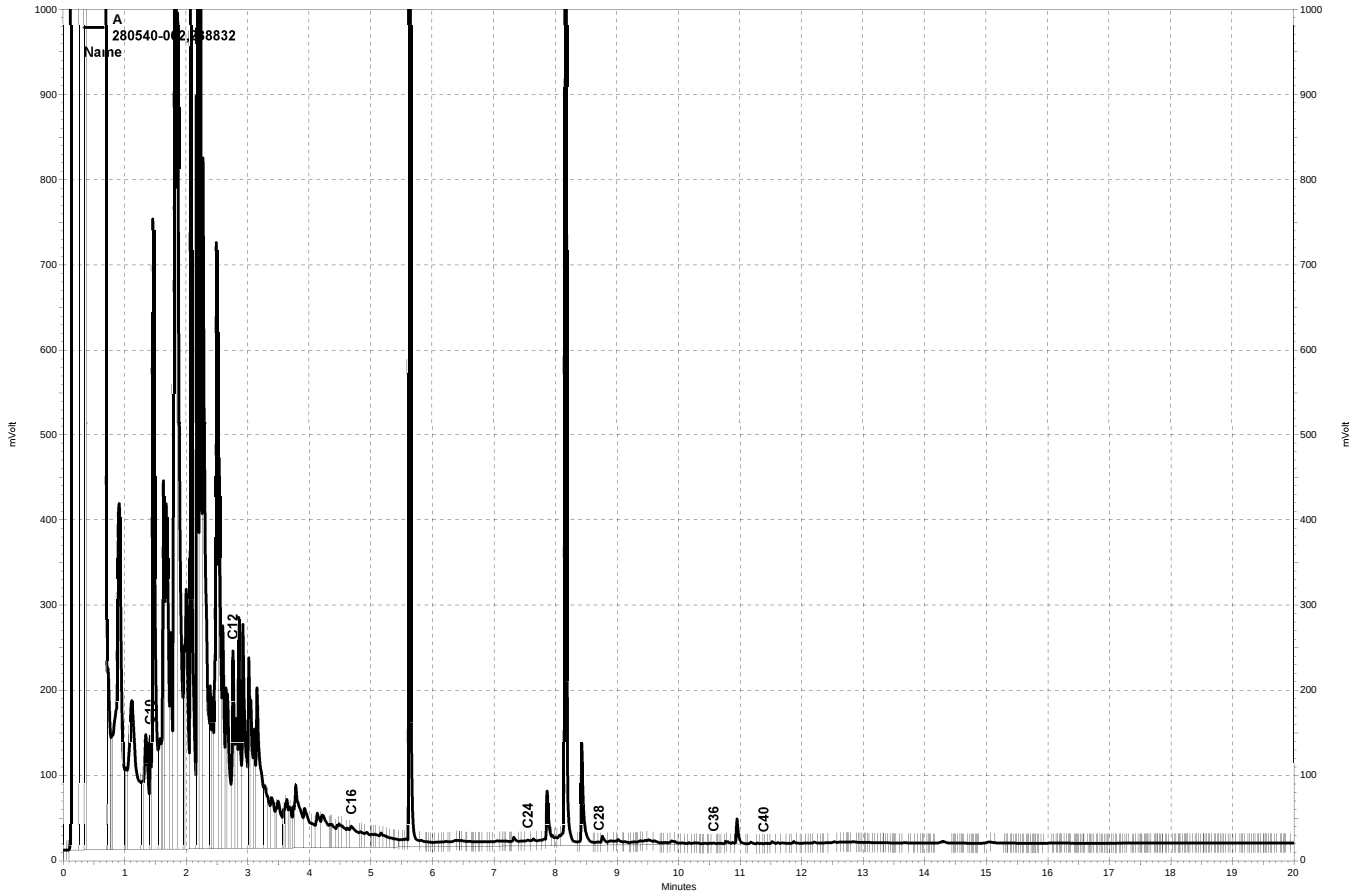

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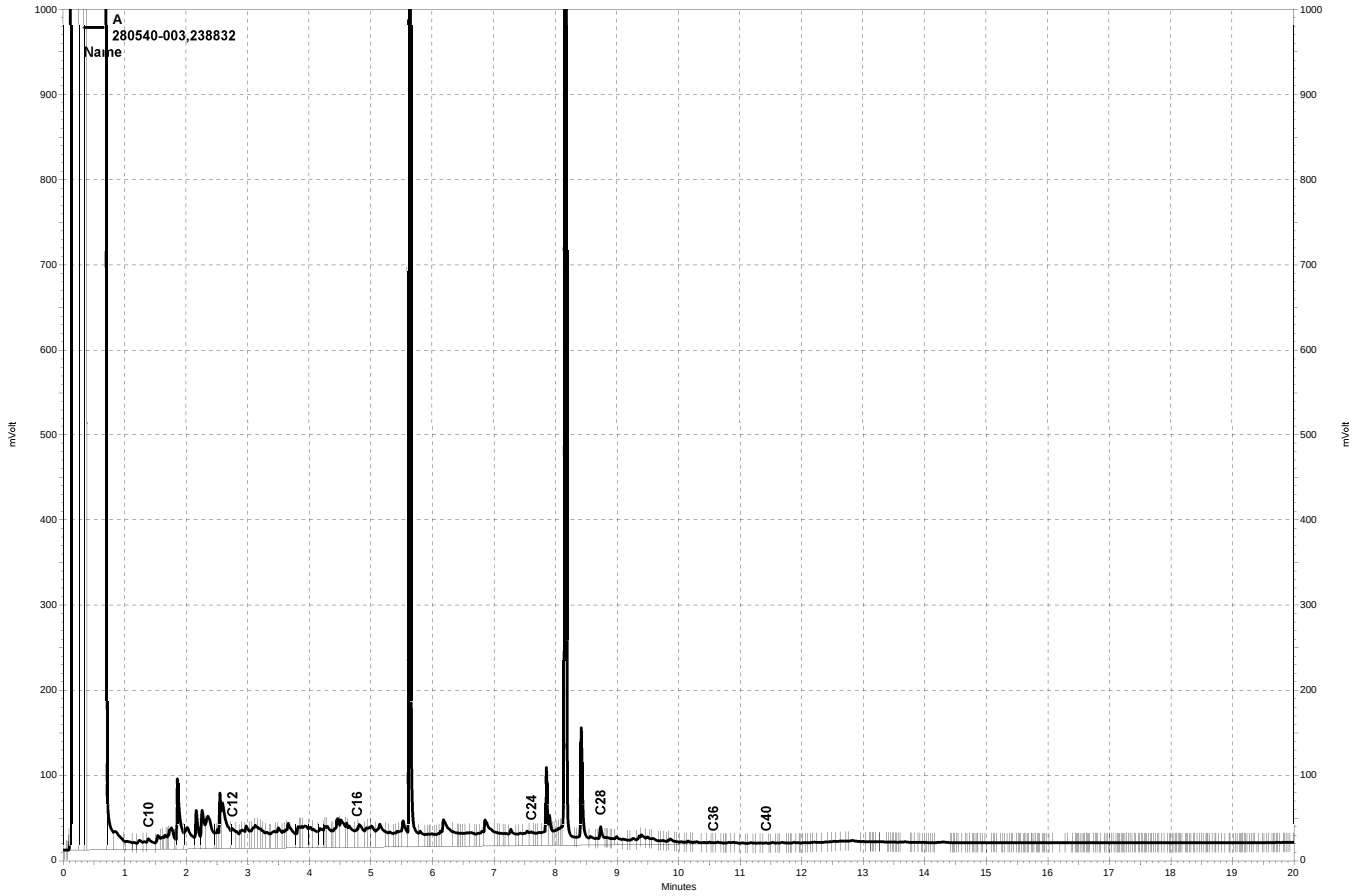

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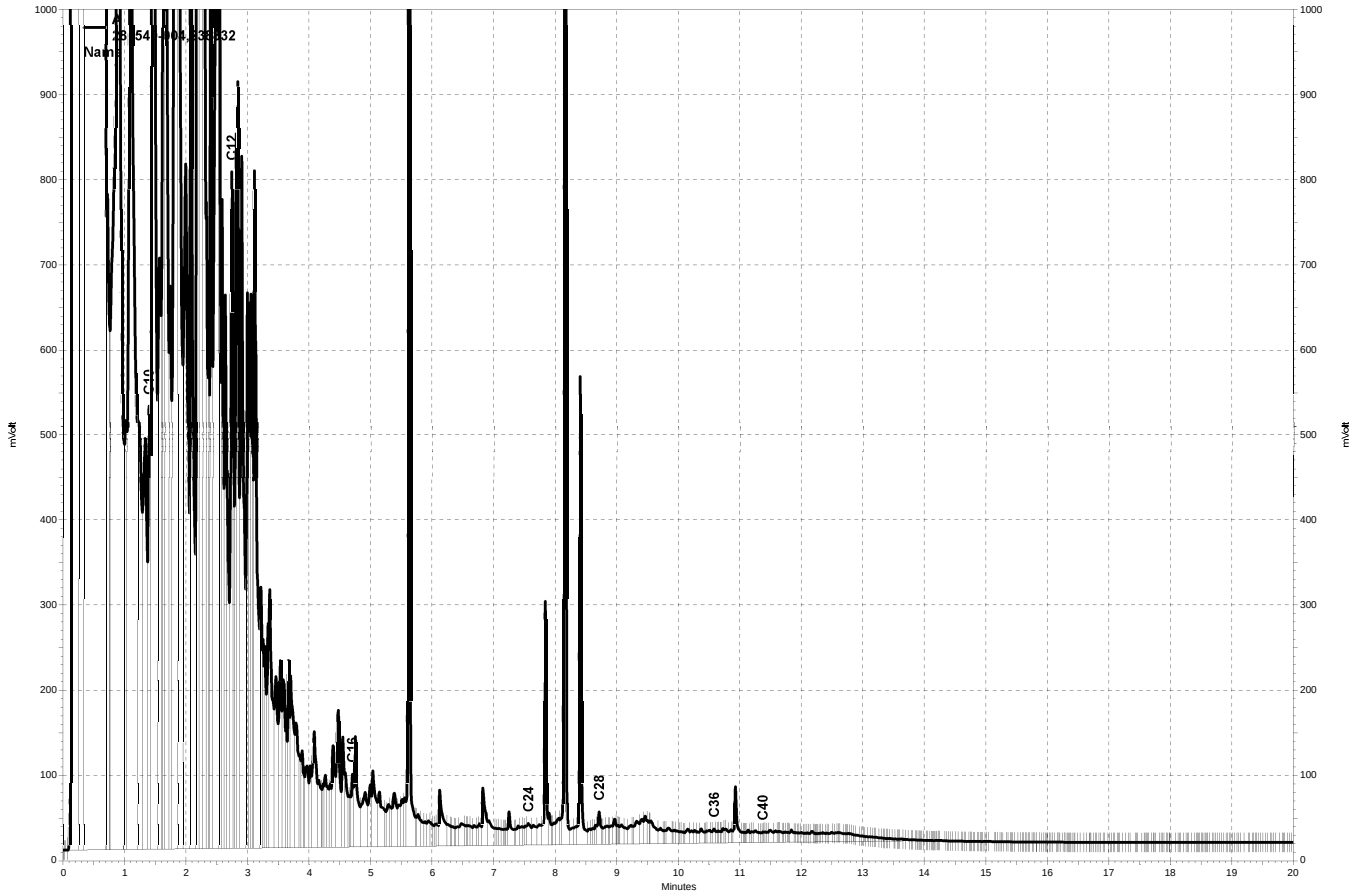

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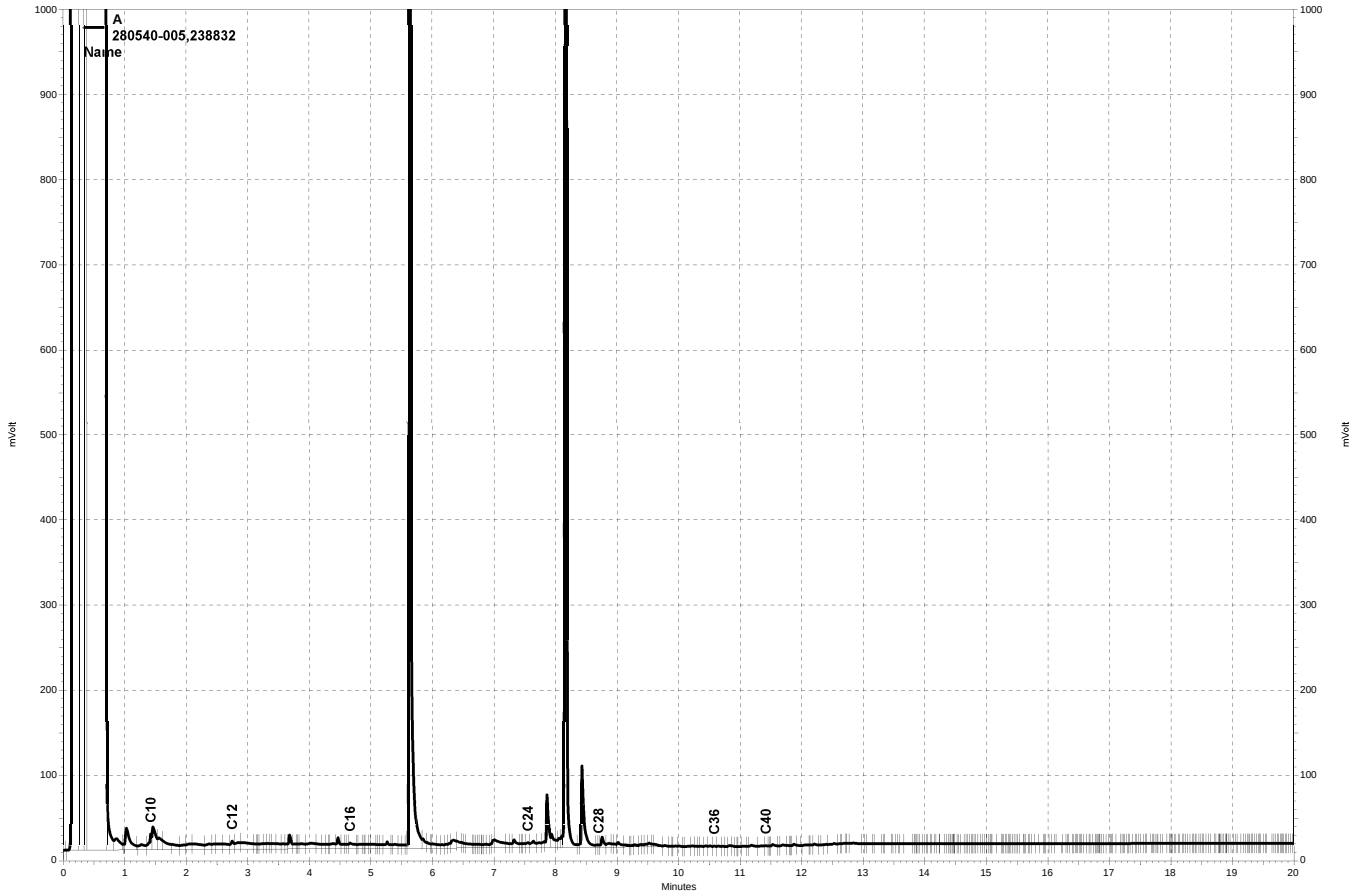

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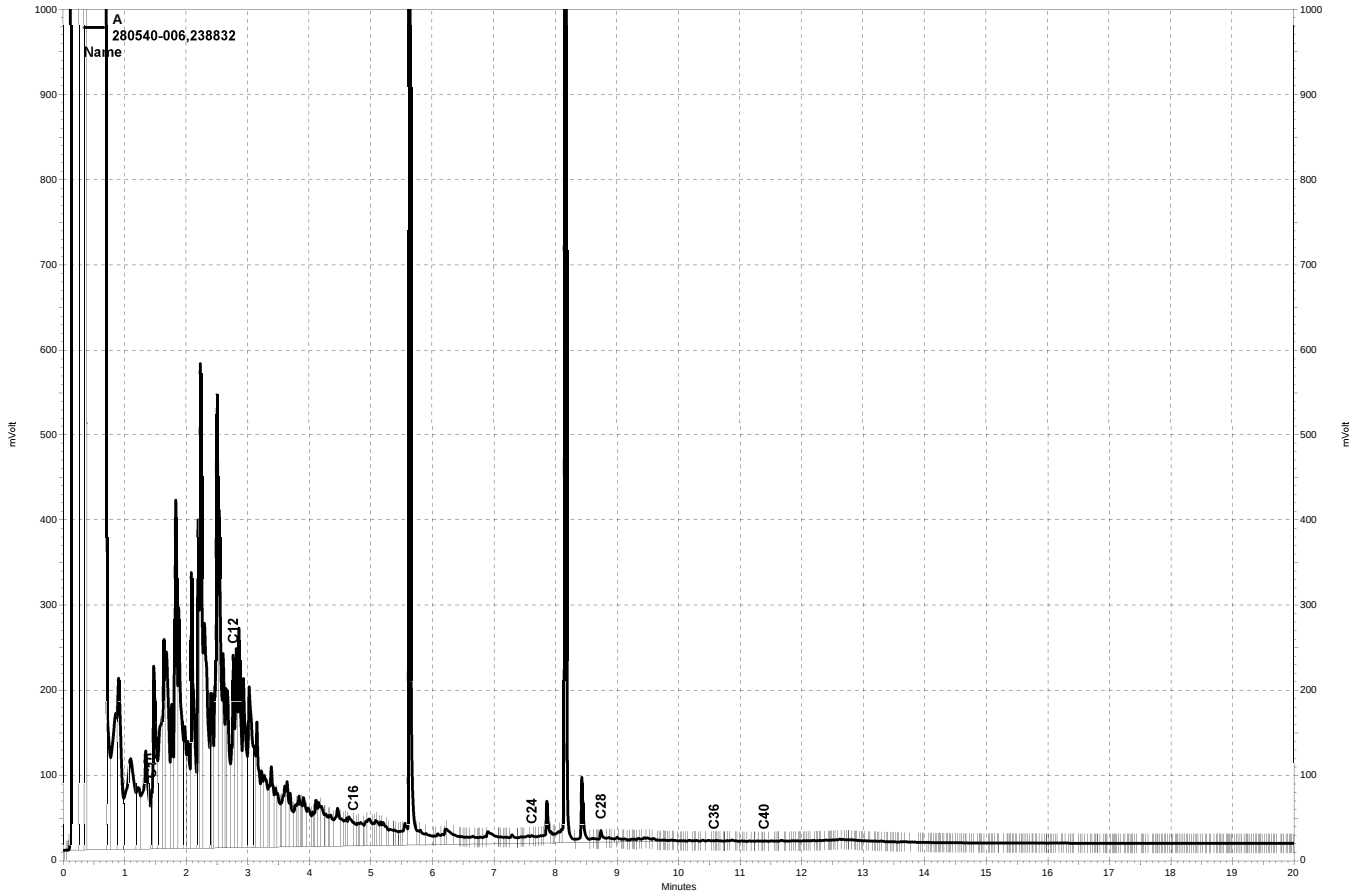

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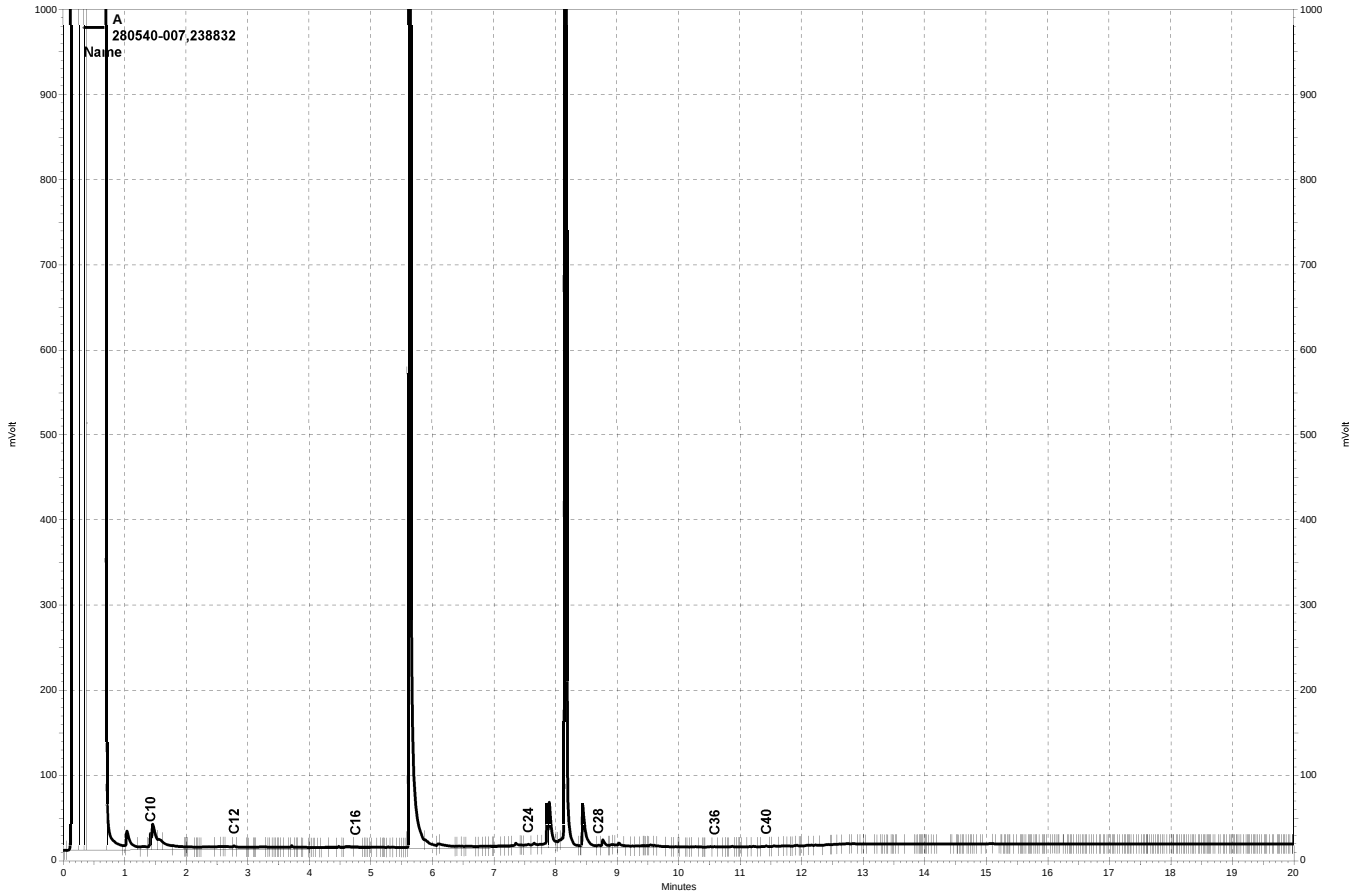

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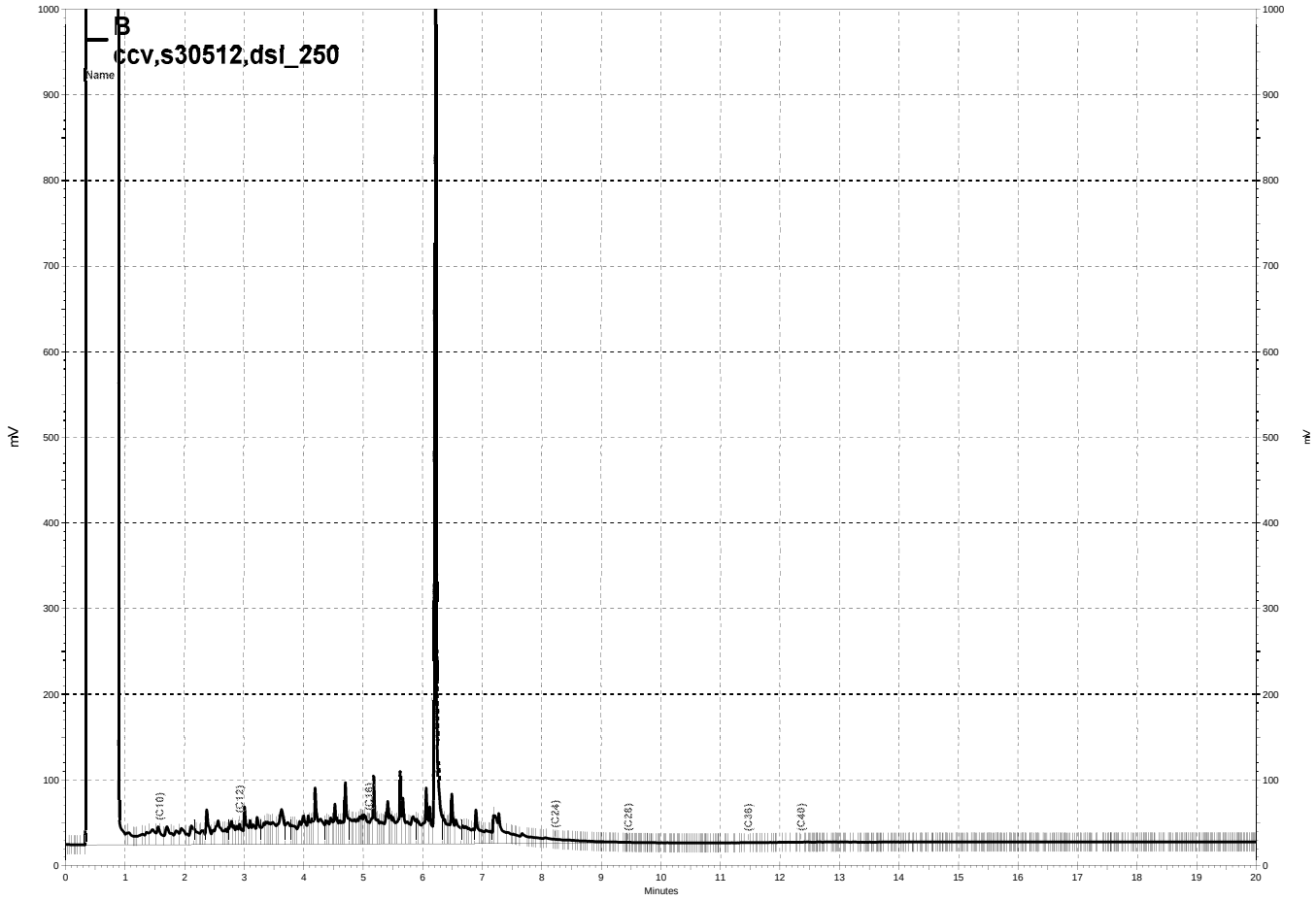

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Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2013-02.	Analysis:	EPA 300.0
Matrix:	Water	Batch#:	238824
Units:	mg/L	Received:	09/06/16
Diln Fac:	1.000		

Field ID: MW-7 Sampled: 09/06/16 11:05
Type: SAMPLE Analyzed: 09/06/16 14:51
Lab ID: 280540-002

Analyte	Result	RL
Nitrogen, Nitrate	ND	0.05
Sulfate	6.1	0.50

Field ID: MW-9 Sampled: 09/06/16 12:45
Type: SAMPLE Analyzed: 09/06/16 15:26
Lab ID: 280540-004

Analyte	Result	RL
Nitrogen, Nitrate	ND	0.05
Sulfate	3.4	0.50

Field ID: MW-12 Sampled: 09/06/16 11:40
Type: SAMPLE Analyzed: 09/06/16 16:01
Lab ID: 280540-007

Analyte	Result	RL
Nitrogen, Nitrate	ND	0.05
Sulfate	47	0.50

Type: BLANK Analyzed: 09/06/16 13:04
Lab ID: QC850447

Analyte	Result	RL
Nitrogen, Nitrate	ND	0.05
Sulfate	ND	0.50

ND= Not Detected
RL= Reporting Limit

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2013-02.	Analysis:	EPA 300.0
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850448	Batch#:	238824
Matrix:	Water	Analyzed:	09/06/16 13:22
Units:	mg/L		

Analyte	Spiked	Result	%REC	Limits
Nitrogen, Nitrate	1.000	0.9662	97	80-120
Sulfate	10.00	10.00	100	80-120

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2013-02.	Analysis:	EPA 300.0
Field ID:	MW-7	Diln Fac:	10.00
MSS Lab ID:	280540-002	Batch#:	238824
Matrix:	Water	Sampled:	09/06/16 11:05
Units:	mg/L	Received:	09/06/16

Type: MS Analyzed: 09/06/16 17:33
Lab ID: QC850449

Analyte	MSS Result	Spiked	Result	%REC	Limits
Nitrogen, Nitrate	<0.01127	5.000	4.844	97	80-120
Sulfate	6.108	50.00	53.42	95	80-120

Type: MSD Analyzed: 09/06/16 17:51
Lab ID: QC850450

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Nitrogen, Nitrate	5.000	4.790	96	80-120	1	20
Sulfate	50.00	48.76	85	80-120	9	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Biochemical Oxygen Demand

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2013-02.	Analysis:	SM5210B
Analyte:	Biochemical Oxygen Demand	Batch#:	238847
Matrix:	Water	Received:	09/06/16
Units:	mg/L	Prepared:	09/07/16 12:58
Diln Fac:	1.000	Analyzed:	09/12/16 10:26

Field ID	Type	Lab ID	Result	RL	Sampled
MW-7	SAMPLE	280540-002	ND	5.0	09/06/16 11:05
MW-9	SAMPLE	280540-004	25	7.5	09/06/16 12:45
MW-12	SAMPLE	280540-007	ND	5.0	09/06/16 11:40
	BLANK	QC850535	ND	5.0	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Biochemical Oxygen Demand

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2013-02.	Analysis:	SM5210B
Analyte:	Biochemical Oxygen Demand	Batch#:	238847
Field ID:	ZZZZZZZZZZ	Sampled:	09/06/16 06:00
MSS Lab ID:	280571-001	Received:	09/06/16
Matrix:	Water	Prepared:	09/07/16 12:58
Units:	mg/L	Analyzed:	09/12/16 10:26
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	RL	%REC	Limits	RPD	Lim
BS	QC850536		198.0	200.1		101	85-115		
BSD	QC850537		198.0	204.6		103	85-115	2	20
SDUP	QC850538	<300.0		<300.0	300.0			NC	26

NC= Not Calculated
RL= Reporting Limit
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Chemical Oxygen Demand

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2013-02.	Analysis:	SM5220D
Analyte:	Chemical Oxygen Demand	Batch#:	238936
Matrix:	Water	Received:	09/06/16
Units:	mg/L	Prepared:	09/09/16 10:00
Diln Fac:	1.000	Analyzed:	09/09/16 12:00

Field ID	Type	Lab ID	Result	RL	Sampled
MW-7	SAMPLE	280540-002	28	10	09/06/16 11:05
MW-9	SAMPLE	280540-004	79	10	09/06/16 12:45
MW-12	SAMPLE	280540-007	19	10	09/06/16 11:40
	BLANK	QC850884	ND	10	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Chemical Oxygen Demand

Lab #:	280540	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2013-02.	Analysis:	SM5220D
Analyte:	Chemical Oxygen Demand	Batch#:	238936
Field ID:	MW-12	Sampled:	09/06/16 11:40
MSS Lab ID:	280540-007	Received:	09/06/16
Matrix:	Water	Prepared:	09/09/16 10:00
Units:	mg/L	Analyzed:	09/09/16 12:00
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
LCS	QC850885		50.00	53.34	107	90-110		
MS	QC850886	18.54	100.0	121.5	103	57-126		
MSD	QC850887		100.0	120.3	102	57-126	1	20

RPD= Relative Percent Difference

APPENDIX D

Historical Analytical Results

HISTORICAL GROUNDWATER MONITORING WELLS ANALYTICAL RESULTS
REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CALIFORNIA
(all concentrations in ug/L, equivalent to parts per billion [ppb])

Well MW-2									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Nov-94	**66**	*< 50*	**3.4**	*< 0.5*	*< 0.5*	**0.9**	**4.3**	*NA*
2	Feb-95	**89**	*< 50*	**18**	**2.4**	**1.7**	**7.5**	**30**	*NA*
3	May-95	*< 50*	*< 50*	**3.9**	*< 0.5*	**1.6**	**2.5**	**8.0**	*NA*
4	Aug-95	*< 50*	*< 50*	**5.7**	*< 0.5*	*< 0.5*	*< 0.5*	**5.7**	*NA*
5	May-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**—**	*NA*
6	Aug-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**—**	*NA*
7	Dec-96	*< 50*	*< 50*	**6.3**	*< 0.5*	**1.6**	*< 0.5*	**7.9**	*NA*
8	Feb-97	*< 50*	*< 50*	**0.69**	*< 0.5*	**0.55**	*< 0.5*	**1.2**	*NA*
9	May-97	**67**	*< 50*	**8.9**	*< 0.5*	**5.1**	*< 1.0*	**14**	*NA*
10	Aug-97	*< 50*	*< 50*	**4.5**	*< 0.5*	**1.1**	*< 0.5*	**5.6**	*NA*
11	Dec-97	**61**	*< 50*	**21**	*< 0.5*	**6.5**	**3.9**	**31**	*NA*
12	Feb-98	**2,000**	**200**	**270**	**92**	**150**	**600**	**1,112**	*NA*
13	Sep-98	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**—**	**7.0**
14	Apr-99	**82**	**710**	**4.2**	*< 0.5*	**3.4**	**4.0**	**12**	**7.5**
15	Dec-99	**57**	*< 50*	**20**	**0.6**	**5.9**	*<0.5*	**27**	**4.5**
16	Sep-00	*< 50*	*< 50*	**0.72**	*< 0.5*	*< 0.5*	*< 0.5*	**0.7**	**7.9**
17	Jan-01	**51**	*< 50*	**8.3**	*< 0.5*	**1.5**	*< 0.5*	**9.8**	**8.0**
18	Apr-01	**110**	*< 50*	**10**	*< 0.5*	**11**	**6.4**	**27**	**10**
19	Aug-01	**260**	**120**	**30**	**6.7**	**1.6**	**6.4**	**45**	**27**
20	Dec-01	**74**	**69**	**14**	**0.8**	**3.7**	**3.5**	**22**	**6.6**
21	Mar-02	*< 50*	*< 50*	**2.3**	**0.51**	**1.9**	**1.3**	**8.3**	**8.2**
22	Jun-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**—**	**7.7**
23	Sep-02	**98**	*< 50*	**5.0**	*< 0.5*	*< 0.5*	*< 0.5*	**—**	**13**
24	Dec-02	*< 50*	*< 50*	**4.3**	*< 0.5*	*< 0.5*	*< 0.5*	**—**	*< 2.0*
25	Mar-03	**130**	**82**	**39**	*< 0.5*	**20**	**4.1**	**63**	**16**
26	Jun-03	*< 50*	*< 50*	**1.9**	*< 0.5*	*< 0.5*	*< 0.5*	**1.9**	**8.7**
27	Sep-03	**120**	*< 50*	**8.6**	**0.51**	**0.53**	*< 0.5*	**9.6**	**23**
28	Dec-03	**282**	*<100*	**4.3**	**1.6**	**1.3**	**1.2**	**8.4**	**9.4**
29	Mar-04	**374**	*<100*	**81**	**1.2**	**36**	**7.3**	**126**	**18**
30	Jun-04	*< 50*	*< 50*	**0.75**	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**15**
31	Sep-04	**200**	*< 50*	**23**	*< 0.5*	*< 0.5*	**0.70**	**24**	**16**
32	Dec-04	**80**	*< 50*	**14**	*< 0.5*	*2.9*	**0.72**	**18**	**20**
33	Mar-05	**190**	**68**	**27**	*<0.5*	**14**	**11**	**52**	**26**
34	Jun-05	**68**	*< 50*	**7.1**	*< 0.5*	**6.9**	**1.8**	**16**	**24**
35	Sep-05	*< 50*	*< 50*	**2.5**	*< 0.5*	*< 0.5*	*< 1.0*	**2.5**	**23**
36	Dec-05	*< 50*	*< 50*	**3.9**	*< 0.5*	*< 0.5*	*< 1.0*	**3.9**	**23**
37	Mar-06	**1300**	**300**	**77**	**4.4**	**91**	**250**	**422**	**18**
38	Jun-06	*< 50*	**60**	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	**—**	**17**
39	Sep-06	**270**	**52**	**31**	*< 0.5*	**15**	**6.69**	**53**	**17**
40	Dec-06	*< 50*	*< 50*	**2.1**	*< 0.5*	*< 0.5*	*< 0.5*	**2**	**16**
41	Mar-07	**59**	*< 50*	**4**	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**14**
42	Jun-07	*<50*	*<50*	**3.5**	*<0.5*	*<0.5*	*<0.5*	**3.5**	**8**
43	Sep-07	**2,600**	**260**	**160**	**44**	**86**	**431**	**721**	**15**
44	Dec-07	**16,000**	**5,800**	**23**	**91**	**230**	**2,420**	**2764**	**16**
44a	Jan-08	**480**	**200**	**1.1**	**3.2**	**5.5**	**68**	**77.8**	**11**
45	Mar-08	**20,000**	**24,000**	**21**	**39**	**300**	**2,620**	**2980**	**13**
45a	Apr-08	**800**	**640**	**2.6**	**2.1**	**13**	**155**	**172.7**	**13**
46a	May-08	**7,100**	**3,900**	**14**	**8.8**	**140**	**710**	**872.8**	**11**
46	Jun-08	**5,700**	**1,000**	**9.4**	**5.2**	**80**	**550**	**644.6**	**11**
46a	Jul-08	**6,400**	**2,200**	**13**	**5.1**	**140**	**570**	**728.1**	**2.9**
46b	Jul-08	**390**	**55**	**1.3**	**0.77**	**4.6**	**44.4**	**51.07**	**9**
46c	Aug-08	**28,000**	**7,100**	**12**	**19**	**260**	**2,740**	**3031**	*<20*
46d	Aug-08	**8,700**	**2,700**	**5.7**	**7.4**	**130**	**900.0**	**1043.1**	**3.5**
47	Sep-08	**40,000**	**9,100**	**1.6**	*<0.5*	**110**	**910.0**	**1021.6**	**9.5**
48	Dec-08	**9,200**	**2,200**	**0.52**	*<0.5*	*<0.5*	**201.0**	**201.52**	**12**
49	Mar-09	**3,100**	**37,000**	**1.1**	**1.4**	**7.9**	**35.0**	**45.4**	**14**
50	May-09	**5,000**	**15,000**	**1.5**	*<0.5*	**9.8**	**39.0**	**50**	**13**
51	Jun-09	**2,400**	**8,000**	**5.4**	*<0.5*	**11**	**20.2**	**36.6**	**13**
52	Aug-09	**1,900**	**3,100**	**1.6**	**1.8**	**11**	**23.8**	**38.2**	**7.1**
53	Sep-09	**1,400**	**1,800**	*<0.5*	*<0.5*	*<0.5*	**4.2**	**4.24**	**12**
54	Dec-09	**590**	**1,800**	*<0.5*	*<0.5*	**1.2**	**1.2**	**2.4**	**3.6**

Well MW-2 Continued

Well MW-2									
55	Mar-10	**1,900**	**3,200**	*<0.5*	*<0.5*	*<0.5*	**2.2**	**2.2**	**2.2**
56	Mar-10	**2,000**	**4,300**	*<0.5*	*<0.5*	*<0.5*	**3.5**	**3.45**	*<2.0*
57	Jun-10	**1,300**	**2,400**	*<0.5*	*<0.5*	*<0.5*	**1.7**	**-**	*<2.0*
58	Sep-10	**910**	*<50*	*<0.5*	*<0.5*	*<0.5*	**1.5**	**1.45**	*<2.0*
59	Dec-10	**910**	**1,600**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	**2.6**
60	Mar-11	**860**	**1,100**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	**3.1**
61	Sep-11	**780**	**810**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
62	Mar-12	**460**	**610**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
63	Sep-12	**160**	**190**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
64	Mar-13	**470**	**810**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
65	Oct-13	**120**	**67**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	**2.3**
66	Mar-14	**320**	**290**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
67	Sep-14	**610**	**480**	*<0.5*	**1**	**4.7**	**1.9**	**7.6**	**3.7**
68	Mar-15	**370**	**450**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
69	Sep-15	**790**	**980**	*<0.5*	**0.6**	*<0.5*	**3.3**	—	*<2.0*
70	Mar-16	*< 50*	*< 50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
71	Sep-16	**410**	**400**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*

Well MW-4									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Nov-94	**2,600**	**230**	**120**	**4.8**	**150**	**88**	**363**	*NA*
2	Feb-95	**11,000**	**330**	**420**	**17**	**440**	**460**	**1,337**	*NA*
3	May-95	**7,200**	**440**	**300**	**13**	**390**	**330**	**1,033**	*NA*
4	Aug-95	**1,800**	**240**	**65**	**6.8**	**89**	**67**	**227**	*NA*
5	May-96	**1,100**	**140**	**51**	*< 0.5*	*< 0.5*	**47**	**98**	*NA*
6	Aug-96	**3,700**	**120**	**63**	**2.0**	**200**	**144**	**409**	*NA*
7	Dec-96	**2,700**	**240**	**19**	*< 0.5*	**130**	**93**	**242**	*NA*
8	Feb-97	**3,300**	*< 50*	**120**	**1.0**	**150**	**103**	**374**	*NA*
9	May-97	**490**	*< 50*	**2.6**	**6.7**	**6.4**	**6.7**	**22**	*NA*
10	Aug-97	**1,900**	**150**	**8.6**	**3.5**	**78**	**53**	**143**	*NA*
11	Dec-97	**1,000**	**84**	**4.6**	**2.7**	**61**	**54**	**123**	*NA*
12	Feb-98	**5,300**	**340**	**110**	**24**	**320**	**402**	**856**	*NA*
13	Sep-98	**1,800**	*< 50*	**8.9**	*< 0.5*	**68**	**27**	**104**	**23**
14	Apr-99	**2,900**	**710**	**61**	**1.2**	**120**	**80**	**263**	**32**
15	Dec-99	**1,000**	**430**	**4.0**	**2.0**	**26**	**14**	**46**	*< 2.0*
16	Sep-00	**570**	**380**	*< 0.5*	*< 0.5*	**16**	**4.1**	**20**	**2.4**
17	Jan-01	**1,600**	**650**	**4.2**	**0.89**	**46**	**13.8**	**65**	**8.4**
18	Apr-01	**1,700**	**1,100**	**4.5**	**2.8**	**48**	**10.7**	**66**	**5.0**
19	Aug-01	**1,300**	**810**	**3.2**	**4.0**	**29**	**9.7**	**46**	*< 2.0*
20	Dec-01	*< 50*	**110**	*< 0.5*	*< 0.5*	*< 0.5*	**1.2**	**1.2**	*< 2.0*
21	Mar-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
22	Jun-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
23	Sep-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
24	Dec-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
25	Mar-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
26	Jun-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
27	Sep-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
28	Dec-03	*<50*	*<100*	*<0.3*	*<0.3*	*<0.3*	*<0.6*	—	*< 5.0*
29	Mar-04	*<50*	*<100*	*<0.3*	*<0.3*	*<0.3*	*<0.6*	—	*< 5.0*
30	Jun-04	*<50*	**2,500**	*<0.3*	*<0.3*	*<0.3*	*<0.6*	—	*< 5.0*
31	Sep-04	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*
32	Dec-04	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*
33	Mar-05	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*
34	Jun-05	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*
35	Sep-05	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*
Groundwater monitoring in this well discontinued with Alameda County Health Care Services Agency approval.									

Well MW-5									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Nov-94	**50**	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
2	Feb-95	**70**	*< 50*	**0.6**	*< 0.5*	*< 0.5*	*< 0.5*	**0.6**	*NA*
3	May-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
4	Aug-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
5	May-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
6	Aug-96	**80**	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
7	Dec-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
8	Feb-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
9	May-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
10	Aug-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
11	Dec-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
12	Feb-98	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
13	Sep-98	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2*
Groundwater monitoring in this well discontinued in 1998 with Alameda County Health Care Services Agency approval. Subsequent groundwater monitoring conducted to confirm plume's southern limit									
14	Jun-04	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	**5.9**
15	Sep-04	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*

Well MW-7									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Jan-01	**13,000**	**3,100**	**95**	**4**	**500**	**289**	**888**	**95**
2	Apr-01	**13,000**	**3,900**	**140**	*< 0.5*	**530**	**278**	**948**	**52**
3	Aug-01	**12,000**	**5,000**	**55**	**25**	**440**	**198**	**718**	**19**
4	Dec-01	**9,100**	**4,600**	**89**	*< 2.5*	**460**	**228**	**777**	*< 10*
5	Mar-02	**8,700**	**3,900**	**220**	**6.2**	**450**	**191**	**867**	**200**
6	Jun-02	**9,300**	**3,500**	**210**	**6.3**	**380**	**155**	**751**	**18**
7	Sep-02	**9,600**	**3,900**	**180**	*< 0.5*	**380**	**160**	**720**	*< 2.0*
8	Dec-02	**9,600**	**3,700**	**110**	*< 0.5*	**400**	**189**	**699**	*< 2.0*
9	Mar-03	**10,000**	**3,600**	**210**	**12**	**360**	**143**	**725**	**45**
10	Jun-03	**9,300**	**4,200**	**190**	*< 10*	**250**	**130**	**570**	**200**
11	Sep-03	**10,000**	**3,300**	**150**	**11**	**300**	**136**	**597**	*< 2.0*
12	Dec-03	**9,140**	**1,100**	**62**	**45**	**295**	**184**	**586**	**89**
13	Mar-04	**8,170**	**600**	**104**	**41**	**306**	**129**	**580**	**84**
14	Jun-04	**9,200**	**2,700**	**150**	*< 0.5*	**290**	**91**	**531**	*< 2.0*
15	Sep-04	**9,700**	**3,400**	**98**	*< 0.5*	**300**	**125**	**523**	*< 2.0*
16	Dec-04	**8200**	**4,000**	**95**	*< 0.5*	**290**	**124**	**509**	*< 2.0*
17	Mar-05	**10,000**	**4,300**	**150**	*<0.5*	**370**	**71**	**591**	*<2.0*
18	Jun-05	**10,000**	**3,300**	**210**	*<1.0*	**410**	**56**	**676**	*<4.0*
19	Sep-05	**7,600**	**2,700**	**110**	*<1.0*	**310**	**54**	**474**	*<4.0*
20	Dec-05	**2,900**	**3,300**	**31**	*<1.0*	**140**	**41**	**212**	*<4.0*
21	Mar-06	**6,800**	**3,000**	**110**	*< 1.0*	**280**	**42**	**432**	**110**
22	Jun-06	**6,900**	**3,600**	**63**	*< 2.5*	**290**	**43**	**396**	*< 10*
23	Sep-06	**7,900**	**3,600**	**64**	*< 0.5*	**260**	**58**	**382**	49
24	Dec-06	**7,300**	**2,400**	**50**	*< 0.5*	**220**	**42**	**312**	*< 2.0*
25	Mar-07	**6,200**	**2,900**	**34**	*< 0.5*	**190**	**15**	**239**	*< 2.0*
26	Jun-07	**6,800**	**3,000**	**30**	*<1.0*	**160**	**27**	**217**	*<4.0*
27	Sep-07	**6,400**	**3,000**	*<0.5*	*<0.5*	**170**	**43**	**213**	*<2.0*
28	Dec-07	**4,800**	**2,800**	*<0.5*	*<0.5*	**100**	**26.5**	**126.5**	*2.7*
30	Mar-08	**5,400**	**5,900**	**21**	*<0.5*	**150**	**15**	**186**	**51**
31	Jun-08	**4,800**	**3,500**	**55**	*<0.5*	**140**	**7.0**	**202**	*<2.0*
32	Sep-08	**6,400**	**2,800**	**22**	*<0.5*	**100**	**9.3**	**131**	*<2.0*
33	Dec-08	**3,500**	**3,600**	**5**	*<0.5*	**100**	**9.1**	**114**	*<2.0*
34	Mar-09	**5,100**	**6,700**	**19**	*<0.5*	**140**	**12.3**	**171**	**51**
35	Jun-09	**4,600**	**5,400**	**40**	*< 0.5*	**140**	**5.1**	**185**	**260**
36	Sep-09	**4,400**	**4,700**	*<0.5*	*<0.5*	**96**	**5.6**	**102**	**3.5**
37	Dec-09	**4,900**	**4,500**	*< 0.5*	*< 0.5*	**90**	**2.9**	**93**	**57.0**
38	Mar-10	**5,300**	**4,300**	**17**	*<0.5*	**110**	**2.6**	**130**	**16.0**
39	Mar-10	**2,600**	**6,100**	**11**	*<0.5*	**76**	**4.5**	**92**	*<2.0*
40	Jun-10	**5,800**	**5,000**	**20**	*<0.5*	**140**	**9.9**	**170**	*<2.0*
41	Sep-10	**6,300**	**4,100**	*<0.5*	*<0.5*	**93**	**6.0**	**99**	**69.0**
42	Dec-10	**5,400**	**3,500**	*<0.5*	*<0.5*	**99**	**9.2**	**108**	**87.0**
43	Mar-11	**5,500**	**3,400**	**11**	*<0.5*	**94**	**8.5**	**114**	*<2.0*
44	Sep-11	**5,800**	**3,300**	*<0.5*	*<0.5*	**97**	**3.1**	**100**	*<2.0*
45	Mar-12	**6,400**	**3,500**	*<0.5*	*<0.5*	**110**	**5.6**	**116**	*<2.0*
46	Sep-12	**5,700**	**3,000**	*<0.5*	*<0.5*	**84**	*<0.5*	**84**	*<2.0*
47	Mar-13	**6,000**	**3,300**	*<0.5*	*<0.5*	**82**	*<0.5*	**82**	*<2.0*
48	Oct-13	**6,400**	**6,000**	**35**	*<0.5*	**75**	**5.10**	**115**	*<2.0*
49	Dec-13	**6,000**	**4,200**	*<0.5*	*<0.5*	**100**	*<0.5*	**100**	*<2.0*
50	Mar-14	**7,500**	**4,900**	*<0.5*	*<0.5*	**130**	**2.0**	**132**	*<2.0*
51	Jun-14	**3,400**	**9,100**	*<0.5*	*<0.5*	**170**	**6.9**	**177**	*<2.0*
52	Sep-14	**6,500**	**6,000**	*<0.5*	*<0.5*	**150**	**5.1**	**155**	*<2.0*
53	Mar-15	**7,700**	**3,200**	*<0.5*	*<0.5*	**91**	*<0.5*	**91**	*<2.0*
54	Sep-15	**6,800**	**2,800**	*<0.5*	*<0.5*	**85**	*<0.5*	**85**	*<2.0*
55	Dec-15	**4,700**	**2,100**	*<0.5*	*<0.5*	**64**	*<0.5*	**64**	**43**
56	Mar-16	**1,500**	**850**	*<0.5*	*<0.5*	**12**	*<0.5*	**12**	*<2.0*
57	Sep-16	**6,800**	**2,100**	**69**	*<0.5*	*<0.5*	**5.3**	**74.3**	*<2.0*

Well MW-8									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Jan-01	**14,000**	**1,800**	**430**	**17**	**360**	**1230**	**2,037**	**96**
2	Apr-01	**11,000**	**3,200**	**320**	**13**	**560**	**1,163**	**2,056**	**42**
3	Aug-01	**9,600**	**3,200**	**130**	**14**	**470**	**463**	**1,077**	**14**
4	Dec-01	**3,500**	**950**	**69**	**2.4**	**310**	**431**	**812**	*< 4.0*
5	Mar-02	**14,000**	**3,800**	**650**	**17**	**1,200**	**1,510**	**3,377**	**240**
6	Jun-02	**2,900**	**1,100**	**70**	**2.0**	**170**	**148**	**390**	**19**
7	Sep-02	**1,000**	**420**	**22**	*< 0.5*	**64**	**50**	**136**	*< 2.0*
8	Dec-02	**3,300**	**290**	**67**	*< 0.5*	**190**	**203**	**460**	*< 2.0*
9	Mar-03	**13,000**	**3,500**	**610**	**12**	**1,100**	**958**	**2,680**	*< 10*
10	Jun-03	**7,900**	**2,200**	**370**	**7.4**	**620**	**562**	**1,559**	*< 4.0*
11	Sep-03	**3,600**	**400**	**120**	**3.3**	**300**	**221**	**644**	*< 2.0*
12	Dec-03	**485**	**100**	**19**	**1.5**	**26**	**36**	**83**	*< 5.0*
13	Mar-04	**16,000**	**900**	**592**	**24**	**1,060**	**1,870**	**3,546**	**90**
14	Jun-04	**5,900**	**990**	**260**	**9.9**	**460**	**390**	**1,120**	*< 10*
15	Sep-04	**2,000**	**360**	**100**	*< 2.5*	**180**	**102**	**382**	*< 10*
16	Dec-04	**15,000**	**4,000**	**840**	**21**	**1,200**	**1,520**	**3,581**	*< 10*
17	Mar-05	**24,000**	**7,100**	**840**	**51**	**1,800**	**2,410**	**5,101**	*<10*
18	Jun-05	**33,000**	**5,700**	**930**	**39**	**2,500**	**3,860**	**7,329**	*<20*
19	Sep-05	**5,600**	**1,200**	**270**	**6.6**	**400**	**390**	**1,067**	*<20*
20	Dec-05	**3,700**	**1,300**	**110**	*< 5.0*	**320**	**356**	**786**	*<20*
21	Mar-06	**22,000**	**4,300**	**550**	**30**	**1,800**	**2,380**	**4,760**	*<20*
22	Jun-06	**19,000**	**5,000**	**500**	**28**	**1,800**	**1,897**	**4,225**	*<20*
23	Sep-06	**9,000**	**820**	**170**	**7.7**	**730**	**539**	**1,447**	*<10*
24	Dec-06	**4,400**	**800**	**75**	**4.2**	**320**	**246**	**645**	*< 2.0*
25	Mar-07	**15,000**	**4,500**	**340**	**19**	**1,300**	**1,275**	**2,934**	*< 20*
26	Jun-07	**10,000**	**3,500**	**220**	**11**	**670**	**675**	**1,576**	*<4.0*
27	Sep-07	**9,400**	**3,400**	**200**	**6.9**	**1,000**	**773**	**1,980**	*<8.0*
28	Dec-07	**1,200**	**500**	**15**	**0.88**	**95**	**57.7**	**168.58**	*<2.0*
30	Mar-08	**11,000**	**13,000**	**150**	**13**	**1,100**	**950.0**	**2,213**	**76**
31	Jun-08	**2,000**	**1,700**	**27**	**2.5**	**190**	**113.2**	**333**	*<2.0*
32	Sep-08	**5,500**	**4,400**	**89**	**3.9**	**630**	**194.4**	**917**	*<2.0*
33	Dec-08	**520**	**400**	**1.5**	*<0.5*	**20**	**4.4**	**26**	**4.5**
34	Mar-09	**4,600**	**7,300**	**55**	*<5.0*	**410**	**639.0**	**1,104**	*<20*
35	Jun-09	**2,100**	**3,400**	**32**	*< 0.5*	**260**	**80.8**	**373**	**55**
36	Sep-09	**440**	**1,700**	**2.8**	*<0.5*	**33**	**2.7**	**39**	**3.7**
37	Dec-09	**560**	**540**	**1.5**	*< 0.5*	**39**	**7.1**	**48**	**4.2**
38	Mar-10	**220**	**270**	**0.8**	*<0.5*	**14**	**3.1**	**18**	**3.9**
39	Mar-10	**3,400**	**5,700**	**28.0**	*<0.5*	**340**	**255.7**	**624**	*<2.0*
40	Jun-10	**4,700**	**4,200**	**27.0**	**2.9**	**400**	**103.2**	**533**	**27**
41	Sep-10	**900**	**1,300**	**2.9**	*<0.5*	**22**	*<2.5*	**25**	*<10*
42	Dec-10	**180**	**260**	*<0.5*	*<0.5*	**5**	**1.0**	**6.4**	**7.2**
43	Mar-11	**6,000**	**5,900**	**39**	*<0.5*	**510**	**431.0**	**980.0**	*<2.0*
44	Sep-11	**1,700**	**1,200**	**7**	**0.9**	**120**	**12.2**	**139.7**	*<2.0*
45	Mar-12	**1,200**	**790**	**11**	**0.9**	*<0.5*	**99.0**	**110.9**	*<2.0*
46	Sep-12	**730**	**430**	**4.7**	*<0.5*	**45**	**3.8**	**53.5**	**9.2**
47	Mar-13	**840**	**690**	**5.6**	*<0.5*	**47**	**9.9**	**62.51**	**15**
48	Oct-13	**150**	**140**	*<0.5*	*<0.5*	**3.3**	*<0.5*	**3.3**	*<2.0*
49	Mar-14	**79**	**120**	*<0.5*	*<0.5*	2.1	*<0.5*	**2.1**	*11*
50	Sep-14	**57**	**66**	*<0.5*	*<0.5*	**1.5**	**0.66**	**2.16**	**11**
51	Mar-15	**190**	**68**	*<0.5*	*<0.5*	**1.6**	*<0.5*	**1.6**	**11**
52	Sep-15	**<50**	**97**	*<0.5*	*<0.5*	**<0.5**	*<0.5*	**0**	**6**
53	Mar-16	**170**	**290**	**0.53**	*<0.5*	**3.6**	**5.52**	**9.65**	**3**
54	Sep-16	**220**	**430**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	**4.5**

Well MW-9									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Aug-01	11,000	170	340	13	720	616	1,689	48
2	Dec-01	9,400	2,700	250	5.1	520	317	1,092	*< 10*
3	Mar-02	1,700	300	53	4.2	120	67	244	20
4	Jun-02	11,000	2,500	200	16	600	509	1,325	85
5	Sep-02	3,600	2,800	440	11	260	39	750	*< 4.0*
6	Dec-02	7,000	3,500	380	9.5	730	147	1,266	*< 10*
7	Mar-03	4,400	1,400	320	6.9	400	93	820	*< 2.0*
8	Jun-03	7,600	1,600	490	10	620	167	1,287	*< 4.0*
9	Sep-03	8,300	2,900	420	14	870	200	1,504	*< 10*
10	Dec-03	7,080	700	287	31	901	255	1,474	*< 10*
11	Mar-04	3,550	600	122	15	313	84	534	35
12	Jun-04	6,800	1,700	350	*< 2.5*	620	99	1,069	*< 10*
13	Sep-04	7,100	1,900	160	*8.1*	600	406	1,174	*< 10*
14	Dec-04	4,700	2,800	160	*< 2.5*	470	*< 0.5*	630	*< 10*
15	Mar-05	4,200	1,600	97	*<2.5*	310	42	449	*< 10*
16	Jun-05	9,900	2,000	170	*<2.5*	590	359	1,119	*< 10*
17	Sep-05	3,600	1,200	250	*<0.5*	330	36	616	*< 2.0*
18	Dec-05	8,700	1,500	150	4	650	551	1,355	*< 4.0*
19	Mar-06	3,600	880	37	*<1.0*	210	165	412	*< 4.0*
20	Jun-06	3,200	1,300	39	*<1.0*	220	144	403	4.2
21	Sep-06	12,000	3,300	130	8	850	604	1,592	*<1.0*
22	Dec-06	12,000	2,800	140	9.4	880	634	1,663	*< 10*
23	Mar-07	9,600	2,900	120	8.7	780	453	1,362	*< 10*
24	Jun-07	7,100	2,200	75	5.2	480	298	858	*<4.0*
25	Sep-07	4,500	2,100	60	3.8	420	227	710	*<4.0*
26	Dec-07	6,200	2,000	51	*<0.5*	340	128.8	519.8	*<2.0*
27	Mar-08	6,400	3,500	67	5.2	480	177.6	724.6	38
28	Jun-08	10,000	3,400	89	*<2.5*	510	231.0	830.0	*<10*
29	Sep-08	4,800	2,700	53	*<0.5*	250	66.4	369.4	*<2.0*
30	Dec-08	4,300	2,300	45	*<0.5*	330	39.1	414.1	*<2.0*
31	Mar-09	4,000	2,200	*<2.0*	*<0.5*	160	34.9	194.9	*<2.0*
32	Jun-09	4,100	3,600	62	*< 0.5*	280	41.7	383.7	160
33	Sep-09	2,200	2,900	15	*<0.5*	110	11.8	136.8	*<2.0*
34	Dec-09	2,500	4,000	27	*<0.5*	170	8.7	205.7	*<2.0*
35	Mar-10	3,300	2,600	15	*<0.5*	140	12.0	167.0	8.6
36	Mar-10	2,500	3,400	16	*<0.5*	70	15.4	101.4	2.1
37	Jun-10	1,700	1,300	13	*<0.5*	48	4.9	65.9	11
38	Sep-10	13,000	2,900	43	*<0.5*	300	47.9	390.9	43
39	Dec-10	3,900	2,400	32	*<0.5*	240	20.5	292.5	82
40	Mar-11	700	680	1.6	*<0.5*	10	3.5	15.1	14
41	Sep-11	2,600	1,900	12	*<0.5*	160	10.2	182.2	*<2.0*
42	Mar-12	1,100	940	9	*<0.5*	25	1.6	35.6	*<2.0*
43	Sep-12	10,000	8,600	25	<0.5	260	19.0	304.0	*<2.0*
44	Mar-13	4,000	2,400	9.1	<0.5	73	9.7	91.8	*<2.0*
45	Oct-13	3,200	1,500	20	<0.5	51	6.6	77.6	*<2.0*
49	Dec-13	3,000	2,700	22	*<0.5*	120	4.6	147	*<2.0*
50	Mar-14	3,100	5,200	49	*<0.5*	420	83	552	*<2.0*
51	Jun-14	12,000	2,600	54	<0.5	610	160	824	*<2.0*
52	Sep-14	17,000	5,800	65	13.0	51	204	333	*<2.0*
53	Mar-15	4,300	2,000	24	*<0.5*	150	19	193	*<2.0*
54	Sep-15	3,000	950	25	*<0.5*	59	3	87	46
55	Dec-15	2,700	1,400	9.6	*<0.5*	*<8.3*	*<8.3*	10	*<33*
56	Mar-16	4,000	2,600	18.0	*<8.3*	84	*<8.3*	102	*<33*
57	Sep-16	120,000	6,400	550	*<8.3*	7,600	490	8,640	*<33*

Well MW-10									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Aug-01	550	2,100	17	< 0.5	31	44	92	40
2	Dec-01	< 50	81	< 0.5	< 0.5	< 0.5	< 0.5	—	25
3	Mar-02	< 50	< 50	0.61	< 0.5	< 0.5	< 0.5	0.61	6.0
4	Jun-02	< 50	< 50	0.59	< 0.5	0.58	< 0.5	1.2	9.0
5	Sep-02	160	120	10	< 0.5	6.7	3.6	20	26
6	Dec-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	16
7	Mar-03	110	< 50	11	< 0.5	12	1.3	24	15
8	Jun-03	110	< 50	9.6	< 0.5	6.8	< 0.5	16	9.0
9	Sep-03	< 50	< 50	1.1	< 0.5	1.5	< 0.5	2.6	7.0
10	Dec-03	162	<100	6.9	<0.3	8.0	<0.6	15	9.9
11	Mar-04	94	<100	2.8	<0.3	5.7	7.0	16	<5.0
12	Jun-04	150	56	11	< 0.5	12	< 0.5	23	15
13	Sep-04	< 50	< 50	1.6	< 0.5	1.9	< 1.0	3.5	5.8
14	Dec-04	64	< 50	3.7	< 0.5	3.7	0.7	8.1	10
15	Mar-05	95	98	8.3	<0.5	7.7	0.77	17	13
16	Jun-05	150	57	14	<0.5	10	1.0	25	<2.0
17	Sep-05	87	< 50	5.0	<0.5	3.6	<1.0	8.6	<2.0
18	Dec-05	< 50	< 50	1.2	<0.5	<0.5	<1.0	1.2	7.8
19	Mar-06	58	71	3.2	<0.5	2.2	<1.0	5.4	8.8
20	Jun-06	73	140	4.9	<0.5	2.5	<1.0	7.4	5.3
21	Sep-06	88	51	<0.5	<0.5	<0.5	<0.5	<0.5	9.6
22	Dec-06	<50	<50	0.61	<0.5	0.55	<0.5	1.2	3.7
23	Mar-07	57	<50	3.6	<0.5	2.2	<0.5	5.8	3.1
24	Jun-07	60	65	2.4	<0.5	1.6	<0.5	4.0	4.0
25	Sep-07	84	<50	3.6	<0.5	2.3	0.52	6.4	3.6
26	Dec-07	130	67	0.77	<0.5	340	0.83	341.6	<2.0
27	Mar-08	78	170	1.7	<0.5	3.1	0.97	5.8	2.4
28	Jun-08	230	320	12	<0.5	9.9	3.50	25.4	<2.0
29	Sep-08	80	<50	1.6	<0.5	0.52	<0.5	2.1	3.0
30	Dec-08	<50	66	0.89	<0.5	<0.5	<0.5	0.9	2.1
31	Mar-09	76	230	<2.0	<0.5	1.4	<0.5	1.4	<2.0
32	Jun-09	72	120	2.0	< 0.5	4.4	1.3	7.7	<2.0
33	Sep-09	74	220	1.6	<0.5	<0.5	<0.5	1.6	<2.0
34	Dec-09	72	150	0.6	<0.5	1.6	1.2	3.4	<2.0
36	Mar-10	63	280	1.3	<0.5	48	<0.5	49.3	<2.0
37	Jun-10	110	340	1.4	<0.5	2.6	0.74	4.7	2.4
38	Sep-10	140	360	2.1	<0.5	1.4	<0.5	3.5	4.3
39	Dec-10	80	440	<0.5	<0.5	0.69	<0.5	0.7	4.1
40	Mar-11	170	1,200	1.0	<0.5	3.7	1.8	6.5	6.3
41	Sep-11	150	220	0.8	<0.5	1.9	1	3.7	<2.0
42	Mar-12	80	92	0.81	<0.5	1.5	<0.5	2.3	3.4
43	Sep-12	170	200	<0.5	<0.5	2	0.94	2.9	<2.0
44	Mar-13	310	58	<0.5	<0.5	7.3	7.94	15.2	<2.0
45	Oct-13	69	<50	<0.5	<0.5	0.84	<0.5	0.8	4.8
46	Dec-13	<52	220	<0.5	0.61	2	1.5	4.1	3.7
47	Mar-14	<50	87	<0.5	<0.5	0.51	<0.5	0.5	3.7
48	Jun-14	55	<50	<0.5	0.61	2	1.5	4.1	<2.0
49	Sep-14	<50	<50	<0.5	<0.5	<0.5	<0.5	0.0	4.5
50	Mar-15	61	<49	<0.5	<0.5	<0.5	<0.5	0.0	3.3
51	Sep-15	<50	<49	<0.5	<0.5	<0.5	<0.5	0.0	2.6
52	Dec-15	<50	<50	<0.5	<0.5	<0.5	<0.5	0.0	2.6
53	Mar-16	90	110	<0.5	<0.5	<0.5	<0.5	0.0	<2.0
54	Sep-16	63	120	<0.5	<0.5	<0.5	<0.5	0	4.4

Well MW-11									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Aug-01	17,000	7,800	390	17	820	344	1,571	< 10
2	Dec-01	5,800	2,800	280	7.8	500	213	1,001	< 10
3	Mar-02	100	94	< 0.5	< 0.5	0.64	< 0.5	0.64	2.4
4	Jun-02	8,200	2,600	570	13	560	170	1,313	< 4
5	Sep-02	12,000	4,400	330	13	880	654	1,877	< 10
6	Dec-02	18,000	4,500	420	< 2.5	1,100	912	2,432	< 10
7	Mar-03	7,800	2,600	170	4.7	530	337	1,042	53
8	Jun-03	14,000	3,800	250	< 2.5	870	693	1,813	< 10
9	Sep-03	10,000	3,000	250	9.9	700	527	1,487	< 4
10	Dec-03	15,000	1,100	314	60	1,070	802	2,246	173
11	Mar-04	4,900	400	72	17	342	233	664	61
12	Jun-04	10,000	2,300	210	2.8	690	514	1,417	< 10
13	Sep-04	7,200	2,300	340	< 2.5	840	75	1,255	< 10
14	Dec-04	11,000	3,900	180	5.1	780	695	1,660	< 10
15	Mar-05	4,600	1,900	69	<2.5	300	206	575	< 10
16	Jun-05	1,400	590	85	<0.5	110	8.2	203	< 2.0
17	Sep-05	12,000	3,100	220	< 1.0	840	762	1,822	< 4.0
18	Dec-05	2,500	2,100	120	< 2.5	260	16	396	< 10
19	Mar-06	2,200	1,300	27	<2.5	130	5.2	162	< 10
20	Jun-06	3,700	1,900	170	<1.0	230	14	414	< 4.0
21	Sep-06	3,600	2,100	80	<0.5	230	8.8	319	< 2.0
22	Dec-06	6,000	3,500	83	<1.0	260	16.4	359	< 4.0
23	Mar-07	4,500	1,900	110	< 0.5	170	7.9	288	< 2.0
24	Jun-07	4,300	2,200	120	<0.5	140	6.6	267	<4.0
25	Sep-07	5,500	2,700	86	<0.5	180	16.1	282	<2.0
26	Dec-07	7,100	4,000	68	<0.5	140	14	222	35
27	Mar-08	5,300	4,000	130	<0.5	120	13	263	8.8
28	Jun-08	3,600	4,200	190	<0.5	140	11	341	<2.0
29	Sep-08	7,300	4,600	130	<0.5	110	4.5	245	<2.0
30	Dec-08	2,800	1,600	93	<0.5	82	0.69	176	<2.0
31	Mar-09	4,100	4,600	18	<0.5	82	8	108	8.0
32	Jun-09	2,100	2,700	38	< 0.5	80	3.3	121	3.3
33	Sep-09	830	2,400	11	<0.5	19	<0.5	30	<2.0
34	Dec-09	2,200	3,100	19	<0.5	46	0.78	66	14.0
35	Mar-10	2,300	2,500	13	<0.5	59	0.79	73	3.4
36	Mar-10	1,500	3,400	12	<0.5	48	<0.5	60	<2.0
37	Jun-10	2,000	3,500	14	<0.5	42	0.92	57	7.9
38	Sep-10	3,000	2,200	18	<0.5	41	0.55	60	8.0
39	Dec-10	1,800	2,900	13	<0.5	49	1.9	64	15.0
40	Mar-11	180	1,600	<0.5	<0.5	1.2	<0.5	1.2	6.9
41	Sep-11	2,200	2,500	12	<0.5	44	2.2	58.2	<2.0
42	Mar-12	1,300	1,200	8.7	<0.5	29	<0.5	37.7	<2.0
43	Sep-12	2,400	1,800	7.7	<0.5	29	<0.5	36.7	<2.0
44	Mar-13	1,500	1,900	4.8	<0.5	22	<0.5	26.8	<2.0
45	Oct-13	3,000	1,600	14	<0.5	35	<0.5	49	<2.0
46	Dec-13	2,500	2,000	<0.5	13	<0.5	0.68	13.7	<2.0
47	Mar-14	3,000	2,800	13	<0.5	34	<0.5	47.0	<2.0
48	Jun-14	2,300	1,400	6	<0.5	20	6.1	32.1	<2.0
49	Sep-14	190	3,400	6.8	<0.5	*26*	<0.5	32.8	3.7
50	Mar-15	1,300	1,500	<0.5	<0.5	8.4	<0.5	8.4	<2.0
51	Sep-15	2,500	1,800	<0.5	<0.5	25	<0.5	25.0	24.0
52	Dec-15	3,100	1,600	<0.5	<0.5	30	<0.5	30.0	<2.0
53	Mar-16	720	610	<0.5	<0.5	6.1	<0.5	6.1	<2.0
54	Sep-16	1,500	1,500	<0.5	<0.5	11	0.62	11.6	<2.0

Well MW-12									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Dec-05	**1,300**	**700**	*< 0.5*	*< 0.5*	**33**	**5.6**	**39**	*< 2.0*
2	Mar-06	**1,100**	**540**	*<0.5*	*<0.5*	**8.5**	**1.5**	**10**	**49**
3	Jun-06	**680**	**400**	*<0.5*	*<0.5*	**5.8**	**1.4**	**7.2**	*< 2.0*
4	Sep-06	**910**	**480**	*<0.5*	*<0.5*	**9.9**	**1.5**	**11.4**	**21**
5	Dec-06	**770**	**230**	*< 0.5*	*< 0.5*	**7.4**	**2.0**	**9.4**	*< 2.0*
6	Mar-07	**390**	**110**	*< 0.5*	*< 0.5*	**1.7**	**1.7**	**3.4**	*< 2.0*
7	Jun-07	**590**	**280**	*<0.5*	*<0.5*	**4.5**	**0.9**	**5.4**	*<2.0*
8	Sep-07	**390**	**180**	*<0.5*	*<0.5*	**2.4**	**2.4**	**4.8**	*<2.0*
9	Dec-07	**210**	**140**	*<0.5*	*<0.5*	**2.1**	**1.3**	**3.4**	*<2.0*
10	Mar-08	**720**	**500**	*<0.5*	**4.4**	**9.0**	**2.8**	**16.2**	*<2.0*
11	Jun-08	**220**	**50**	*<0.5*	*<0.5*	**2.0**	*<0.5*	**2.0**	*<2.0*
12	Sep-08	**370**	**95**	*<0.5*	*<0.5*	**2.8**	**0.98**	**3.8**	*<2.0*
13	Dec-08	**93**	**170**	*<0.5*	*<0.5*	**0.76**	*<0.5*	**0.8**	*<2.0*
14	Mar-09	**180**	**130**	*<0.5*	*<0.5*	**1.70**	*<0.5*	**1.7**	*<2.0*
15	Jun-09	**300**	**280**	*< 0.5*	*< 0.5*	**4.60**	*< 0.5*	**4.6**	*<2.0*
16	Sep-09	**330**	**270**	*<0.5*	*<0.5*	**2.30**	*<0.5*	**2.3**	*<2.0*
17	Dec-09	**76**	**170**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.0	*<2.0*
18	Mar-10	**240**	**380**	*<0.5*	*<0.5*	**2.7**	*<0.5*	**2.7**	*<2.0*
19	Jun-10	**540**	**370**	*<0.5*	*<0.5*	**3.5**	**0.92**	**4.4**	**7.9**
20	Sep-10	**380**	**220**	*<0.5*	*<0.5*	**1.7**	*<0.5*	**1.7**	**8**
21	Dec-10	**320**	**350**	*<0.5*	*<0.5*	**1.5**	*<0.5*	**1.5**	**3.9**
22	Mar-11	**290**	**450**	*<0.5*	**0.74**	**1.3**	*<0.5*	**2.0**	**11**
23	Sep-11	**530**	**340**	*<0.5*	*<0.5*	**2.2**	*<0.5*	**2.2**	*<2.0*
24	Mar-12	**410**	**240**	*<0.5*	*<0.5*	**1.9**	*<0.5*	**1.9**	*<2.0*
25	Sep-12	**340**	**210**	*<0.5*	*<0.5*	**1.1**	*<0.5*	**1.1**	*<2.0*
26	Mar-13	**430**	**200**	*<0.5*	*<0.5*	**1.2**	*<0.5*	**1.2**	**7.1**
27	Oct-13	**350**	**200**	*<0.5*	*<0.5*	**0.92**	*<0.5*	**0.92**	*<2.0*
28	Dec-13	**290**	**210**	*<0.5*	*<0.5*	**0.68**	*<0.5*	**0.68**	**2.5**
29	Mar-14	*<50*	**62**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	**2.8**
30	Jun-14	**2,300**	**190**	*<0.5*	*<0.5*	**0.65**	*<0.5*	**0.65**	*<2.0*
31	Sep-14	**2,500**	**130**	*<0.5*	**6.8**	**26**	*<0.5*	**32.8**	*<2.0*
32	Mar-15	*<50*	*<49*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*
33	Sep-15	*<50*	**91**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*
34	Dec-15	*<50*	*<49*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*2.1*
35	Mar-16	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*
36	Sep-16	*<50*	**58**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*

HISTORICAL SURFACE WATER ANALYTICAL RESULTS
REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CALIFORNIA
(all concentrations in ug/L, equivalent to parts per billion [ppb])

Surface Water Sampling Location SW-1 (Upstream of Contaminated Groundwater Discharge Location SW-2)

Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Feb-94	**50**	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
2	May-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
3	May-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
4	Aug-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
5	Dec-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
6	Feb-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
7	Aug-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
8	Dec-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
9	Feb-98	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
10	Sep-98	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
11	Apr-99	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*

Sampling at this location discontinued after April 1999 with Alameda County Health Services Agency approval.

Surface Water Sampling Location SW-2 (Area of Historical Contaminated Groundwater Discharge)

Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Feb-94	**130**	*< 50*	**1.9**	*< 0.5*	**4.4**	**3.2**	**9.5**	*NA*
2	May-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
3	Aug-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
4	May-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
5	Aug-96	**200**	*< 50*	**7.5**	*< 0.5*	**5.4**	*< 0.5*	**13**	*NA*
6	Dec-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
7	Feb-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
8	Aug-97	**350**	**130**	**13**	**0.89**	**19**	**11**	**44**	*NA*
9	Dec-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
10	Feb-98	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
11	Sep-98	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
12	Apr-99	**81**	*<50*	**2.0**	*< 0.5*	**2.5**	**1.3**	**5.8**	**2.3**
13	Dec-99	**1,300**	**250**	**10**	**1.0**	**47**	**27**	**85**	**2.2**
14	Sep-00	**160**	**100**	**2.1**	*< 0.5*	**5.2**	**1.9**	**9.2**	**3.4**
15	Jan-01	*< 50*	*< 50*	*< 0.5*	*< 0.5*	**0.53**	*< 0.5*	**0.5**	*< 2.0*
16	Apr-01	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
17	Sep-01	**440**	**200**	**2.1**	*< 0.5*	**17**	**1.3**	**20**	**10**
18	Dec-01	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
19	Mar-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
20	Jun-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
21	Sep-02	**220**	**590**	**10**	*< 0.5*	**13**	*< 0.5*	**23**	*< 2.0*
22	Dec-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
23	Mar-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	**0.56**	*< 0.5*	**0.56**	**2.8**
24	Jun-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
25	Sep-03	**190**	**92**	**2.1**	*< 0.5*	**4.2**	*< 0.5*	**6.3**	*< 2.0*
26	Dec-03	**86**	*< 100*	*< 0.3*	*< 0.3*	*< 0.3*	*< 0.6*	*<0.6*	*< 5.0*
27	Mar-04	*<50*	*<100*	*<0.3*	*<0.3*	**1.1**	*<0.6*	**1.1**	*< 5.0*
28	Jun-04	*<50*	*<50*	*<0.5*	*<0.5*	**0.83**	*<0.5*	**0.83**	*< 2.0*
29	Sep-04	**260**	**370**	**4.4**	*<0.5*	**6.3**	*< 1.0*	**11**	*< 2.0*
30	Dec-04	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*1.0*	*< 2.0*
31	Mar-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
32	Jun-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
33	Sep-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
34	Dec-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
35	Mar-06	*<50*	**62**	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
36	Jun-06	*<50*	**110**	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
37	Sep-06	**62**	**94**	*<0.5*	*<0.5*	**0.81**	*<0.5*	**0.8**	*< 2.0*
38	Dec-06	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
39	Mar-07	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
40	Jun-07	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<1.0*	*<2.0*
41	Sep-07	*<50*	**77**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	<1.0	*<2.0*
42	Dec-07	**130**	**430**	*<0.5*	*<0.5*	**1.5**	*<0.5*	**1.5**	*<2.0*
43	Mar-08	*<50*	**130**	*<0.5*	*<0.5*	*<0.5*	**0.61**	**0.61**	*<2.0*
44	Jun-08	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
45	Sep-08	**530**	**690**	*<0.5*	*<0.5*	**4.3**	*<0.5*	**4.3**	*<2.0*
46	Dec-08	*<50*	**83**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*

Surface Water Sampling Location SW-2 Continued

47	Mar-09	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<1.0*	*<2.0*
48	Jun-09	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
49	Sep-09	**110**	**220**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
50	Dec-09	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
51	Mar-10	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
52	Jun-10	*<50*	**240**	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
53	Sep-10	*<50*	**66**	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
54	Dec-10	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*NA*
55	Mar-11	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*NA*
56	Sep-11	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*NA*
57	Mar-12	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
58	Sep-12	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
59	Mar-13	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
60	Oct-13	*<50*	**930**	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	**4.8**
61	Mar-14	*<50*	<49	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
62	Sep-14	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
63	Mar-15	*<50*	<51	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
64	Sep-15	*NS*	NS	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
65	Mar-16	*<50*	<50	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
66	Sep-16	*NS*	NS	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*

Surface Water Sampling Location SW-3 (Downstream of Contaminated Groundwater Discharge Location SW-2)									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	May-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
2	Aug-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
3	May-96	*< 50*	**74**	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
4	Aug-96	**69**	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
5	Dec-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
6	Feb-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
7	Aug-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
8	Dec-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
9	Feb-98	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
10	Sep-98	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
11	Apr-99	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
12	Dec-99	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
13	Sep-00	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
14	Jan-01	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
15	Apr-01	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
16	Sep-01	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*< 0.5*	*NS*
17	Dec-01	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
18	Mar-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
19	Jun-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**2.4**
20	Sep-02	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
21	Dec-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
22	Mar-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
23	Jun-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
24	Sep-03	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
25	Dec-03	**60**	*< 100*	*< 0.3*	*< 0.3*	*< 0.3*	*< 0.6*	*<0.6*	*< 5.0*
26	Mar-04	*<50*	*<100*	*<0.3*	*<0.3*	*<0.6*	*<0.6*	*<0.6*	*< 5.0*
27	Jun-04	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
28	Sep-04	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
29	Dec-04	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
30	Mar-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
31	Jun-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
32	Sep-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
33	Dec-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
34	Mar-06	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
35	Jun-06	*<50*	**120**	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
36	Sep-06	*<50*	**120**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*0.5*	**7.8**
37	Dec-06	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
38	Mar-07	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	**3.3**
39	Jun-07	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*0.5*	*<2.0*
40	Sep-07	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
41	Dec-07	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
42	Mar-08	*<50*	**200**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
43	Jun-08	*<50*	**55**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
44	Sep-08	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
45	Dec-08	*<50*	**360**	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<2.0*
46	Mar-09	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*0.5*	*<2.0*
47	Jun-09	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<2.0*
48	Sep-09	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
49	Dec-09	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
50	Mar-10	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
51	Jun-10	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
52	Sep-10	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
53	Dec-10	*<50*	*<50*	*<0.5*	**0.57**	*<0.5*	**0.81**	**1.4**	*NA*
54	Mar-11	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*NA*
55	Sep-11	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*NA*
57	Mar-12	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
58	Sep-12	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
59	Mar-13	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
60	Oct-13	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
61	Mar-14	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
62	Sep-14	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
63	Mar-15	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
64	Sep-15	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
65	Mar-16	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
66	Sep-16	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*

NS = Not Sampled (no surface water present during sampling event)