RO246

STELLAR ENVIRONMENTAL SOLUTIONS, INC.
2198 SIXTH STREET, BERKELEY, CA 94710
TEL: 510.644.3123 ★ FAX: 510.644.3859

TRANSMITTAL MEMORANDUM	
TO: ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY DEPT. OF ENVIRONMENTAL HEALTH HAZARDOUS MATERIALS DIVISION 1131 HARBOR BAY PKWY, SUITE 250 ALAMEDA, CA 94502	DATE: OCTOBER 15, 2004 Alameda County OCT 18 2004 Environmental Health
ATTENTION: MR. SCOTT SEERY	FILE: SES-2004-02
SUBJECT: REDWOOD REGIONAL PARK FUEL LEAK SITE	
WE ARE SENDING: ☒ HEREWITH	☐ UNDER SEPARATE COVER
☒ VIA MAIL	☐ VIA
THE FOLLOWING: THIRD QUARTER 2004 GROUNDWATER MONITORING REPORT FOR REDWOOD REGIONAL PARK SERVICE YARD SITE – OAKLAND, CALIFORNIA (DATED OCTOBER 15, 2004)	
☐ AS REQUESTED	☐ FOR YOUR APPROVAL
☐ FOR REVIEW	☒ FOR YOUR USE
☐ FOR SIGNATURE	☒ FOR YOUR FILES
COPIES TO: N. FUJITA (EBRPD) C. WILCOX (CA FISH & GAME) R. BREWER (REGIONAL BOARD)	BY: Bruce Rucker

STELLAR
ENVIRONMENTAL SOLUTIONS, INC.

2198 SIXTH STREET, SUITE 201-BERKELEY, CA 94710
TEL: (510)644-3123 · FAX: (510)644-3859
GEOSCIENCE & ENGINEERING CONSULTING

October 15, 2004

Mr. Scott O. Seery
Hazardous Materials Specialist
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Subject: Third Quarter 2004 Site Monitoring Report
Redwood Regional Park Service Yard Site – Oakland, California

Dear Mr. Seery:

Attached is the referenced Stellar Environmental Solutions, Inc. (SES) 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 (Alameda County Health), the Regional Water Quality Control Board, and the California Department of Fish and Game.

This report summarizes groundwater and surface monitoring and sampling activities conducted in September 2004 (Third Quarter 2004) and makes recommendations for future corrective action measures. Following the conclusion of the First Quarter 2004 event, the EBRPD and Alameda County Health agreed to proceed with a bioventing pilot test and full-scale bioventing system design, with full-scale implementation when the technical feasibility and design specifications are confirmed. Those activities will be reported in separate (from ongoing groundwater and surface water monitoring quarterly reports) technical submittals, with salient summary discussions in ongoing quarterly groundwater monitoring reports.

If you have any questions regarding this report, please contact Mr. Neal Fujita of the EBRPD, or contact us directly at (510) 644-3123.

Sincerely,

Bruce M. Rucker

Bruce M. Rucker, R.G., R.E.A.
Project Manager

REGISTERED GEOLOGIST
BRUCE M. RUCKER
No. 6814
Exp. 9/06
STATE OF CALIFORNIA

Richard S. Makdisi, R.G., R.E.A.
Principal

cc: Michael Rugg, California Department of Fish and Game
Roger Brewer, California Regional Water Quality Control Board
Neal Fujita, East Bay Regional Park District

THIRD QUARTER 2004
SITE MONITORING REPORT

REDWOOD REGIONAL PARK
SERVICE YARD
OAKLAND, CALIFORNIA

Prepared for:

EAST BAY REGIONAL PARK DISTRICT
P.O. BOX 5381
OAKLAND, CALIFORNIA 94605

Prepared by:

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

October 15, 2004

Project No. 2004-02

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLES AND FIGURES

Tables **Page**

Figures **Page**

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 site investigations and remediation since 1993 to address subsurface contamination caused by leakage from one or both of two former underground fuel storage tanks (UFSTs) that contained gasoline and diesel fuel. The Alameda County Department of Environmental Health (Alameda County Health) has provided regulatory oversight of the investigation since its inception. Other regulatory agencies with historical involvement in site review include the Regional Water Quality Control Board (RWQCB) and the California Department of Fish and Game (CDFG).

OBJECTIVES AND SCOPE OF WORK

This report discusses the following activities conducted/coordinated by Stellar Environmental Solutions, Inc. (SES) between July 1 and September 30, 2004:

- Collecting water levels in site wells to determine shallow groundwater flow direction;
- Sampling site wells for contaminant analysis and natural attenuation indicators; and
- Collecting surface water samples for contaminant analysis.

In the current quarter, SES also implemented a bioventing pilot test. A full discussion of the bioventing program will be presented in a separate bioventing-specific technical report.

HISTORICAL CORRECTIVE ACTIONS AND INVESTIGATIONS

Previous SES reports have provided a full discussion of previous site remediation and investigations; site geology and hydrogeology; residual site contamination; conceptual model for contaminant fate and transport; and evaluation of hydrochemical trends and plume stability. Section 7.0 (References and Bibliography) of this report provides a listing of all technical reports for the site. The following is a summary of the general phases of site work:

- ***April through June 1993.*** Two site UFSTs and 600 cubic yards of contaminated soil were removed, and excavation confirmation soil samples were collected.

- ***September and October 1993.*** An initial site characterization was conducted, including advancing and sampling 17 exploratory boreholes.
- ***February 1994.*** Initial soil and surface water samples were collected along Redwood Creek.
- ***October and November 1994.*** Six groundwater monitoring wells (MW-1 through MW-6) were installed, and the initial groundwater monitoring event was conducted.
- ***April 1999.*** Ten exploratory boreholes (HP-01 through HP-10) were drilled and sampled. The first of two instream bioassessment events was conducted in Redwood Creek.
- ***January 2000.*** The second of two instream bioassessment events was conducted in Redwood Creek.
- ***October 2000.*** A Site Feasibility Study was conducted.
- ***December 2000.*** Two groundwater monitoring wells (MW-7 and MW-8) were installed and added to the quarterly groundwater monitoring program.
- ***September 2001.*** Three groundwater monitoring wells (MW-9 through MW-11) were installed and added to the quarterly groundwater monitoring program. The first of two ORC™ injection phases (as a corrective action) was conducted, including the injection of 3,000 pounds of ORC™ slurry in 44 boreholes.
- ***July 2002.*** The second of two ORC™ injection phases (as a corrective action) was conducted, including the injection of 1,000 pounds of ORC™ slurry in 30 boreholes.
- ***September 2003.*** Eight exploratory boreholes were installed and sampled.
- ***June 2004.*** One vent well and three vapor monitoring points for the bioventing pilot test were installed.
- ***September 2004.*** The bioventing pilot test was conducted.

Including the current event, a total of 31 quarterly groundwater monitoring events have been conducted on a quarterly basis since inception (November 1994), and a total of 11 groundwater monitoring wells are currently available for monitoring.

RELATED SITE ACTIVITIES

The EBRPD has proposed to implement bioventing as a corrective action to mitigate residual site contamination. In May 2004, Alameda County Health approved conducting a bioventing pilot test to evaluate the feasibility of this strategy. The bioventing approach included installing (in June 2004) bioventing pilot test wells (one vent well and three vapor monitoring points), conducting soil sampling during well installations, and measuring water levels at installed wells.

SITE DESCRIPTION

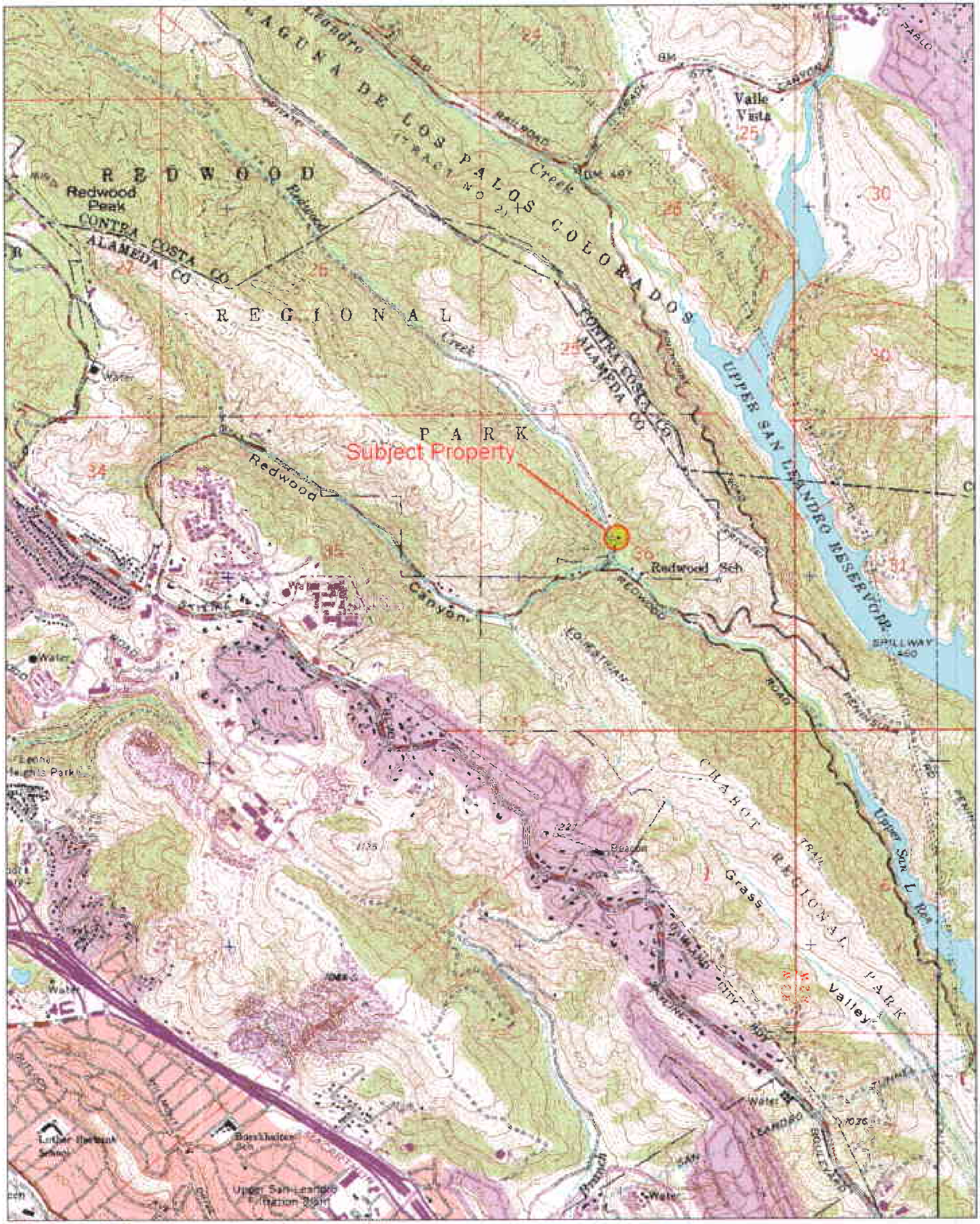
Figure 1 shows the location of the project site. The site slopes to the west, from an elevation of approximately 564 feet above mean sea level (amsl) at the eastern edge of the service yard to approximately 545 feet amsl at Redwood Creek, which defines the approximate western edge of the project site with regard to this investigation. Figure 2 shows the site plan.

REGULATORY OVERSIGHT

The lead regulatory agency for the site investigation and remediation is Alameda County Health, with oversight provided by the RWQCB. CDFG is also involved with regard to water quality impacts to Redwood Creek. All workplans and reports are submitted to these agencies.

Historical Alameda County Health-approved revisions to the groundwater sampling program have included: 1) discontinuing hydrochemical sampling and analysis in wells MW-1, MW-3, MW-5, and MW-6; 2) discontinuing creek surface water sampling at upstream location SW-1; and 3) reducing the frequency of creek surface water sampling from quarterly to semi-annually (Alameda County Health, 1996). EBRPD has pro-actively elected not to implement the latter-approved revision due to continued concern over potential impacts to Redwood Creek.

Since 2001, Electronic Data Format (EDF) groundwater analytical results, well construction and water level data, and site maps have been successfully uploaded to the State Water Resources Control Board's GeoTracker database, in accordance with that agency's requirements for EDF submittals.



N

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

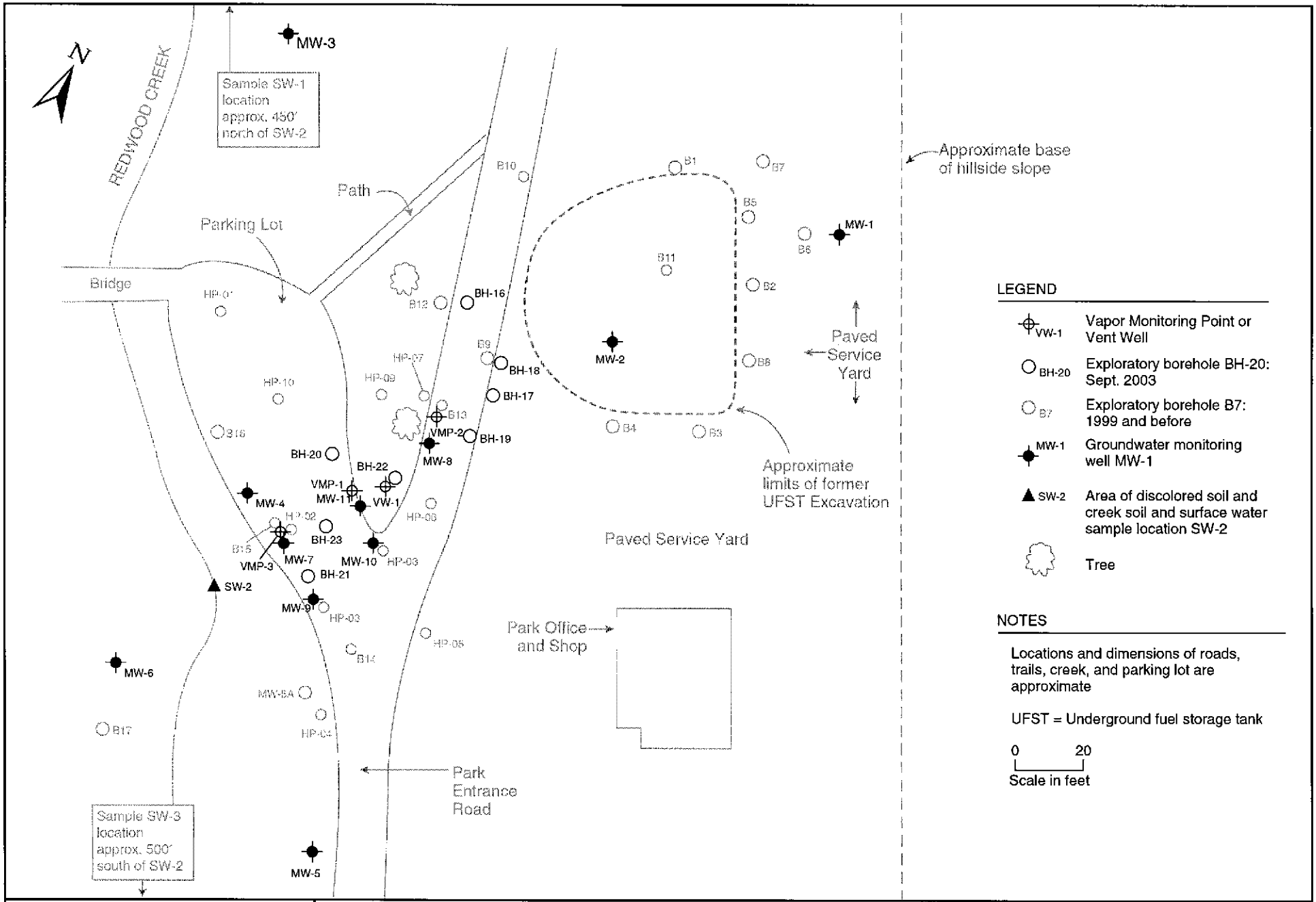
Redwood Reg. Park Service Yard
Oakland, CA

By: MJC | APRIL 2004

Figure 1

★ Stellar Environmental Solutions, Inc.
Geoscience & Engineering Consulting

2004-02-01



Stellar Environmental Solutions, Inc.
Geoscience & Engineering Consulting

SITE PLAN AND HISTORICAL SAMPLING LOCATIONS
Redwood Regional Park Service Yard, Oakland, CA

Figure 2

by: MJC | OCTOBER 2004

2004-02-13

2.0 PHYSICAL SETTING

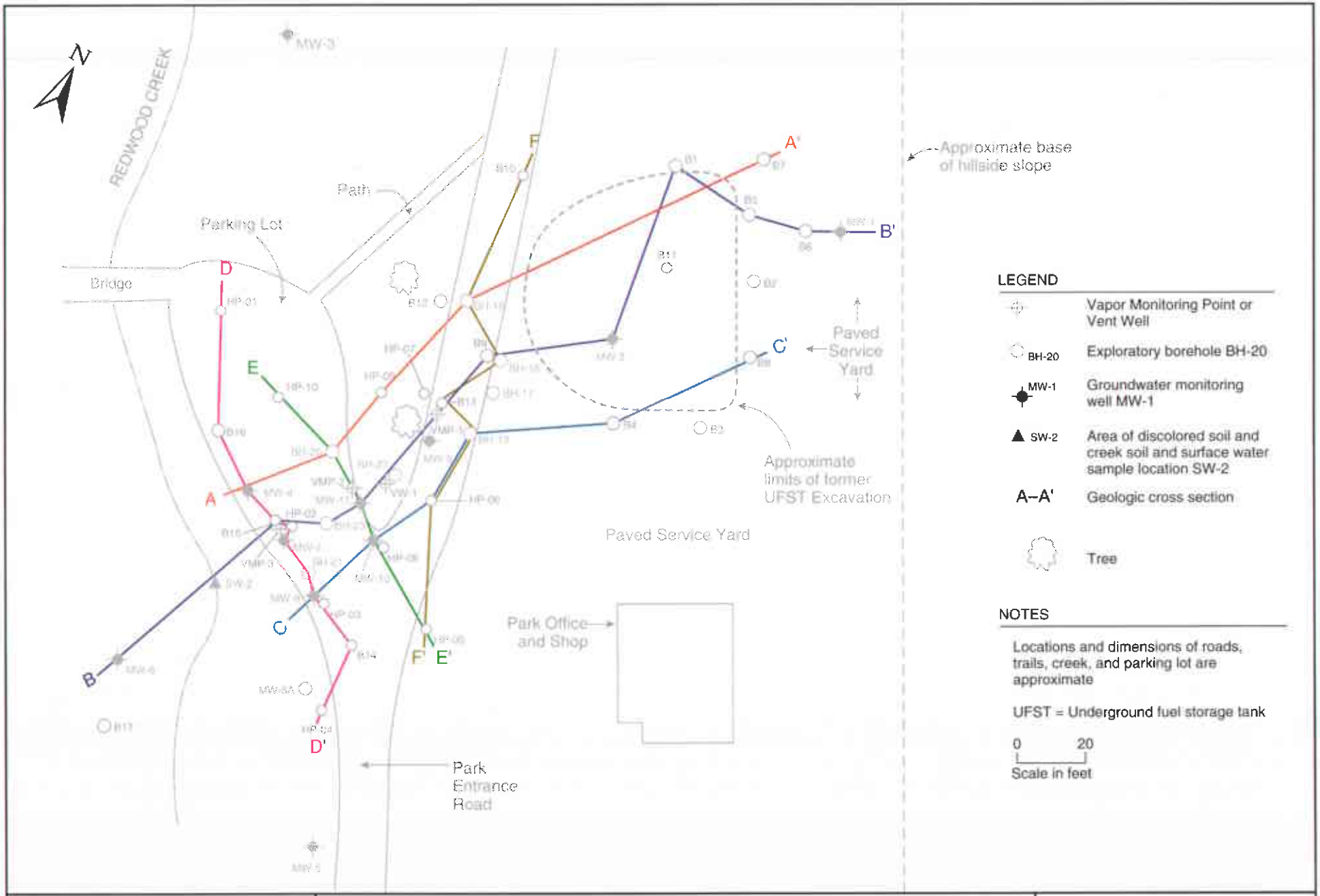
This section discusses the site hydrogeologic conditions based on geologic logging and water level measurements collected at the site since September 1993. Previous SES reports have included detailed discussions of site lithologic and hydrogeologic conditions. Alameda County Health requested via email (in May 2004) that additional evaluation of site lithology be conducted, specifically the preparation of multiple geologic cross-sections parallel to and perpendicular to the contaminant plume's long axis.

SITE LITHOLOGY

Figure 3 shows the location of geologic cross-sections. Figure 4 shows three sub-parallel geologic cross-sections (A-A' through C-C') along the long axis of the groundwater contaminant plume (i.e., along local groundwater flow direction). Figure 5 shows three sub-parallel geologic cross-sections (D-D' through F-F') roughly perpendicular to groundwater direction. In each figure, the three sub-parallel sections are presented together for ease of comparison. Due to the small scale, these sections show only lithologic conditions (i.e., soil type and bedrock depth). Additional information on water level depths, historical range of water levels, and inferred thickness of soil contamination) were presented in a previous report (SES, 2004c) for cross-section B-B'.

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 SES report (SES, 2004c) presented a bedrock surface isopleth map (elevation contours for the top of the bedrock surface) in the contaminant plume area. That isopleth map and Figures 4 and 5 indicate the following. 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 shows a gentle east-to-west slope in the downgradient portion of the site (under the gravel parking area) toward Redwood Creek. This general gradient corresponds to the local groundwater flow direction. On the southern side of the plume area, bedrock slopes gently



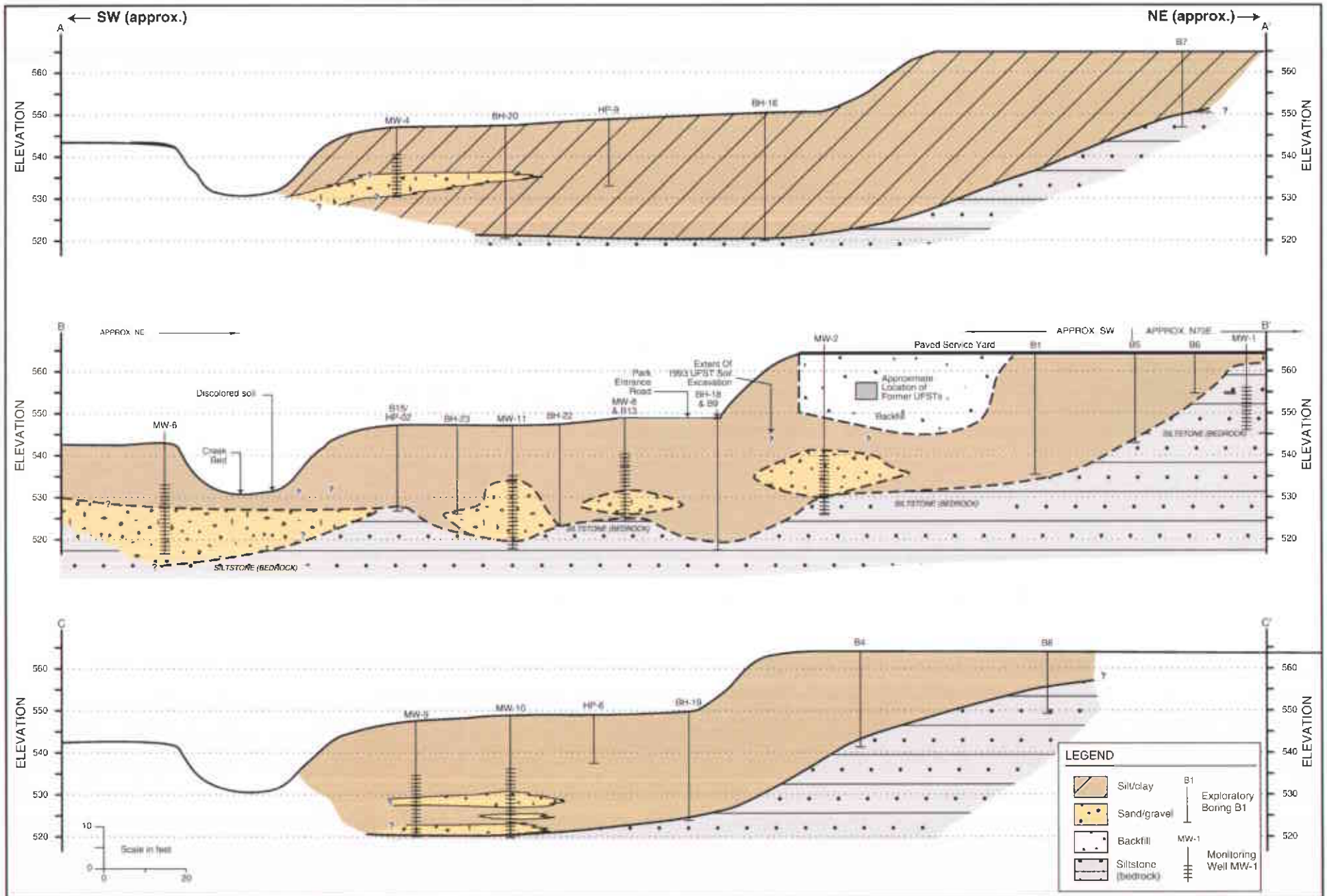
Stellar Environmental Solutions, Inc.
Geoscience & Engineering Consulting

GEOLOGIC CROSS-SECTION LOCATIONS
Redwood Regional Park Service Yard, Oakland, CA

Figure 3

by: MJC | JULY 2004

2003-02-44



Stellar Environmental Solutions, Inc.
Geoscience & Engineering Consulting

GEOLOGIC CROSS SECTIONS — A-A' through C-C'
Redwood Regional Park Service Yard, Oakland, CA

Figure 4

by: MJC

JULY 2004

2003-02-45

Stellar Environmental Solutions, Inc.
Geoscience & Engineering Consulting

GEOLOGIC CROSS SECTIONS — D-D' through F-F'
Redwood Regional Park Service Yard, Oakland, CA

Figure 5

by: MJC | JULY 2004

2003-02-46

from south to north (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 (see Cross Section F-F') and at downgradient location B15/HP-02 (see Cross-Section B-B'). Intervening elevation lows create troughs which trend north-south in the central portion of the plume, and east-west in the downgradient portion of the plume.

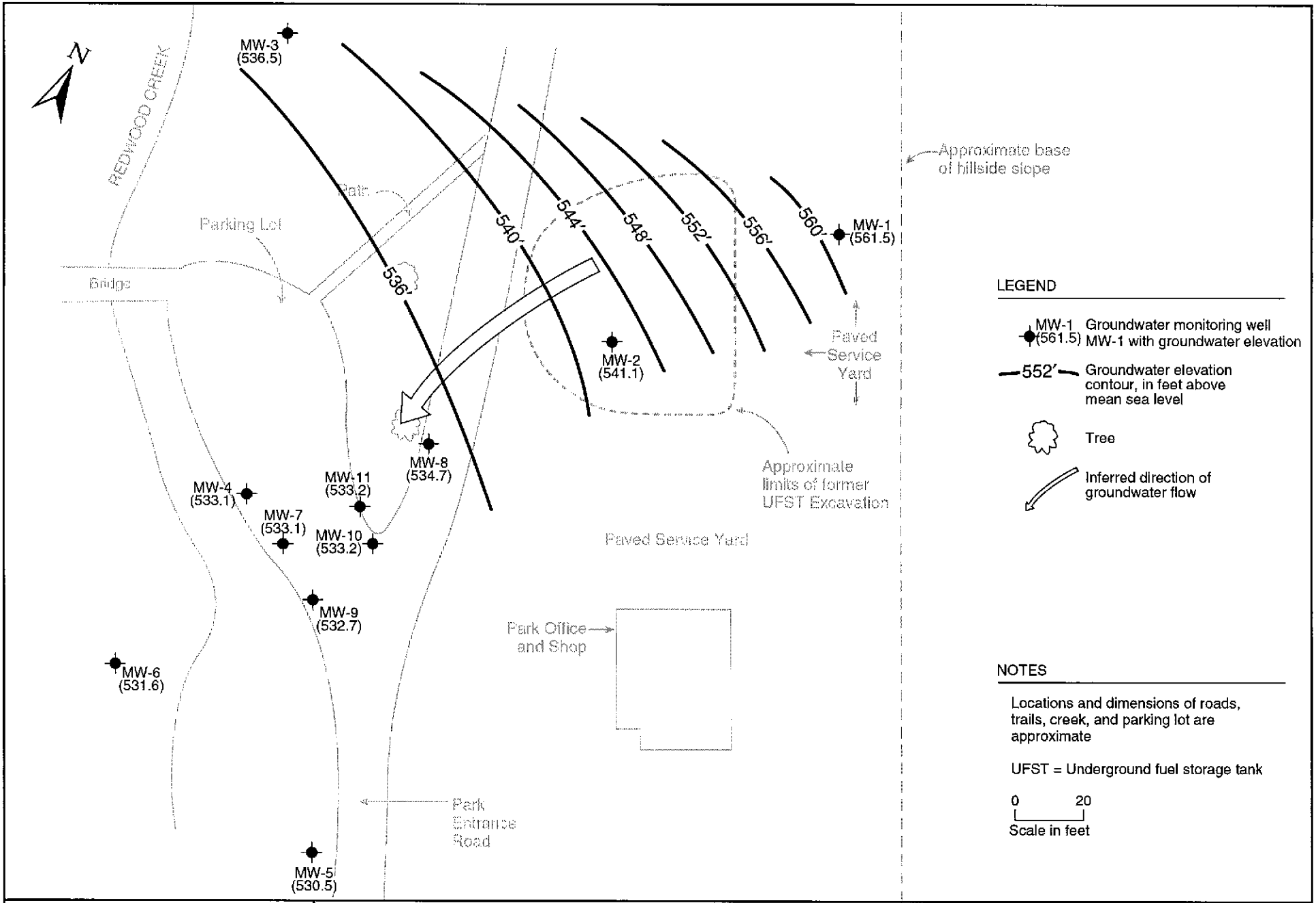
The bedrock surface (and overlying unconsolidated sediment lithology) suggest that the bedrock surface may have at one time undergone channel erosion from a paleostream(s) flowing sub-parallel to present-day Redwood Creek. Because groundwater flows in the unconsolidated sediments that directly overlie 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), and 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 which 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.

Figure 6 is a groundwater elevation map constructed from the current event monitoring well static water levels. Table 1 (in Section 3.0) summarizes current event groundwater elevation data. Appendix A contains historical groundwater elevation data. Consistent with the bedrock isopleth map showing an elevation depression in the vicinity of MW-11, historical groundwater elevations in MW-11 are generally lower than in the surrounding area. As discussed in the previous sub-section, local groundwater flow direction is likely more variable than expressed by groundwater monitoring well data, due to localized bedrock surface topography.

In the upgradient portion of the site (between well MW-1 and the former UFST source area, in landslide debris), the groundwater gradient is approximately 0.2 feet per foot. Downgradient from



Stellar Environmental Solutions, Inc.
Geoscience & Engineering Consulting

GROUNDWATER ELEVATION MAP–SEPTEMBER 21, 2004
Redwood Regional Park Service Yard, Oakland, CA

Figure 6

by: MJC | OCTOBER 2004

2004-02-11

(west of) the UFST source area (between MW-2 and Redwood Creek), the groundwater gradient is approximately 0.1 feet per foot. 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.

We assume a site groundwater velocity at 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 likely conservatively low, but does meet minimum-distance-traveled criteria from the date when contamination was first observed in Redwood Creek (1993) relative to when the USTs were installed in the late 1970s. However, locally, the groundwater velocity could vary significantly. To calculate the specific hydraulic conductivity critical to an accurate site-specific groundwater velocity estimate 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 the 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.

3.0 Q3 2004 GROUNDWATER AND SURFACE WATER MONITORING EVENT ACTIVITIES

This section presents the creek surface water and groundwater sampling and analytical methods for the most recent groundwater monitoring event (Q3 2004) in September 2004. Groundwater and surface water analytical results are summarized in Section 5.0. Monitoring and sampling protocols were in accordance with the Alameda County Health-approved SES technical workplan (SES, 1998a). Current event activities included:

- Measuring static water levels and field analyzing pre-purge groundwater samples for indicators of natural attenuation (dissolved oxygen, ferrous iron, and redox potential) in all 11 site wells;
- Collecting pre-purge groundwater samples for laboratory analysis of the natural attenuation indicators nitrate and sulfate from monitoring wells MW-3, MW-4, MW-7, MW-8, MW-9, MW-10, and MW-11;
- Collecting post-purge groundwater samples for laboratory analysis of site contaminants from wells located within (or potentially within) the groundwater plume (MW-2, MW-4, MW-5, MW-7, MW-8, MW-9, MW-10, and MW-11); and
- Collecting Redwood Creek surface water samples for laboratory analysis from location SW-2. Downstream location SW-3 was not sampled in the current event, as there was no water in the creek in the vicinity of this location.

Creek sampling and groundwater monitoring/sampling was conducted on September 21, 2004. Creek sampling was conducted by the SES project manager. The locations of all site monitoring wells and creek water sampling locations are shown on Figure 2 (in Section 1.0). Well construction information and water level data are summarized in Table 1. Appendix B contains the groundwater monitoring field records for the current event.

GROUNDWATER LEVEL MONITORING AND SAMPLING

Groundwater monitoring well water level measurements, purging, sampling, and field analyses were conducted by Blaine Tech Services under the supervision of SES personnel. Groundwater sampling

Table 1
Groundwater Monitoring Well Construction and
Groundwater Elevation Data – September 21, 2004 Monitoring Event
Redwood Regional Park Corporation Yard, Oakland, California

Well	Well Depth	Screened Interval	TOC Elevation	Groundwater Depth [a]	Groundwater Elevation [b]
MW-1	18	7 to 17	565.9	4.40	561.5
MW-2	36	20 to 35	566.5	25.43	541.1
MW-3	42	7 to 41	560.9	24.41	536.5
MW-4	26	10 to 25	548.1	14.98	533.1
MW-5	26	10 to 25	547.5	17.05	530.5
MW-6	26	10 to 25	545.6	14.00	531.6
MW-7	24	9 to 24	547.7	14.64	533.1
MW-8	23	8 to 23	549.2	14.52	534.7
MW-9	27	12 to 27	549.4	16.77	532.7
MW-10	28	13 to 28	547.3	14.18	532.2
MW-11	26	11 to 26	547.9	14.64	533.2

Notes:

[a] Depths are in feet relative to top of well casing.

[b] All elevations are relative to top of well casing, and are expressed as feet above USGS mean sea level. Elevations of wells MW-1 through MW-6 were surveyed by EBRPD relative to USGS Benchmark No. JHF-49. Wells MW-7 through MW-11 were surveyed by a licensed land surveyor using existing site wells as datum.

TOC = Top of casing.

Wells MW-1 through MW-6 are 4-inch-diameter; all other wells are 2-inch-diameter.

was conducted in accordance with State of California guidelines for sampling dissolved analytes in groundwater associated with leaking UFSTs (RWQCB, 1989), and followed the methods and protocols approved by Alameda County Health in the SES 1998 workplan (SES, 1998a).

As the first task of the monitoring event, static water levels were measured using an electric water level indicator. Pre-purge groundwater samples were then collected for field and laboratory analysis of natural attenuation indicators. 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, and electrical conductivity) 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 quarter).

The well development, purge water, and decontamination rinseate (approximately 100 gallons) from the current event was containerized in the onsite plastic tank. Purge water from future events will continue to be accumulated in the onsite tank until it is full, at which time the water will be transported offsite for proper disposal.

CREEK SURFACE WATER SAMPLING

Surface water sampling was conducted by SES on September 21, 2004. A surface water sample was collected from Redwood Creek location SW-2 (immediately downgradient of the former UFST source area and within the area of documented creek bank soil contamination). Downstream sampling location SW-3 (approximately 500 feet downstream of the SW-2 location) was not sampled as no surface water was present in the vicinity of that location. In accordance with a previous Alameda County Health-approved SES recommendation, upstream sample location SW-1 is no longer part of the surface water sampling program.

At the time of sampling, the creek was stagnant (no discernible flow) and water was present locally in pools approximately 6 to 12 inches deep. In the vicinity of SW-2 and immediately downstream, where contaminated groundwater discharge to the creek historically has been observed, an orange organic mat (inferred to be iron-fixing bacteria) was observed growing on the saturated portion of the creek bank. There was a slight petroleum sheen, but no petroleum odor was observed. It is likely that the bacteria are utilizing the petroleum as a carbon source, and that the observed sheen is an indicator of the presence of petroleum contamination.

4.0 REGULATORY CONSIDERATIONS

The following is a summary of regulatory considerations regarding surface water and groundwater contamination. There are no Alameda County Health or RWQCB cleanup orders for the site, although all site work has been conducted under oversight of these agencies.

GROUNDWATER CONTAMINATION

As specified in the RWQCB's *San Francisco Bay Region Water Quality Control Plan*, all groundwaters are considered potential sources of drinking water unless otherwise approved by the RWQCB, 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), RWQCB approval for this exclusion has not been obtained for the site. As summarized in Table 4 (Section 5.0), site groundwater contaminant levels are compared to two sets of criteria: 1) RWQCB Tier 1 Environmental Screening Levels (ESLs) for sites where groundwater is a current or potential drinking water source; and 2) ESLs for sites where groundwater is not a current or potential drinking water source.

As stipulated in the ESL document (July 2003), 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, Alameda County Health 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 4 (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. EPA, and U.S. Department of Energy. These screening criteria address chronic and acute exposures to aquatic life. As discussed in the RWQCB's ESL document, 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 macroinvertebrate 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-4, MW-7, and MW-9).

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 screening level 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.

5.0 MONITORING EVENT ANALYTICAL RESULTS

This section presents the field and laboratory analytical results of the most recent monitoring event. Table 2 summarizes the contaminant analytical results of the current monitoring event, and Table 3 summarizes natural attenuation indicator results from the current event. Figure 7 shows the current event 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 for the current event. Appendix D contains a summary of historical groundwater and surface analytical results.

CURRENT EVENT GROUNDWATER AND SURFACE WATER RESULTS

Current quarter site groundwater contaminant concentrations exceed their respective groundwater ESLs (for both cases in which the drinking water resource is and is not threatened)—with the exception of toluene and MTBE, which do not exceed their respective values for groundwater that is not a drinking source. Maximum site groundwater contaminant concentrations also exceed all surface water screening levels, with the exception of toluene and MTBE.

Maximum or near maximum groundwater contaminant concentrations were detected in wells MW-7 and MW-9 (adjacent to the creek bed) as well as in well MW-11 (located between the former source area and well MW-7). Somewhat lower concentrations were detected in MW-8 (located approximately half the distance between the former source area and the creek). The northern and southern edges of the plume in the downgradient area of the plume appear to be well defined by wells MW-4 and MW-10.

The surface water sample collected from location SW-2 had detectable concentrations of total volatile hydrocarbons as gasoline (TVHg) (260 µg/L), total extractable hydrocarbons as diesel (TEHd) (370 µg/L), benzene (4.4 µg/L), and ethylbenzene (6.3 µg/L). Only the concentration of TEHd exceeds the established regulatory surface water screening levels.

CURRENT EVENT NATURAL ATTENUATION PARAMETERS RESULTS

Pre-purge groundwater samples from selected wells were collected and analyzed for indicators of the natural biodegradation of the hydrocarbon contamination or "natural attenuation." Petroleum hydrocarbons require oxygen to efficiently biodegrade specific constituents. Although biodegradation

Table 2
Groundwater and Surface Water Sample
Analytical Results – September 21, 2004
Redwood Regional Park Corporation Yard, Oakland, California

Compound	Concentrations in µg/L						
	TVHg	TEHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
GROUNDWATER SAMPLES							
MW-2	**200**	*<50*	**23**	*<0.5*	*<0.5*	**0.7**	**16**
MW-4	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<1.0*	*<2.0*
MW-5	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<1.0*	*<2.0*
MW-7	**9,700**	**3,400**	**98**	*<0.5*	**300**	**125**	*<2.0*
MW-8	**2,000**	**360**	**100**	*<2.5*	**180**	**102**	*<10*
MW-9	**7,100**	**1,900**	**160**	**8.1**	**600**	**406**	*<10*
MW-10	*<50*	*<50*	**1.6**	*<0.5*	**1.9**	*<1.0*	**5.8**
MW-11	**7,200**	**2,300**	**340**	*<2.5*	**840**	**75**	*<10*
Groundwater ESLs [a]	100 / 500	100 / 640	1.0 / 46	40 / 130	30 / 290	13 / 13	5 / 1,800
REDWOOD CREEK SURFACE WATER SAMPLES							
SW-2	**260**	**370**	**4.4**	*<0.5*	**6.3**	*<1.0*	*<2.0*
Surface Water Screening Levels [a, b]	500	100	46	130	290	13	8,000

Notes:

[a] RWQCB Environmental Screening Levels (drinking water resource threatened/not threatened) (RWQCB, 2003).

[b] Lowest of chronic and acute surface water criteria published by the State of California, U.S. Environmental Protection Agency, or U.S. Department of Energy.

MTBE = Methyl *tertiary*-butyl ether.

TVHg = Total volatile hydrocarbons - gasoline range.

TEHd = Total extractable hydrocarbons - diesel range.

µg/L = Micrograms per liter, equivalent to parts per billion (ppb).

of hydrocarbons can occur under anaerobic conditions, hydrocarbon biodegradation is most efficient under aerobic conditions. As a result of the demonstrated degradability of petroleum hydrocarbons, remediation by natural attenuation has been found to be a viable option for addressing many hydrocarbon plumes, replacing the need for active remediation.

However, such natural attenuation is successful in remediating plumes only if the concentration of hydrocarbons is low enough and infiltration of natural oxygen is high enough to support the microorganisms for which the contamination is a food source (thus "attenuating" it). The

Table 3
Groundwater Sample Analytical Results
Natural Attenuation Indicators – September 21, 2004
Redwood Regional Park Corporation Yard, Oakland, California

Sample I.D.	Nitrate (as Nitrogen) (mg/L)	Sulfate (mg/L)	Dissolved Oxygen (mg/L)	Ferrous Iron (mg/L)	Redox Potential (milliVolts)
MW-1	NA	*NA*	0.4	0.0	155
MW-2	NA	*NA*	0.3	0.8	-36
MW-3	0.07	35	0.4	0.0	-59
MW-4	0.32	53	13.7	0.0	00
MW-5	NA	*NA*	0.4	0.0	-45
MW-6	NA	*NA*	7.7	3.5	-80
MW-7	*<0.05*	*<1.0*	0.4	4.5	-119
MW-8	*<0.05*	80	0.4	1.8	-93
MW-9	*<0.05*	4.4	0.4	4.4	-109
MW-10	*<0.05*	65	0.3	0.0	12
MW-11	*<0.05*	71	0.2	0.0	-28

Notes:

mg/L = Milligrams per liter, equivalent to parts per million (ppm).

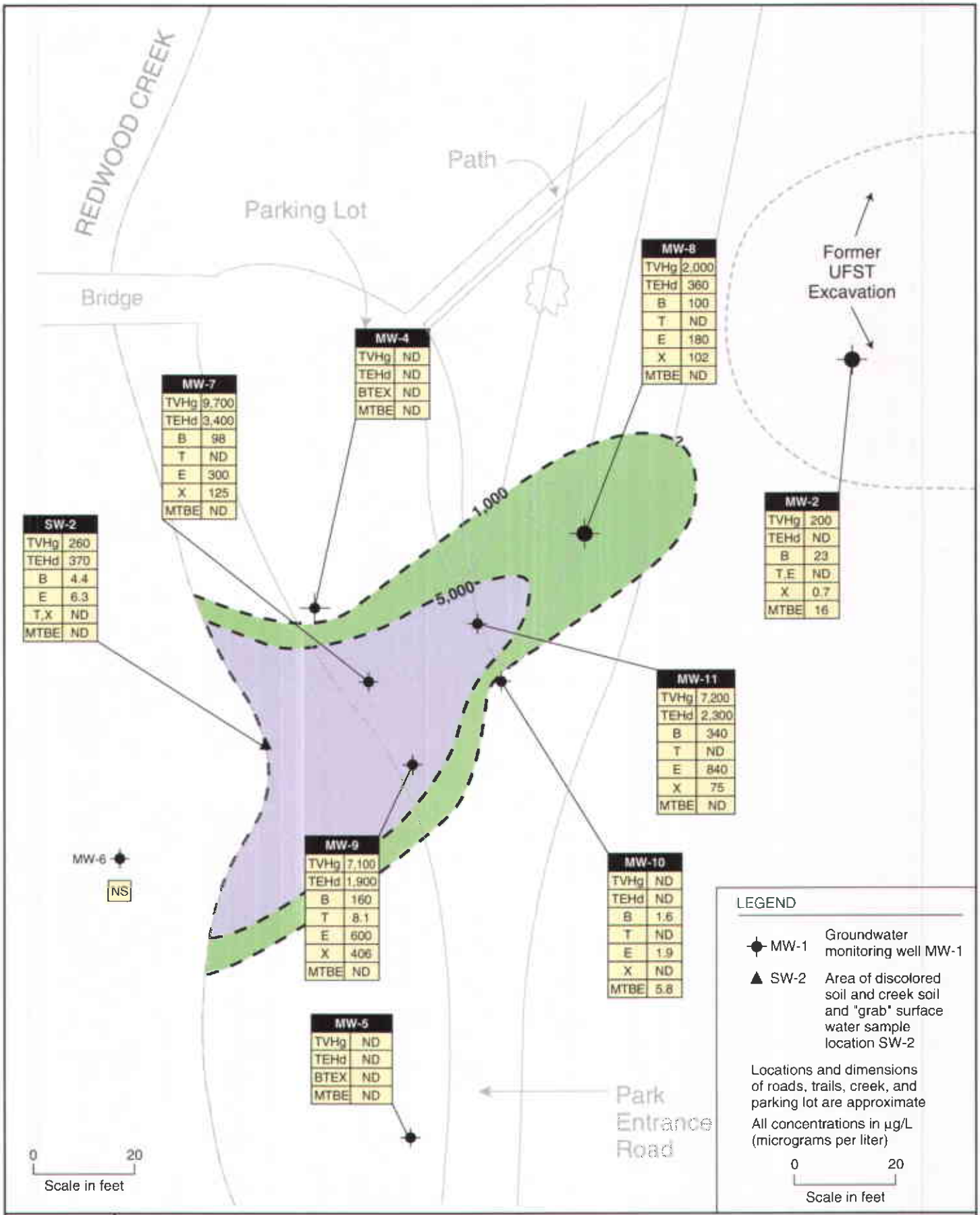
NA = Not analyzed.

concentration in soil or groundwater where natural attenuation alone would be successful in remediating a site is necessarily site-specific and remains the subject of various research studies.

In general, biodegradation of petroleum hydrocarbons in groundwater has a significant role in creating a stable plume and minimizing groundwater contaminant plume extent and concentrations over time. Evidence of the historical occurrence and potential for future occurrence of biodegradation can be obtained from analysis of groundwater for specific biodegradation-indicator parameters, including dissolved oxygen (DO), oxidation-reduction potential (ORP), and general mineral analyses.

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 1 to 2 mg/L of DO in groundwater. During aerobic biodegradation, DO levels are reduced in the



SEPTEMBER 2004 GROUNDWATER RESULTS AND GASOLINE CONTOURS

Redwood Regional Park Oakland, CA	By: MJC	OCTOBER 2004	Stellar Environmental Solutions, Inc. Geoscience & Engineering Consulting
	Figure 7		

2004-02-12

hydrocarbon plume as respiration occurs. Therefore, DO levels that vary inversely to hydrocarbon concentrations are consistent with the occurrence of aerobic biodegradation.

Current monitoring event DO concentrations ranged from 0.2 mg/L to 13.7 mg/L (well MW-4). The elevated DO concentration in MW-4 is likely the result of localized supersaturation resulting from the previous ORC™ injection and the lack of oxygen demand at this well, which is now non-detect for hydrocarbons. The elevated DO concentration in MW-6 is consistent with previous analytical results that indicated hydrocarbon contamination is not present across Redwood Creek. All other monitoring wells show DO concentrations less than 1.0 mg/L, indicating that groundwater is under anaerobic conditions, which is expected when oxygen is currently limiting hydrocarbon biodegradation.

Oxidation-Reduction Potential

The oxidation-reduction potential (ORP, or redox potential) 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, measured relative to the platinum electrode of a direct-read instrument. In oxidizing (aerobic) conditions, the ORP of groundwater is typically greater than +400 mv; in reducing (anaerobic) conditions, the ORP is typically much less than this value and it is not unusual in even moderately-reducing groundwater environments for ORP to be a negative value. Groundwater ORP values inside or a short distance downgradient of a hydrocarbon plume are typically less than those measured upgradient or under background conditions.

For this monitoring event, for the four monitoring wells within the 1,000-μg/L TVHg contour (MW-7, MW-8, MW-9, and MW-11) (see Figure 6 in Section 4.0), ORP values ranged from -119 mV to -28 mV. Other monitoring wells showed generally more positive ORP values ranging from -80 mV to +155 mV. For this monitoring event, the lowest measured ORP values generally corresponded with wells with the highest contaminant concentrations, and the highest ORP values were measured in upgradient, background well MW-1 and at crossgradient well MW-4, where residual ORC™ is likely responsible for supersaturation of DO, as discussed above. These results are consistent with the DO results and indicate that groundwater is anaerobic and moderately- to strongly-reducing.

General Mineral Analyses

The relationship between ferrous iron, nitrate, and sulfate and hydrocarbon concentrations can also be indicative of anaerobic biodegradation and a measurement of the strength of the reducing environment. Specifically, anaerobic degradation of hydrocarbon compounds is indicated when

nitrate concentrations are below background, ferrous iron concentrations are above background, and/or sulfate concentrations are below background.

In the current site monitoring event, for the four wells within the 1,000-µg/L TVHg contour, nitrate was not detected in any of the four wells and ferrous iron concentrations were generally higher than for other monitoring wells (with the exception that no ferrous iron was detected in MW-11, which showed significant hydrocarbon contamination). Sulfate was significantly lower in two of the four wells (at MW-7 and MW-9). These results indicate that anaerobic degradation is likely occurring within the plume now that most, if not all, of the previously-injected ORC™ has been depleted within the existing plume area. The groundwater environment is now moderately- to strongly-reducing (i.e., between the sulfate and iron-reducing conditions). These results are consistent with the DO and ORP data discussed above, supporting the conclusion that oxygen is currently limiting the more efficient aerobic biodegradation process but that some slower degree of anaerobic biodegradation is probably occurring.

Because it appears that the previously-injected ORC™ has been depleted, continued monitoring of the natural attenuation parameters (DO, ORP, nitrate, ferrous iron, and sulfate) is of marginal value until such time as additional corrective actions that would increase oxygen concentrations are implemented (e.g., bioventing).

QUALITY CONTROL SAMPLE ANALYTICAL RESULTS

Laboratory QC samples (e.g., method blanks, matrix spikes, surrogate spikes, etc.) 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).

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 findings.

SUMMARY AND CONCLUSIONS

- Groundwater sampling has been conducted approximately on a quarterly basis since November 1994 (31 events in the original wells). The existing well layout fully constrains the lateral extent of groundwater contamination, and the vertical (lowest) limit is very likely the top of the siltstone bedrock. The saturated interval extends approximately 12 to 15 feet from top of bedrock upward through the capillary fringe.
- Current site groundwater contaminant concentrations exceed their respective groundwater ESLs (both for cases in which the drinking water resource is and is not threatened)—with the exception of toluene and MTBE, of which only MTBE exceeds only the more conservative criterion. Site groundwater contaminant concentrations also exceed all surface water screening levels, with the exception of toluene and MTBE.
- Historical and current event monitoring data indicate that the groundwater contaminant plume has become disconnected from the former source, and has migrated well beyond the former source area (represented by well MW-2) toward Redwood Creek. The area of groundwater contamination in excess of screening level criteria appears to be no greater than 120 feet long by 60 feet wide (at Redwood Creek). The lateral wells MW-4 and MW-10 have shown significant reduction of hydrocarbon contamination since the ORC™ injections. Maximum groundwater concentrations for the majority of the contaminants may have reached the most downgradient wells (just upgradient of the creek), and the plume likely has stabilized (maximum site contaminant concentrations have not increased in recent sampling events).
- Contaminants detected in the current event site surface water (creek samples) include TVHg, TEHd, benzene, and ethylbenzene. The only detected contaminant concentration above the established regulatory surface water screening level was TEHd.
- Hydrochemical (contaminant and natural attenuation parameter) trends indicate that the two ORC™ injection phases (in September 2001 and July 2002) were generally successful in increasing DO levels and reducing groundwater contaminant concentrations, but additional

seasonal dissolved-phase hydrocarbon input eventually causes contaminant concentrations within the centerline of the plume to rebound. Residual groundwater concentrations exceed groundwater and surface water screening-level criteria, and the active life of the previously-injected ORC™ product has been exceeded.

- The available data indicate that continued contaminant mass input is occurring within the centerline portions of the plume and potentially from sources upgradient of MW-8, possibly from residual light non-aqueous phase liquid in the capillary fringe/unsaturated zone. Any additional corrective action to prevent contaminated groundwater discharge to Redwood Creek would be required to address the potential sources of continuing mass input to the plume.
- Continued field and laboratory analysis for indicators of natural attenuation is not warranted, because: 1) natural attenuation appears to be insufficient to mitigate site contamination; and 2) active remediation (bioventing) will likely be implemented. Re-starting analyses for natural attenuation indicators will be appropriate when active remediation measures reduce groundwater concentrations to levels amenable to natural attenuation (likely approximately 6 months after bioventing system startup).
- Four bioventing pilot test wells (one vent well and three vapor monitoring points) were installed in June 2004, and a bioventing pilot test was conducted in September 2004 to determine the feasibility and likely efficacy of bioventing as a corrective action. Those activities will be discussed in a separate technical report, to be submitted after the pilot test is completed.

PROPOSED ACTIONS

EBRPD proposes to implement the following actions to address regulatory concerns:

- Continue the quarterly program of creek and groundwater sampling and reporting for contaminants of concern.
- Discontinue monitoring for natural attenuation parameters (DO, ORP, nitrate, ferrous iron, and sulfate) from subsequent sampling events until such time as the proposed full-scale bioventing system begins to affect groundwater hydrochemistry.
- Prepare and submit to Alameda County Health a bioventing pilot test report including a full-scale system design. The pilot test report would be followed by implementation of a full-scale bioventing system, if the pilot test data support it.

7.0 REFERENCES AND BIBLIOGRAPHY

Parsons Engineering Science (Parsons), 1998. Quarterly Progress Report 11, Redwood Regional Park Service Yard, Oakland, California. January 28.

Parsons, 1997a. Quarterly Progress Report 7, Redwood Regional Park Service Yard, Oakland, California. January 31.

Parsons, 1997b. Quarterly Progress Report 8 and Annual Summary Assessment, Redwood Regional Park Service Yard, Oakland, California. April 4.

Parsons, 1997c. Quarterly Progress Report 9, Redwood Regional Park Service Yard, Oakland, California. June 30.

Parsons, 1997d. Quarterly Progress Report 10, Redwood Regional Park Service Yard, Oakland, California. September 22.

Parsons, 1996a. Quarterly Progress Report 5, Redwood Regional Park Service Yard, Oakland, California. June 6.

Parsons, 1996b. Quarterly Progress Report 6, Redwood Regional Park Service Yard, Oakland, California. September 24.

Parsons, 1995a. Quarterly Progress Report 2, Redwood Regional Park Service Yard, Oakland, California. March 8.

Parsons, 1995b. Quarterly Progress Report 3, Redwood Regional Park Service Yard, Oakland, California. June 23.

Parsons, 1995c. Quarterly Progress Report 4 and Annual Summary Assessment (November 1994 - August 1995), Redwood Regional Park Service Yard, Oakland, California. November 13.

Parsons, 1994a. Creek and Soil Sampling at Redwood Regional Park, Oakland, California. March 2.

Parsons, 1994b. Creek Surface Water at Redwood Regional Park, Oakland, California. May 13.

Parsons, 1994c. Workplan for Groundwater Characterization Program at East Bay Regional Park Service Yard, Oakland, California. August 17.

Parsons, 1994d. Quarterly Progress Report 1, Redwood Regional Park Service Yard, Oakland, California. December 28.

Parsons, 1993a. Closure of Underground Fuel Storage Tanks and Initial Site Characterization at Redwood Regional Park Service Yard, Oakland, California. December 16.

Parsons, 1993b. Workplan for Site Characterization at East Bay Regional Park District, Redwood Regional Park Corporation Yard, Oakland, Alameda County, California. September 3.

Regional Water Quality Control Board, San Francisco Bay Region, 2004. Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater. February.

Stellar Environmental Solutions (SES), 2004a. Year 2003 Annual Summary Report, Redwood Regional Park Service Yard, Oakland, California. January 15.

SES, 2004b. Bioventing Feasibility Letter Report - Redwood Regional Park Service Yard, Oakland, California. February 6.

SES, 2004c. First Quarter 2004 Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. April 14.

SES, 2004d. Second Quarter 2004 Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. July 16.

SES, 2003a. Year 2002 Annual Summary Report, Redwood Regional Park Service Yard, Oakland, California. January 27.

SES, 2003b. First Quarter 2003 Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. May 5.

SES, 2003c. Second Quarter 2003 Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. July 29.

SES, 2003d. Third Quarter 2003 Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. October 3.

SES, 2003e. Letter to Alameda County Health Care Services Agency proposing bioventing as a corrective action remedy at Redwood Regional Park Service Yard, Oakland, California. November 6.

SES, 2002a. First Quarter 2002 Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. April 16.

SES, 2002b. Second Quarter 2002 Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. July 23.

SES, 2002c. Third Quarter 2002 Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. October 14.

SES, 2001a. Monitoring Well Installation and Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. February 8.

SES, 2001b. Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. May 4.

SES, 2001c. Well Installation, Site Monitoring, and Corrective Action Report, Redwood Regional Park Service Yard, Oakland, California. October 26.

SES, 2000a. Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. April 21.

SES, 2000b. Workplan for Groundwater Monitoring Well Installations, Redwood Regional Park Service Yard, Oakland, California. October 19.

SES, 2000c. Site Monitoring Report, Redwood Regional Park Service Yard, Oakland, California. October 19.

SES, 2000d. Site Feasibility Study Report, Redwood Regional Park Service Yard, Oakland, California. October 20.

SES, 1999a. Workplan for Subsurface Investigation, Redwood Regional Park Service Yard, Oakland, California. April 8.

SES, 1999b. Residual Contamination Investigation and Remedial Action Assessment Report, Redwood Regional Park Service Yard, Oakland, California. June 9.

SES, 1998a. Workplan for Continued Site Investigation and Closure Assessment, Redwood Regional Park Service Yard, Oakland, California. October 9.

SES, 1998b. Site Investigation and Closure Assessment Report, Redwood Regional Park Service Yard, Oakland, California. December 4.

State Water Resources Control Board, 1989. Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure. State of California Leaking Underground Fuel Tank Task Force. October.

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 provides neither a certification nor guarantee that the property is free of hazardous substance contamination. This report has been prepared in accordance with generally accepted methodologies and standards of practice. The SES personnel who performed this limited remedial investigation are qualified to perform such investigations and have accurately reported the information available, but cannot attest to the validity of that information. No warranty, expressed or implied, is made as to the findings, conclusions, and recommendations included in the report.

The findings of this report are valid as of the 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 the investigation and remediation completed.

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
TOC Elevation	565.90	566.50	560.90	548.10	547.50	545.60	547.70	549.20	549.40	547.30	547.90
Date Monitored	Groundwater Elevations (feet above mean sea level)										
September 18, 1998	563.7	544.2	540.8	534.5	531.1	545.6					
April 6, 1999	565.2	546.9	542.3	535.6	532.3	532.9					
December 20, 1999	562.9	544.7	541.5	534.9	531.2	532.2					
September 28, 2000	562.8	542.7	538.3	532.2	530.9	532.0					
January 11, 2001	562.9	545.1	541.7	535.0	531.2	532.3	534.9	538.1			
April 13, 2001	562.1	545.7	541.7	535.1	531.5	532.4	535.3	539.8			
September 1, 2001	560.9	542.0	537.7	533.9	530.7	531.8	534.0	535.6			
December 17, 2001	562.2	545.2	542.2	534.8	531.4	532.4	534.8	538.4	534.6	535.7	535.2
March 14, 2002	563.0	547.1	542.2	535.5	532.4	533.3	535.7	541.8	535.0	537.6	536.6
June 18, 2002	562.1	544.7	541.1	534.6	531.2	532.2	534.8	537.9	534.7	535.6	535.3
September 24, 2002	561.4	542.2	537.3	533.5	530.6	531.8	533.5	535.5	535.3	533.8	531.7
December 18, 2002	562.4	545.0	542.0	534.8	531.5	532.5	534.6	537.1	536.5	535.2	532.8
March 27, 2003	562.6	545.7	541.7	534.8	531.6	532.4	535.1	539.9	537.2	536.2	533.6
June 19, 2003	562.3	544.9	541.5	534.8	531.3	532.3	534.9	538.2	536.9	535.7	533.2
September 10, 2003	561.6	542.1	537.9	533.8	530.8	531.9	533.7	535.6	535.6	534.1	531.9
December 10, 2003	562.4	542.7	537.6	533.7	530.9	531.9	533.7	535.2	535.5	533.8	531.7
March 18, 2004	563.1	546.6	541.9	535.0	531.7	532.4	535.2	540.9	537.4	536.6	533.8
June 17, 2004	562.1	544.3	540.7	534.3	531.0	532.1	534.6	537.4	536.5	535.1	532.7
September 21, 2004	561.5	541.1	536.5	533.1	530.5	531.6	533.1	534.7	532.7	533.2	533.2

TOC = Top of well Casing

WELL GAUGING DATA

Project # 040921-3A1 Date 9/21/04 Client Stellar

Site Redwood Regional Park Service

Well ID	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	
MW-1	4					4.40	19.14	TOC	
MW-2	4					25.43	38.87		
MW-3	4					24.41	45.07		
MW-4	4					14.98	26.38		
MW-5	4					17.05	26.97		
MW-6	4					14.00	27.43		
MW-7	2					14.64	25.39		
MW-8	2					14.52	22.14		
MW-9	2					16.77	30.25		
MW-10	2					14.18	28.28		
MW-11	2					14.64	26.25		

WELLHEAD INSPECTION CHECKLIST

Client Stellar Date 9/21/04

Site Address Redwood Regional Park Service

Job Number 040921-BA1 Technician Brian Alcorn

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-4				X				
MW-5	X							
MW-6	X							
MW-7	X							
MW-8		1 Bolt broken / No Rimseal / Apron-moderate						
MW-9	X							
MW-10				X				
MW-11	X			X				

NOTES:

[redacted] WELL MONITORING DATA SHEET

BTS #: 040921-3A1	Site: RRPS
Sampler: Brian Alcom	Date: 9/21/04
Well I.D.: MW-1	Well Diameter: 2 3 (4) 6 8 ____
Total Well Depth (TD): 19.14	Depth to Water (DTW): 4.40
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer / Disposable Bailer / Positive Air Displacement / Electric Submersible / Waterra / Peristaltic / Extraction Pump / Other_____

Sampling Method: Bailer / Disposable Bailer / Extraction Port / Dedicated Tubing / Other: _____

_____(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)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0900		DO = 0.4		ORP = 155	Fe^{2+} = Ø	

Did well dewater? Yes No Gallons actually evacuated:

Sampling Date: Sampling Time: Depth to Water:

Sample I.D.: Laboratory: STL Other_____

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

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

Analyzed for: TPH-G BTEX MTBE TPH-D 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

[redacted] WELL MONITORING DATA SHEET

BTS #: 040921-BA1	Site: Stellar e RRPS
Sampler: Brian Alcorn	Date: 9/21/04
Well I.D.: MW-2	Well Diameter: 2 3 (4) 6 8 ____
Total Well Depth (TD): 38.87	Depth to Water (DTW): 25.43
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: ____

9.0 (Gals.) X	3	=	27.0 Gals.
1 Case Volume	Specified Volumes		Calculated Volume

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

Time	Temp (°F)	pH	Cond. (mS or (µS))	Turbidity (NTUs)	Gals. Removed	Observations
1055			DO=0.3	ORP=-38	Fe^{2+}=0.8	
1534	61.9	7.2	844	47	9.0	clear
1536	60.9	6.8	853	122	18.0	"
1542	61.2	6.9	838	214	27.0	"

Did well dewater? (Yes) No Gallons actually evacuated: 27.0

Sampling Date: 9/21/04 Sampling Time: 1545 Depth to Water: 36.95

Sample I.D.: MW-2 Laboratory: STL Other CT

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

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

Analyzed for: TPH-G BTEX MTBE TPH-D 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

[redacted] WELL MONITORING DATA SHEET

BTS #: 040921-BA1	Site: RRPS
Sampler: Brian Aleem	Date: 9/21/04
Well I.D.: MW-3	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth (TD): 45.07	Depth to Water (DTW): 24.41
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]: 28.5	

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: ____

No Purge

____ (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)	pH	Cond. (mS or (uS))	Turbidity (NTUs)	Gals. Removed	Observations
0944	56.3	6.8	610		—	DO = 0.4
						ORP = -59
						Fe^{2+} = ϕ

Did well dewater? Yes No Gallons actually evacuated: —

Sampling Date: 9/21/04 Sampling Time: 0945 Depth to Water: 14.00

Sample I.D.: MW-3 Laboratory: STL Other CAT

Analyzed for: TPH-G BTEX MTBE TPH-D Other: Nitrate / Sulfate

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

Analyzed for: TPH-G BTEX MTBE TPH-D 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

[redacted] WELL MONITORING DATA SHEET

BTS #: 040921-BA1	Site: Stellar @ RRPS
Sampler: Brian Alcorn	Date: 9/21/04
Well I.D.: MW-4	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth (TD): 26.38	Depth to Water (DTW): 14.98
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

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: _____

7.5 (Gals.) X 3 = 22.5 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

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

Time	Temp (°F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1025			DO= 13.7	ORP= Ø	Fe^{2+} = Ø	
1502	61.5	8.4	786	70	7.5	gray
1505	60.2	8.4	769	102	15.0	"
1510	62.2	9.0	792	421	22.5	"

Did well dewater? (Yes) No Gallons actually evacuated: 22.5

Sampling Date: 9/21/04 Sampling Time: 1025 Depth to Water: 24.95

Sample I.D.: MW-4 Laboratory: STL Other CAT

Analyzed for: (TPH-G) (BTEX) (MTBE) (TPH-D) Other: Nitrate/Sulfate

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

Analyzed for: TPH-G BTEX MTBE TPH-D 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 #: 040921-BA1	Client: RRPS
Sampler: Brian Alcom	Date: 9/21/04
Well I.D.: MW-5	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth (TD): 26.97	Depth to Water (DTW): 17.05
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: _____

6.5 (Gals.) X 3 = 19.5 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

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

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1004			DO= 0.4	ORP= -45	Fe++= 0	
1441	64.9	8.2	606	481	6.5	grey,
1443	61.8	7.7	592	603	13.0	"
1445	60.4	7.6	~~21,000~~ 592 *	>1,000	19.5	"

Did well dewater? Yes (No) Gallons actually evacuated: 19.5

Sampling Date: 9/21/04 Sampling Time: ~~1004~~ 1450 * Depth to Water: 22.72

Sample I.D.: MW-5 Laboratory: Kiff CalScience Other CTT

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

[redacted] WELL MONITORING DATA SHEET

BTS #: 040921-BA1	Site: RRPS
Sampler: Brian Aleem	Date: 9/21/04
Well I.D.: MW-6	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth (TD): 27.43	Depth to Water (DTW): 14.00
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)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0925						DO= 7.7
						ORP= -80
						Fe^{2+}= 3.5

Did well dewater? Yes No Gallons actually evacuated:

Sampling Date: Sampling Time: Depth to Water:

Sample I.D.: Laboratory: STL Other ____

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

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

Analyzed for: TPH-G BTEX MTBE TPH-D 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

[redacted] WELL MONITORING DATA SHEET

BTS #: 040921-BA1	Site: Stellar @ RRPS
Sampler: Brian Alcorn	Date: 9/21/04
Well I.D.: MW-7	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth (TD): 25.39	Depth to Water (DTW): 14.64
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]:	

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: _____

1.75 (Gals.) X 3 = 5.25 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)	pH	Cond. (mS or (µS))	Turbidity (NTUs)	Gals. Removed	Observations
1140			DO= 0.4	ORP= -119	Fe^{2+} = 4.5	
1350	65.6	6.9	786	>1,000	1.75	grey, odor
1352	63.7	6.9	771	>1,000	3.5	" "
1356	65.1	6.8	757	>1,000	5.25	" "

Did well dewater? Yes (No) Gallons actually evacuated: 5.25

Sampling Date: 9/21/04 Sampling Time: 1140 Depth to Water: 17.18

Sample I.D.: MW-7 Laboratory: STL Other CET

Analyzed for: (TPH-G) BTEX (MTBE) (TPH-D) Other: Nitrate/Sulfate

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

Analyzed for: TPH-G BTEX MTBE TPH-D 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

[redacted] WELL MONITORING DATA SHEET

BTS #: 040921-BA1	Site: Stellar @ RRPS
Sampler: Brian Alcorn	Date: 9/21/04
Well I.D.: MW-8	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth (TD): 22.14	Depth to Water (DTW): 14.52
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): (YSI) HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

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: _____

1.25 (Gals.) X	3	= 3.75 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)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1112			DO= 0.4	ORP= -93	Fe^{2+}= 1.8	
1235	60.3	6.8	816	>1,000	1.25	gray, odor
1238	59.9	6.7	818	>1,000	2.5	" "
1242	59.4	6.8	827	>1,000	3.75	" "

Did well dewater? Yes (No) Gallons actually evacuated: 3.75

Sampling Date: 9/21/04 Sampling Time: 1112 Depth to Water: 15.50

Sample I.D.: MW-8 Laboratory: STL Other CalT

Analyzed for: (TPH-G) (BTEX) (MTBE) (TPH-D) Other: Nitrate/sulfate

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

Analyzed for: TPH-G BTEX MTBE TPH-D 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

[redacted] WELL MONITORING DATA SHEET

BTS #: 040921-BA1	Site: Stellar @ RRPS
Sampler: Brian Alcorn	Date: 9/21/04
Well I.D.: MW-9	Well Diameter: (2) 3 ~~4~~ 6 8 ___
Total Well Depth (TD): 30.25	Depth to Water (DTW): 16.77
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: _____

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

2.25 (Gals.) X 3 = 6.75 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Time	Temp (°F)	pH	Cond. (mS or (µS))	Turbidity (NTUs)	Gals. Removed	Observations
1126			DO= 0.4	ORP= -109	Fe^{2+} = 4.4	
1313	61.7	6.7	987	>1,000	2.25	gray, odor
1316	60.4	6.8	1,001	>1,000	4.5	" "
1319	60.1	6.8	979	>1,000	6.75	" "

Did well dewater? Yes (No) Gallons actually evacuated: 6.75

Sampling Date: 9/21/04 Sampling Time: 1126 Depth to Water: 21.60

Sample I.D.: MW-9 Laboratory: STL Other CET

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

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

Analyzed for: TPH-G BTEX MTBE TPH-D 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

[redacted] WELL MONITORING DATA SHEET

BTS #: 040921-BA1	Site: Stellar e RRPS
Sampler: Brian Alcom	Date: 9/21/04
Well I.D.: MW-10	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth (TD): 28.28	Depth to Water (DTW): 14.18
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): (YSI) HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

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: _____

2.25 (Gals.) X 3 = 6.75 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)	pH	Cond. (mS or (µS))	Turbidity (NTUs)	Gals. Removed	Observations
1040			DO= 0.3	ORP= 12	Fe^{2+}= 0	
1215	61.6	8.2	734	169	2.25	gray
1218	60.8	7.6	722	233	4.5	"
1220	60.2	7.7	703	356	6.75	"

Did well dewater? Yes (No) Gallons actually evacuated: 6.75

Sampling Date: 9/21/04 Sampling Time: 1040 Depth to Water: 23.22

Sample I.D.: MW-10 Laboratory: STL Other CT

Analyzed for: (TPH-G) (BTEX) (MTBE) (TPH-D) Other: Nitrate/Sulfate

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

Analyzed for: TPH-G BTEX MTBE TPH-D 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

[redacted] WELL MONITORING DATA SHEET

BTS #: 040921-BA1	Site: Stellar e RRPS
Sampler: Brian Alcorn	Date: 9/21/04
Well I.D.: MW-11	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 26.25	Depth to Water (DTW): 14.64
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]:	

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: _____

2.0 (Gals.) X	3	= 6.0 Gals.
1 Case Volume	Specified Volumes	Calculated Volume

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

Time	Temp (°F)	pH	Cond. (mS or (µS))	Turbidity (NTUs)	Gals. Removed	Observations
1155			DO=0.2	ORP= -28	Fe2+= 0	
1413	67.6	8.6	711	>1,000	2.0	gray, odor
1416	64.7	7.8	828	>1,000	4.0	" "
1418	63.8	8.3	935	>1,000	6.0	" "

Did well dewater? Yes (No) Gallons actually evacuated: 6.0

Sampling Date: 9/21/04 Sampling Time: 1155 Depth to Water: 14.85

Sample I.D.: MW-11 Laboratory: STL Other C&T

Analyzed for: (TPH-G) (BTEX) (MTBE) (TPH-D) Other: Nitrate/sulfate

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

Analyzed for: TPH-G BTEX MTBE TPH-D 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

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

A N A L Y T I C A L R E P O R T

Prepared for:

Stellar Environmental Solutions
2198 6th Street
Suite 201
Berkeley, CA 94710

Date: 27-SEP-04
Lab Job Number: 174810
Project ID: 2004-02
Location: Redwood Regional Park

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

Reviewed by: _____
Project Manager

Reviewed by: _____
Operations Manager

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**174810**
Client:	**Stellar Environmental Solutions**
Project:	**2004-02**
Location:	**Redwood Regional Park**
Request Date:	**09/21/04**
Samples Received:	**09/21/04**

This hardcopy data package contains sample and QC results for ten water samples, requested for the above referenced project on 09/21/04. The samples were received cold and intact.

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

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

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

Chain of Custody Record

174810

Date 9/21/04

Page 1 of 1

Laboratory Curtis & TompKins Ltd

Address 2323 Fifth Street
Berkeley CA 94710
510/486-0900

Project Owner EBRPD

Site Address Trail Redwood Rd
Oakland CA

Project Name Redwood

Project Number 2004-02

Method of Shipment hand delivery

Shipment No. —

Airbill No. —

Cooler No. —

Project Manager Bruce Rucker

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	Analysis Required: Filtered	No. of Containers	TVH + BTEX + MTBE	TEPH	Nitrate	Sulfate	Remarks
-1	MW-3		9/21	0945	W	500mL NP Poly		NP		1			X	X	
-2	SW-2		9/21	1040	W	(a)		(a)		4	X	X			
-3	MW-5			1450		(a)		(a)		4	X	X			
-4	MW-4			1025		(a) (b)		(a) (b)		5	X	X	X	X	
-5	MW-10			1040		(a) (b)		(a) (b)		5	X	X	X	X	
-6	MW-2			1545		(a)		(a)		4	X	X			
-7	MW-8			1112		(a) (b)		(a) (b)		5	X	X	X	X	
-8	MW-9			1126		(a) (b)		(a) (b)		5	X	X	X	X	
-9	MW-7			1140		(a) (b)		(a) (b)		5	X	X	X	X	
-10	MW-11			1158		(a) (b)		(a) (b)		5	X	X	X	X	

Relinquished by:	Date	Received by:	Date
Signature	9/21/04	Signature Lavanna Curtis	9/21/04
Printed Brian Akom	Time	Printed Lavanna Curtis	Time 1645
Company Blaine Tech Services	1645	Company Curtis & Tompkins	

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

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

Turnaround Time: 5-DAY TAT

Comments: (a) 1L unpreserved Amber + 3 40 mL HCl preserved VOAs
Sample SW-2 collected by JOSEPH DIVAN of SES. (b) 1 500mL NP Poly.

2000-00-01

★ Stellar Environmental Solutions

2198 Sixth Street #201, Berkeley, CA 94710

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02		
Matrix:	Water	Sampled:	09/21/04
Units:	ug/L	Received:	09/21/04
Batch#:	94785		

Field ID:	SW-2	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	09/21/04
Lab ID:	174810-002		

Analyte	Result	RL	Analysis
Gasoline C7-C12	260	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	4.4	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	6.3	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	110	70-141	EPA 8015B
Bromofluorobenzene (FID)	97	80-143	EPA 8015B
Trifluorotoluene (PID)	107	59-133	EPA 8021B
Bromofluorobenzene (PID)	95	76-128	EPA 8021B

Field ID:	MW-5	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	09/21/04
Lab ID:	174810-003		

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

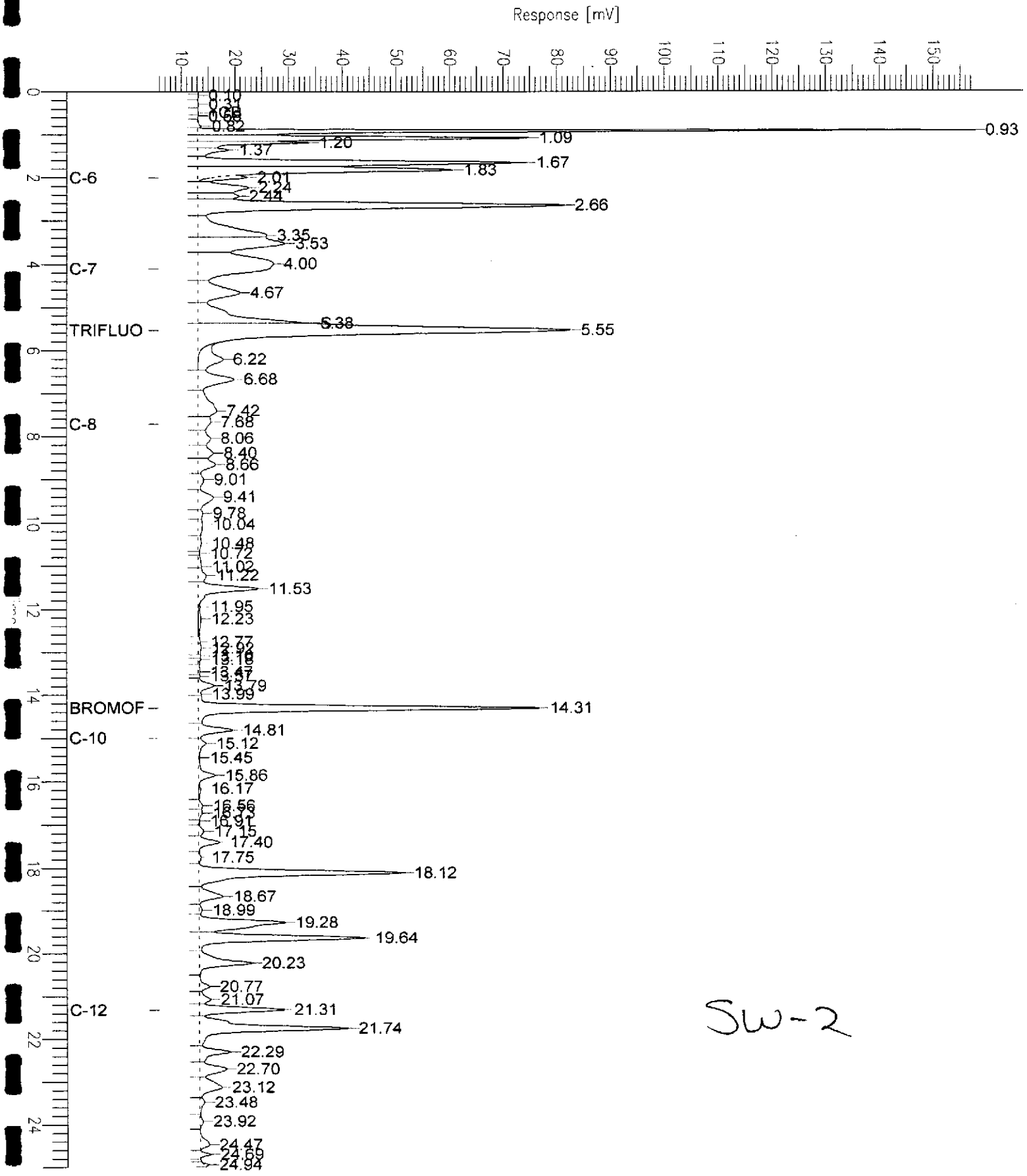
Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	91	70-141	EPA 8015B
Bromofluorobenzene (FID)	99	80-143	EPA 8015B
Trifluorotoluene (PID)	88	59-133	EPA 8021B
Bromofluorobenzene (PID)	97	76-128	EPA 8021B

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

Chromatogram

ample Name : 174810-002,94785
leName : G:\GC05\DATA\265G019.raw
thod : TVHBTXE
art Time : 0.00 min End Time : 25.00 min
cale Factor: 1.0 Plot Offset: 6 mV

Sample #: a1.0 Page 1 of 1
Date : 9/22/04 11:09 AM
Time of Injection: 9/21/04 08:22 PM
Low Point : 5.82 mV High Point : 157.84 mV
Plot Scale: 152.0 mV



SW-2

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02		
Matrix:	Water	Sampled:	09/21/04
Units:	ug/L	Received:	09/21/04
Batch#:	94785		

Field ID:	MW-4	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	09/21/04
Lab ID:	174810-004		

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
Trifluorotoluene (FID)	90	70-141	EPA 8015B
Bromofluorobenzene (FID)	96	80-143	EPA 8015B
Trifluorotoluene (PID)	87	59-133	EPA 8021B
Bromofluorobenzene (PID)	92	76-128	EPA 8021B

Field ID:	MW-10	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	09/21/04
Lab ID:	174810-005		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	5.8	2.0	EPA 8021B
Benzene	1.6	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	1.9	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	87	70-141	EPA 8015B
Bromofluorobenzene (FID)	92	80-143	EPA 8015B
Trifluorotoluene (PID)	88	59-133	EPA 8021B
Bromofluorobenzene (PID)	91	76-128	EPA 8021B

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

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02		
Matrix:	Water	Sampled:	09/21/04
Units:	ug/L	Received:	09/21/04
Batch#:	94785		

ield ID:	MW-2	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	09/21/04
Lab ID:	174810-006		

Analyte	Result	RL	Analysis
Gasoline C7-C12	200	50	EPA 8015B
MTBE	16	2.0	EPA 8021B
Benzene	23	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	0.70	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	111	70-141	EPA 8015B
Bromofluorobenzene (FID)	89	80-143	EPA 8015B
Trifluorotoluene (PID)	101	59-133	EPA 8021B
Bromofluorobenzene (PID)	91	76-128	EPA 8021B

ield ID:	MW-8	Diln Fac:	5.000
ype:	SAMPLE	Analyzed:	09/21/04
Lab ID:	174810-007		

Analyte	Result	RL	Analysis
Gasoline C7-C12	2,000	250	EPA 8015B
MTBE	ND	10	EPA 8021B
Benzene	100	2.5	EPA 8021B
Toluene	ND	2.5	EPA 8021B
Ethylbenzene	180	2.5	EPA 8021B
m,p-Xylenes	97	2.5	EPA 8021B
o-Xylene	4.8	2.5	EPA 8021B

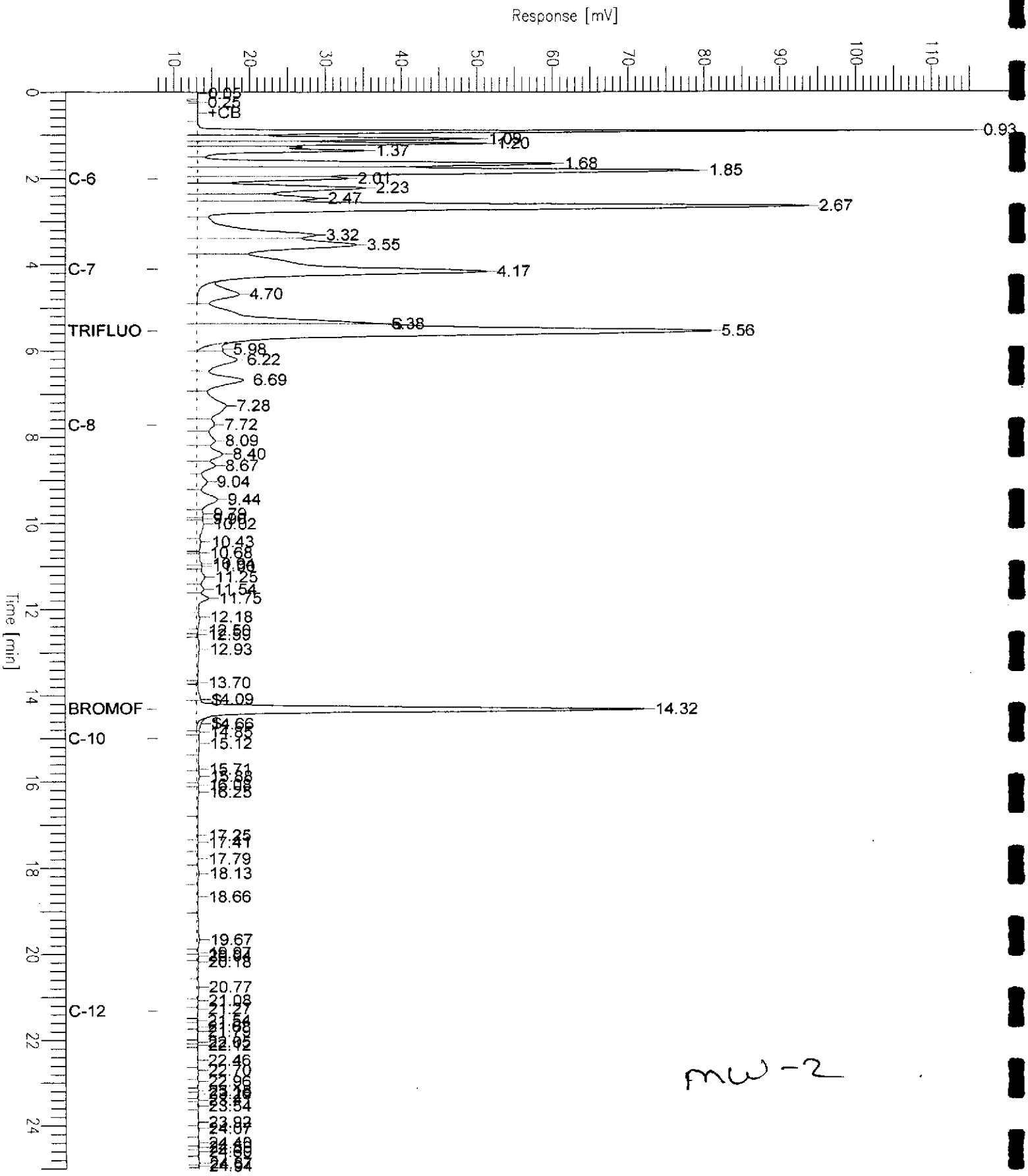
Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	104	70-141	EPA 8015B
Bromofluorobenzene (FID)	95	80-143	EPA 8015B
Trifluorotoluene (PID)	89	59-133	EPA 8021B
Bromofluorobenzene (PID)	92	76-128	EPA 8021B

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

Chromatogram

Sample Name : 174810-006,94785
FileName : G:\GC05\DATA\265G022.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 25.00 min
Scale Factor: 1.0 Plot Offset: 8 mV

Sample #: a1.0 Page 1 of 1
Date : 9/22/04 11:10 AM
Time of Injection: 9/21/04 09:58 PM
Low Point : 7.88 mV High Point : 115.56 mV
Plot Scale: 107.7 mV

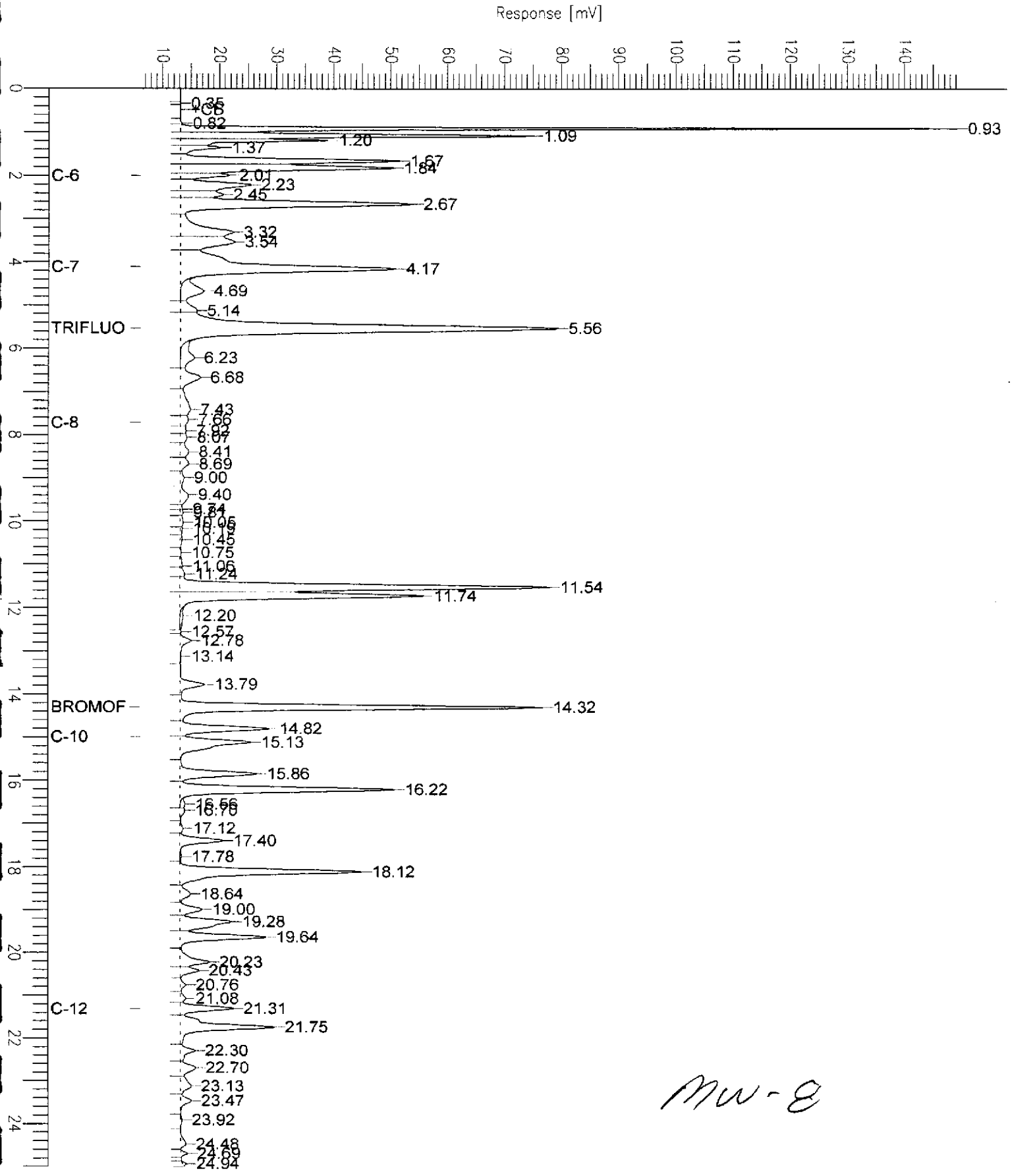


MW-2

Chromatogram

Sample Name : 174810-007,94785
leName : G:\GC05\DATA\265G025.raw
thod : TVHBTXE
art Time : 0.00 min End Time : 25.00 min
Scale Factor: 1.0 Plot Offset: 6 mV

Sample #: a1.0 Page 1 of 1
Date : 9/21/04 11:58 PM
Time of Injection: 9/21/04 11:33 PM
Low Point : 6.26 mV High Point : 149.33 mV
Plot Scale: 143.1 mV



MW-8

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02		
Matrix:	Water	Sampled:	09/21/04
Units:	ug/L	Received:	09/21/04
Batch#:	94785		

Field ID:	MW-9	Diln Fac:	5.000
Type:	SAMPLE	Analyzed:	09/22/04
Lab ID:	174810-008		

Analyte	Result	RL	Analysis
Gasoline C7-C12	7,100	250	EPA 8015B
MTBE	ND	10	EPA 8021B
Benzene	160	2.5	EPA 8021B
Toluene	8.1	2.5	EPA 8021B
Ethylbenzene	600	2.5	EPA 8021B
m,p-Xylenes	390	2.5	EPA 8021B
o-Xylene	16	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	104	70-141	EPA 8015B
Bromofluorobenzene (FID)	88	80-143	EPA 8015B
Trifluorotoluene (PID)	92	59-133	EPA 8021B
Bromofluorobenzene (PID)	87	76-128	EPA 8021B

Field ID:	MW-7	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	09/21/04
Lab ID:	174810-009		

Analyte	Result	RL	Analysis
Gasoline C7-C12	9,700	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	98	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	300	0.50	EPA 8021B
m,p-Xylenes	120	0.50	EPA 8021B
o-Xylene	5.0	0.50	EPA 8021B

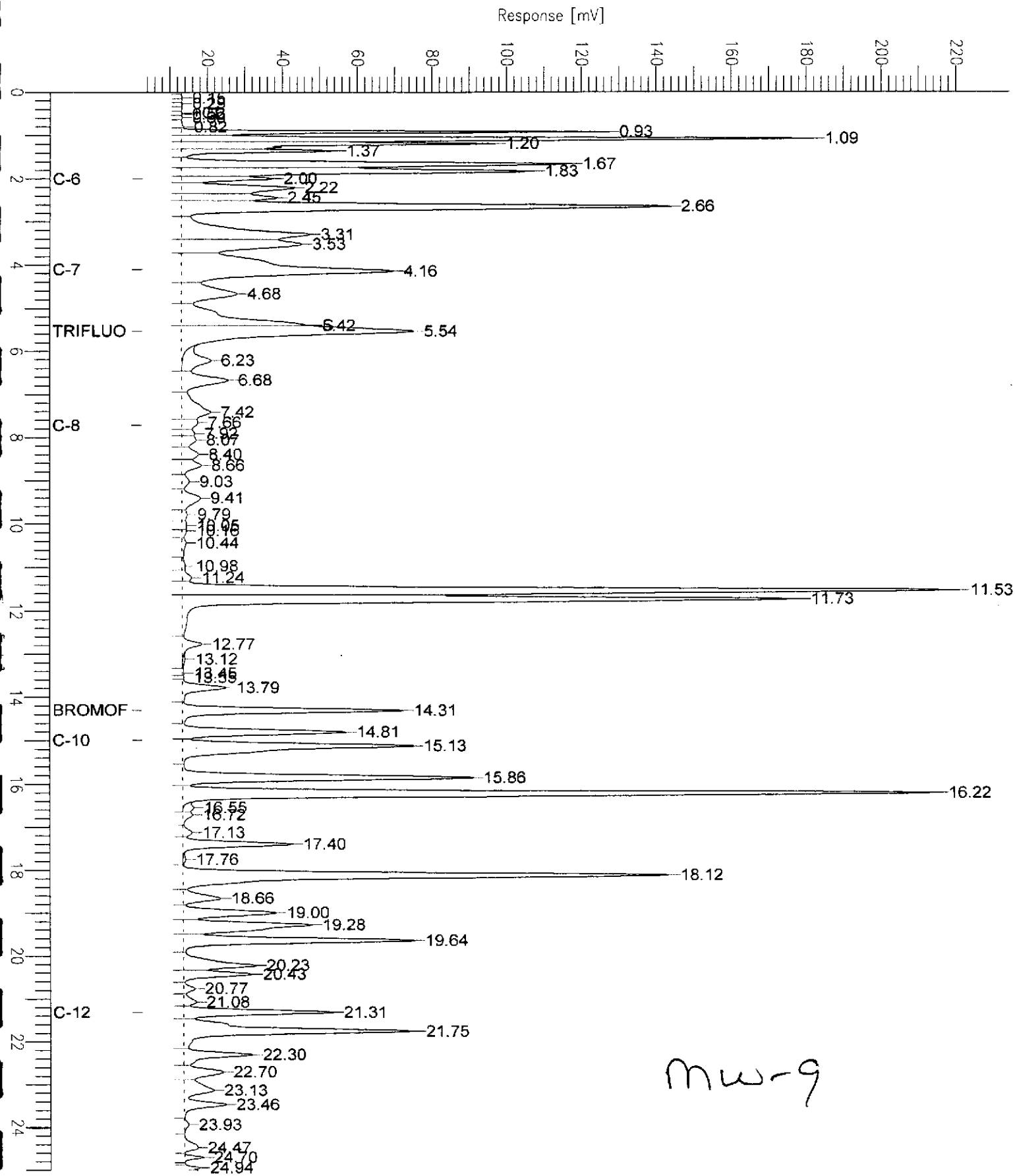
Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	133	70-141	EPA 8015B
Bromofluorobenzene (FID)	114	80-143	EPA 8015B
Trifluorotoluene (PID)	119	59-133	EPA 8021B
Bromofluorobenzene (PID)	104	76-128	EPA 8021B

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

Chromatogram

Sample Name : 174810-008,94785
FileName : G:\GC05\DATA\265G026.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 25.00 min
Scale Factor: 1.0 Plot Offset: 3 mV

Sample #: a1.0 Page 1 of 1
Date : 9/22/04 11:10 AM
Time of Injection: 9/22/04 12:05 AM
Low Point : 2.72 mV High Point : 221.22 mV
Plot Scale: 218.5 mV

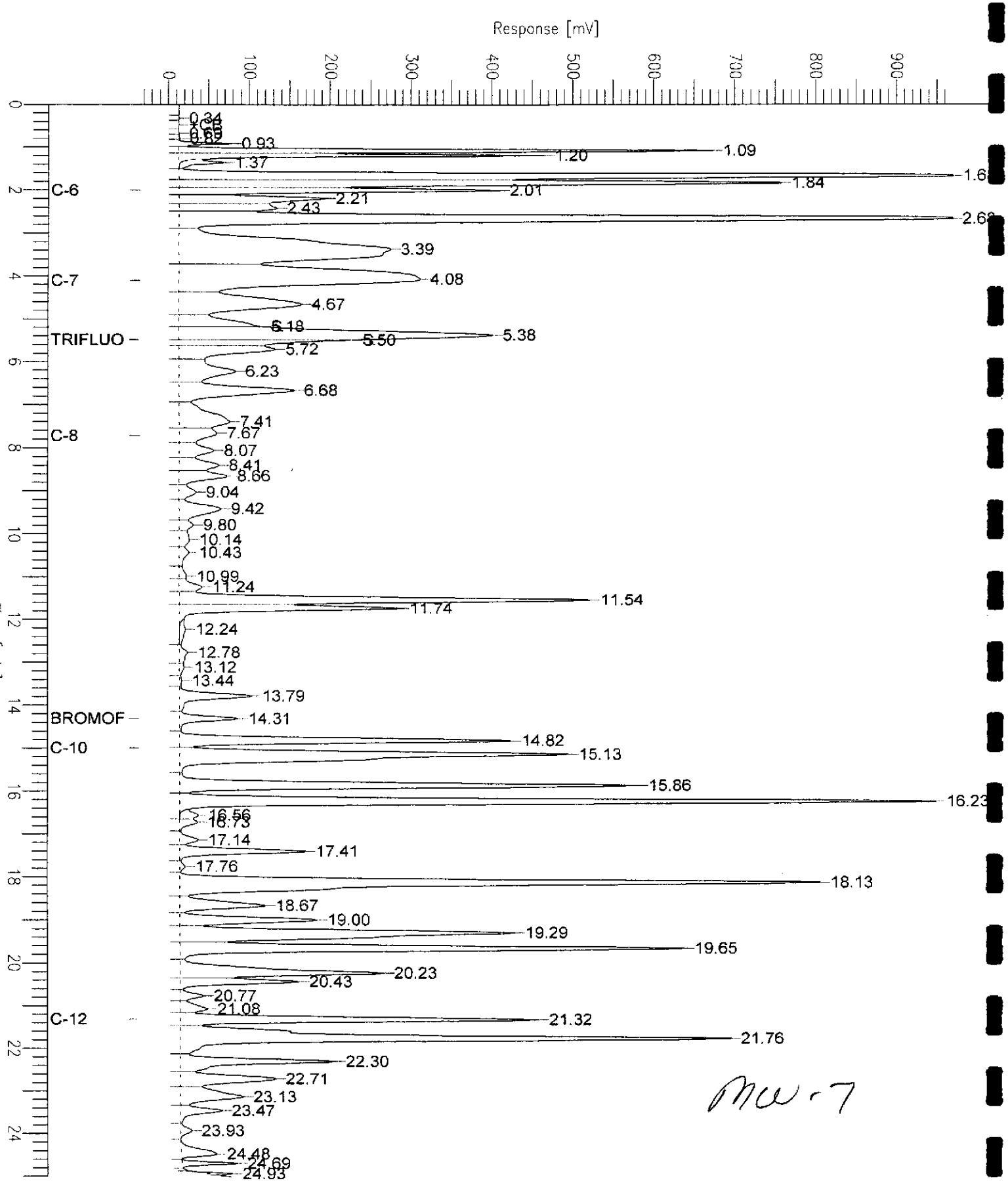


MW-9

Chromatogram

Sample Name : 174810-009,94785
FileName : G:\GC05\DATA\265G024.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 25.00 min
Scale Factor: 1.0 Plot Offset: -35 mV

Sample #: c1.0 Page 1 of 1
Date : 9/22/04 11:16 AM
Time of Injection: 9/21/04 11:01 PM
Low Point : -34.81 mV High Point : 969.76 mV
Plot Scale: 1004.6 mV



MW-7

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02		
Matrix:	Water	Sampled:	09/21/04
Units:	ug/L	Received:	09/21/04
Batch#:	94785		

Field ID:	MW-11	Diln Fac:	5.000
Type:	SAMPLE	Analyzed:	09/22/04
Lab ID:	174810-010		

Analyte	Result	RL	Analysis
Gasoline C7-C12	7,200	250	EPA 8015B
MTBE	ND	10	EPA 8021B
Benzene	340	2.5	EPA 8021B
Toluene	ND	2.5	EPA 8021B
Ethylbenzene	840	2.5	EPA 8021B
m,p-Xylenes	69 C	2.5	EPA 8021B
o-Xylene	5.6 C	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	124	70-141	EPA 8015B
Bromofluorobenzene (FID)	104	80-143	EPA 8015B
Trifluorotoluene (PID)	109	59-133	EPA 8021B
Bromofluorobenzene (PID)	98	76-128	EPA 8021B

Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC265415	Analyzed:	09/21/04

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

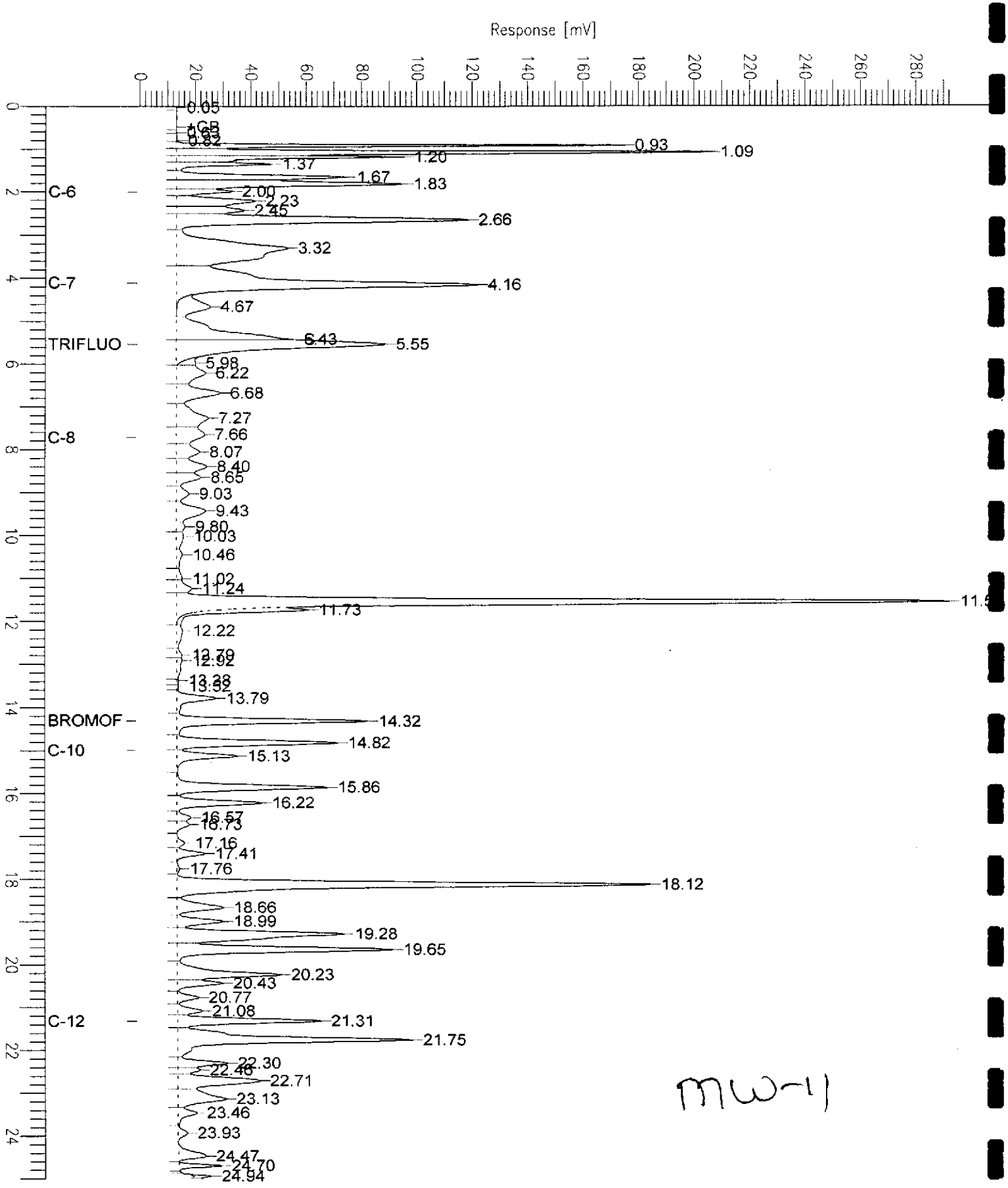
Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	84	70-141	EPA 8015B
Bromofluorobenzene (FID)	83	80-143	EPA 8015B
Trifluorotoluene (PID)	84	59-133	EPA 8021B
Bromofluorobenzene (PID)	83	76-128	EPA 8021B

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

Chromatogram

Sample Name : 174810-010,94785
FileName : G:\GC05\DATA\265G027.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 25.00 min
Scale Factor: 1.0 Plot Offset: -1 mV

Sample #: a1.0 Page 1 of 1
Date : 9/22/04 11:10 AM
Time of Injection: 9/22/04 12:37 AM
Low Point : -0.88 mV High Point : 292.66 mV
Plot Scale: 293.5 mV

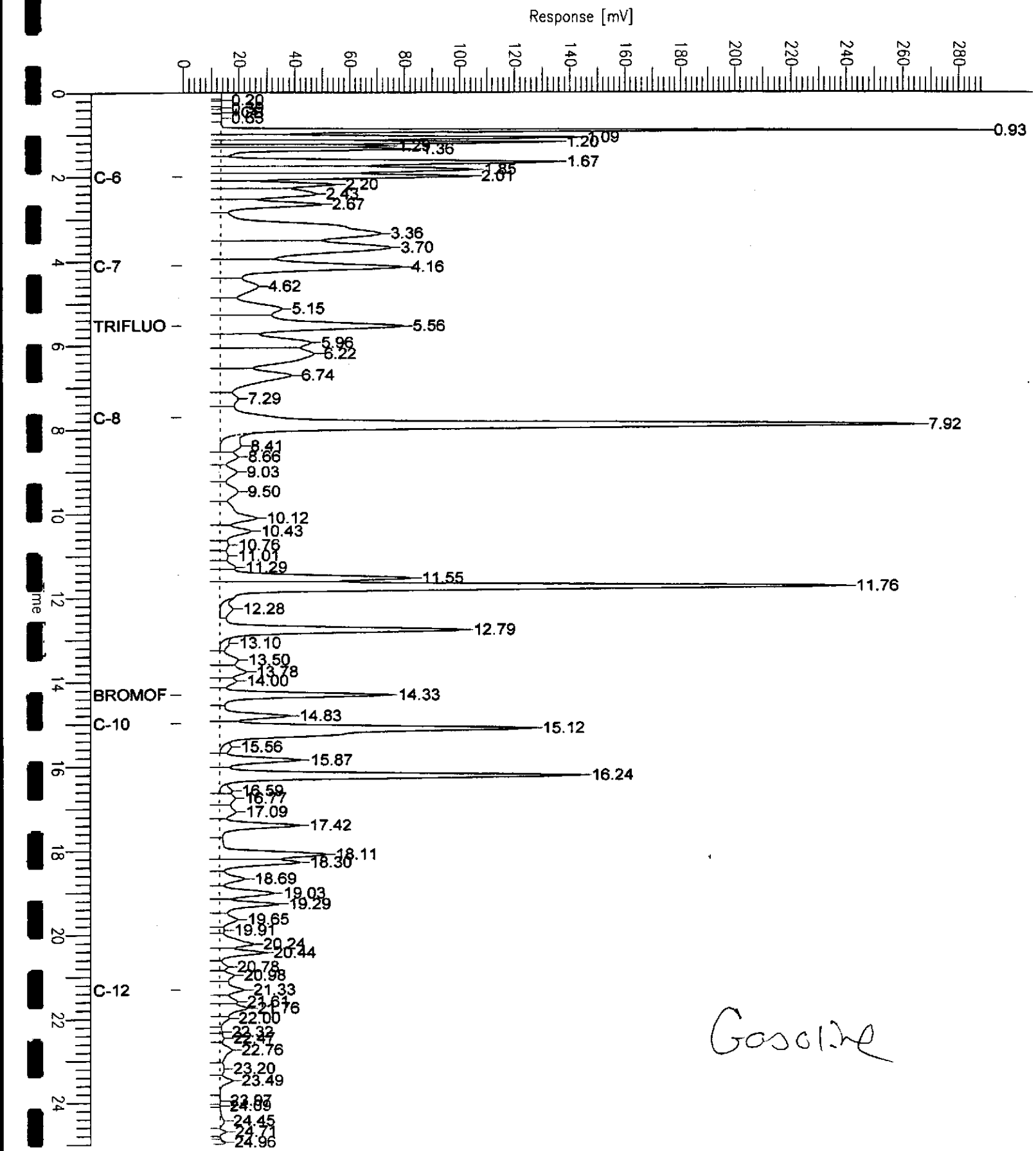


MW-11

Chromatogram

Sample Name : ccv/bs,qc265416,94785,04ws1636,5/5000
FileName : g:\gc05\data\265g003.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 25.00 min
Scale Factor: 1.0 Plot Offset: -0 mV

Sample #: Page 1 of 1
Date : 9/22/04 09:15 AM
Time of Injection: 9/21/04 11:36 AM
Low Point : -0.30 mV High Point : 289.00 mV
Plot Scale: 289.3 mV



Gasoline

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	94785
Units:	ug/L	Analyzed:	09/21/04
Diln Fac:	1.000		

Type: BS Lab ID: QC265416

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2,000	1,840	92	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	119	70-141
Bromofluorobenzene (FID)	97	80-143

Type: BSD Lab ID: QC265417

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,814	91	80-120	1	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	123	70-141
Bromofluorobenzene (FID)	103	80-143

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC265460	Batch#:	94785
Matrix:	Water	Analyzed:	09/21/04
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
MTBE	20.00	18.96	95	67-124
Benzene	20.00	21.30	107	80-120
Toluene	20.00	21.08	105	80-120
Ethylbenzene	20.00	21.17	106	80-120
m,p-Xylenes	20.00	19.35	97	80-120
o-Xylene	20.00	21.55	108	80-120

Surrogate	%REC	Limits
Trifluorotoluene (PID)	89	59-133
Bromofluorobenzene (PID)	88	76-128

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8021B
Field ID:	ZZZZZZZZZZ	Batch#:	94785
MSS Lab ID:	174793-003	Sampled:	09/21/04
Matrix:	Water	Received:	09/21/04
Units:	ug/L	Analyzed:	09/21/04
Diln Fac:	1.000		

Type: MS Lab ID: QC265458

Analyte	MSS Result	Spiked	Result	%REC	Limits
MTBE	<0.6100	20.00	21.54	108	52-142
Benzene	<0.05700	20.00	21.39	107	80-120
Toluene	<0.04000	20.00	22.42	112	80-120
Ethylbenzene	<0.04200	20.00	21.07	105	80-120
m,p-Xylenes	<0.04500	20.00	19.40	97	80-120
o-Xylene	<0.04600	20.00	21.68	108	80-120

Surrogate	%REC	Limits
Trifluorotoluene (PID)	94	59-133
Bromofluorobenzene (PID)	99	76-128

Type: MSD Lab ID: QC265459

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	20.00	21.85	109	52-142	1	23
Benzene	20.00	21.96	110	80-120	3	20
Toluene	20.00	22.97	115	80-120	2	20
Ethylbenzene	20.00	21.70	108	80-120	3	20
m,p-Xylenes	20.00	19.73	99	80-120	2	20
o-Xylene	20.00	22.24	111	80-120	3	20

Surrogate	%REC	Limits
Trifluorotoluene (PID)	96	59-133
Bromofluorobenzene (PID)	100	76-128

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2004-02	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	09/21/04
Units:	ug/L	Received:	09/21/04
Dilu Fac:	1.000	Prepared:	09/23/04
Batch#:	94881		

Field ID: SW-2 Lab ID: 174810-002
Type: SAMPLE Analyzed: 09/24/04

Analyte	Result	RL
Diesel C10-C24	370 Y	50

Surrogate	%REC	Limits
Hexacosane	91	53-143

Field ID: MW-5 Lab ID: 174810-003
Type: SAMPLE Analyzed: 09/24/04

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	113	53-143

Field ID: MW-4 Lab ID: 174810-004
Type: SAMPLE Analyzed: 09/24/04

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	110	53-143

Field ID: MW-10 Lab ID: 174810-005
Type: SAMPLE Analyzed: 09/24/04

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	91	53-143

Field ID: MW-2 Lab ID: 174810-006
Type: SAMPLE Analyzed: 09/25/04

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	108	53-143

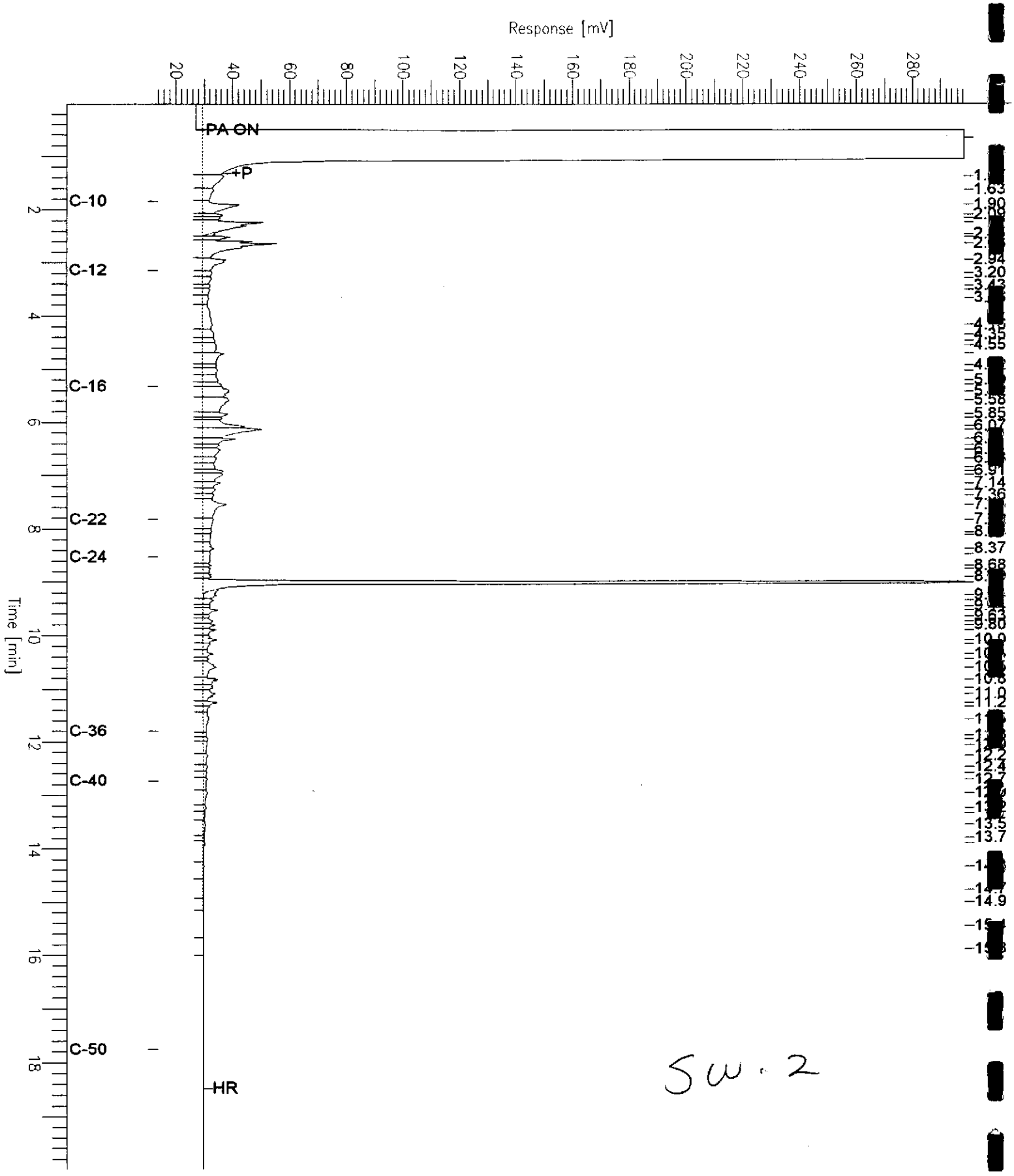
L= Lighter hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
D= Not Detected
L= Reporting Limit

10.0

Chromatogram

Sample Name : 174810-002,94881
FileName : G:\GC17\CHA\268A022.RAW
Method : ATEH241.MTH
Start Time : 0.01 min End Time : 19.99 min
Scale Factor: 0.0 Plot Offset: 14 mV

Sample #: 94881 Page 1 of 1
Date : 9/26/04 02:00 PM
Time of Injection: 9/24/04 10:27 PM
Low Point : 13.69 mV High Point : 298.38 mV
Plot Scale: 284.7 mV



SW.2

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2004-02	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	09/21/04
Units:	ug/L	Received:	09/21/04
Diln Fac:	1.000	Prepared:	09/23/04
Batch#:	94881		

Field ID: MW-8 Lab ID: 174810-007
Type: SAMPLE Analyzed: 09/24/04

Analyte	Result	RL
Diesel C10-C24	360 L Y	50

Surrogate	%REC	Limits
Hexacosane	89	53-143

Field ID: MW-9 Lab ID: 174810-008
Type: SAMPLE Analyzed: 09/24/04

Analyte	Result	RL
Diesel C10-C24	1,900 L Y	50

Surrogate	%REC	Limits
Hexacosane	82	53-143

Field ID: MW-7 Lab ID: 174810-009
Type: SAMPLE Analyzed: 09/24/04

Analyte	Result	RL
Diesel C10-C24	3,400 L Y	50

Surrogate	%REC	Limits
Hexacosane	106	53-143

Field ID: MW-11 Lab ID: 174810-010
Type: SAMPLE Analyzed: 09/24/04

Analyte	Result	RL
Diesel C10-C24	2,300 L Y	50

Surrogate	%REC	Limits
Hexacosane	92	53-143

Type: BLANK Analyzed: 09/24/04
Lab ID: QC265760 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	91	53-143

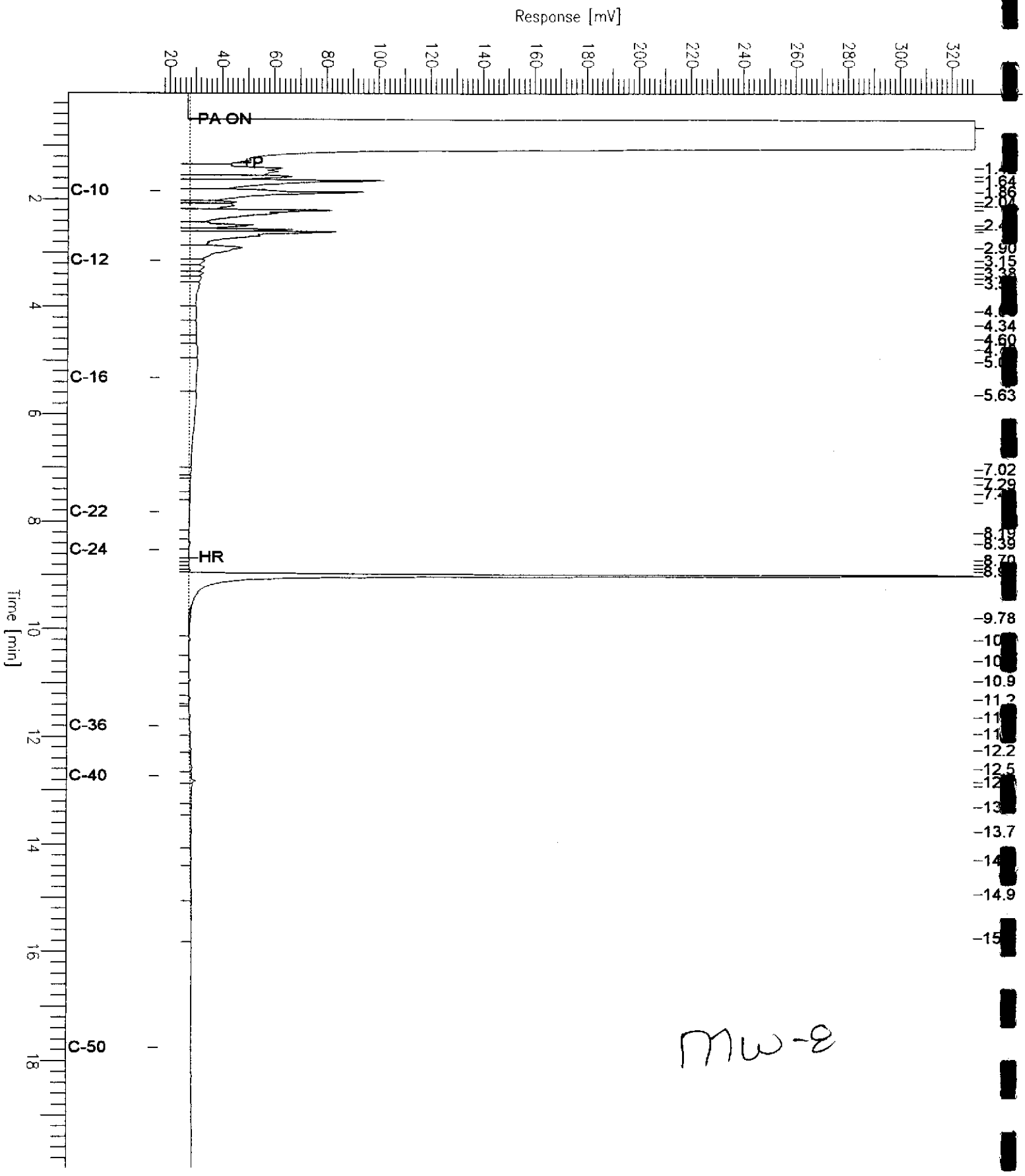
L= Lighter hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
D= Not Detected
L= Reporting Limit

10.0

Chromatogram

Sample Name : 174810-007,94881
FileName : G:\GC17\CHA\268A013.RAW
Method : ATEH241.MTH
Start Time : 0.01 min End Time : 19.99 min
Scale Factor: 0.0 Plot Offset: 16 mV

Sample #: 94881
Date : 9/26/04 01:53 PM
Time of Injection: 9/24/04 06:10 PM
Low Point : 16.25 mV High Point : 328.87 mV
Plot Scale: 312.6 mV

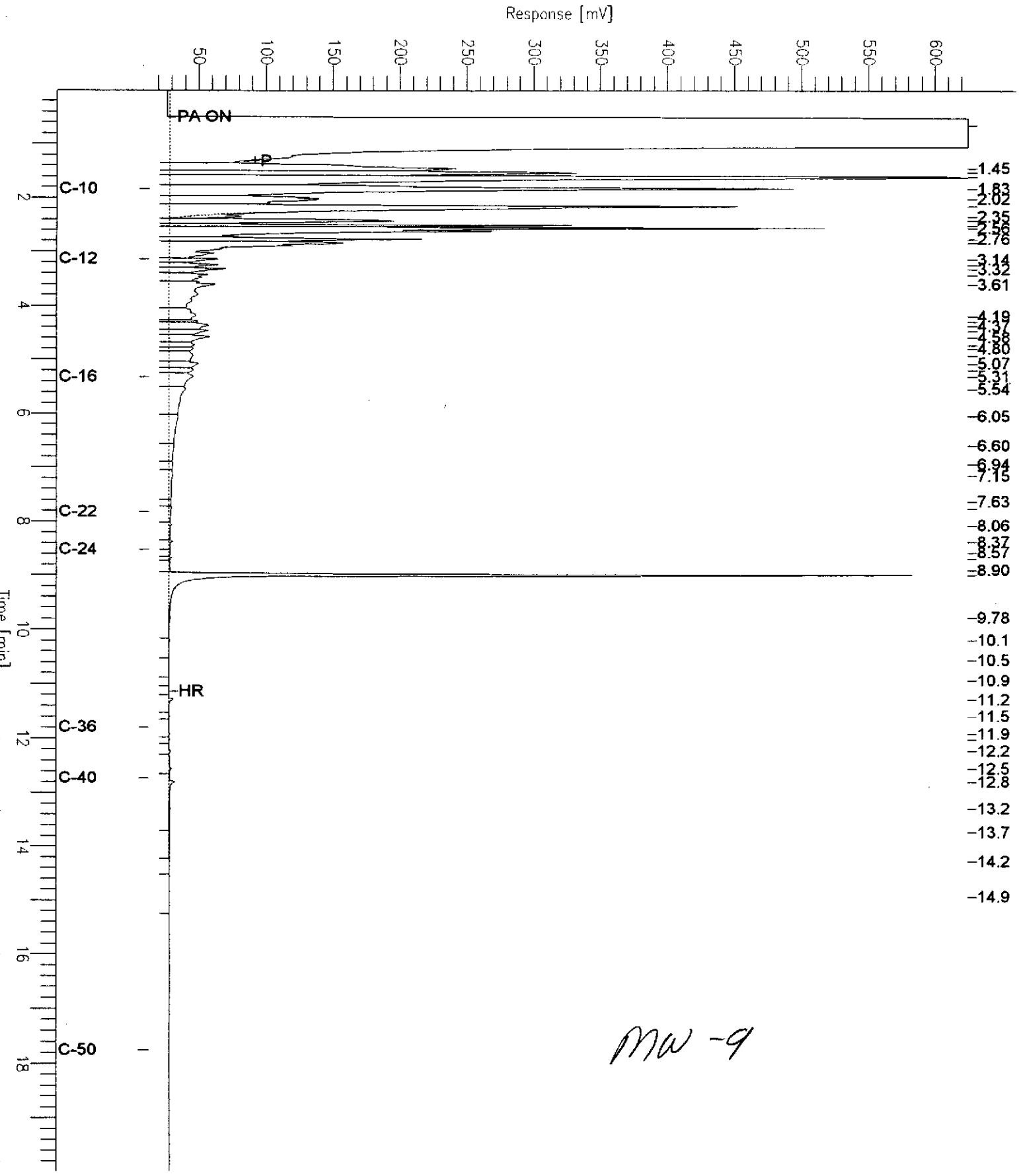


MW-E

Chromatogram

Sample Name : 174810-008,94881
FileName : G:\GC17\CHA\268A014.RAW
Method : ATEH241.MTH
Start Time : 0.01 min End Time : 19.99 min
Scale Factor: 0.0 Plot Offset: 13 mV

Sample #: 94881 Page 1 of 1
Date : 9/26/04 01:53 PM
Time of Injection: 9/24/04 06:38 PM
Low Point : 13.31 mV High Point : 624.85 mV
Plot Scale: 611.5 mV

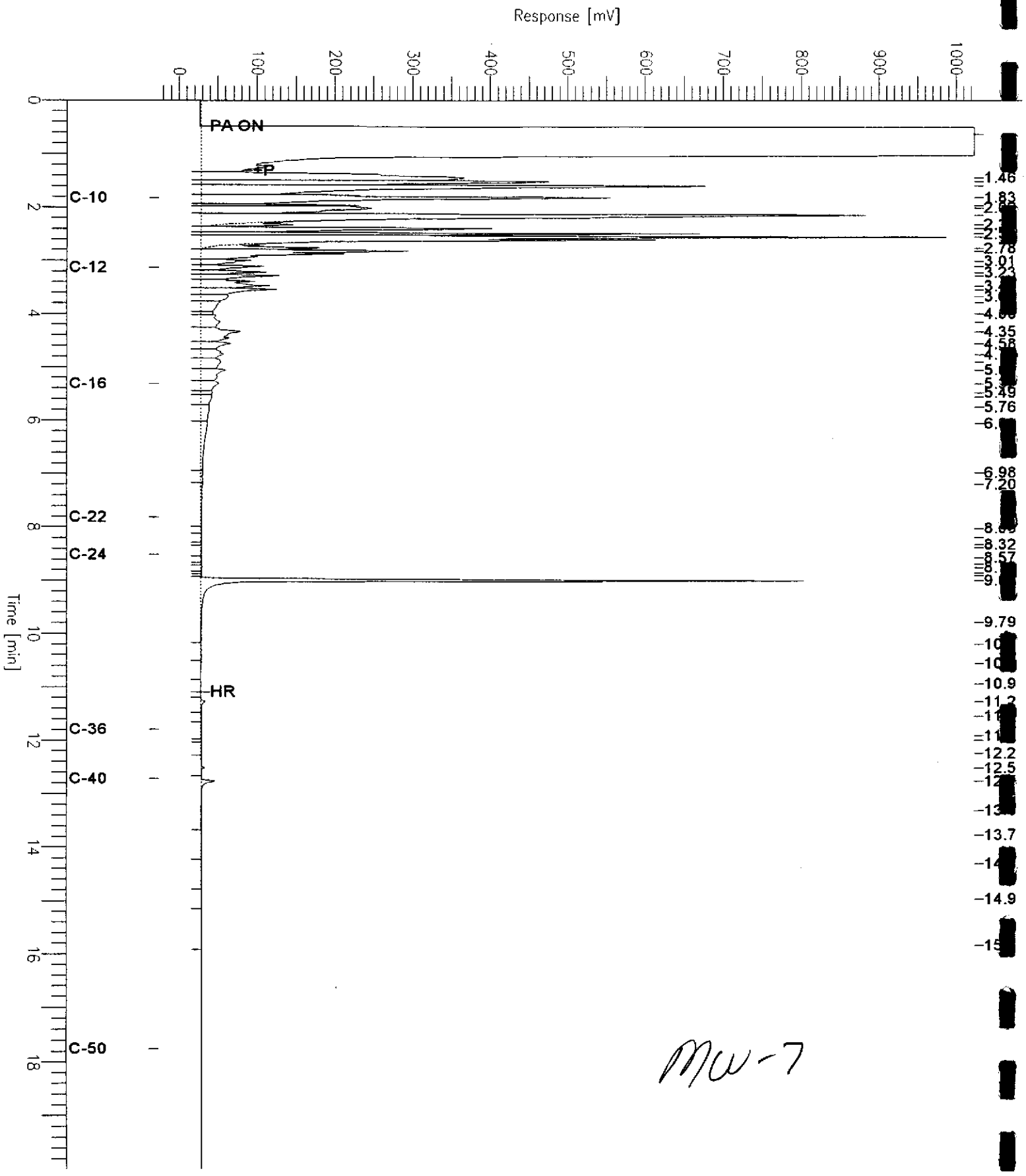


MW-9

Chromatogram

Sample Name : 174810-009,94881
FileName : G:\GC17\CHA\268A015.RAW
Method : ATEH241.MTH
Start Time : 0.00 min End Time : 19.99 min
Scale Factor: 0.0 Plot Offset: -26 mV

Sample #: 94881 Page 1 of 1
Date : 9/26/04 01:54 PM
Time of Injection: 9/24/04 07:07 PM
Low Point : -25.65 mV High Point : 1024.00 mV
Plot Scale: 1049.6 mV

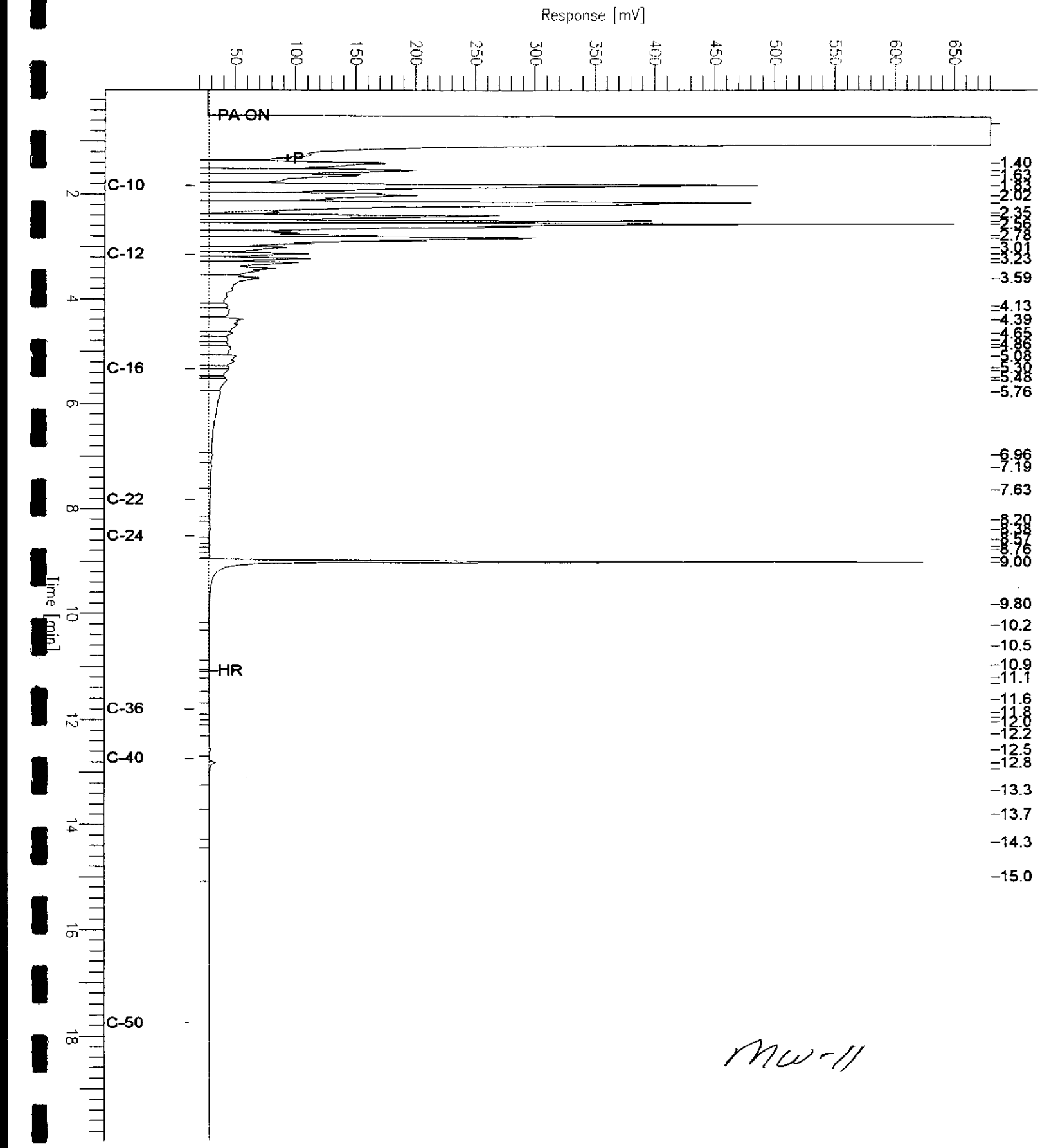


MW-7

Chromatogram

Sample Name : 174810-010,94881
FileName : G:\GC17\CHA\268A016.RAW
Method : ATEH241.MTH
Start Time : 0.01 min End Time : 19.99 min
Scale Factor: 0.0 Plot Offset: 16 mV

Sample #: 94881 Page 1 of 1
Date : 9/26/04 01:55 PM
Time of Injection: 9/24/04 07:35 PM
Low Point : 16.21 mV High Point : 680.67 mV
Plot Scale: 664.5 mV

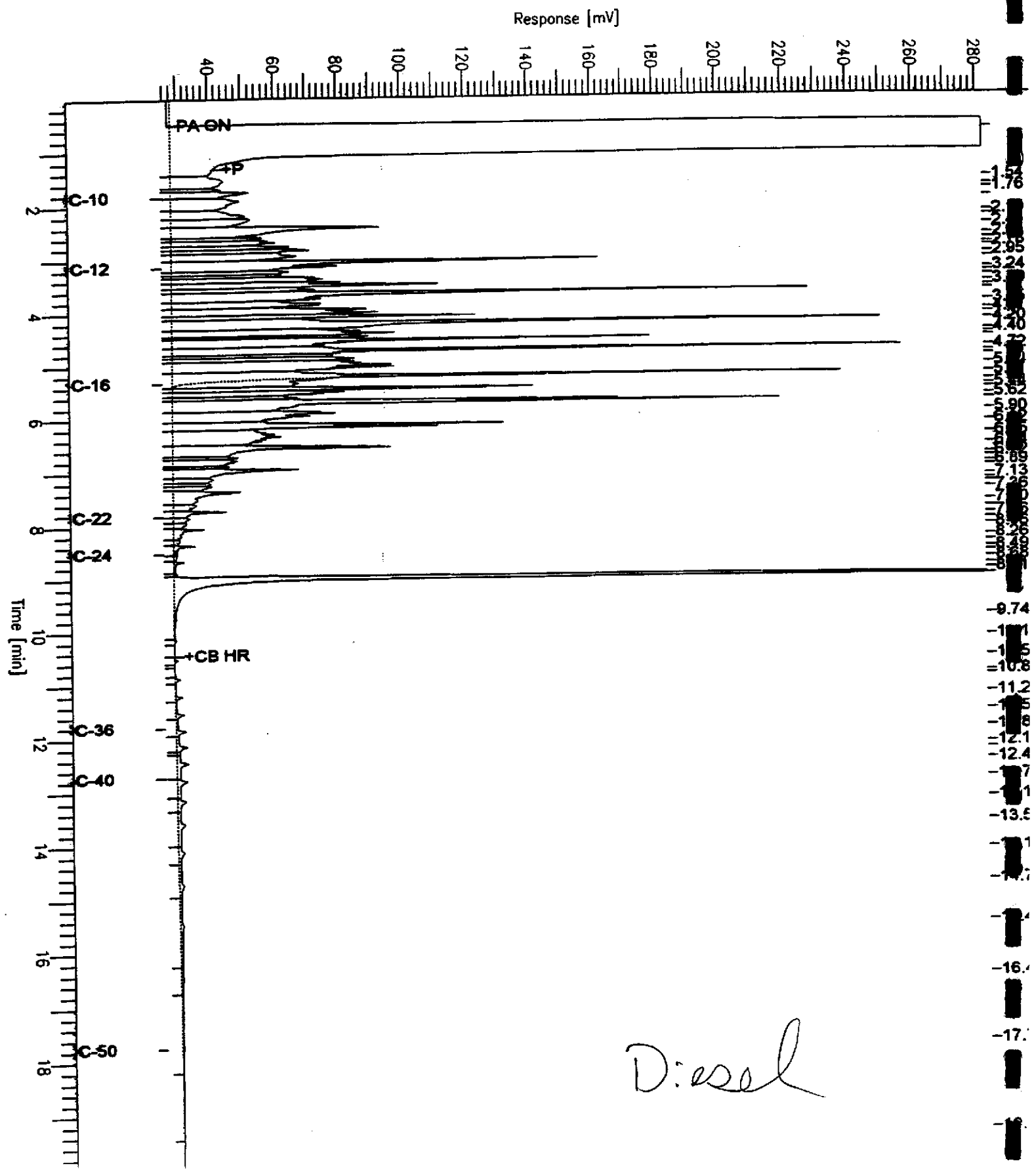


MW-11

Chromatogram

ample Name : ccv,04ws1621,dsl
ileName : G:\GC17\CHA\268A003.RAW
ethod : ATEH241.MTH
tart Time : 0.01 min End Time : 19.99 min
cale Factor: 0.0 Plot Offset: 25 mV

Sample #: 500mg/L
Date : 9/24/04 11:14 AM
Time of Injection: 9/24/04 10:43 AM
Low Point : 25.36 mV High Point : 282.00 mV
Plot Scale: 256.6 mV



Diesel

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2004-02	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	94881
Units:	ug/L	Prepared:	09/23/04
Diln Fac:	1.000	Analyzed:	09/24/04

Type: BS Cleanup Method: EPA 3630C
Lab ID: QC265761

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	1,927	77	51-131

Surrogate	%REC	Limits
Hexacosane	86	53-143

Type: BSD Cleanup Method: EPA 3630C
Lab ID: QC265762

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	1,839	74	51-131	5	42

Surrogate	%REC	Limits
Hexacosane	84	53-143

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Nitrate Nitrogen

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2004-02	Analysis:	EPA 300.0
Analyte:	Nitrogen, Nitrate	Batch#:	94851
Matrix:	Water	Sampled:	09/21/04
Units:	mg/L	Received:	09/21/04
Diln Fac:	1.000	Analyzed:	09/22/04

Field ID	Type	Lab ID	Result	RL
MW-3	SAMPLE	174810-001	0.07	0.05
MW-4	SAMPLE	174810-004	0.32	0.05
MW-10	SAMPLE	174810-005	ND	0.05
MW-8	SAMPLE	174810-007	ND	0.05
MW-9	SAMPLE	174810-008	ND	0.05
MW-7	SAMPLE	174810-009	ND	0.05
MW-11	SAMPLE	174810-010	ND	0.05
	BLANK	QC265648	ND	0.05

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Nitrate Nitrogen

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2004-02	Analysis:	EPA 300.0
Analyte:	Nitrogen, Nitrate	Batch#:	94851
Field ID:	MW-4	Sampled:	09/21/04
MSS Lab ID:	174810-004	Received:	09/21/04
Matrix:	Water	Analyzed:	09/22/04
Units:	mg/L		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Dil Fac
BS	QC265649		1.000	1.010	101	80-120			1.000
BSD	QC265650		1.000	1.094	109	80-120	8	20	1.000
MS	QC265651	0.3176	2.500	2.828	100	80-120			5.000
MSD	QC265652		2.500	2.786	99	80-120	1	20	5.000

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Sulfate

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2004-02	Analysis:	EPA 300.0
Analyte:	Sulfate	Sampled:	09/21/04
Matrix:	Water	Received:	09/21/04
Units:	mg/L	Analyzed:	09/22/04
Batch#:	94851		

Field ID	Type	Lab ID	Result	RL	Dilu Fac
MW-3	SAMPLE	174810-001	35	0.50	1.000
MW-4	SAMPLE	174810-004	53	1.0	2.000
MW-10	SAMPLE	174810-005	65	1.0	2.000
MW-8	SAMPLE	174810-007	80	1.0	2.000
MW-9	SAMPLE	174810-008	4.4	0.50	1.000
MW-7	SAMPLE	174810-009	ND	0.50	1.000
MW-11	SAMPLE	174810-010	71	1.0	2.000
	BLANK	QC265648	ND	0.50	1.000

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Sulfate

Lab #:	174810	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2004-02	Analysis:	EPA 300.0
Analyte:	Sulfate	Batch#:	94851
Field ID:	MW-4	Sampled:	09/21/04
MSS Lab ID:	174810-004	Received:	09/21/04
Matrix:	Water	Analyzed:	09/22/04
Units:	mg/L		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Dil Fac
BS	QC265649		10.00	9.930	99	80-120			1.000
BSD	QC265650		10.00	10.58	106	80-120	6	20	1.000
MS	QC265651	53.18	25.00	77.00	95	80-120			5.000
MSD	QC265652		25.00	76.65	94	80-120	0	20	5.000

RPD= Relative Percent Difference

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	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	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

Well MW-2 (continued)									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
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	81.0	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	0.7	0.7	16

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

Well MW-4 (continued)									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
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

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

Well MW-5 (continued)									
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	188.9	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

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

Well MW-8 (continued)									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
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

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

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

Well MW-10 (continued)									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
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	<0.6	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

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	3000	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

HISTORICAL SURFACE WATER ANALYTICAL RESULTS

REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CALIFORNIA

(all concentrations in ug/L, equivalent to parts per billion [ppb])

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.									

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	—	NA
3	Aug-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
4	May-96	< 50	< 50	< 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	—	NA
7	Feb-97	< 50	< 50	< 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	—	NA
10	Feb-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
11	Sep-98	< 50	<50	< 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	—	< 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	-	< 2.0
19	Mar-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	-	< 2.0
20	Jun-02	< 50	< 50	< 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	-	< 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	-	< 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	-	< 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

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	—	NA
2	Aug-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
3	May-96	< 50	74	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
4	Aug-96	69	< 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
12	Dec-99	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
13	Sep-00	NS	NS	NS	NS	NS	NS	—	NS
14	Jan-01	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
15	Apr-01	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
16	Sep-01	NS	NS	NS	NS	NS	NS	—	NS
17	Dec-01	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
18	Mar-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
19	Jun-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	2.4
20	Sep-02	NS	NS	NS	NS	NS	NS	—	NS
21	Dec-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	-	< 2.0
22	Mar-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	-	< 2.0
23	Jun-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	-	< 2.0
24	Sep-03	NS	NS	NS	NS	NS	NS	—	NS
25	Dec-03	60	< 100	< 0.3	< 0.3	< 0.3	< 0.6	-	< 5.0
26	Mar-04	<50	<100	<0.3	<0.3	<0.6	<0.6	-	< 5.0
27	Jun-04	NS	NS	NS	NS	NS	NS	—	NS
28	Sep-04	NS	NS	NS	NS	NS	NS	—	NS

NA = Not Analyzed for this constituent
NS = Not Sampled (no surface water present during sampling event)