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Alameda County
JUL 28 2004
Environmental Health

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: JULY 20, 2004
ATTENTION: MR. SCOTT SEERY	FILE: SES-2004-02
SUBJECT: REDWOOD REGIONAL PARK FUEL LEAK SITE	
WE ARE SENDING: <input checked="" type="checkbox"/> HEREWITH	<input type="checkbox"/> UNDER SEPARATE COVER
<input checked="" type="checkbox"/> VIA MAIL	<input type="checkbox"/> VIA
THE FOLLOWING: SECOND QUARTER 2004 GROUNDWATER MONITORING REPORT FOR REDWOOD REGIONAL PARK SERVICE YARD SITE - OAKLAND, CALIFORNIA (DATED JULY 15, 2004)	
<input type="checkbox"/> AS REQUESTED	<input type="checkbox"/> FOR YOUR APPROVAL
<input type="checkbox"/> FOR REVIEW	<input checked="" type="checkbox"/> FOR YOUR USE
<input type="checkbox"/> FOR SIGNATURE	<input type="checkbox"/> FOR YOUR FILES
COPIES TO: N. FUJITA (EBRPD) C. WILCOX (CA FISH & GAME) R. BREWER (REGIONAL BOARD)	By: <u>Bruce Rucker</u> 

July 16, 2004

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

Alameda County
Environmental Health
JUL 23 2004

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

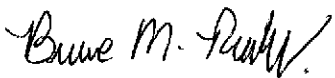
Dear Mr. Seery:

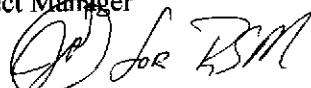
Attached is the referenced Stellar Environmental Solutions, Inc. (SES) report for the underground fuel storage tank (UFST) site at the Redwood Regional Park Service Yard, located at 7867 Redwood Road, Oakland, California. This project is being conducted for the East Bay Regional Park District (EBRPD), 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 June 2004 (Second Quarter 2004), and makes recommendations for future corrective action measures. Following the conclusion of the previous quarter, 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.

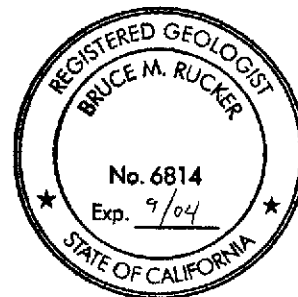
If you have any questions regarding this report, please contact Mr. Neal Fujita of the EBRPD, or contact us directly at (510) 644-3123.

Sincerely,


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


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



**SECOND 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
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July 16, 2004

Project No. 2004-02

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1.0 INTRODUCTION

PROJECT BACKGROUND

The subject property is the East Bay Regional Park District (EBRPD) Redwood Regional Park Service Yard located at 7867 Redwood Road in Oakland, Alameda County, California. The site has undergone 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 April 1 and July 31, 2004:

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

In the current quarter, SES also implemented a bioventing pilot test, which included installing one bioventing vent well and three vapor monitoring points and conducting a pilot test. This report discusses the borehole soil analytical data collected during the pilot test well installations. A full discussion of the bioventing program will be presented in separate technical reports.

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 8.0 (References and Bibliography) of this report provides a listing of all technical reports for the site. The following summarizes 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 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 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.

Including the current event, a total of 30 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. The bioventing approach, approved by Alameda County Health, included the installation (in June 2004) of pilot test bioventing wells (one vent well and three vapor monitoring points), conducting soil sampling during well installations, and measuring water levels in installed wells. Based on the findings, SES has proposed to Alameda County Health that water levels in bioventing wells continued to be measured until they reach their lowest depth, at which time the pilot test will be conducted and the full-scale bioventing system design will be prepared. The pilot test

activities will be documented in a separate technical report. Findings of the pilot test well installations (soil sample analytical results and hydrogeologic information) are presented herein as well, as they supplement the overall site conceptual model.

SITE DESCRIPTION

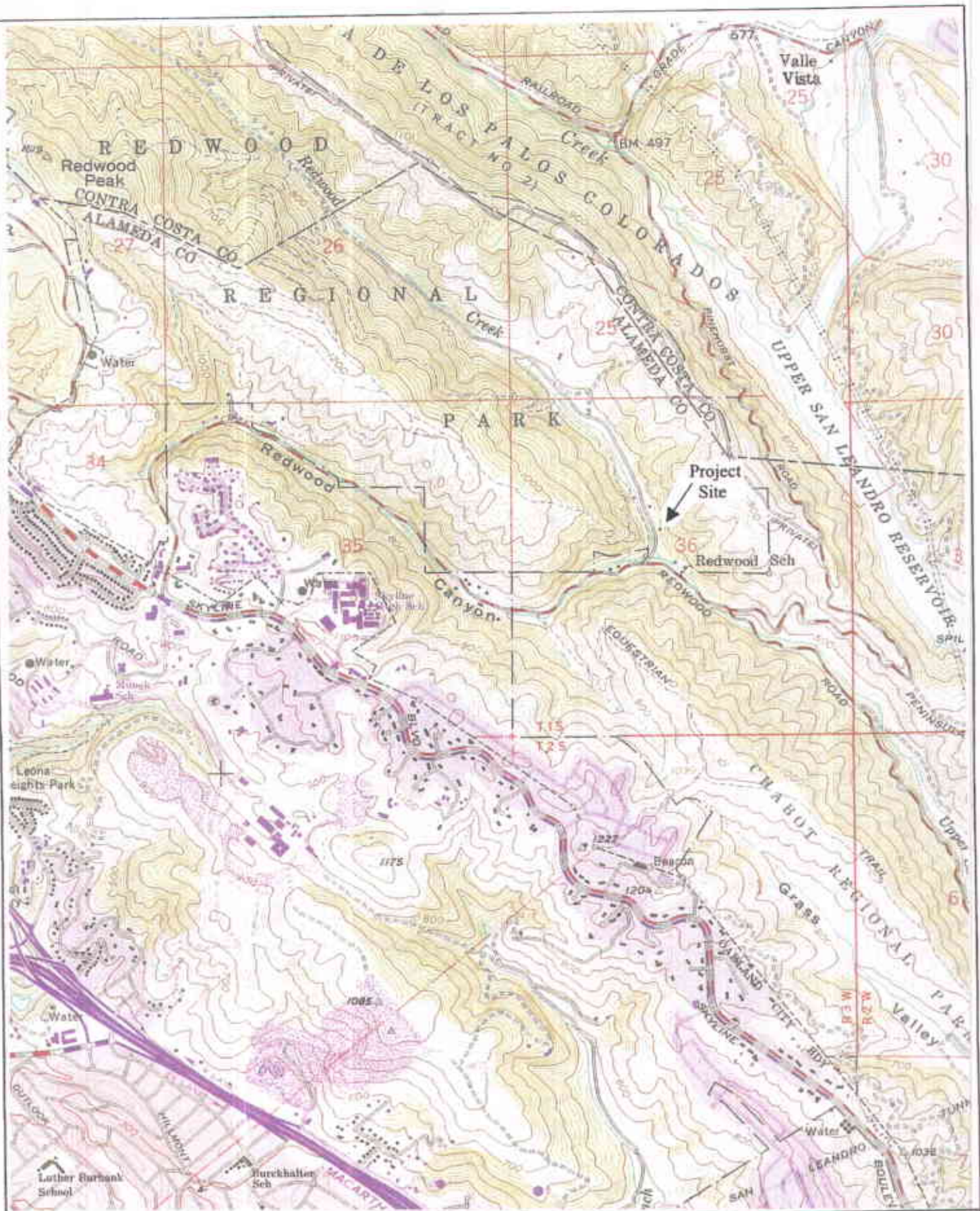
Figure 1 shows the location of the project site. The site slopes to the west, from an elevation of approximately 564 feet above mean sea level (amsl) at the eastern edge of the service yard to approximately 545 feet amsl at Redwood Creek, which defines the approximate western edge of the project site 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. In May 2004, Alameda County Health approved conducting a bioventing pilot test as a corrective action (discussed in separate bioventing-specific technical reports).

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). EBPRD 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.



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



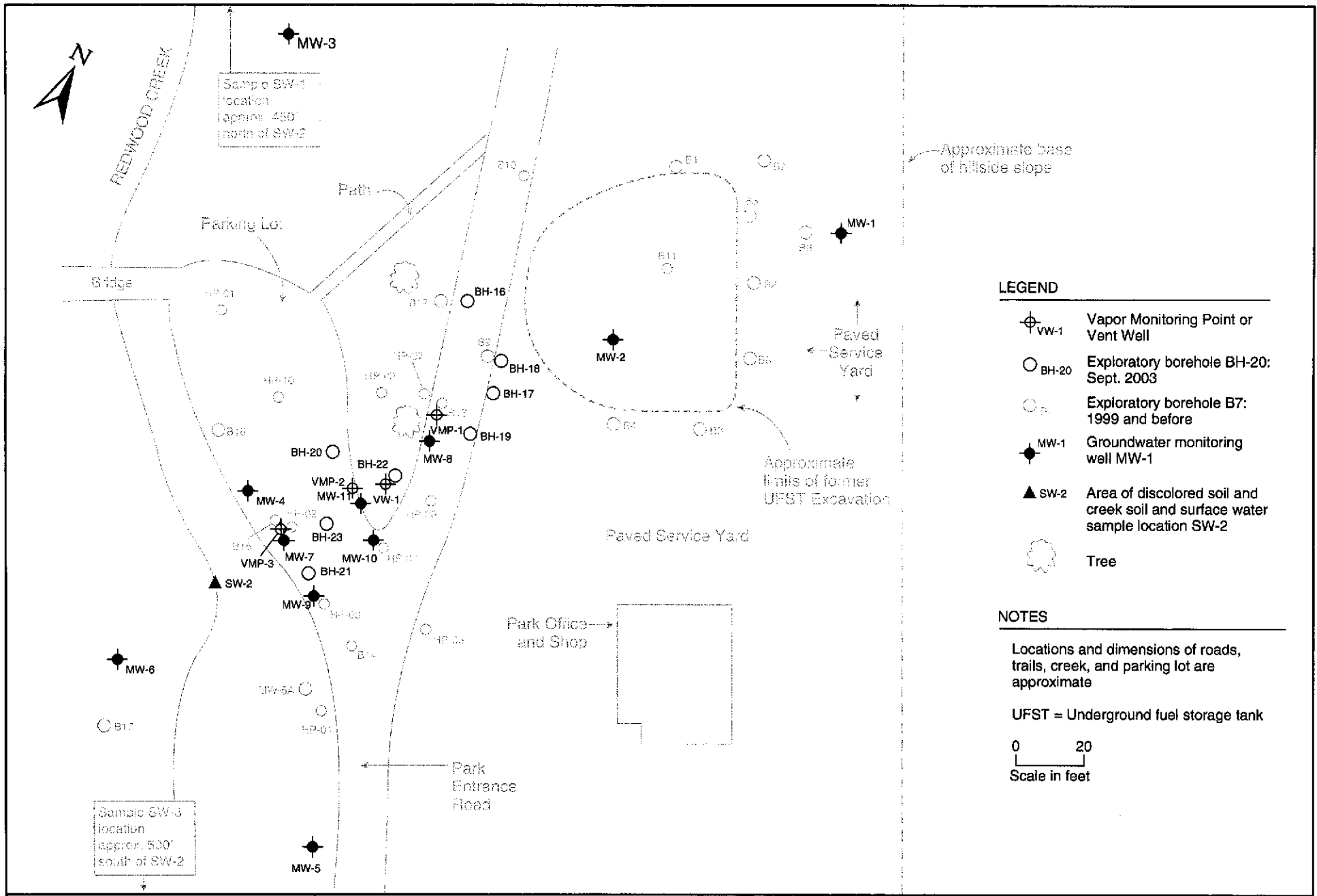
Redwood Regional Park Service Yard
Oakland, Alameda County, California

By: MJC







NOVEMBER 1997

★ Stellar Environmental Solutions
Geoscience & Engineering Consulting

Figure 1



LEGEND

-  Vapor Monitoring Point or Vent Well
-  Exploratory borehole BH-20: Sept. 2003
-  Exploratory borehole B7: 1999 and before
-  Groundwater monitoring well MW-1
-  Area of discolored soil and creek soil and surface water sample location SW-2
-  Tree

NOTES

Locations and dimensions of roads, trails, creek, and parking lot are approximate

UFST = Underground fuel storage tank

0 20
Scale in feet

2.0 PHYSICAL SETTING

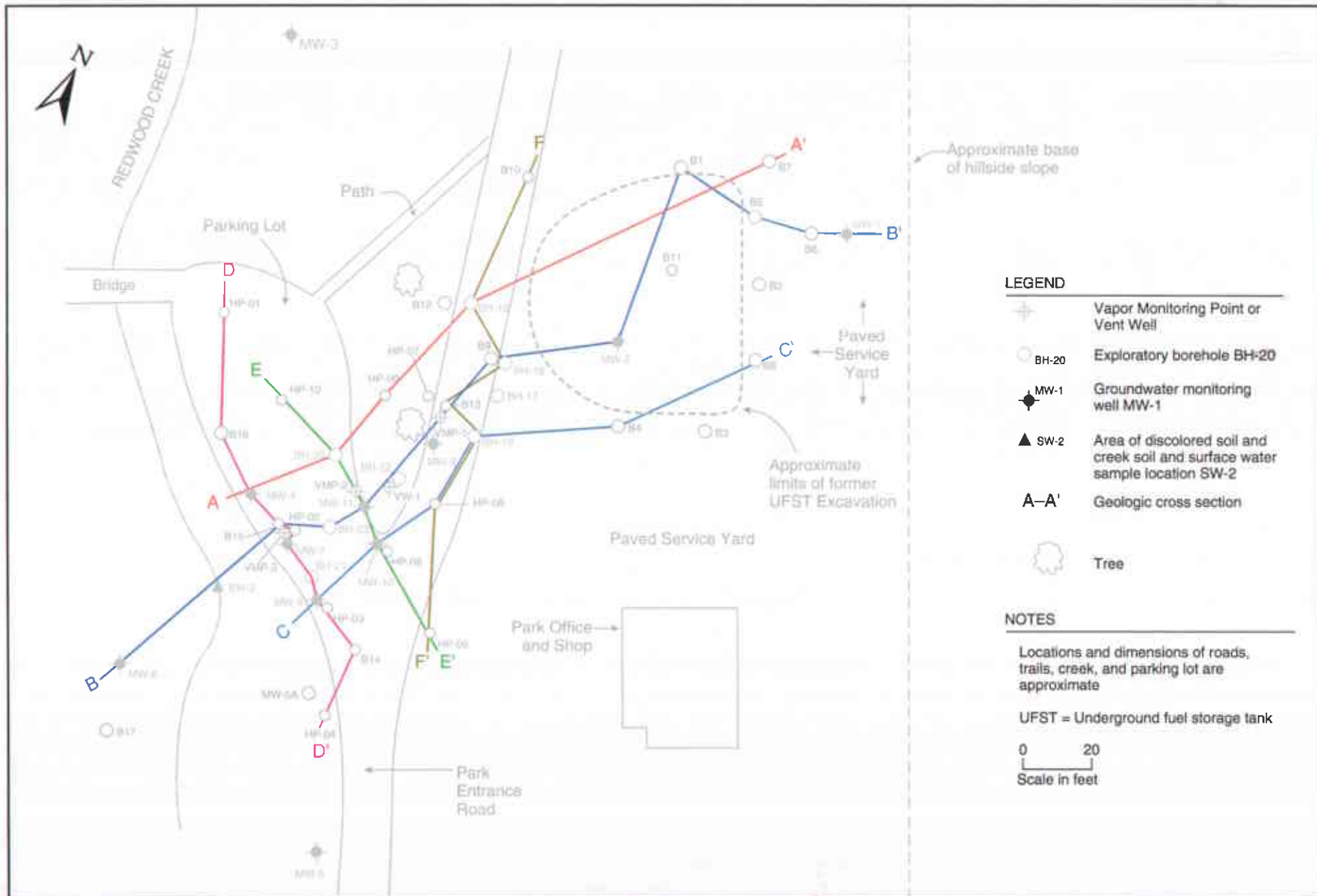
This section discusses the site hydrogeologic conditions based on geologic logging and water level measurements collected at the site since September 1993. Previous SES reports have included detailed discussions of site lithologic and hydrogeologic conditions. Alameda County Health requested in a May 2004 e-mail 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.

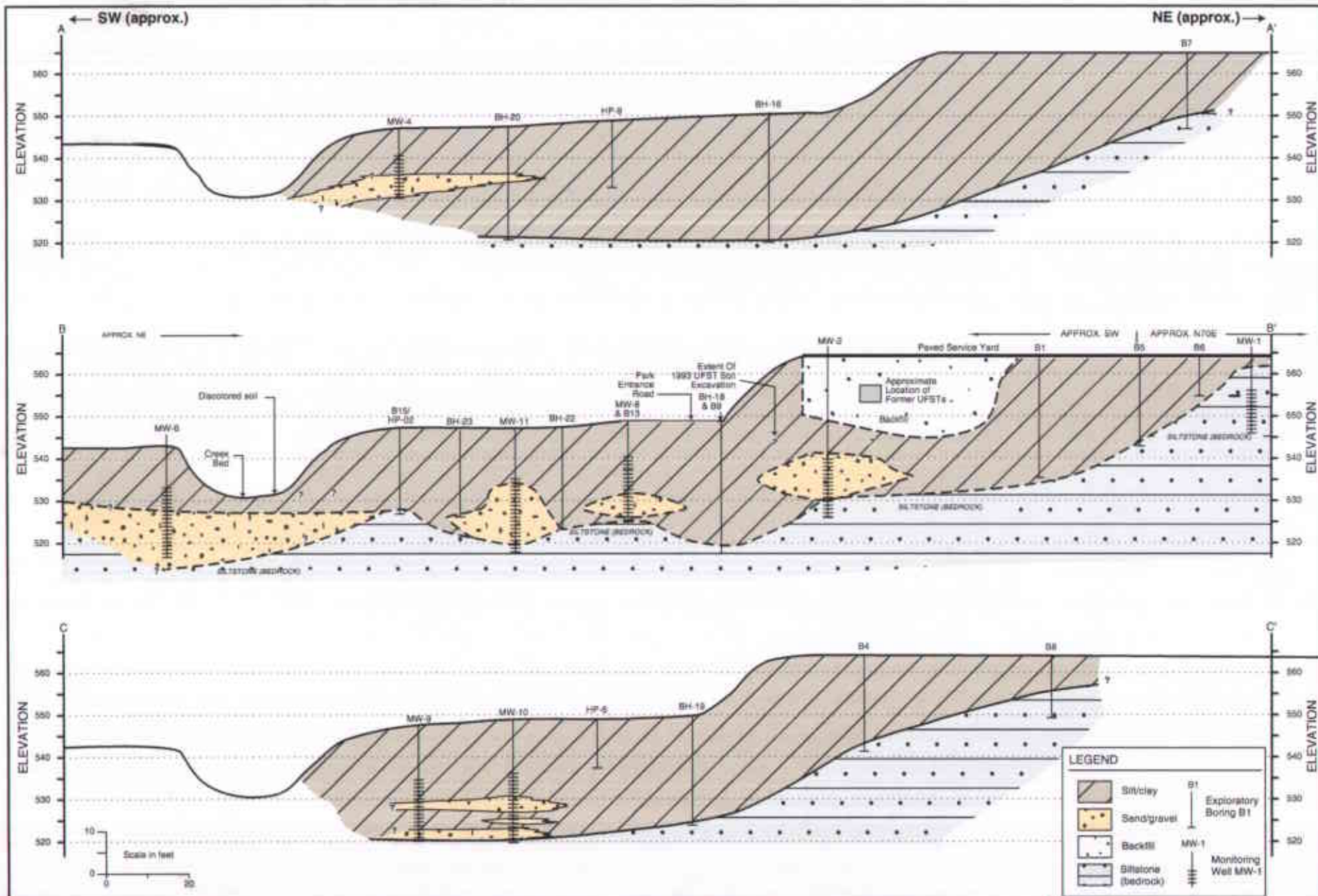
SITE LITHOLOGY

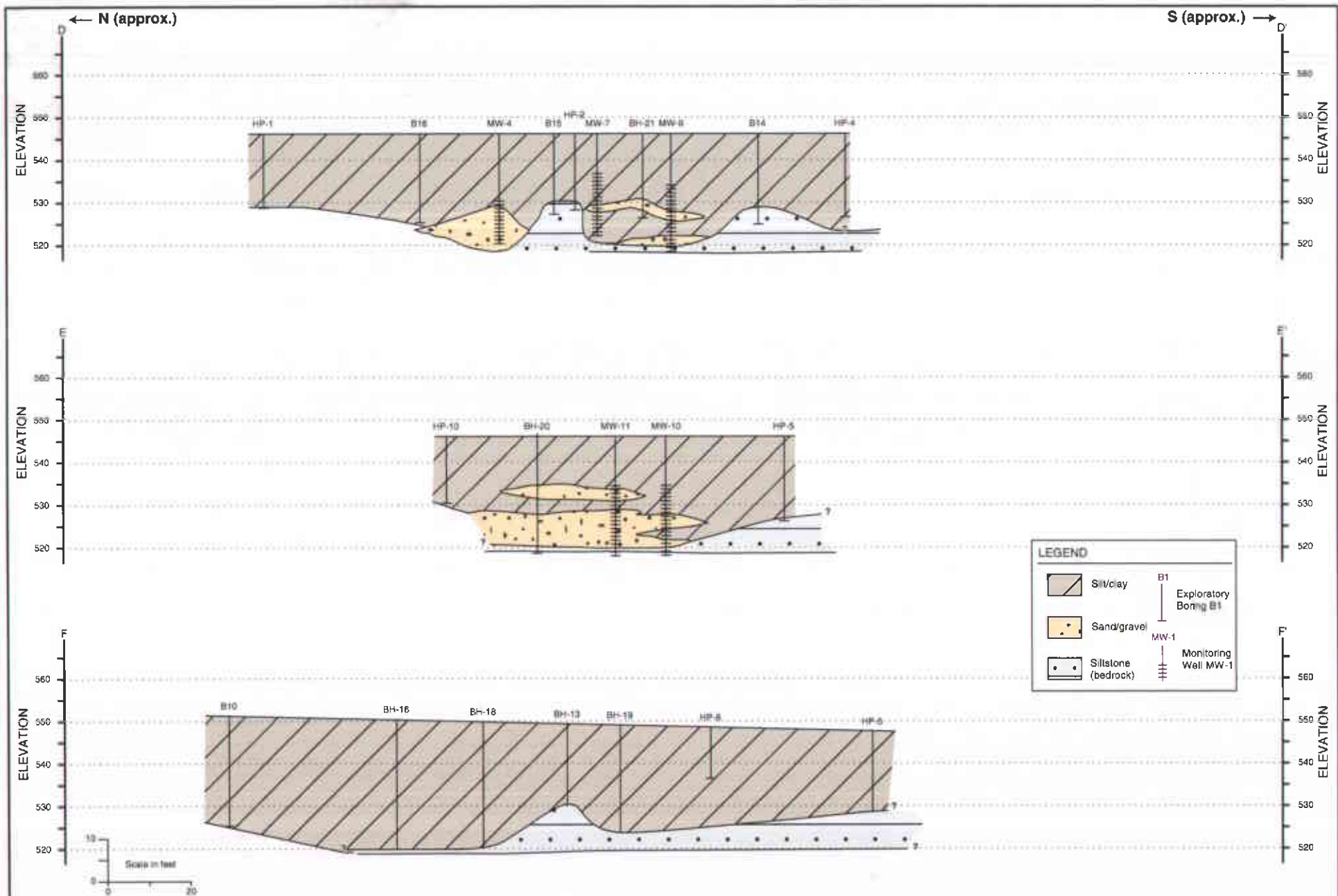
Figure 3 shows the location of geologic cross-sections. Figure 4 shows three sub-parallel geologic cross-sections (A-A' through C-C') along the long axis of the groundwater contaminant plume (i.e., along local groundwater flow direction). Figure 5 shows three sub-parallel geologic cross-sections (D-D' 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 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.

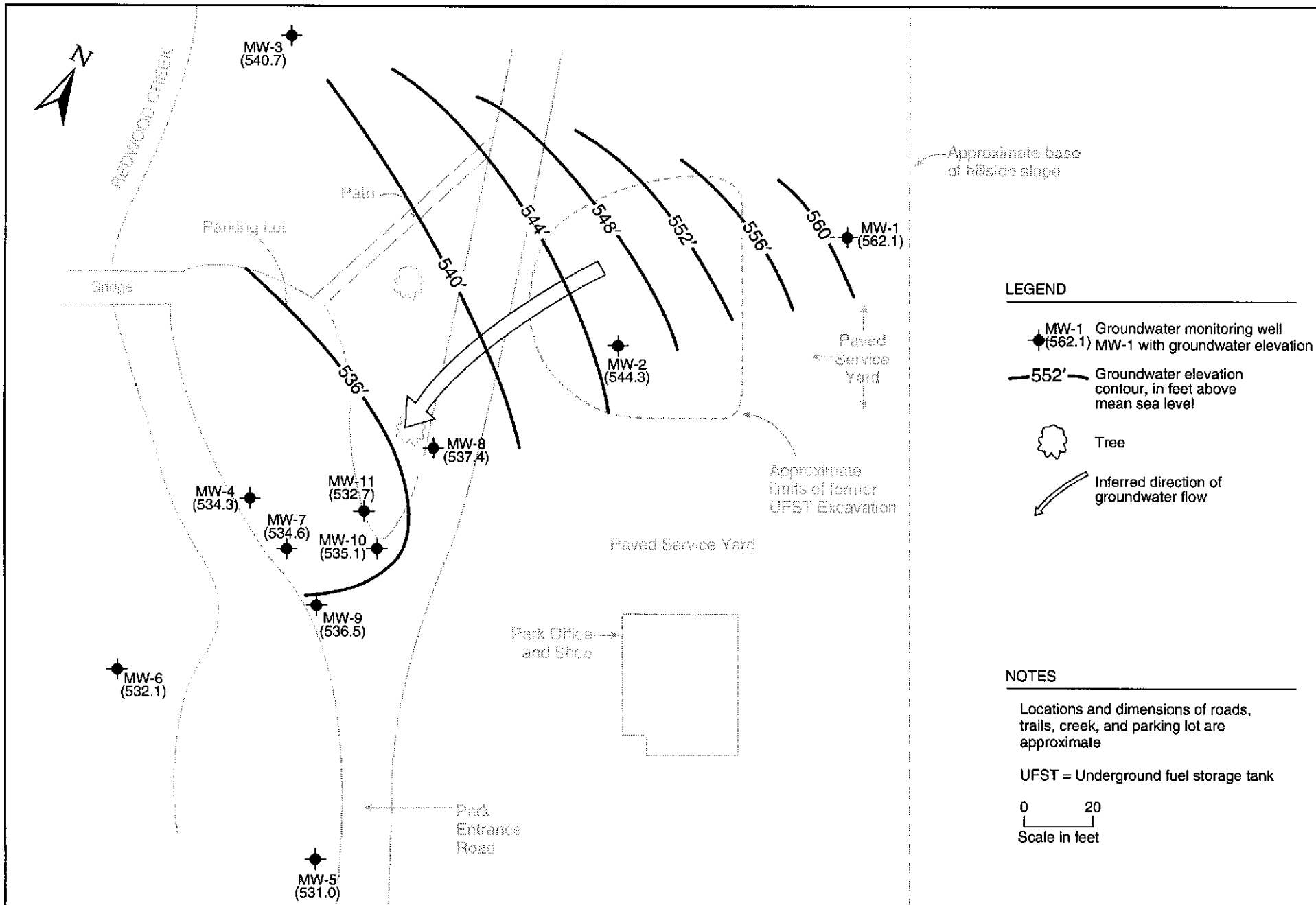
In the central and downgradient portions of the groundwater contaminant plume (under the entrance road and the parking area), the bedrock surface has local, fairly steep elevation highs and lows, expressing a hummocky surface. Bedrock elevations vary by up to 10 feet over distances of less than 20 feet 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 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.



GROUNDWATER ELEVATION MAP—JUNE 17, 2004
Redwood Regional Park Service Yard, Oakland, CA

Figure 6

by: MJC

JULY 2004

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 (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); therefore, there is little to no observable creek flow at these times.

3.0 Q2 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 (Q2 2004) in June 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-5 (added for this event to supplement recent creek bank grab-groundwater results), 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 the groundwater plume (MW-2, MW-4, 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 due to low flow).

Creek sampling and groundwater monitoring/sampling was conducted on June 18, 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 – June 18, 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	3.85	562.1
MW-2	36	20 to 35	566.5	22.23	544.3
MW-3	42	7 to 41	560.9	20.19	540.7
MW-4	26	10 to 25	548.1	13.85	534.3
MW-5	26	10 to 25	547.5	16.51	531.0
MW-6	26	10 to 25	545.6	13.51	532.1
MW-7	24	9 to 24	547.7	13.08	534.6
MW-8	23	8 to 23	549.2	11.82	537.4
MW-9	27	12 to 27	549.4	12.93	536.5
MW-10	28	13 to 28	547.3	12.24	535.1
MW-11	26	11 to 26	547.9	15.14	532.7

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 June 17, 2004. Surface water samples were 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 in the current event due to low-flow conditions. 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 flow) and water was present locally in pools approximately 6 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 visible petroleum sheen, but no petroleum odor was observed. It is likely that the bacteria is utilizing the petroleum as a carbon source, and is therefore a good indicator of the presence of petroleum contamination. A discussion of recent creek bank soil and grab-groundwater sampling is presented in following sections of this report.

4.0 ADDITIONAL SOIL AND GROUNDWATER SAMPLING

Additional soil and grab-groundwater sampling was conducted in the current quarter, for the following two objectives:

1. Determine pre-bioventing (“baseline”) soil contaminant concentrations at the depth intervals coincident with the newly-installed bioventing wells; and
2. Address an Alameda County Health request to evaluate the width and concentrations of contamination at the Redwood Creek bank/groundwater interface, to supplement data available from groundwater well monitoring.

CREEK BANK SAMPLING

The Redwood Creek bank immediately downgradient of the hydrocarbon plume has shown historical evidence of hydrocarbon seepage from the groundwater-surface water interface zone. Historically, there has been visual evidence of contamination in the creek bank (petroleum sheen and/or a thin mat of orange iron-fixing bacteria on the creek bank) in the immediate area of SW-2. To more precisely define this area and collect data more indicative of hydrocarbon concentrations in groundwater nearest the Redwood Creek interface, we collected samples by digging a hole at an angle into the creek bank above the surface water and sampling the resultant infiltrating groundwater.

There are four groundwater monitoring wells (MW-4, MW-7, MW-9, and MW-5) immediately upgradient of Redwood Creek that provide data on the likely width and magnitude of groundwater contamination. These wells are located approximately 20 to 40 feet upgradient of the creek; more proximal wells cannot be installed due to the steep topography. Historical groundwater monitoring has indicated that the groundwater contaminant plume intersects Redwood Creek over an approximately 60-foot-long interval—from near surface water sampling location SW-2 (represented by well MW-4) to a point between wells MW-9 and MW-5. Groundwater contamination was detected at a trace level of 80 $\mu\text{g/L}$ or less total petroleum hydrocarbons as gasoline (TPHg) in site well MW-5 in some monitoring events prior to 1996. No detectable hydrocarbons were found in well MW-5 between 1996 and 1998. Monitoring was then discontinued until this current event, when MW-5 was resampled and again had no detectable hydrocarbons.

To evaluate if soil and/or groundwater contamination extends a significant distance south of the area of known contamination, in May 2004, SES collected soil and groundwater sampling along the creek bank. As shown on Figures 7 and 8 (in Section 6.0 of this report), we sampled at four locations:

- CB-1: Approximately 15 feet upstream of SW-2 (the most upstream location where evidence of contamination has been observed);
- CB-2: Approximately 15 feet downstream of SW-2;
- CB-3: Approximately 30 feet downstream of CB-2; and
- CB-4: Approximately 30 feet downstream of CB-3 (this location is due west [downgradient] of monitoring well MW-5).

At each location, we utilized the following sampling methodology. A hand auger was used to create an approximately 2-inch-diameter borehole, beginning at the creek bank/creek bed interface, and angled at approximately 45 degrees into the creek bank. Each borehole was advanced until groundwater was encountered (approximately 3 feet into the creek bank). Groundwater entered the boreholes at a depth of approximately 1 foot. It was visually obvious that the water entering the boreholes was groundwater (and not creek surface water) based on the direction from which the water could be seen entering the boreholes (from the creek bank side rather than the creek bed side).

We collected one soil sample from each borehole, at the depth that displayed the most obvious visual/odorous evidence of contamination. In CB-1 (near the area of known contaminated groundwater discharge), the sample was collected at the surface. In the other boreholes, the samples were collected at depths between 1 and 2 feet (corresponding to borehole lengths of 2 and 3 feet). All soil samples were wet (saturated), and appeared to be of the same clayey sand or gravel material that constitutes the upper water-bearing zone at the site. One grab-groundwater sample was collected from each borehole using a new plastic bailer.

Borehole CW-1 exhibited both petroleum sheen/odor and the orange bacterial mat. Borehole CW-2 exhibited only the petroleum sheen and odor, but not the orange bacterial mat. Neither petroleum sheen/odor nor the orange bacterial mat were evident in downstream boreholes CW-3 or CW-4.

Section 6.0 discusses the analytical results of the creek bank sampling.

BIOVENTING PILOT TEST WELL SOIL SAMPLING

Four bioventing wells were installed in June 2004 for a pilot test to evaluate the feasibility of bioventing as a corrective action. Those activities will be discussed in detail in a separate technical report. Soil sampling analytical results conducted during borehole drilling are reported herein as well, as the data contribute to the overall understanding of site contamination.

Figure 2 shows the location of the four wells (VW-1, VMP-1, VMP-2, VMP-3). Two soil samples were collected from each of the four boreholes with 6-inch brass sleeves. All samples were within the interval of soil contamination of the unsaturated zone. Section 6 discusses the analytical results.

5.0 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 (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.

6.0 ANALYTICAL RESULTS

This section presents the field and laboratory analytical results of the following sampling events conducted in this quarter:

- Redwood Creek bank soil and grab-groundwater sampling (May 2004);
- Bioventing pilot test well installation borehole soil sampling (June 2004); and
- The most recent groundwater and creek surface water monitoring event (June 2004).

Appendix C contains the certified analytical laboratory reports and chain-of-custody records. Appendix D contains a summary of historical groundwater and surface analytical results.

MAY 2004 CREEK BANK SAMPLE ANALYTICAL RESULTS

As discussed in Section 4.0, the objective of the May 2004 creek bank sampling was to provide additional data on the lateral extent and magnitude of contamination at the Redwood Creek/groundwater interface, along the downgradient edge of the contaminant plume. Specifically, the sampling was designed to evaluate if the southern lateral limit of the groundwater contamination is adequately represented by the existing groundwater monitoring wells or, alternatively, if the plume extends farther south than previously inferred. Table 2 summarizes the analytical results of the May 2004 creek bank grab-groundwater samples, which shows concentrations detected in grab-groundwater sample CB-2-GW, located downgradient of well MW-9.

Soil Samples

Figure 7 shows the creek bank soil sampling locations and analytical results. Elevated petroleum contamination was present only at location CB-2, just downstream from surface water sampling SW-2 where evidence of creek bank soil contamination historically has been observed. Trace soil contamination was detected in CB-1 and CB-3 (immediately upstream and downstream of CB-2, respectively), indicating the northern and southern limits of the groundwater plume/creek bank interface.

Table 2
Creek Bank Soil and Groundwater Sample
Analytical Results – May 17, 2004
Redwood Regional Park Corporation Yard, Oakland, California

	TVHg	TEHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
GROUNDWATER SAMPLES (concentrations in µg/L)							
CB-1-GW	22,000	20,000	1,400	< 5.0	2,100	210	910
CB-2-GW	54,000	130,000	300	< 10	650	104	120
CB-3-GW	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	< 2.0
CB-4-BW	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	< 2.0
SOIL SAMPLES (concentrations in mg/kg)							
CB-1-0'	1.2	15	< 5.6	< 5.6	6.4	< 11.2	< 22
CB-2-2'	370	180	380	780	2,100	1,910	920
CB-3-3'	< 1.1	2.9	< 5.4	< 5.4	< 5.4	< 10.8	< 22
CB-4-2'	< 1.0	1.6	< 5.1	< 5.1	< 5.1	< 10.2	< 20

Notes:

MTBE = Methyl tertiary-butyl ether.

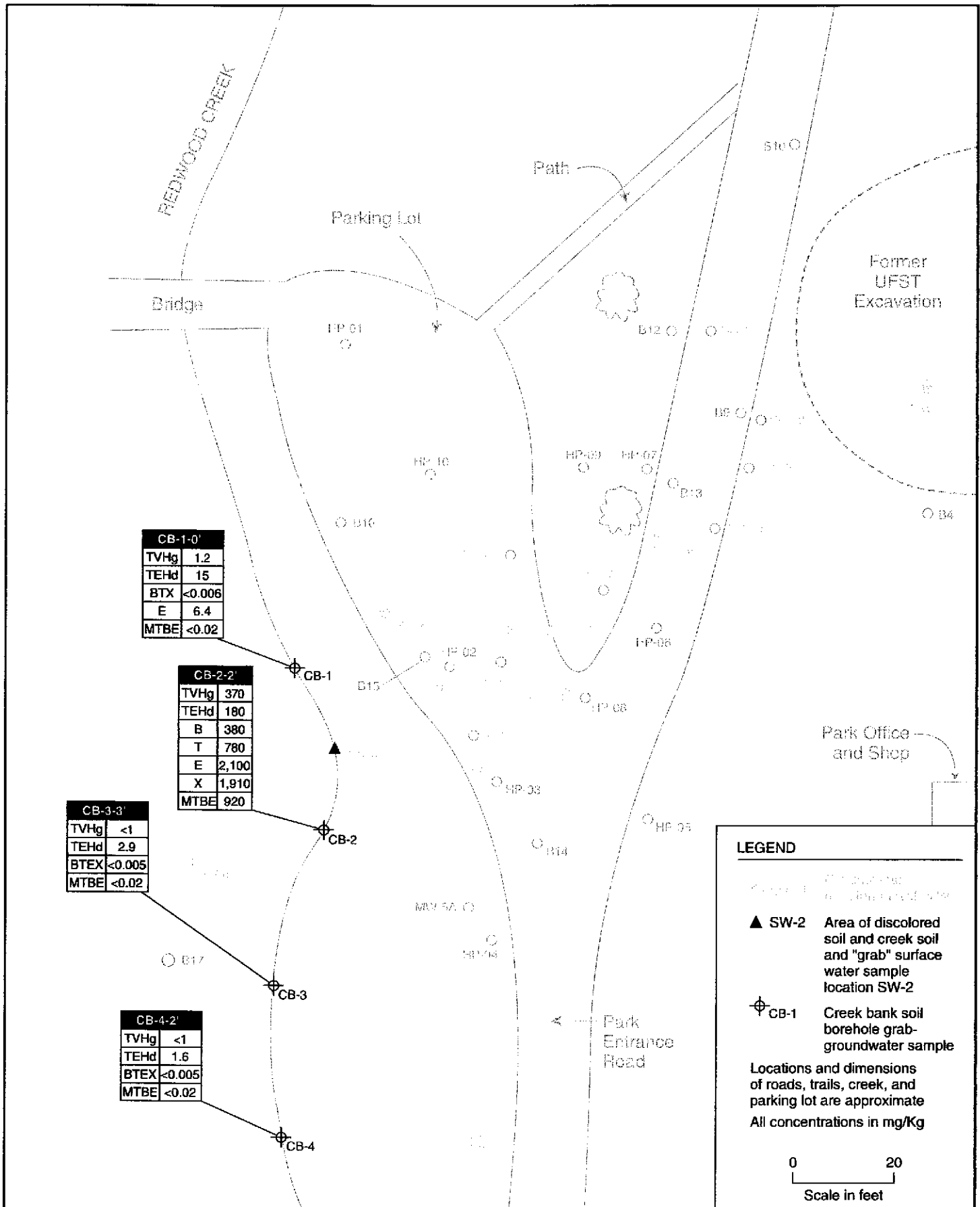
TEHd = Total extractable hydrocarbons - diesel range (equivalent to total petroleum hydrocarbons - diesel range).

TVHg = Total volatile hydrocarbons - gasoline range (equivalent to total petroleum hydrocarbons - gasoline range).

Groundwater Samples

Figure 8 shows the creek bank groundwater sampling locations and analytical results. The data support the following conclusions.

- The creek bank grab-groundwater samples represent the uppermost portion of the saturated interval, several feet upgradient of the creek itself.
- The lateral extent of groundwater contamination along the creek bank/groundwater interface is approximately 60 feet long, as evidenced by both the analytical results and visual observations during sampling. The northern limit appears to be north (upstream) of creek surface water sampling location SW-2 (approximately downgradient of well MW-4, which in recent events has shown no detectable contamination. The grab-groundwater sample CB-2 represents the highest concentration detected in the creek bank samples; it is downgradient from well MW-7 and the 1999 grab-groundwater sampling location HP-02 (in the area of MW-7), which had the highest detectable hydrocarbon concentrations at the site to date. The southern limit of groundwater contamination is between creek bank samples CB-2 and CB-3,



CB-1-0'	
TVHg	1.2
TEHd	15
BTX	<0.006
E	6.4
MTBE	<0.02

CB-2-2'	
TVHg	370
TEHd	180
B	380
T	780
E	2,100
X	1,910
MTBE	920

CB-3-3'	
TVHg	<1
TEHd	2.9
BTEX	<0.005
MTBE	<0.02

CB-4-2'	
TVHg	<1
TEHd	1.6
BTEX	<0.005
MTBE	<0.02

LEGEND

○ SW-1 Area of discolored soil and creek soil

▲ SW-2 Area of discolored soil and creek soil and "grab" surface water sample location SW-2

⊕ CB-1 Creek bank soil borehole grab-groundwater sample

Locations and dimensions of roads, trails, creek, and parking lot are approximate
All concentrations in mg/Kg

0 20
Scale in feet

MAY 2004 CREEK BANK SOIL SAMPLE RESULTS

Redwood Regional Park
Oakland, CA

By: MJC

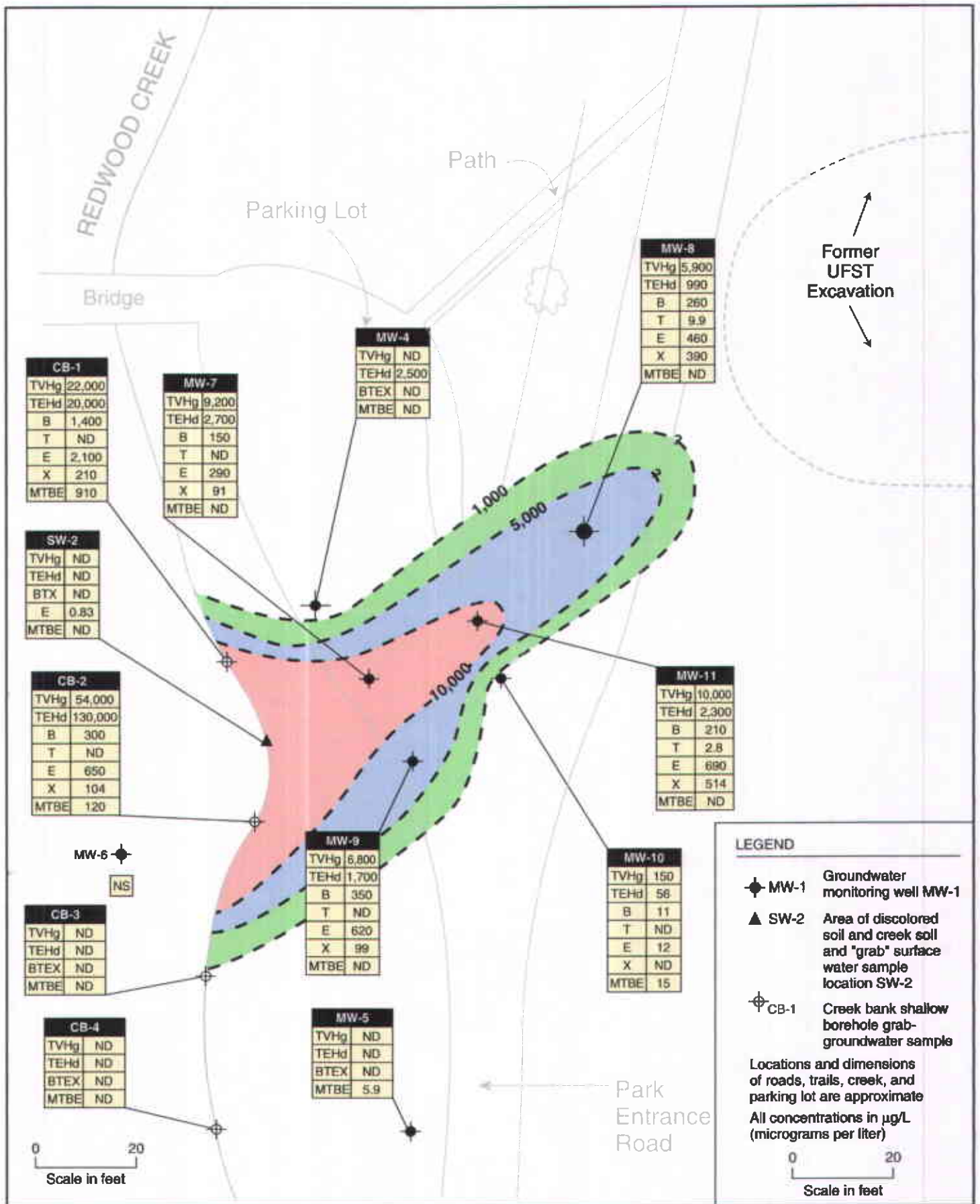
JUNE 2004

Figure 7

★ Stellar Environmental Solutions, Inc.
Geoscience & Engineering Consulting

2004-02-09





CB-1	
TVHq	22,000
TEHd	20,000
B	1,400
T	ND
E	2,100
X	210
MTBE	910

MW-7	
TVHq	9,200
TEHd	2,700
B	150
T	ND
E	290
X	91
MTBE	ND

MW-4	
TVHq	ND
TEHd	2,500
BTEX	ND
MTBE	ND

MW-8	
TVHq	5,900
TEHd	990
B	260
T	9.9
E	460
X	390
MTBE	ND

SW-2	
TVHq	ND
TEHd	ND
BTX	ND
E	0.83
MTBE	ND

CB-2	
TVHq	54,000
TEHd	130,000
B	300
T	ND
E	650
X	104
MTBE	120

MW-11	
TVHq	10,000
TEHd	2,300
B	210
T	2.8
E	690
X	514
MTBE	ND

MW-5
NS

CB-3	
TVHq	ND
TEHd	ND
BTEX	ND
MTBE	ND

MW-9	
TVHq	6,800
TEHd	1,700
B	350
T	ND
E	620
X	99
MTBE	ND

MW-10	
TVHq	150
TEHd	56
B	11
T	ND
E	12
X	ND
MTBE	15

CB-4	
TVHq	ND
TEHd	ND
BTEX	ND
MTBE	ND

MW-5	
TVHq	ND
TEHd	ND
BTEX	ND
MTBE	5.9

MAY-JUNE 2004 GROUNDWATER RESULTS AND GASOLINE CONTOURS

Redwood Regional Park
Oakland, CA

By: MJC

JULY 2004

Figure 8

★ Stellar Environmental Solutions, Inc.
Geoscience & Engineering Consulting

Approximately 45 feet downstream of SW-2. This distribution concurs with the limits of the groundwater contaminant plume, as indicated by the June 2004 groundwater well sampling data. This indicates that the existing groundwater monitoring well network adequately constrains the lateral limits of the groundwater plume at the creek bank.

- Petroleum concentrations in the creek bank grab-groundwater samples were significantly higher than recent and historical creek surface water samples, even at surface water sampling location SW-2 where maximum creek surface water concentrations have been detected. This is likely due to contaminant dilution of surface water samples.
- Grab-groundwater samples commonly display greater concentrations than groundwater well samples, due to the adsorbed-phase contaminant contribution in unfiltered grab samples. However, it is unlikely that the contaminant concentration variance results from the sampling methodology. It is more likely that groundwater concentrations are indeed greater at the creek bank/groundwater interface, representing a “slug” of higher contamination that has migrated to and has accumulated at that interface. In addition, the creek bank grab-groundwater samples represent the uppermost portion of the saturated interval, which is typically the most contaminated portion of an aquifer with petroleum compounds. It is possible that groundwater well sample concentrations may be an average of higher and lower concentrations that might vary vertically across the saturated interval.
- Historical groundwater analytical results have generally shown diesel concentrations to be approximately 1 order of magnitude below gasoline concentrations. The creek bank groundwater samples show diesel concentrations approximately equal to or greater than gasoline concentrations. This is consistent with the inferred “slug” of contamination discussed above, and the less volatile diesel component of the contamination may be accumulating, while the more volatile gasoline component is reduced in concentration via volatilization and/or flushing by the creek surface water.

BIOVENTING PILOT TEST WELL INSTALLATION BOREHOLE RESULTS

Four bioventing pilot test wells were installed on June 1 and 2, 2004. The wells included one vent well (VW-1) and three vapor monitoring points (VMP-1 through VMP-3). A full discussion of the bioventing pilot test will be presented in separate, bioventing-specific technical reports. The following summarizes the analytical results of soil samples collected during well installations, as these analytical results are relevant to the overall understanding of the groundwater monitoring program. Table 3 summarizes the analytical results (for contaminants only) of the borehole soil samples. Analytical results of those soil samples that were analyzed for bioventing-related physical and chemical characteristics will be reported in the bioventing-specific technical report.

Table 3
Bioventing Pilot Test Well Borehole Soil Samples
Analytical Results – June 1 and 2, 2004
Redwood Regional Park Corporation Yard, Oakland, California

Borehole Soil Sample I.D.	Sampling Depth (feet)	TVHg	TEHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
VMP-1-10'	10.5'	< 1.0	< 1.0	< 0.0052	< 0.0052	< 0.0052	< 0.0104	< 0.021
VMP-1-14.5'	14.5'	2,100	42	< 0.5	< 0.5	15	4.0	< 2.0
VMP-2-10.5'	10.5'	3,500	1,000	1.4	< 1.3	42	197	< 5.0
VMP-2-14.5'	14.5'	3,200	650	8.0	< 0.5	40	77	< 2.0
VMP-3-10.5'	10.5'	< 1.1	1.2	< 0.0055	< 0.0055	< 0.0055	< 0.011	< 0.022
VMP-3-14.5'	14.5'	1,400	470	< 0.5	< 0.5	8.9	5.3	< 2.0
VW-1-10'	10'	< 0.98	1.1	< 0.0049	< 0.0049	< 0.0049	< 0.098	< 0.02
VW-1-15.5'	15.5'	38	1.5	< 0.025	< 0.025	0.26	0.13	< 0.10

Notes:

MTBE = Methyl tertiary-butyl ether.

TEHd = Total extractable hydrocarbons - diesel range (equivalent to total petroleum hydrocarbons - diesel range).

TVHg = Total volatile hydrocarbons - gasoline range (equivalent to total petroleum hydrocarbons - gasoline range).

All concentrations reported in milligrams per kilogram (mg/kg).

In the upper sampled zone (approximately 10 to 11 feet deep), elevated soil contamination was detected only in the VMP-1 location (approximately 10 feet from the vent well VW-1). At the other three locations, the absence of elevated contaminant concentrations in the upper soil samples constrain the upper depth of residual soil contamination.

In the lower sampled zone (approximately 14 to 15 feet deep), elevated soil contamination was detected in all the wells except VMP-3, which is the most downgradient VMP, approximately 35 feet from vent well VW-1. These data confirm the existing model that a significant mass of residual soil contamination exists in the seasonally-unsaturated zone (above the zone that appears to be saturated year-round).

Consistent with previous findings, diesel-range hydrocarbon concentrations were generally much lower than gasoline-range hydrocarbons, especially when petroleum concentrations exceeded 1,000 milligram per kilogram (mg/kg).

CURRENT EVENT GROUNDWATER (WELL) AND SURFACE WATER RESULTS

Table 4 summarizes the contaminant analytical results of the current monitoring event, and Table 5 summarizes natural attenuation indicator results from the current event. Figure 8 shows the current event contaminant analytical results and the inferred limits of the gasoline groundwater plume. In the current event, well MW-5 was sampled for the first time since, to re-confirm that this well constrains the southern limit of the plume.

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. Site groundwater contaminant concentrations also exceed all surface water screening levels, with the exception of toluene and MTBE.

Consistent with recent historical well sampling events, maximum or near maximum groundwater contaminant concentrations were detected in wells in the downgradient portion of the contaminant plume, including the most downgradient wells MW-7 and MW-9. Minimal contamination was detected in upgradient well MW-2 and crossgradient (to the south) wells MW-10 and MW-5.

Prior to this groundwater monitoring event, well MW-5 had not been sampled since 1998 due to the absence of contamination in the 1996-1998 sampling events. To supplement the creek bank grab-groundwater sampling conducted in this event (see following discussion), well MW-5 was sampled in the current event. The only contaminant detected was MTBE, at a concentration just above the most conservative ESL criterion. These data confirm that the southern limit of the groundwater contaminant plume, in the downgradient portion of the plume, is constrained to the north of MW-5. The trace concentration of MTBE and the absence of other fuel contaminants is expected, given that MTBE is known to have greater lateral dispersivity than other fuel contaminants. As discussed below, the current event groundwater data correlate well with contemporaneous creek bank grab-groundwater sampling results.

The surface water sample collected from location SW-2 had a detectable concentration of only ethylbenzene (0.83 µg/L), which does not exceed the established regulatory surface water screening level.

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 molecular oxygen to efficiently break down the ring structure of specific constituents. Although biodegradation of hydrocarbons can occur under anaerobic conditions,

Table 4
Groundwater and Surface Water Sample
Analytical Results – June 17, 2004
Redwood Regional Park Corporation Yard, Oakland, California

	TVHg	TEHd	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE
GROUNDWATER SAMPLES							
MW-2	< 50	< 50	0.75	< 0.5	< 0.5	< 0.5	15
MW-4	< 50	2,500	< 0.5	< 0.5	< 0.5	< 0.5	3.5
MW-5	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	5.9
MW-7	9,200	2,700	150	< 0.5	290	91	< 2.0
MW-8	5,900	990	260	9.9	460	390	< 10
MW-9	6,800	1,700	350	< 2.5	620	99.2	< 10
MW-10	150	56	11	< 0.5	12	< 0.5	15
MW-11	10,000	2,300	210	2.8	690	514	< 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	< 50	< 50	< 0.5	< 0.5	0.83	< 0.5	< 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, 2004).

^(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.

TEHd = Total extractable hydrocarbons - diesel range (equivalent to total petroleum hydrocarbons - diesel range).

TVHg = Total volatile hydrocarbons - gasoline range (equivalent to total petroleum hydrocarbons - gasoline range).

All concentrations reported in micrograms per liter ($\mu\text{g/L}$) (equivalent to parts per billion).

hydrocarbon biodegradation is greatest 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. Under favorable conditions, this approach has the potential to eliminate the need for active remediation.

However, such natural attenuation only occurs if the concentration of hydrocarbons is low enough to facilitate the infiltration of natural oxygen through the interstitial space around the contamination, supporting the microorganisms for which the contamination is a food source (thus "attenuating" it).

Table 5
Groundwater Well Sample Analytical Results
Natural Attenuation Indicators – June 17, 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	3.2	0	257
MW-2	NA	NA	1.1	0	225
MW-3	< 0.05	37	1.0	0	264
MW-4	0.33	55	10.9	0	267
MW-5	NA	NA	1.2	0	268
MW-6	NA	NA	1.5	0	267
MW-7	< 0.05	1.4	1.0	5.0	210
MW-8	< 0.05	61	1.1	2.0	206
MW-9	< 0.05	66	1.5	0	222
MW-10	< 0.05	62	5.6	0	251
MW-11	< 0.05	7.5	1.3	4.2	198

Notes:

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

NA = Not analyzed.

The concentration in soil or groundwater above which natural attenuation is unlikely to take place is still 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.

Conditions that can render natural attenuation an infeasible or unacceptable remedial strategy include: a nearby sensitive receptor; sufficient residual contamination (in soil or groundwater) such that it is a continued input to groundwater contamination; unfavorable conditions for microbial activity; and/or insufficient distance for the plume to stabilize before migrating to a receptor of concern.

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, oxidation-reduction potential (ORP), and general mineral analyses.

Dissolved Oxygen

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 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 1.2 mg/L to 5.6 mg/L, with one well (MW-4) at 10.9 mg/L. The elevated DO concentration in this well may be a function of localized supersaturation resulting from the previous ORC™ injection. There was no clear correlation between DO and hydrocarbon concentrations in the current event; however, in general, monitoring wells upgradient and crossgradient of the plume had higher DO concentrations than monitoring wells within and downgradient of the plume. This trend is to be 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. In oxidizing (aerobic) conditions, the ORP of groundwater is typically positive; in reducing (anaerobic) conditions, the ORP is typically negative (or less positive). Therefore, groundwater ORP values inside a hydrocarbon plume are typically less than those measured outside the plume.

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), ORP values ranged from +198 mV to +222 mV. Other monitoring wells showed positive ORP values ranging from +225 mV to +268 mV. Therefore, the ORP values showed the expected general inverse correlation with hydrocarbon concentrations during this event. The data also indicate that aerobic conditions likely exist outside the plume, and are less aerobic within the plume, suggesting that oxygen depletion is occurring due to the presence of hydrocarbon contamination.

General Mineral Analyses

An inverse relationship between general minerals—including ferrous iron, nitrate, and sulfate—and hydrocarbon concentrations is indicative of the occurrence of anaerobic biodegradation. Specifically, anaerobic degradation of hydrocarbon compounds is indicated when DO concentrations are low (less

than 1.0 mg/L), ORP is low (less than 50 mV), and general mineral concentrations are below background.

In the current site monitoring event, for the four wells within the 1,000- $\mu\text{g/L}$ TPHg contour, nitrate was not detected and ferrous iron concentrations were generally higher than for other monitoring wells. The results are also consistent with the DO and ORP data, supporting the conclusion that oxygen is currently limiting the more efficient aerobic biodegradation process. Sulfate concentration showed no discernable trend, indicating that anaerobic biodegradation is probably within the iron-reducing redox environment rather than the sulfate-reducing environment.

These results indicate that some degree of aerobic degradation is likely occurring within the plume, predominantly on the lateral edges. Due to the substantial mass of residual soil contamination in the seasonally-unsaturated zone, it is unlikely that natural attenuation is contributing to a significant reduction in groundwater contaminant mass. The recently implemented bioventing pilot test program (reported in separate technical documents) will determine if bioventing is a feasible strategy for reducing residual soil contamination to the point that natural attenuation will become effective for reducing groundwater concentrations.

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).

7.0 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 (30 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, which exceed 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 well MW-4 showed significantly 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 may have stabilized (maximum site contaminant concentrations have not increased in recent sampling events). The lateral extent of the groundwater contaminant plume as illustrated by groundwater monitoring well data concurs with recent downgradient (near the creek bank) grab-groundwater and soil sampling data.
- The only contaminant detected in the current event site surface water (creek samples) was ethylbenzene; however, the detected contaminant concentration is not above the established regulatory surface water screening levels.

- 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 need to address the potential sources of continuing mass input to the plume.
- Four grab-groundwater samples were collected in May 2004 along the Redwood Creek bank surface water/groundwater interface zone by boring back at an angle into the creek bank. The analytical results of the creek bank grab-groundwater samples show significant concentrations detected in grab-groundwater sample CB-2-GW, located downgradient of well MW-9. The hydrochemical results from the four samples along the creek show results that concur with the conceptual model and that generally fit the observed limits of the orange algae degradation zone.
- Four bioventing pilot test wells (one vent well and three vapor monitoring points) were installed in June 2004, and will be used in a pilot test 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 conducted.

PROPOSED ACTIONS

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

- Continue the quarterly program of creek and groundwater sampling and reporting; and
- Implement the proposed bioventing pilot test and prepare a full-scale system design, when water levels drop sufficiently to expose lower screened intervals or when water levels appear to have reached their lowest level. The pilot test will be followed by design of a full-scale bioventing system, if the pilot test data support implementing bioventing.

8.0 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, 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.

9.0 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

TOC = Top of well Casing

WELL GAUGING DATA

Project # 040617-Ad Date 6/17/04 Client Stellar

Site Redwood Regional Park Oakland

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					3.85	19.25	TOC
MW-2	4					22.23	38.90	↓
MW-3	4					20.19	45.10	
MW-4	4					13.85	26.40	
MW-5	4					16.51	26.96	
MW-6	24					13.51	27.45	
MW-7	2					13.08	25.40	
MW-8	2					11.82	22.30	
MW-9	2					12.93	26.40	
MW-10	2					12.24	28.35	
MW-11	2					15.14	30.27	

WELL MONITORING DATA SHEET

Project #: 040617-Act	Client: Stellar
Sampler: Ac	Start Date: 6/17/04
Well I.D.: MW-1	Well Diameter: 2 3 <u>4</u> 6 8
Total Well Depth: 19.25	Depth to Water: 3.85
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH

Purge Method:	Sampling Method: Bailer
Bailer	Disposable Bailer
Disposable Bailer	Extraction Port
Middleburg	Dedicated Tubing
Electric Submersible	Other: _____
Waterra	
Peristaltic	
Extraction Pump	
Other: _____	

Field Analysis

(Gals.) X _____ = _____
Gals.

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Observations
2:14	—	—	—	—	—	Fe ²⁺ : 0 mg/L

Did well dewater? Yes No Gallons actually evacuated: _____

Sampling Time: _____ Sampling Date: _____

Sample I.D.: _____ Laboratory: _____

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

Equipment Blank I.D.: _____ @ _____ Time Duplicate I.D.: _____

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

D.O. (if req'd):	<u>Pre-purge</u>	3.2 mg/L	Post-purge:	mg/L
ORP (if req'd):	<u>Pre-purge</u>	257 mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: <u>040617-Act</u>	Client: <u>Stellar</u>
Amplifier: <u>AC</u>	Start Date: <u>6/17/04</u>
Well I.D.: <u>MW-2</u>	Well Diameter: 2 3 <u>4</u> 6 8
Total Well Depth: <u>38.90</u>	Depth to Water: <u>22.23</u>
Before: _____ After: _____	Before: _____ After: _____
Depth to Free Product: _____	Thickness of Free Product (feet): _____
Referenced to: <u>PVC</u> Grade _____	D.O. Meter (if req'd): <u>YSI</u> HACH

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

$$11 \text{ (Gals.)} \times 3 = 33 \text{ Gals.}$$
 Case Volume Specified Volumes Calculated Volume

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

Time	Temp. (° or °C)	pH	Conductivity (mS or μS)	Turbidity (NTU)	Gals. Removed	Observations
108	60.9	6.9	855	86	11	Fe ²⁺ : 0 mg/L
111	60.9	6.8	863	108	22	clear
113	60.7	6.8	861	112	33	DTW = 24.87

Did well dewater? Yes No Gallons actually evacuated: 33

Sampling Time: 1120 Sampling Date: 6/17/04

Sample I.D.: MW-2 Laboratory: STL C&T

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

Equipment Blank I.D.: _____ @ _____ Time Duplicate I.D.: _____

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

D.O. (if req'd):	<u>Pre-purge:</u> 1.1 mg/L	Post-purge:	mg/L
ORP (if req'd):	<u>Pre-purge:</u> 225 mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 040617-ACC	Client: Stellar
Sampler: AC	Start Date: 6/17/04
Well I.D.: MW-3	Well Diameter: 2 3 (4) 6 8
Total Well Depth: 45.10	Depth to Water: 20.19
Before: _____ After: _____	Before: _____ After: _____
Depth to Free Product: _____	Thickness of Free Product (feet): _____
Referenced to: (PVC) Grade	D.O. Meter (if req'd): (YSI) HACH

Purge Method:	Sampling Method: Bailer
<input checked="" type="checkbox"/> Bailer <input type="checkbox"/> Disposable Bailer <input type="checkbox"/> Middleburg <input type="checkbox"/> Electric Submersible	<input type="checkbox"/> Waterra <input type="checkbox"/> Peristaltic <input type="checkbox"/> Extraction Pump <input type="checkbox"/> Other _____
	<input checked="" type="checkbox"/> Disposable Bailer <input type="checkbox"/> Extraction Port <input type="checkbox"/> Dedicated Tubing Other: _____

_____ (Gals.) X _____ = _____
Gals.

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Observations
0835	—	—	—	—	—	Fe²⁺: 0 mg/L

Did well dewater? Yes No Gallons actually evacuated: _____

Sampling Time: **0835** Sampling Date: **6/17/04**

Sample I.D.: **MW-3** Laboratory: **C3T**

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

Equipment Blank I.D.: _____ @ _____ Time Duplicate I.D.: _____

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

D.O. (if req'd):	(Pre-purge)	1.0 mg/L	Post-purge:	mg/L
CRP (if req'd):	(Pre-purge)	264 mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 040617-Act	Client: Stellar
Sampler: pc	Date: 6/17/04
Well I.D.: MW-4	Well Diameter: 2 3 <u>4</u> 6 8
Total Well Depth (TD): 26.40	Depth to Water (DTW): 13.85
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): <u>YSI</u> HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 16.36	

Purge Method: Bailer Disposable Bailer Positive Air Displacement <u>Electric Submersible</u>	Waterra Peristaltic Extraction Pump Other _____	Sampling Method: Bailer <u>Disposable Bailer</u> Extraction Port Dedicated Tubing Other: _____
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$$8.1 \text{ (Gals.)} \times 3 = 24.3 \text{ Gals.}$$
 I Case Volume Specified Volumes Calculated Volume

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

Time	Temp (<u>D</u> or °C)	pH	Cond. (mS or <u>µS</u>)	Turbidity (NTUs)	Gals. Removed	Observations
1014	57.5	7.9	774	139	8.5	Fe ²⁺ : 0 mg/L
Well	dewatered	@			12 gal	DTW = 22.59
1035	58.2	9.0	815	259	—	

Did well dewater? Yes No Gallons actually evacuated: 12

Sampling Date: 6/17/04 Sampling Time: 1035 Depth to Water: 16.36

Sample I.D.: MW-4 Laboratory: Kiff CalScience Other: C3T

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

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): <u>Pre-purge</u>	10.9	mg/L	Post-purge:	mg/L
O.R.P. (if req'd): <u>Pre-purge</u>	267	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 040617-Ac1	Client: Stellar
Sampler: Ac	Date: 6/17/04
Well I.D.: MW-5	Well Diameter: 2 3 4 6 8
Total Well Depth (TD): 26.96	Depth to Water (DTW): 16.51
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 18.60	

Purge Method: Bailer Disposable Bailer Positive Air Displacement <u>Electric Submersible</u>	Waterra Peristaltic Extraction Pump Other: _____	Sampling Method: Bailer <u>Disposable Bailer</u> Extraction Port Dedicated Tubing Other: _____
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7 (Gals.) X 3 = 21 Gals.
 Case Volume Specified Volumes Calculated Volume

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

Time	Temp (°F or °C)	pH	Cond. (mS or <u>µS</u>)	Turbidity (NTUs)	Gals. Removed	Observations
0956	58.4	7.1	616	178	7	Fe ²⁺ : 0 mg/L
0958	57.5	7.2	615	171	14	cloudy, odor
1000	57.2	7.2	619	756	21	↓

Did well dewater? Yes No Gallons actually evacuated: **21**

Sampling Date: **6/17/04** Sampling Time: **1005** Depth to Water: **17.85**

Sample I.D.: **MW-5** Laboratory: Kiff CalScience Other **C3T**

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

SB 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): <u>Pre-purge</u>	1.2 mg/L	Post-purge:	mg/L
D.P. (if req'd): <u>Pre-purge</u>	268 mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: <u>040617-ACL</u>	Client: <u>Stellar</u>
Sampler: <u>Ac</u>	Date: <u>6/17/04</u>
Well I.D.: <u>MW-6</u>	Well Diameter: 2 3 <u>(4)</u> 6 8
Total Well Depth (TD): <u>27.45</u>	Depth to Water (DTW): <u>13.51</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): <u>YSI</u> HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

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

Field Analysis

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

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

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
<u>0930</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>Fe²⁺: 0 mg/L</u>

Did well dewater? Yes No Gallons actually evacuated: _____

Sampling Date: _____ Sampling Time: _____ Depth to Water: _____

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

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

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

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

D.O. (if req'd): <u>Pre-purge:</u> <u>1.5</u> mg/L	Post-purge: _____ mg/L
O.R.P. (if req'd): <u>Pre-purge:</u> <u>267</u> mV	Post-purge: _____ mV

WELL MONITORING DATA SHEET

Project #: <u>040617-Ac1</u>	Client: <u>Stellar</u>
Sampler: <u>Ac</u>	Start Date: <u>6/17/04</u>
Well I.D.: <u>MW-7</u>	Well Diameter: <u>2</u> 3 4 6 8 <u> </u>
Total Well Depth: <u>25.40</u>	Depth to Water: <u>13.08</u>
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): <u>YSI</u> HACH

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

2 (Gals.) X 3 = 6 Gals.
 Case Volume Specified Volumes Calculated Volume

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or <u>µS</u>)	Turbidity (NTU)	Gals. Removed	Observations
<u>1235</u>	<u>59.8</u>	<u>7.1</u>	<u>896</u>	<u>362</u>	<u>2</u>	<u>Fe²⁺, 5.0 mg/L</u>
<u>1237</u>	<u>60.1</u>	<u>7.0</u>	<u>904</u>	<u>774</u>	<u>4</u>	<u>gas odor</u>
<u>1239</u>	<u>61.1</u>	<u>7.0</u>	<u>912</u>	<u>809</u>	<u>6</u>	<u>DTW = 14.70</u>

Did well dewater? Yes No Gallons actually evacuated: 6

Sampling Time: 1245 Sampling Date: 6/17/04

Sample I.D.: MW-7 Laboratory: STL-C3T

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

Equipment Blank I.D.: @ Time Duplicate I.D.:

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

D.O. (if req'd):	<u>Pre-purge:</u>	<u>1.0</u> mg/L	Post-purge:	mg/L
ORP (if req'd):	<u>Pre-purge:</u>	<u>210</u> mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 040617-AC2	Client: stellar
Sampler: AC	Start Date: 6/17/04
Well I.D.: MW-8	Well Diameter: (2) 3 4 6 8
Total Well Depth: 22.30	Depth to Water: 11.82
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): (YSI) HACH

Purge Method: Bailer (Disposable Bailer) Positive Air Displacement Electric Submersible	Sampling Method: Bailer (Disposable Bailer) Extraction Port Dedicated Tubing Other:
Waterra Peristaltic Extraction Pump Other:	

1.75 (Gals.) X 3 = 5.25 Gals.
 Case Volume Specified Volumes Calculated Volume

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Observations
1137	59.8	6.9	872	349	1.75	Fe ²⁺ : 2.0 mg/L
1139	60.1	6.9	889	558	3.5	gas odor
1141	60.4	6.9	905	642	5.25	DW = 13.21

Did well dewater? Yes No Gallons actually evacuated: 5.25

Sampling Time: 1145 Sampling Date: 6/17/04

Sample I.D.: MW-8 Laboratory: STE C&T

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

Equipment Blank I.D.: @ Time Duplicate I.D.: Nitrate/sulfate

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

D.O. (if req'd):	Pre-purge:	1.1 mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	206 mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: <u>D40617-ACC</u>	Client: <u>SAeller</u>
Sampler: <u>AC</u>	Start Date: <u>6/17/04</u>
Well I.D.: <u>MW-9</u>	Well Diameter: <u>2</u> 3 4 6 8
Total Well Depth: <u>26.40</u>	Depth to Water: <u>12.93</u>
Before: _____ After: _____	Before: _____ After: _____
Depth to Free Product: _____	Thickness of Free Product (feet): _____
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): <u>YSI</u> HACH

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

2.1 (Gals.) X 3 = 6.3 Gals.
 Case Volume Specified Volumes Calculated Volume

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

Time	Temp. (°F or °C)	pH	Conductivity (mS or μ S)	Turbidity (NTU)	Gals. Removed	Observations
<u>1214</u>	<u>58.9</u>	<u>6.8</u>	<u>850</u>	<u>133</u>	<u>2.5</u>	<u>Fe²⁺: 0 mg/L</u>
<u>1216</u>	<u>60.0</u>	<u>6.8</u>	<u>852</u>	<u>129</u>	<u>5</u>	<u>gas odor</u>
<u>1219</u>	<u>60.6</u>	<u>6.7</u>	<u>846</u>	<u>138</u>	<u>7.5</u>	<u>DTW = 14.89</u>

Did well dewater? Yes No Gallons actually evacuated: 7.5

Sampling Time: 1225 Sampling Date: 6/17/04

Sample I.D.: MW-9 Laboratory: STL C3T

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

Equipment Blank I.D.: _____ @ _____ Time Duplicate I.D.: _____

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

D.O. (if req'd):	<u>Pre-purge:</u> <u>1.5</u> mg/L	Post-purge:	mg/L
ORP (if req'd):	<u>Pre-purge:</u> <u>222</u> mV	Post-purge:	mV

May 2004 Creek Bank Samples



ANALYTICAL REPORT

Prepared for:

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

Date: 02-JUN-04

Lab Job Number: 172357

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: *[Signature]*
Project Manager

Reviewed by: *[Signature]*
Operations Manager

This package may be reproduced only in its entirety.



Laboratory Number: 172357
Client: Stellar Environmental Solutions
Project: 2004-02
Request Date: 5/17/2004

CASE NARRATIVE

This hardcopy data package contains sample results and batch QC results for four soil and four water samples requested from the above referenced project on May 17, 2004. The samples were received cold and intact.

Total Volatile Hydrocarbons:

In several samples, the recoveries for the surrogates exceed control limits due to coelution of the surrogate peak with other hydrocarbon peaks. Associated surrogate recoveries are acceptable.

No other analytical problems were encountered.

Total Extractable Hydrocarbons:

No analytical problems were encountered.

Total Volatile Hydrocarbons

Lab #: 172357	Location: Redwood Regional Park	EPA 5030B
Client: Stellar Environmental Solutions	Prep:	
Project#: 2004-02		
Matrix: Water	Sampled: 05/17/04	
Units: ug/L	Received: 05/17/04	
Batch#: 91222	Analyzed: 05/18/04	

Field ID: CB-3-GW Lab ID: 172357-007
 Type: SAMPLE Diln Fac: 1.000

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

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	106	74-142	EPA 8015B
Bromofluorobenzene (FID)	109	80-139	EPA 8015B
Trifluorotoluene (PID)	85	55-139	EPA 8021B
Bromofluorobenzene (PID)	91	62-134	EPA 8021B

Field ID: CB-4-GW Lab ID: 172357-008
 Type: SAMPLE Diln Fac: 1.000

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

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	105	74-142	EPA 8015B
Bromofluorobenzene (FID)	113	80-139	EPA 8015B
Trifluorotoluene (PID)	85	55-139	EPA 8021B
Bromofluorobenzene (PID)	91	62-134	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 Y= Sample exhibits chromatographic pattern which does not resemble standard
 b= See narrative
 ND= Not Detected
 RL= Reporting Limit
 LR= Response exceeds instrument's linear range



Total Volatile Hydrocarbons

Lab #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02		
Matrix:	Water	Sampled:	05/17/04
Units:	ug/L	Received:	05/17/04
Batch#:	91222	Analyzed:	05/18/04

Type: BLANK Diln Fac: 1.000
 Lab ID: QC251437

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)	102	74-142	EPA 8015B
Bromofluorobenzene (FID)	109	80-139	EPA 8015B
Trifluorotoluene (PID)	88	55-139	EPA 8021B
Bromofluorobenzene (PID)	93	62-134	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 Y= Sample exhibits chromatographic pattern which does not resemble standard
 b= See narrative
 ND= Not Detected
 RL= Reporting Limit
 >LR= Response exceeds instrument's linear range

GC04 TVH 'J' Data File FID

Sample Name : 172357-005,91222

Sample #: a1.9

Page 1 of 1

File Name : G:\GC04\DATA\139J011.raw

Date : 5/19/04 10:02 AM

Method : TVHBTXE

Time of Injection: 5/18/04 03:32 PM

Start Time : 0.00 min

End Time : 26.00 min

Low Point : 54.83 mV

High Point : 141.69 mV

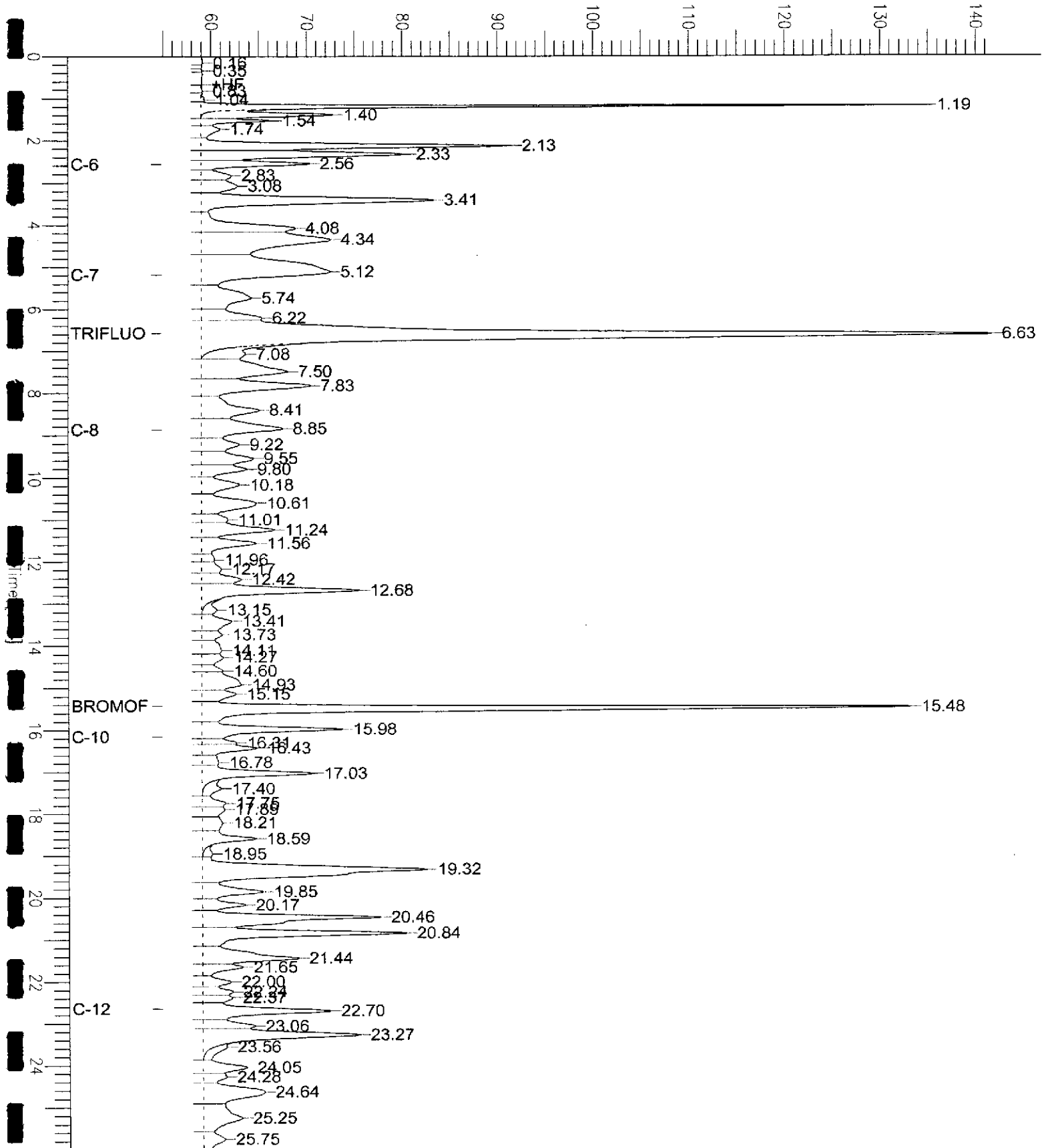
Scale Factor: 1.0

Plot Offset: 55 mV

Plot Scale: 86.9 mV

CB-1-GW

Response [mV]



GC04 TVH 'J' Data File FID

Sample Name : 172357-006,91222

Sample #: a1.9

Page 1 of 1

File Name : G:\GC04\DATA\139J006.raw

Date : 5/19/04 10:02 AM

Method : TVHBTXE

Time of Injection: 5/18/04 12:32 PM

Start Time : 0.00 min

End Time : 26.00 min

Low Point : 50.75 mV

High Point : 227.82 mV

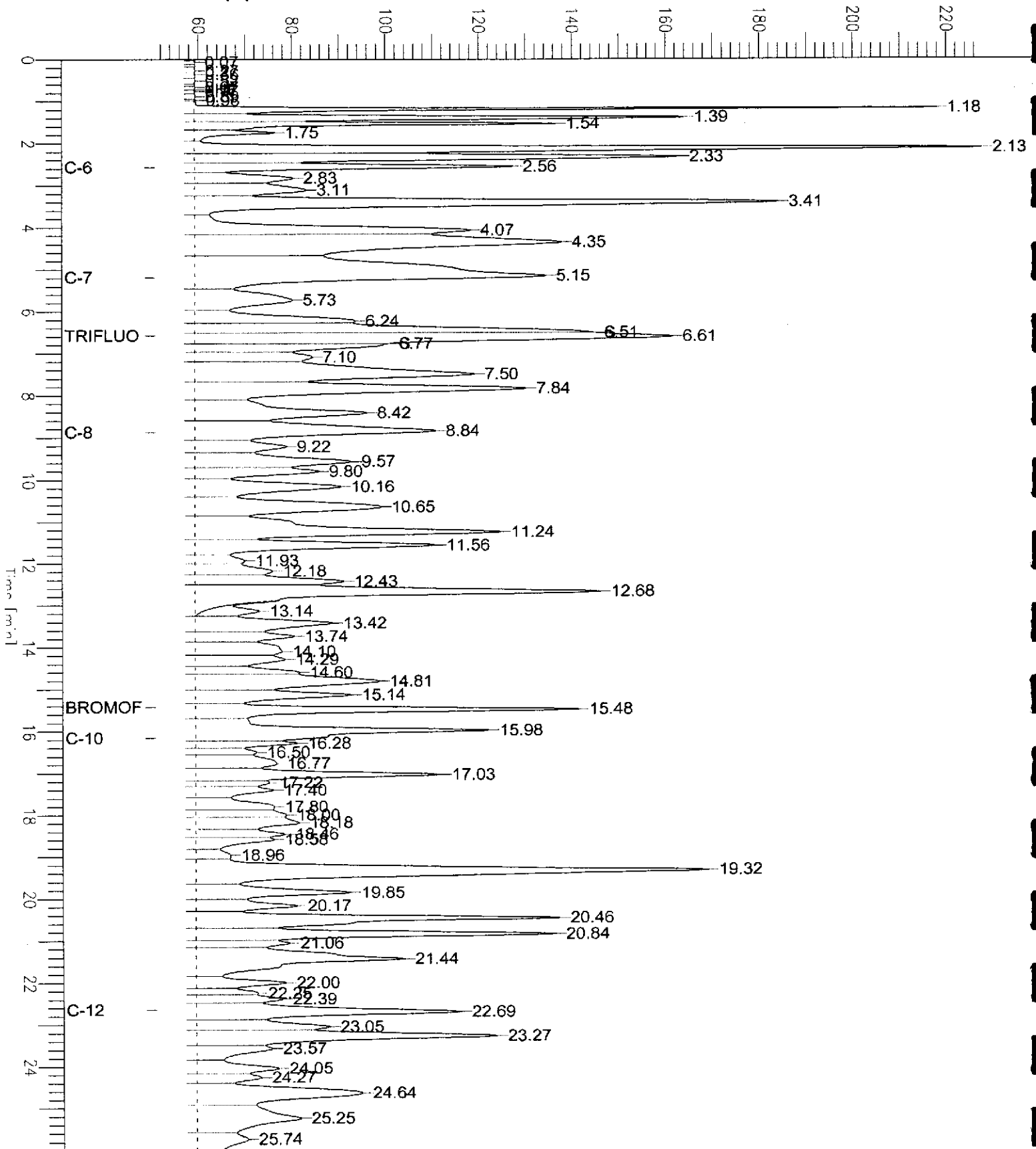
Scale Factor: 1.0

Plot Offset: 51 mV

Plot Scale: 177.1 mV

CB-2-GW

Response [mV]



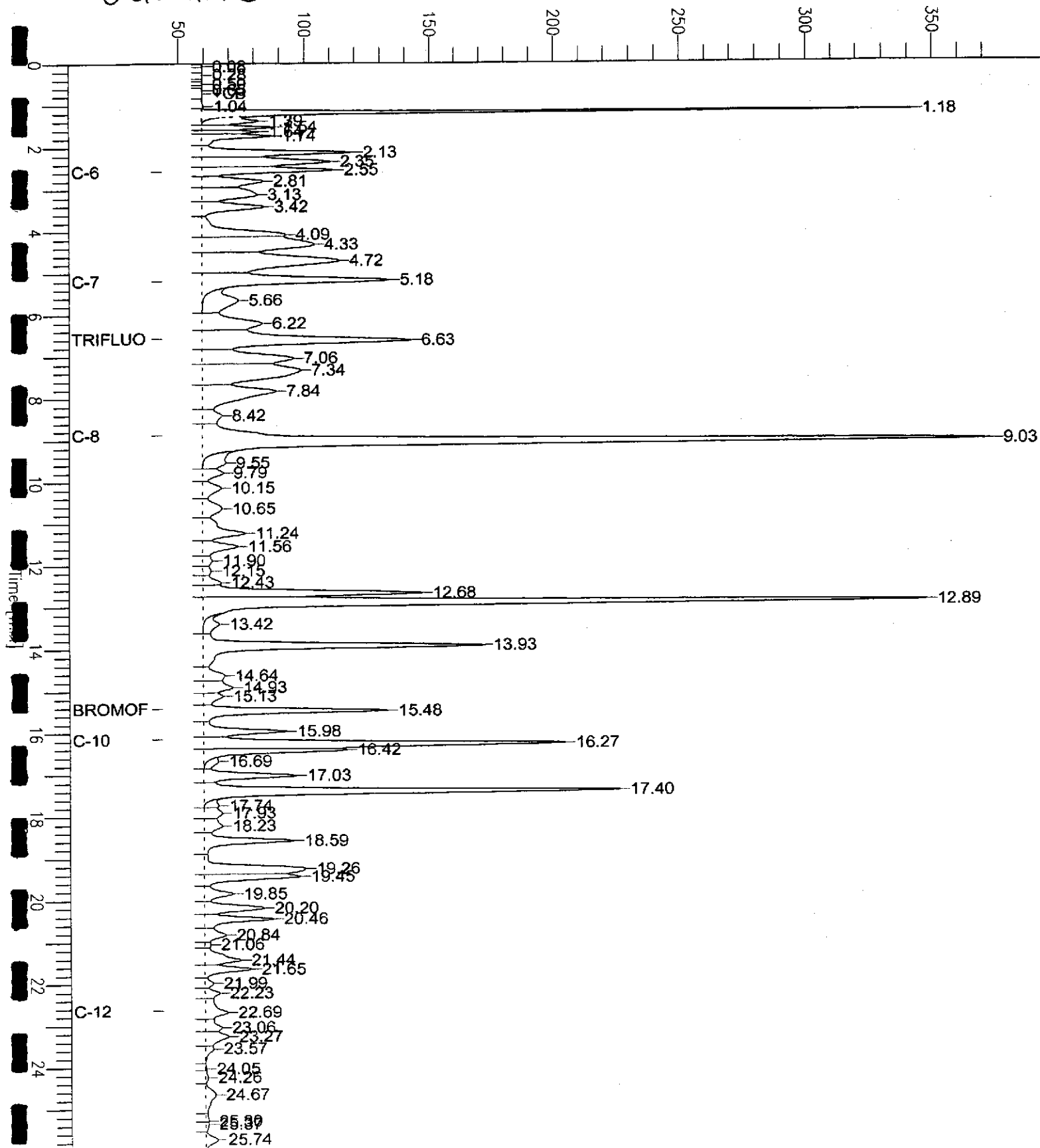
GC04 TVH 'J' Data File FID

Sample Name : ccv/lcs,gc251439,91222,04ws0672,5/5000
File Name : G:\GC04\DATA\139J002.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.00 min
Scale Factor : 1.0 Plot Offset : 44 mV

Sample # :
Date : 5/18/04 10:04 AM
Time of Injection : 5/18/04 09:38 AM
Low Point : 43.62 mV High Point : 373.92 mV
Plot Scale : 330.3 mV

Gasoline

Response [mV]



Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172357	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:	QC251438	Batch#:	91222
Matrix:	Water	Analyzed:	05/18/04
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
MTBE	20.00	17.82	89	59-131
Benzene	20.00	17.65	88	80-120
Toluene	20.00	19.03	95	80-120
Ethylbenzene	20.00	18.38	92	80-120
m,p-Xylenes	20.00	18.52	93	80-120
o-Xylene	20.00	18.45	92	80-120

Surrogate	%REC	Limits
Trifluorotoluene (PID)	78	55-139
Bromofluorobenzene (PID)	84	62-134

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC251439	Batch#:	91222
Matrix:	Water	Analyzed:	05/18/04
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2,000	2,028	101	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	136	74-142
1,2,4-Trichlorobenzene (FID)	114	80-139

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	91222
MSS Lab ID:	172365-003	Sampled:	05/17/04
Matrix:	Water	Received:	05/18/04
Units:	ug/L	Analyzed:	05/18/04
Diln Fac:	1.000		

Type: MS Lab ID: QC251506

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	20.62	2,000	1,921	95	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	138	74-142
Bromofluorobenzene (FID)	116	80-139

Type: MSD Lab ID: QC251507

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,968	97	80-120	2	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	134	74-142
Bromofluorobenzene (FID)	109	80-139

Total Volatile Hydrocarbons

Lab #: 172357	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 2004-02	
Matrix: Soil	Sampled: 05/17/04
Basis: as received	Received: 05/17/04
Batch#: 91221	Analyzed: 05/18/04

Field ID: CB-1-0'	Lab ID: 172357-001
Type: SAMPLE	Diln Fac: 1.000

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	1.2 Y	1.1	mg/Kg	EPA 8015B
MTBE	ND	22	ug/Kg	EPA 8021B
Benzene	ND	5.6	ug/Kg	EPA 8021B
Toluene	ND	5.6	ug/Kg	EPA 8021B
Ethylbenzene	6.4	5.6	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.6	ug/Kg	EPA 8021B
o-Xylene	ND	5.6	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	105	71-138	EPA 8015B
Bromofluorobenzene (FID)	110	73-143	EPA 8015B
Trifluorotoluene (PID)	87	55-135	EPA 8021B
Bromofluorobenzene (PID)	101	58-135	EPA 8021B

Field ID: CB-2-2'	Lab ID: 172357-002
Type: SAMPLE	Diln Fac: 10.00

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	370 Y	10	mg/Kg	EPA 8015B
MTBE	920	200	ug/Kg	EPA 8021B
Benzene	380 C	50	ug/Kg	EPA 8021B
Toluene	780	50	ug/Kg	EPA 8021B
Ethylbenzene	2,100 C	50	ug/Kg	EPA 8021B
m,p-Xylenes	410 C	50	ug/Kg	EPA 8021B
o-Xylene	1,500 C	50	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	211 *	>LR b 71-138	EPA 8015B
Bromofluorobenzene (FID)	298 *	>LR b 73-143	EPA 8015B
Trifluorotoluene (PID)	126	55-135	EPA 8021B
Bromofluorobenzene (PID)	149 *	58-135	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 Y= Sample exhibits chromatographic pattern which does not resemble standard
 b= See narrative
 ND= Not Detected
 L= Reporting Limit
 LR= Response exceeds instrument's linear range

GC19 TVH 'X' Data File (FID)

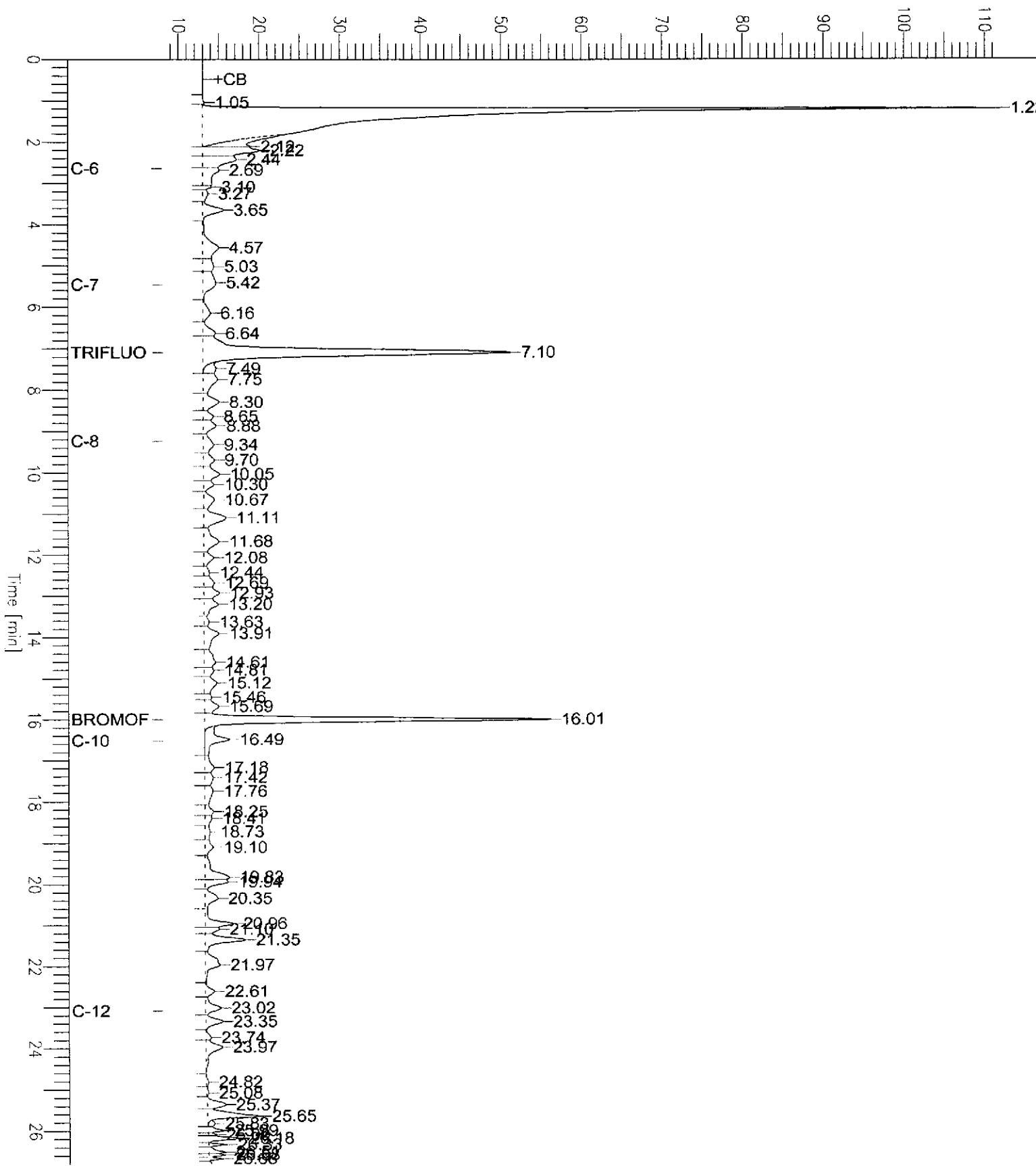
Sample Name : 172357-001,91221
 FileName : G:\GC19\DATA\139X004.raw
 Method : TVHBTXE
 Start Time : 0.00 min
 Scale Factor: 1.0

End Time : 26.80 min
 Plot Offset: 8 mV

Sample #: a
 Date : 5/18/04 03:30 PM
 Time of Injection: 5/18/04 03:03 PM
 Low Point : 8.02 mV
 High Point : 111.95 mV
 Plot Scale: 103.9 mV

CB-1-0'

Response [mV]



GC19 TVH 'X' Data File (FID)

Sample Name : 172357-002,91221

Sample #: a

Page 1 of 1

File Name : G:\GC19\DATA\139X011.RAW

Date : 5/19/04 08:53 AM

Method :

Time of Injection: 5/18/04 07:04 PM

Start Time : 0.02 min

End Time : 26.80 min

Low Point : 11.49 mV

High Point : 108.33 mV

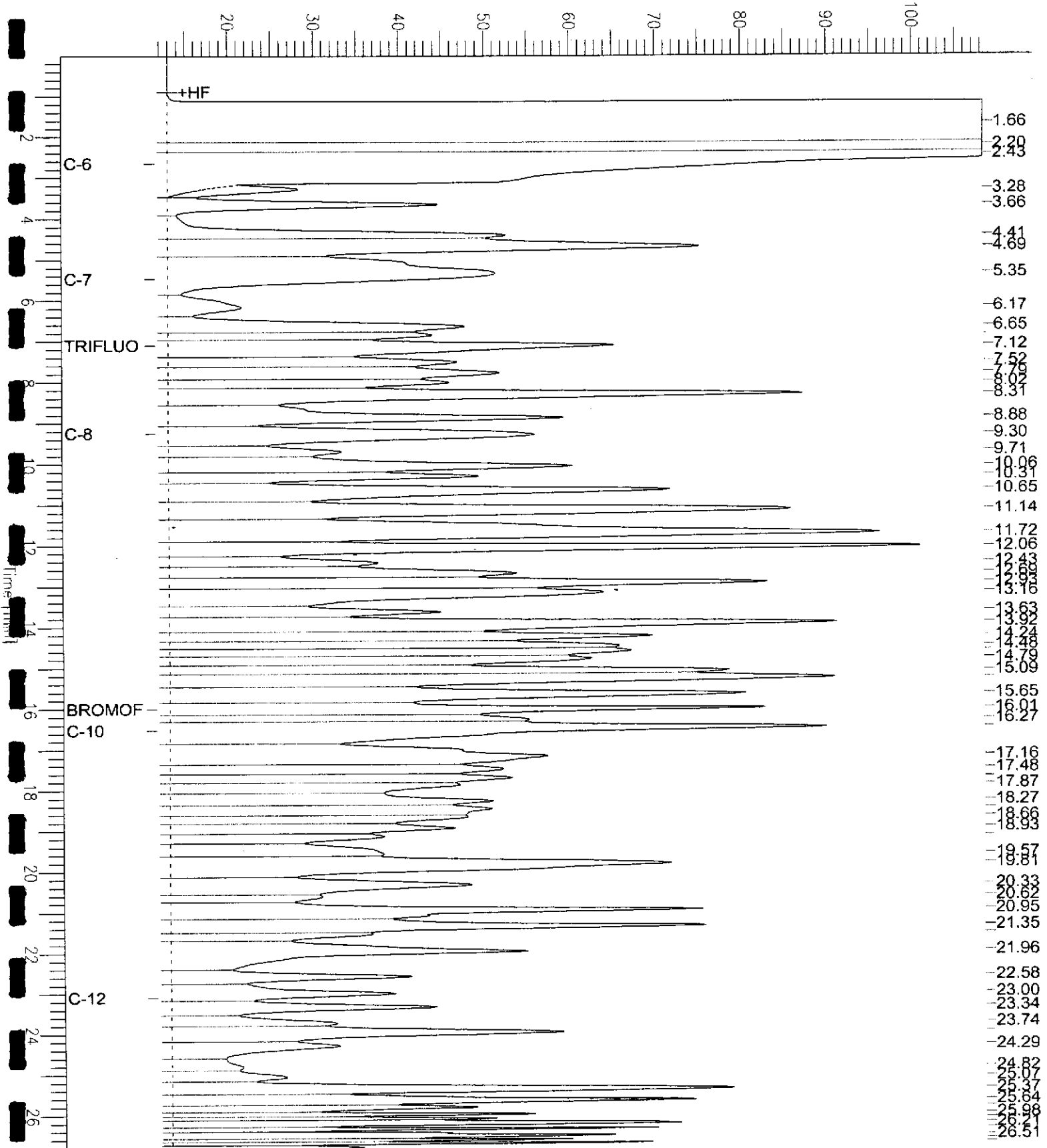
Scale Factor: 0.0

Plot Offset: 11 mV

Plot Scale: 96.8 mV

CB-2-2'

Response [mV]



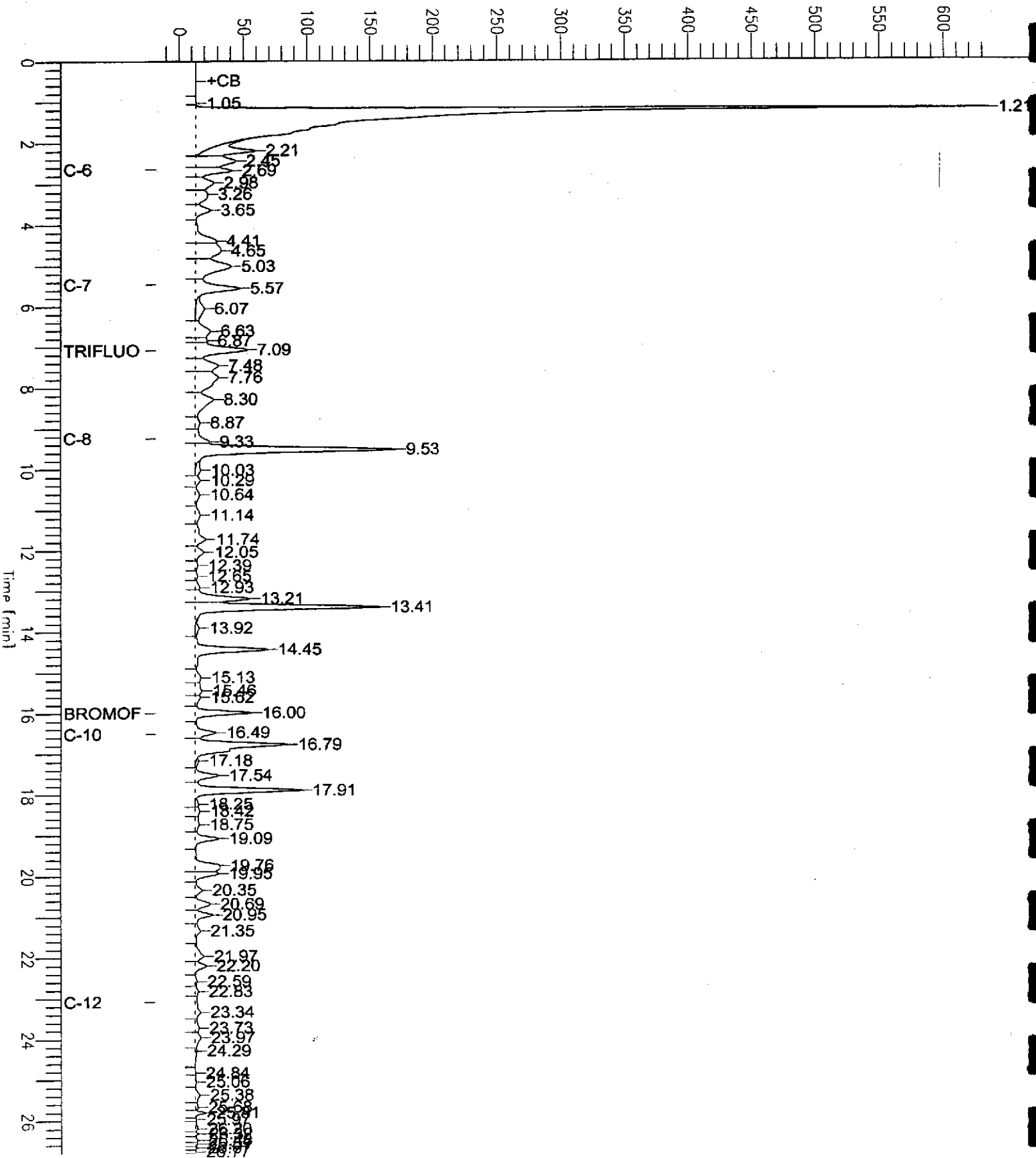
GC19 TVH 'X' Data File (FID)

Sample Name : ccv/lcs,qc251436,91221,04ws0672,5/5000
 FileName : G:\GC19\DATA\139X002.raw
 Method : TVHBTXE
 Start Time : 0.00 min
 Scale Factor : 1.0

Sample # :
 Date : 5/18/04 11:03 AM
 Time of Injection: 5/18/04 10:36 AM
 Low Point : -17.93 mV
 High Point : 634.41 mV
 Plot Scale: 652.3 mV
 End Time : 26.80 min
 Plot Offset: -18 mV

Gasoline

Response [mV]





Total Volatile Hydrocarbons

Lab #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02		
Matrix:	Soil	Sampled:	05/17/04
Basis:	as received	Received:	05/17/04
Batch#:	91221	Analyzed:	05/18/04

Field ID:	CB-3-3'	Lab ID:	172357-003
Type:	SAMPLE	Diln Fac:	1.000

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.1	mg/Kg	EPA 8015B
MTBE	ND	22	ug/Kg	EPA 8021B
Benzene	ND	5.4	ug/Kg	EPA 8021B
Toluene	ND	5.4	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.4	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.4	ug/Kg	EPA 8021B
o-Xylene	ND	5.4	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	98	71-138	EPA 8015B
Bromofluorobenzene (FID)	112	73-143	EPA 8015B
Trifluorotoluene (PID)	90	55-135	EPA 8021B
Bromofluorobenzene (PID)	104	58-135	EPA 8021B

Field ID:	CB-4-2'	Lab ID:	172357-004
Type:	SAMPLE	Diln Fac:	1.000

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	EPA 8015B
MTBE	ND	20	ug/Kg	EPA 8021B
Benzene	ND	5.1	ug/Kg	EPA 8021B
Toluene	ND	5.1	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.1	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.1	ug/Kg	EPA 8021B
o-Xylene	ND	5.1	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	100	71-138	EPA 8015B
Bromofluorobenzene (FID)	111	73-143	EPA 8015B
Trifluorotoluene (PID)	93	55-135	EPA 8021B
Bromofluorobenzene (PID)	104	58-135	EPA 8021B

*= Value outside of QC limits; see narrative
C= Presence confirmed, but RPD between columns exceeds 40%
Y= Sample exhibits chromatographic pattern which does not resemble standard
b= See narrative
ND= Not Detected
RL= Reporting Limit
LR= Response exceeds instrument's linear range

**Total Volatile Hydrocarbons**

Lab #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02		
Matrix:	Soil	Sampled:	05/17/04
Basis:	as received	Received:	05/17/04
Batch#:	91221	Analyzed:	05/18/04

Type: BLANK Diln Fac: 1.000
 Lab ID: QC251434

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	EPA 8015B
MTBE	ND	20	ug/Kg	EPA 8021B
Benzene	ND	5.0	ug/Kg	EPA 8021B
Toluene	ND	5.0	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.0	ug/Kg	EPA 8021B
m, p-Xylenes	ND	5.0	ug/Kg	EPA 8021B
o-Xylene	ND	5.0	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	96	71-138	EPA 8015B
Bromofluorobenzene (FID)	108	73-143	EPA 8015B
Trifluorotoluene (PID)	91	55-135	EPA 8021B
Bromofluorobenzene (PID)	102	58-135	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 Y= Sample exhibits chromatographic pattern which does not resemble standard
 b= See narrative
 ND= Not Detected
 RL= Reporting Limit
 >LR= Response exceeds instrument's linear range

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8021B
Type:	LCS	Basis:	as received
Lab ID:	QC251435	Diln Fac:	1.000
Matrix:	Soil	Batch#:	91221
Units:	ug/Kg	Analyzed:	05/18/04

Analyte	Spiked	Result	%REC	Limits
MTBE	100.0	102.7	103	56-137
Benzene	100.0	94.59	95	80-120
Toluene	100.0	94.05	94	80-120
Ethylbenzene	100.0	95.95	96	79-120
m,p-Xylenes	100.0	96.23	96	80-120
o-Xylene	100.0	99.38	99	80-120

Surrogate	%REC	Limits
Trifluorotoluene (PID)	87	55-135
Bromofluorobenzene (PID)	98	58-135

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8015B
Type:	LCS	Basis:	as received
Lab ID:	QC251436	Diln Fac:	1.000
Matrix:	Soil	Batch#:	91221
Units:	mg/Kg	Analyzed:	05/18/04

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	10.00	10.10	101	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	111	71-138
Bromofluorobenzene (FID)	113	73-143

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8015B
Field ID:	CB-1-0'	Diln Fac:	1.000
SS Lab ID:	172357-001	Batch#:	91221
Matrix:	Soil	Sampled:	05/17/04
Units:	mg/Kg	Received:	05/17/04
Basis:	as received		

Type:	MS	Analyzed:	05/18/04
Lab ID:	QC251502		

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	1.245	10.75	12.22	102	47-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	124	71-138
Bromofluorobenzene (FID)	120	73-143

Type:	MSD	Analyzed:	05/19/04
Lab ID:	QC251503		

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	10.99	12.58	103	47-120	1	23

Surrogate	%REC	Limits
Trifluorotoluene (FID)	117	71-138
Bromofluorobenzene (FID)	122	73-143

**Total Extractable Hydrocarbons**

Lab #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2004-02	Analysis:	EPA 8015B
Matrix:	Water	Received:	05/17/04
Units:	ug/L	Prepared:	05/22/04
Batch#:	91373	Analyzed:	05/24/04
Sampled:	05/17/04		

Field ID:	CB-1-GW	Lab ID:	172357-005
Type:	SAMPLE	Diln Fac:	5.000

Analyte	Result	RL
Diesel C10-C24	20,000 L Y	250

Surrogate	%REC	Limits
Hexacosane	77	53-142

Field ID:	CB-2-GW	Lab ID:	172357-006
Type:	SAMPLE	Diln Fac:	20.00

Analyte	Result	RL
Diesel C10-C24	130,000 L Y	1,000

Surrogate	%REC	Limits
Hexacosane	DO	53-142

Field ID:	CB-3-GW	Lab ID:	172357-007
Type:	SAMPLE	Diln Fac:	1.000

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	105	53-142

Field ID:	CB-4-GW	Lab ID:	172357-008
Type:	SAMPLE	Diln Fac:	1.000

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	93	53-142

Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC252032	Cleanup Method:	EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	113	53-142

L= Lighter hydrocarbons contributed to the quantitation
 Y= Sample exhibits chromatographic pattern which does not resemble standard
 D= Diluted Out
 N= Not Detected
 L= Reporting Limit
 Page 1 of 1

Chromatogram

Sample Name : 172357-005,91373

Sample #: 91373

Page 1 of 1

File Name : G:\GC17\CHA\145A012.RAW

Date : 5/25/04 08:16 AM

Method : ATEH139.MTH

Time of Injection: 5/24/04 05:51 PM

Start Time : 0.01 min

End Time : 19.99 min

Low Point : -0.24 mV

High Point : 899.28 mV

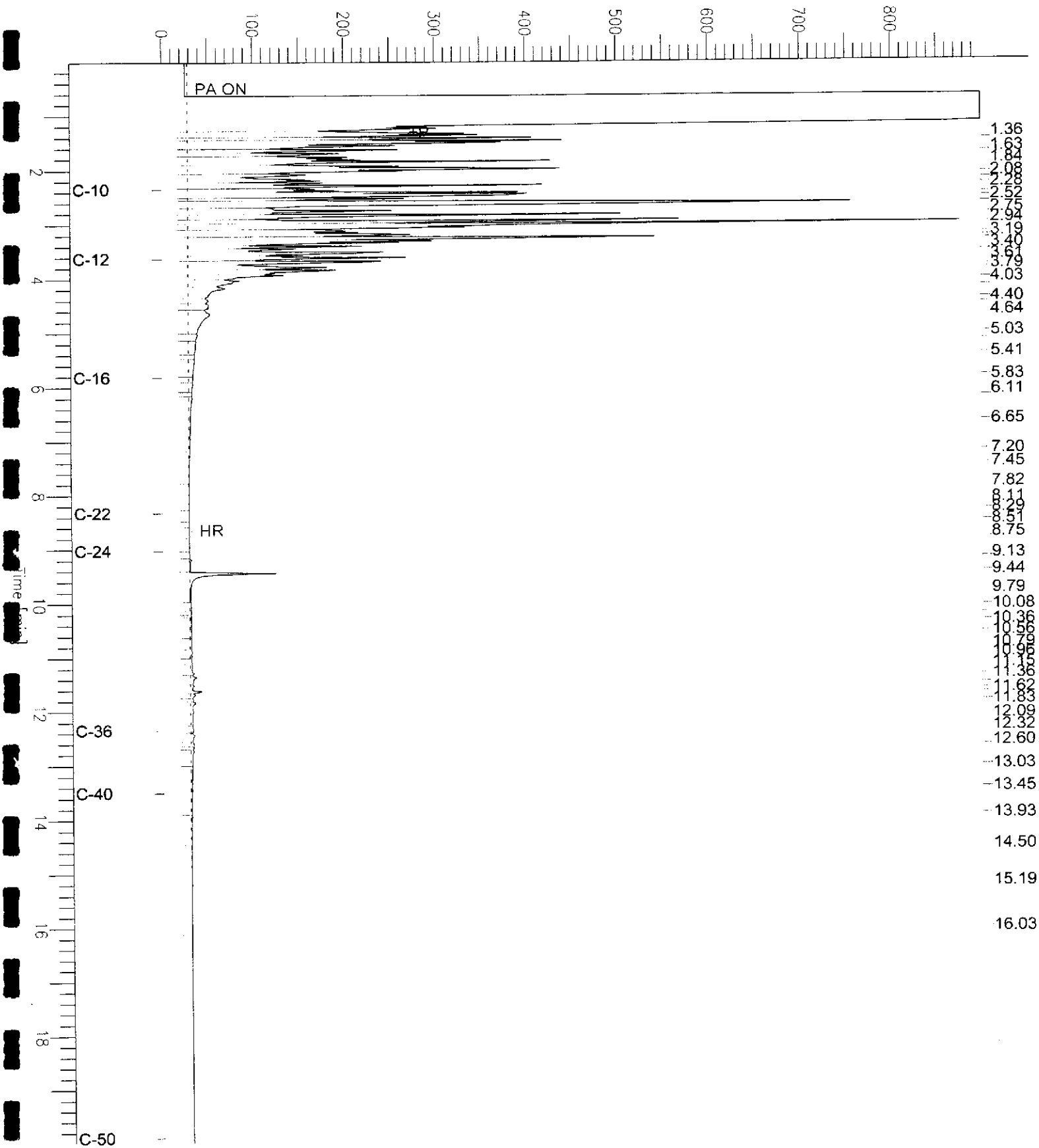
Scale Factor: 0.0

Plot Offset: -0 mV

Plot Scale: 899.5 mV

CB-1-GW

Response [mV]



Chromatogram

Sample Name : 172357-006,91373
FileName : G:\GC17\CHA\145A013.RAW
Method : ATEH139.MTH
Start Time : 0.00 min
Scale Factor: 0.0

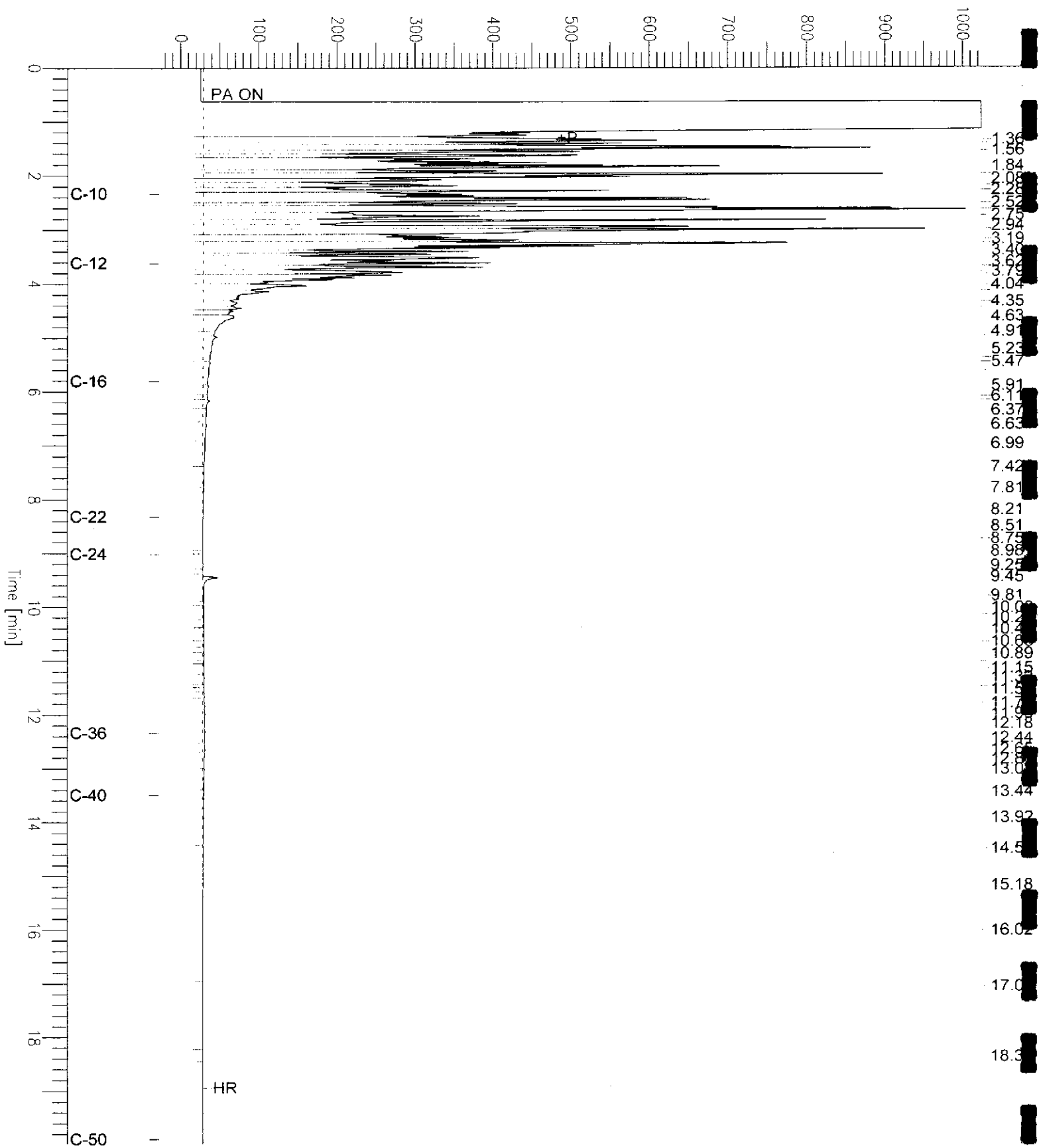
End Time : 19.99 min
Plot Offset: -27 mV

Sample #: 91373
Date : 5/25/04 08:16 AM
Time of Injection: 5/24/04 06:19 PM
Low Point : -26.72 mV
Plot Scale: 1050.7 mV

Page 1 of 1

CB-2-GW

Response [mV]



Chromatogram

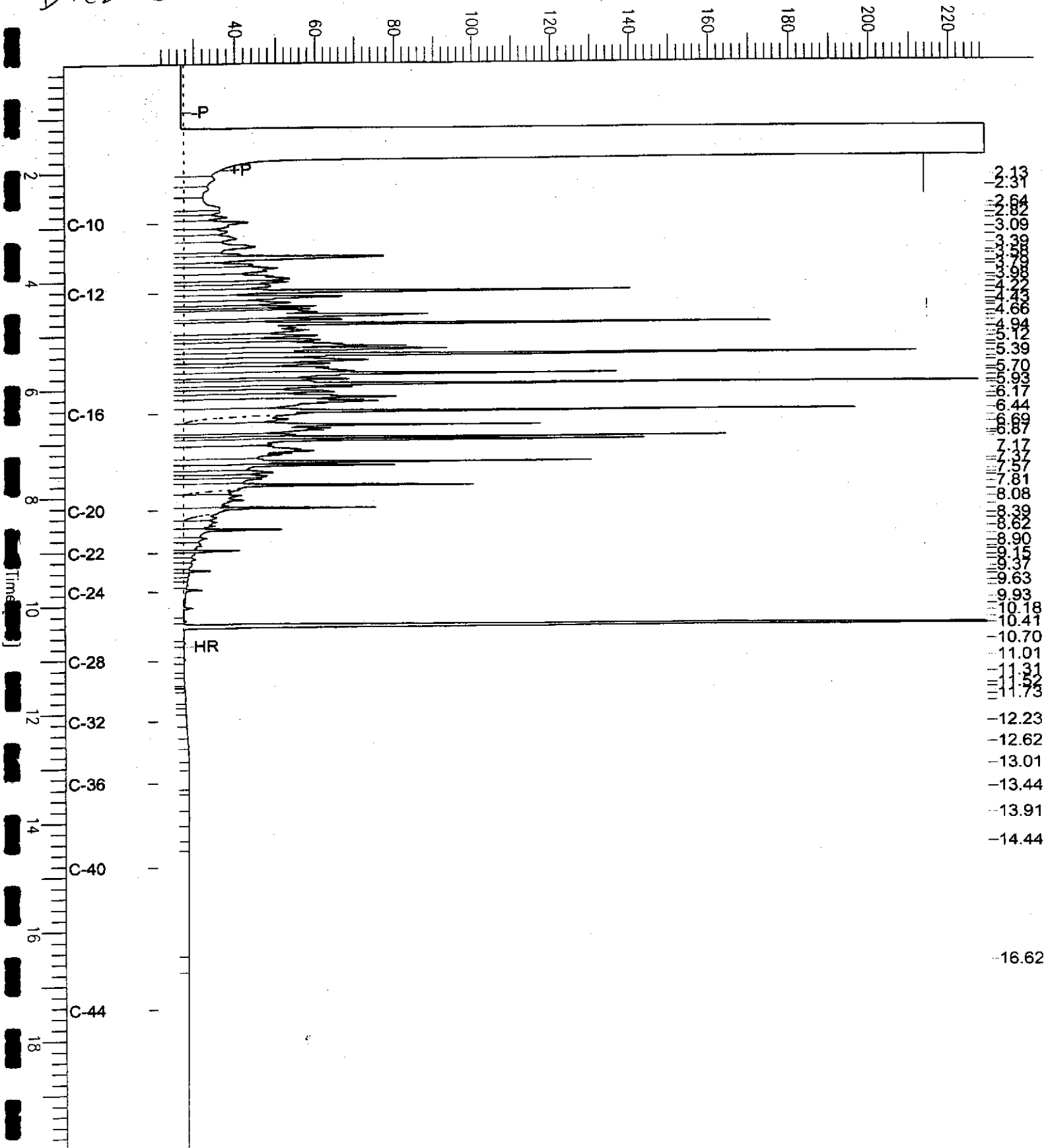
Sample Name : ccv_04ws0894.dsl
File Name : G:\GC13\CHB\145B002.RAW
Method : BTEH140S.MTH
Start Time : 0.01 min
Scale Factor : 0.0

Sample #: 500mg/L
Date : 5/24/04 09:17 AM
Time of Injection: 5/24/04 08:23 AM
End Time : 19.99 min
Plot Offset: 21 mV

Page 1 of 1
Low Point : 21.11 mV
High Point : 228.94 mV
Plot Scale: 207.8 mV

Diesel

Response [mV]



Total Extractable Hydrocarbons

Lab #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	SHAKER TABLE
Project#:	2004-02	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	05/17/04
Units:	mg/Kg	Received:	05/17/04
Basis:	as received	Prepared:	05/22/04
Diln Fac:	1.000	Analyzed:	05/23/04
Batch#:	91372		

Field ID: CB-1-0' Lab ID: 172357-001
 Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	15 L Y	1.0

Surrogate	%REC	Limits
Hexacosane	69	52-131

Field ID: CB-2-2' Lab ID: 172357-002
 Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	180 L Y	1.0

Surrogate	%REC	Limits
Hexacosane	76	52-131

Field ID: CB-3-3' Lab ID: 172357-003
 Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	2.9 H Y	1.0

Surrogate	%REC	Limits
Hexacosane	78	52-131

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

Chromatogram

Sample Name : 172357-001,91372

Sample #: 91372

Page 1 of 1

File Name : G:\GC11\CHA\144A008.RAW

Date : 5/24/04 07:51 AM

Method : ATEH140S.MTH

Time of Injection: 5/23/04 03:41 PM

Start Time : 0.01 min

End Time : 20.45 min

Low Point : -0.21 mV

High Point : 925.73 mV

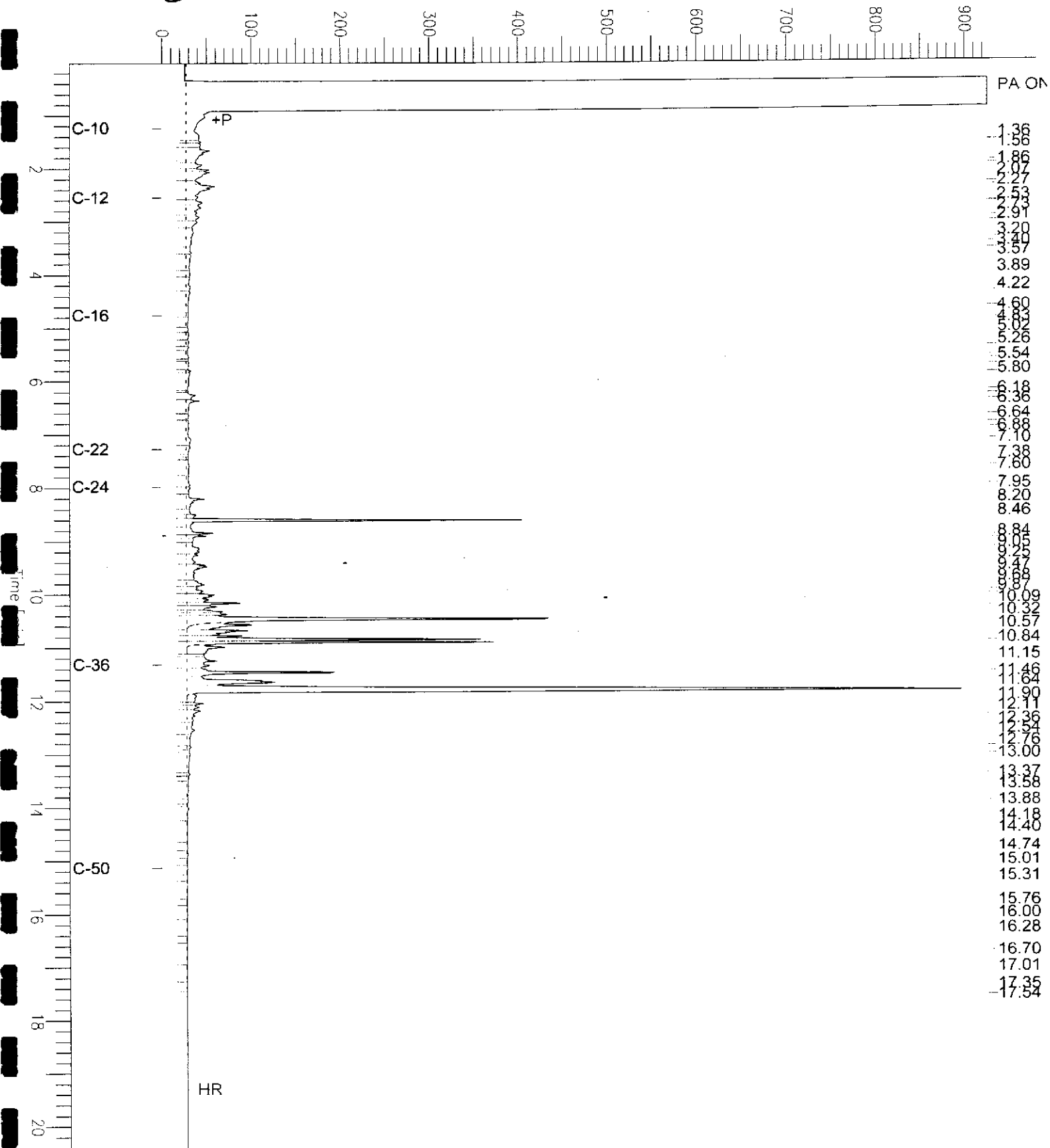
Scale Factor: 0.0

Plot Offset: -0 mV

Plot Scale: 925.9 mV

CB-1-0'

Response [mV]

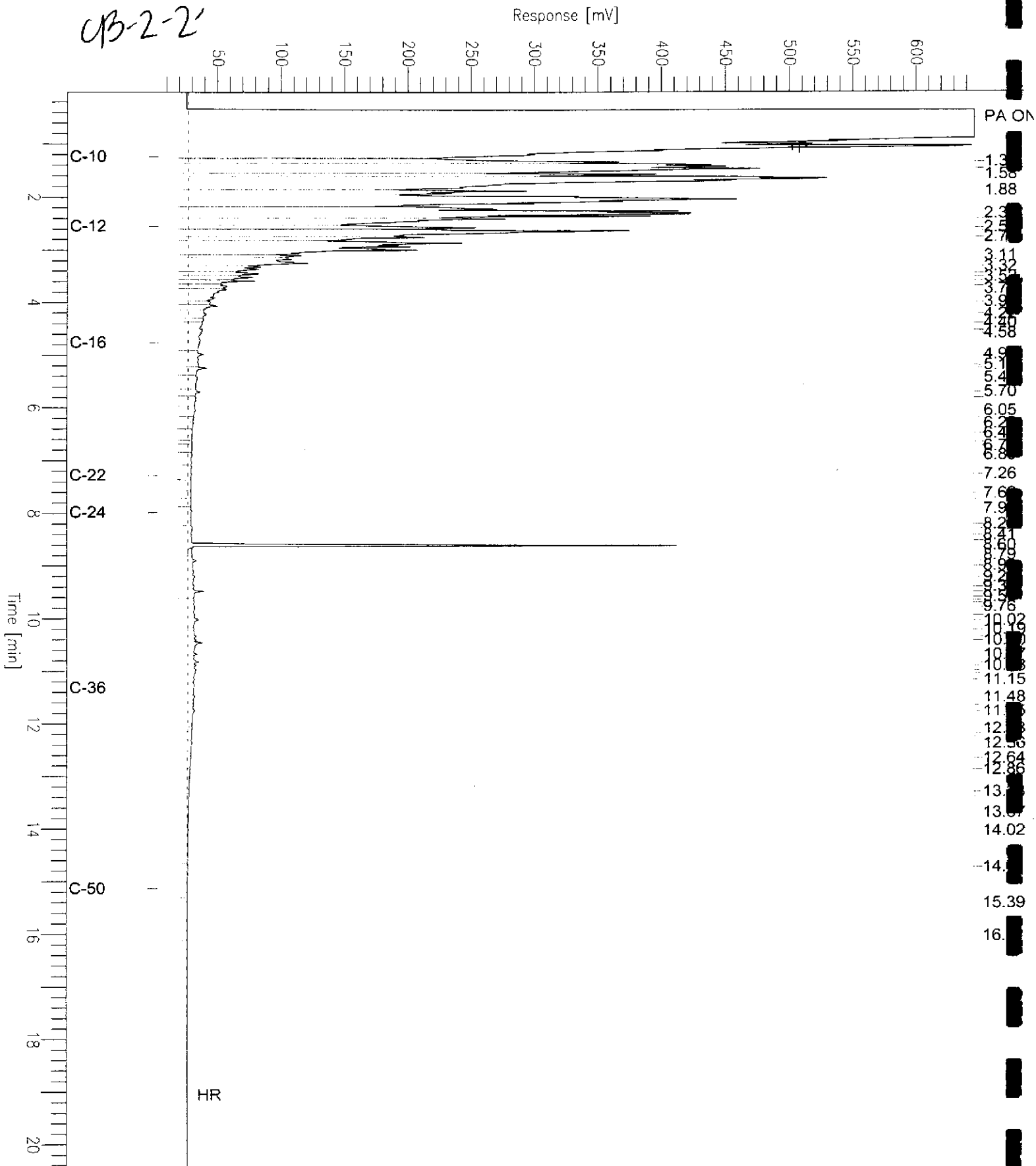


Chromatogram

Sample Name : 172357-002,91372
FileName : G:\GC11\CHA\144A009.RAW
Method : ATEH140S.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 20.45 min
Plot Offset: 3 mV

Sample #: 91372
Date : 5/24/04 07:57 AM
Time of Injection: 5/23/04 04:10 PM
Low Point : 3.47 mV
High Point : 646.06 mV
Plot Scale: 642.6 mV



Chromatogram

Sample Name : 172357-003,91372

Sample #: 91372

Page 1 of 1

FileName : G:\GC11\CHA\144A010.RAW

Date : 5/24/04 07:58 AM

Method : ATEH140S.MTH

Time of Injection: 5/23/04 04:39 PM

Start Time : 0.01 min End Time : 20.45 min

Low Point : 7.11 mV

High Point : 483.47 mV

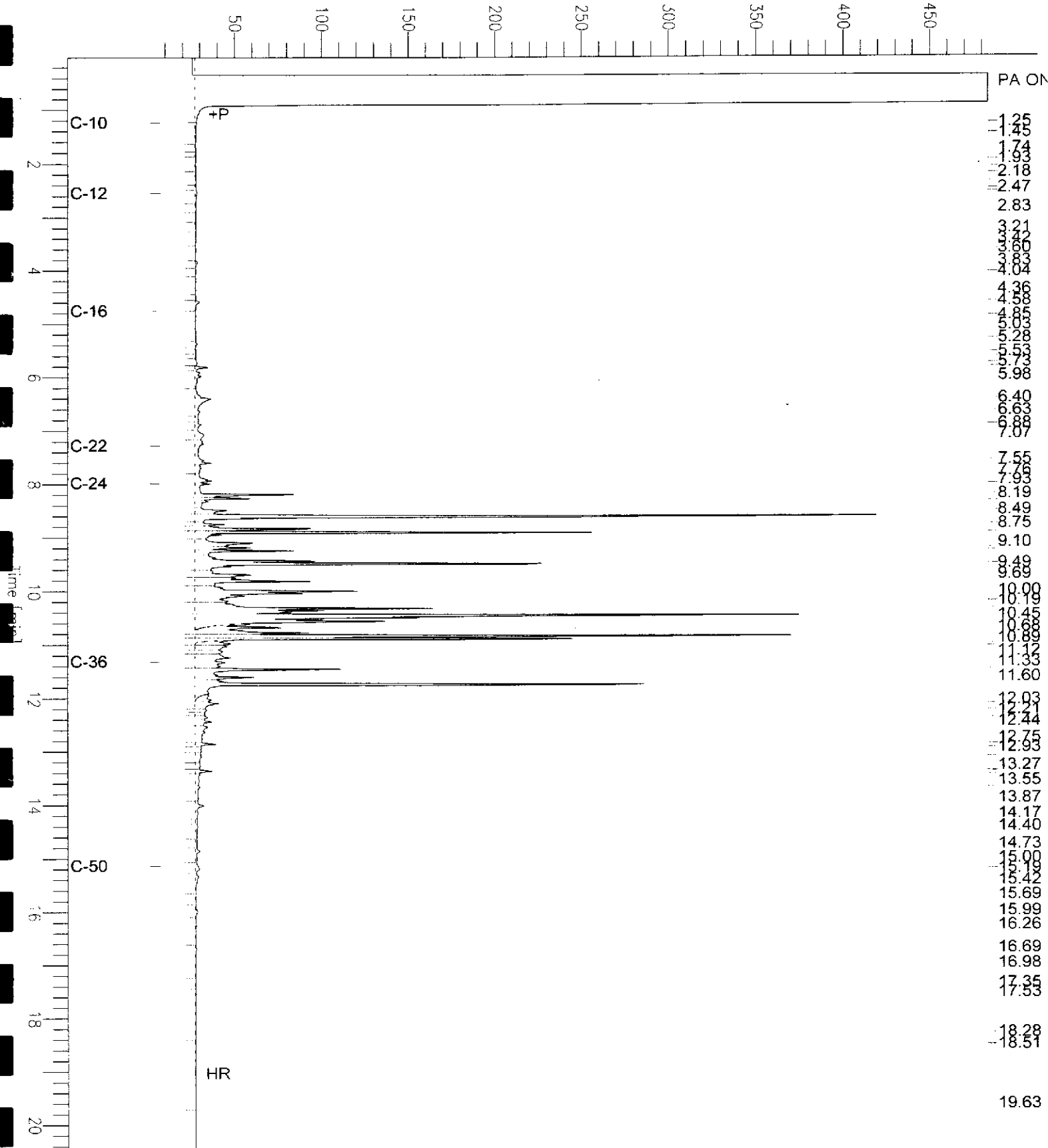
Scale Factor: 0.0

Plot Offset: 7 mV

Plot Scale: 476.4 mV

CB-3-3'

Response [mV]



Chromatogram

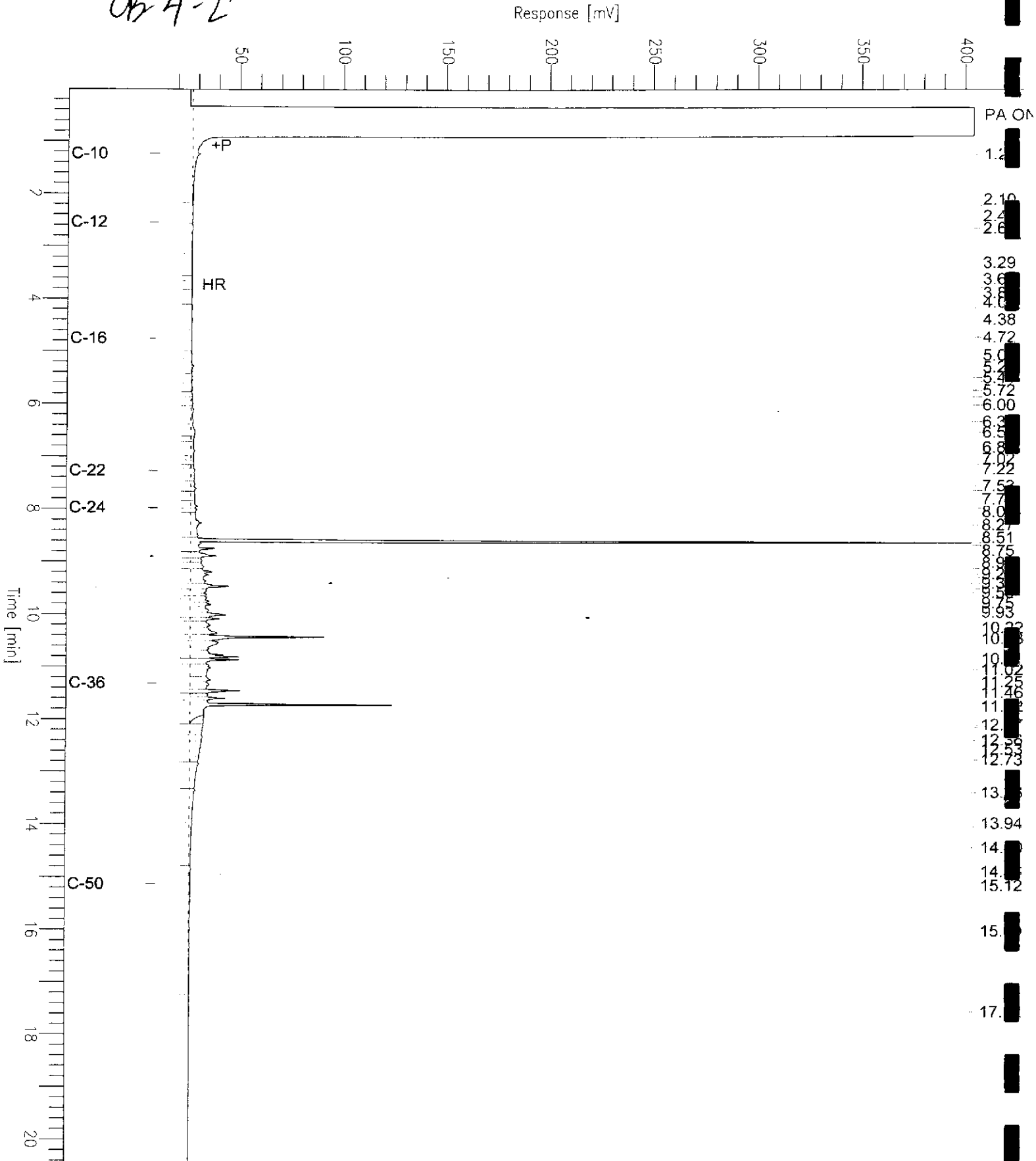
Sample Name : 172357-004,91372
FileName : G:\GC11\CHA\144A011.RAW
Method : ATEH140S.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 20.45 min
Plot Offset: 11 mV

Sample #: 91372
Date : 5/24/04 07:58 AM
Time of Injection: 5/23/04 05:08 PM
Low Point : 11.02 mV
Plot Scale: 393.1 mV
High Point : 404.13 mV

Page 1 of 1

CB 4-2'



Chromatogram

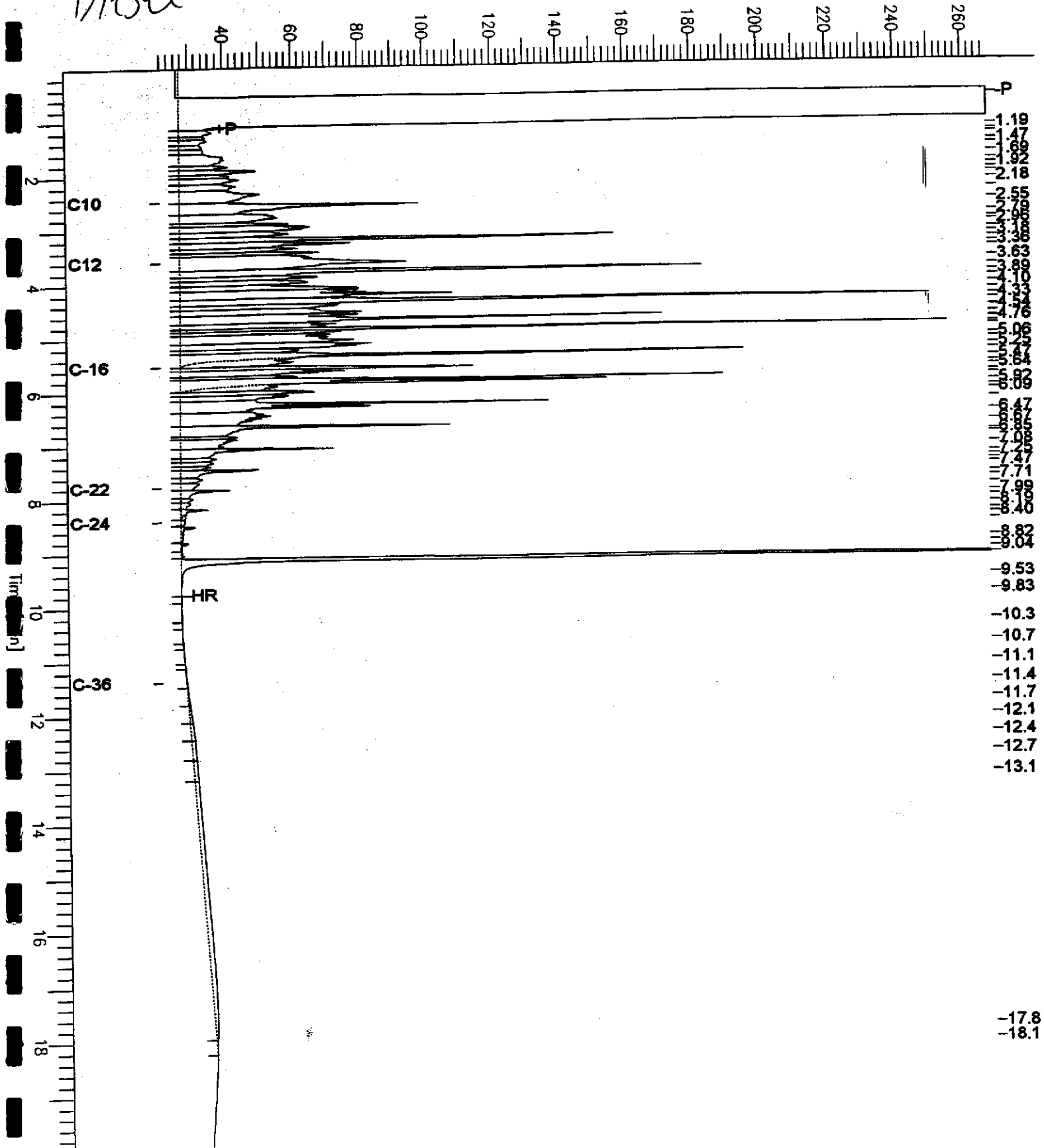
Sample Name : ccv,04ws0894,dsl
FileName : G:\GC15\CHB\144B002.RAW
Method : BTEH142S.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 19.99 min
Plot Offset: 22 mV

Sample #: 500mg/L
Date : 5/23/04 12:33 PM
Time of Injection: 5/23/04 11:52 AM
Low Point : 21.83 mV
Plot Scale: 245.7 mV
High Point : 267.51 mV

Diesel

Response [mV]



Batch QC Report

Total Extractable Hydrocarbons

Lab #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	SHAKER TABLE
Project#:	2004-02	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC252029	Batch#:	91372
Matrix:	Soil	Prepared:	05/22/04
Units:	mg/Kg	Analyzed:	05/23/04
Basis:	as received		

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	49.95	49.49	99	56-129

Surrogate	%REC	Limits
Hexacosane	99	52-131

Batch QC Report

Total Extractable Hydrocarbons

Job #:	172357	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	SHAKER TABLE
Project#:	2004-02	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	91372
MS Lab ID:	172380-019	Sampled:	05/17/04
Matrix:	Soil	Received:	05/18/04
Units:	mg/Kg	Prepared:	05/22/04
Basis:	as received	Analyzed:	05/23/04
Fltn Fac:	1.000		

Type: MS Cleanup Method: EPA 3630C
 Job ID: QC252030

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	25.91	49.96	79.25	107	27-146

Surrogate	%REC	Limits
Hexacosane	89	52-131

Type: MSD Cleanup Method: EPA 3630C
 Job ID: QC252031

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	49.86	78.08	105	27-146	1	50

Surrogate	%REC	Limits
Hexacosane	94	52-131

June 2004 Bioventing Pilot Test Well Soil Samples



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: 16-JUN-04

Lab Job Number: 172625

Project ID: 2004-02

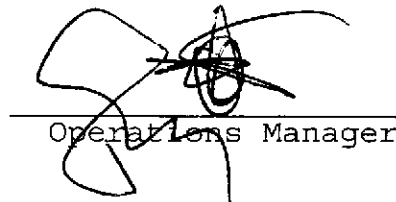
Location: Redwood Regional Park

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

This package may be reproduced only in its entirety.

Laboratory Numbers: **172625**
Client: **Stellar Environmental Solutions**
Location: **Redwood Regional Park**
Project #: **2004-02**

Sampled Date: **06/01/04**
Received Date: **06/02/04**

CASE NARRATIVE

This hardcopy data package contains sample and QC results for eight water samples, which were received from the site referenced above on June 02, 2004. The samples were received cold and intact.

TVH/BTXE:

High surrogate recoveries were observed for many samples as a result of hydrocarbons coeluting with the surrogate. No other analytical problems were encountered.

TEH by (EPA 8015B):

No analytical problems were encountered.

General Chemistry:

Low Total Phosphorus matrix spike recoveries were observed for sample VW-1-15.5' (CT# 172625-008). The associated laboratory control sample (LCS) passed all quality control criteria. No other analytical problems were encountered.

TKN by (EPA 351.3):

This analysis was sub-contracted to Calscience Environmental Laboratories, Inc. in Garden Grove, California. No analytical problems were encountered.

Total Volatile Hydrocarbons

Lab #: 172357	Location: Redwood Regional Park	Prep: EPA 5030B
Client: Stellar Environmental Solutions		
Project#: 2004-02		
Matrix: Water	Sampled: 05/17/04	
Units: ug/L	Received: 05/17/04	
Batch#: 91222	Analyzed: 05/18/04	

Field ID: CB-1-GW Lab ID: 172357-005
 Type: SAMPLE

Analyte	Result	RL	Diln Fac	Analysis
Gasoline C7-C12	22,000 Y	2,500	50.00	EPA 8015B
MTBE	910 C	20	10.00	EPA 8021B
Benzene	1,400 C	5.0	10.00	EPA 8021B
Toluene	ND	5.0	10.00	EPA 8021B
Ethylbenzene	2,100	5.0	10.00	EPA 8021B
m,p-Xylenes	210 C	5.0	10.00	EPA 8021B
o-Xylene	ND	5.0	10.00	EPA 8021B

Surrogate	%REC	Limits	Diln Fac	Analysis
Trifluorotoluene (FID)	142	74-142	50.00	EPA 8015B
Bromofluorobenzene (FID)	116	80-139	50.00	EPA 8015B
Trifluorotoluene (PID)	247 *	>LR b 55-139	10.00	EPA 8021B
Bromofluorobenzene (PID)	181 *	62-134	10.00	EPA 8021B

Field ID: CB-2-GW Lab ID: 172357-006
 Type: SAMPLE Diln Fac: 20.00

Analyte	Result	RL	Analysis
Gasoline C7-C12	54,000 Y	1,000	EPA 8015B
MTBE	120 C	40	EPA 8021B
Benzene	300	10	EPA 8021B
Toluene	ND	10	EPA 8021B
Ethylbenzene	650	10	EPA 8021B
m,p-Xylenes	49 C	10	EPA 8021B
o-Xylene	55	10	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	151 *	74-142	EPA 8015B
Bromofluorobenzene (FID)	149 *	80-139	EPA 8015B
Trifluorotoluene (PID)	112	55-139	EPA 8021B
Bromofluorobenzene (PID)	102	62-134	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 Y= Sample exhibits chromatographic pattern which does not resemble standard
 b= See narrative
 ND= Not Detected
 RL= Reporting Limit
 >LR= Response exceeds instrument's linear range

Laboratory Curtis & Tompkins Ltd.
 Address 2323 Farn Street
Berkeley CA 94710
510-486-0900
 Project Owner East Bay Regional Park District
 Site Address 7867 Redwood Road
Oakland CA
 Project Name Redwood Park Service Yard
 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) B. M. Rucker

Filtered	No. of Containers	Analysis Required										Remarks	
		TVH _g & BTEX	TM _g & TMT&E	Moisture Content	Alkalinity (ASTM D2206)	Total Phosphorus (SM 403)	Total Phosphorus (E305.3)	Total Kjeldahl Nitrogen (E351.4)					
	2	X	X	X	X	X	X						
	1	X	X										
	1	X	X										
	1	X	X	X	X	X	X						
	2	X	X	X	X	X	X						
	1	X	X										
	2	X	X	X	X	X	X						

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		Filtered	No. of Containers	TVH _g & BTEX	TM _g & TMT&E	Moisture Content	Alkalinity (ASTM D2206)	Total Phosphorus (SM 403)	Total Phosphorus (E305.3)	Total Kjeldahl Nitrogen (E351.4)	Remarks
						Cooler	Chemical										
VMP-2-10.5'	10.5'	6/1/04	900	502L	brass sleeve & glass jar	Yes	No		2	X	X	X	X	X	X		
VMP-2-14.5'	14.5'		915		brass sleeve	Yes	No		1	X	X						
VMP-3-10.5'	10.5'		1105		brass sleeve	Yes	No		1	X	X						
VMP-3-15'	15'		1120		brass sleeve & glass jar	Yes	No		1	X	X	X	X	X	X		
VMP-1-10.5'	10.5'		1310		brass sleeve	Yes	No		1	X	X						
VMP-1-14.5'	14.5'		1340		brass sleeve & glass jar	Yes	No		2	X	X	X	X	X	X		
VW-1-10'	10'	6/2/04	835		brass sleeve	Yes	No		1	X	X						
VW-1-15.5'	15.5'		845		brass sleeve & glass jar	Yes	No		2	X	X	X	X	X	X		

Relinquished by: <u>B. M. Rucker</u> Signature _____ Printed <u>Bruce M. Rucker</u> Company <u>STELLAR ENVIRONMENTAL</u>	Date <u>6/2/04</u> Time <u>1315</u>	Received by: <u>[Signature]</u> Signature _____ Printed <u>[Signature]</u> Company <u>Curtis & Tompkins Ltd</u>	Date <u>6/2/04</u> Time <u>1315</u>	Relinquished by: _____ Signature _____ Printed _____ Company _____	Date _____ Time _____	Received by: _____ Signature _____ Printed _____ Company _____	Date _____ Time _____
Turnaround Time: <u>1-2 weeks</u>				Relinquished by: _____ Signature _____ Printed _____ Company _____			
Comments: <u>Received cold & intact</u>				Relinquished by: _____ Signature _____ Printed _____ Company _____			



Total Volatile Hydrocarbons

Lab #: 172625	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 2004-02	
Basis: as received	Received: 06/02/04

Field ID: VMP-2-10.5'	Diln Fac: 250.0
Type: SAMPLE	Batch#: 91672
Lab ID: 172625-001	Sampled: 06/01/04
Matrix: Soil	Analyzed: 06/03/04

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	3,500	250	mg/Kg	EPA 8015B
MTBE	ND	5,000	ug/Kg	EPA 8021B
Benzene	1,400 C	1,300	ug/Kg	EPA 8021B
Toluene	ND	1,300	ug/Kg	EPA 8021B
Ethylbenzene	42,000	1,300	ug/Kg	EPA 8021B
m,p-Xylenes	160,000	1,300	ug/Kg	EPA 8021B
o-Xylene	37,000	1,300	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	117	71-138	EPA 8015B
Bromofluorobenzene (FID)	111	73-143	EPA 8015B
Trifluorotoluene (PID)	93	55-135	EPA 8021B
Bromofluorobenzene (PID)	88	58-135	EPA 8021B

Field ID: VMP-2-14.5'	Diln Fac: 100.0
Type: SAMPLE	Batch#: 91672
Lab ID: 172625-002	Sampled: 06/01/04
Matrix: Soil	Analyzed: 06/03/04

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	3,200	100	mg/Kg	EPA 8015B
MTBE	ND	2,000	ug/Kg	EPA 8021B
Benzene	8,000 C	500	ug/Kg	EPA 8021B
Toluene	ND	500	ug/Kg	EPA 8021B
Ethylbenzene	40,000	500	ug/Kg	EPA 8021B
m,p-Xylenes	72,000	500	ug/Kg	EPA 8021B
o-Xylene	5,000	500	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	180 *	71-138	EPA 8015B
Bromofluorobenzene (FID)	130	73-143	EPA 8015B
Trifluorotoluene (PID)	102	55-135	EPA 8021B
Bromofluorobenzene (PID)	85	58-135	EPA 8021B

*= Value outside of QC limits; see narrative

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

ND= Not Detected

RL= Reporting Limit

Page 1 of 6

GC07 TVH 'A' Data File RTX 502

Sample Name : 172625-001,91672

Sample #: a

Page 1 of 1

File Name : G:\GC07\DATA\155A016.raw

Date : 6/4/04 10:35 AM

Method : TVHBTXE

Time of Injection: 6/3/04 08:06 PM

Start Time : 0.00 min

End Time : 26.00 min

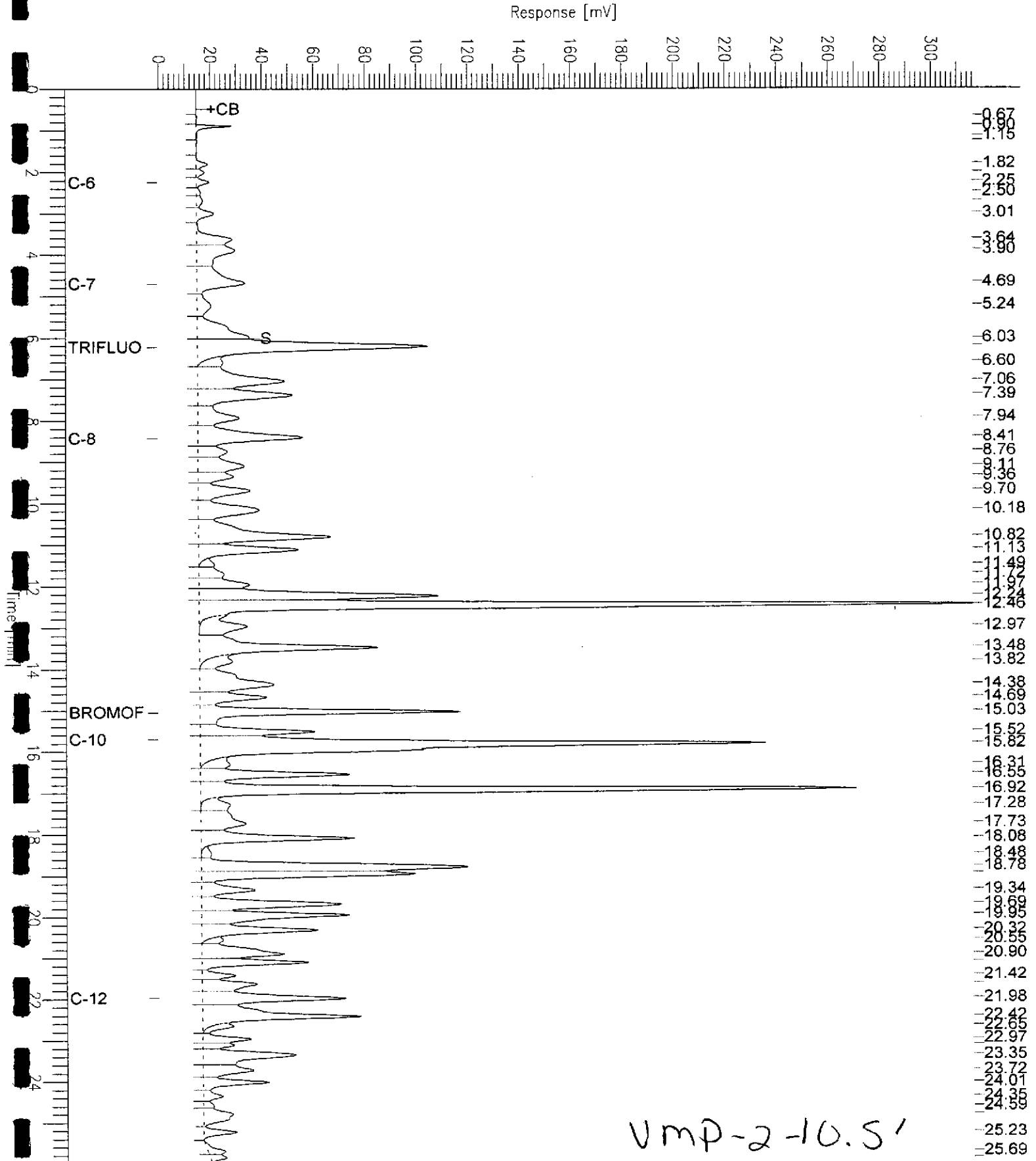
Low Point : -0.50 mV

High Point : 316.20 mV

Scale Factor: 1.0

Plot Offset: -1 mV

Plot Scale: 316.7 mV

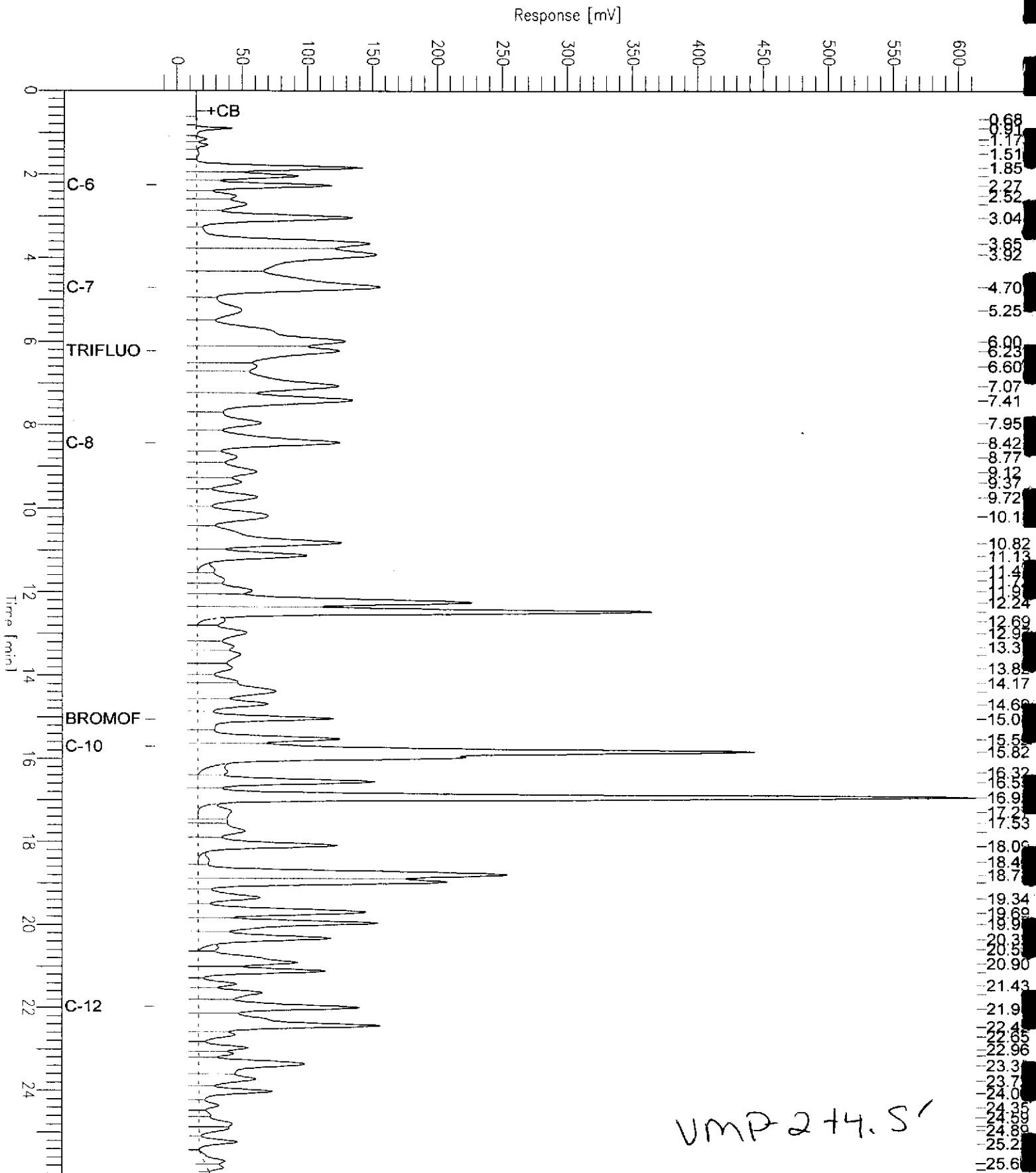


GC07 TVH 'A' Data File RTX 502

Sample Name : 172625-002,91672
 FileName : G:\GC07\DATA\155A017.raw
 Method : TVHBTXE
 Start Time : 0.00 min
 Scale Factor: 1.0

End Time : 26.00 min
 Plot Offset: -15 mV

Sample #: a
 Date : 6/3/04 09:08 PM
 Time of Injection: 6/3/04 08:41 PM
 Low Point : -15.39 mV
 High Point : 615.72 mV
 Plot Scale: 631.1 mV



Total Volatile Hydrocarbons

Lab #: 172625	Location: Redwood Regional Park	EPA 5030B
Client: Stellar Environmental Solutions	Prep:	
Project#: 2004-02		
Basis: as received	Received:	06/02/04

Field ID: VMP-3-10.5'	Diln Fac: 1.000	Batch#: 91651
Type: SAMPLE	Batch#:	06/01/04
Lab ID: 172625-003	Sampled:	06/02/04
Matrix: Soil	Analyzed:	

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.1	mg/Kg	EPA 8015B
MTBE	ND	22	ug/Kg	EPA 8021B
Benzene	ND	5.5	ug/Kg	EPA 8021B
Toluene	ND	5.5	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.5	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.5	ug/Kg	EPA 8021B
o-Xylene	ND	5.5	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	95	71-138	EPA 8015B
Bromofluorobenzene (FID)	116	73-143	EPA 8015B
Trifluorotoluene (PID)	74	55-135	EPA 8021B
Bromofluorobenzene (PID)	90	58-135	EPA 8021B

Field ID: VMP-3-15'	Diln Fac: 100.0	Batch#: 91672
Type: SAMPLE	Batch#:	06/01/04
Lab ID: 172625-004	Sampled:	06/03/04
Matrix: Soil	Analyzed:	

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	1,400	100	mg/Kg	EPA 8015B
MTBE	ND	2,000	ug/Kg	EPA 8021B
Benzene	ND	500	ug/Kg	EPA 8021B
Toluene	ND	500	ug/Kg	EPA 8021B
Ethylbenzene	8,900	500	ug/Kg	EPA 8021B
m,p-Xylenes	5,300	500	ug/Kg	EPA 8021B
o-Xylene	ND	500	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	149 *	71-138	EPA 8015B
Bromofluorobenzene (FID)	111	73-143	EPA 8015B
Trifluorotoluene (PID)	97	55-135	EPA 8021B
Bromofluorobenzene (PID)	82	58-135	EPA 8021B

* = Value outside of QC limits; see narrative
 C = Presence confirmed, but RPD between columns exceeds 40%
 ND = Not Detected
 RL = Reporting Limit

GC07 TVH 'A' Data File RTX 502

Sample Name : 172625-004,91672

Sample #: a

Page 1 of 1

FileName : G:\GC07\DATA\155A018.raw

Date : 6/3/04 09:43 PM

Method : TVHBTXE

Time of Injection: 6/3/04 09:17 PM

Start Time : 0.00 min

End Time : 26.00 min

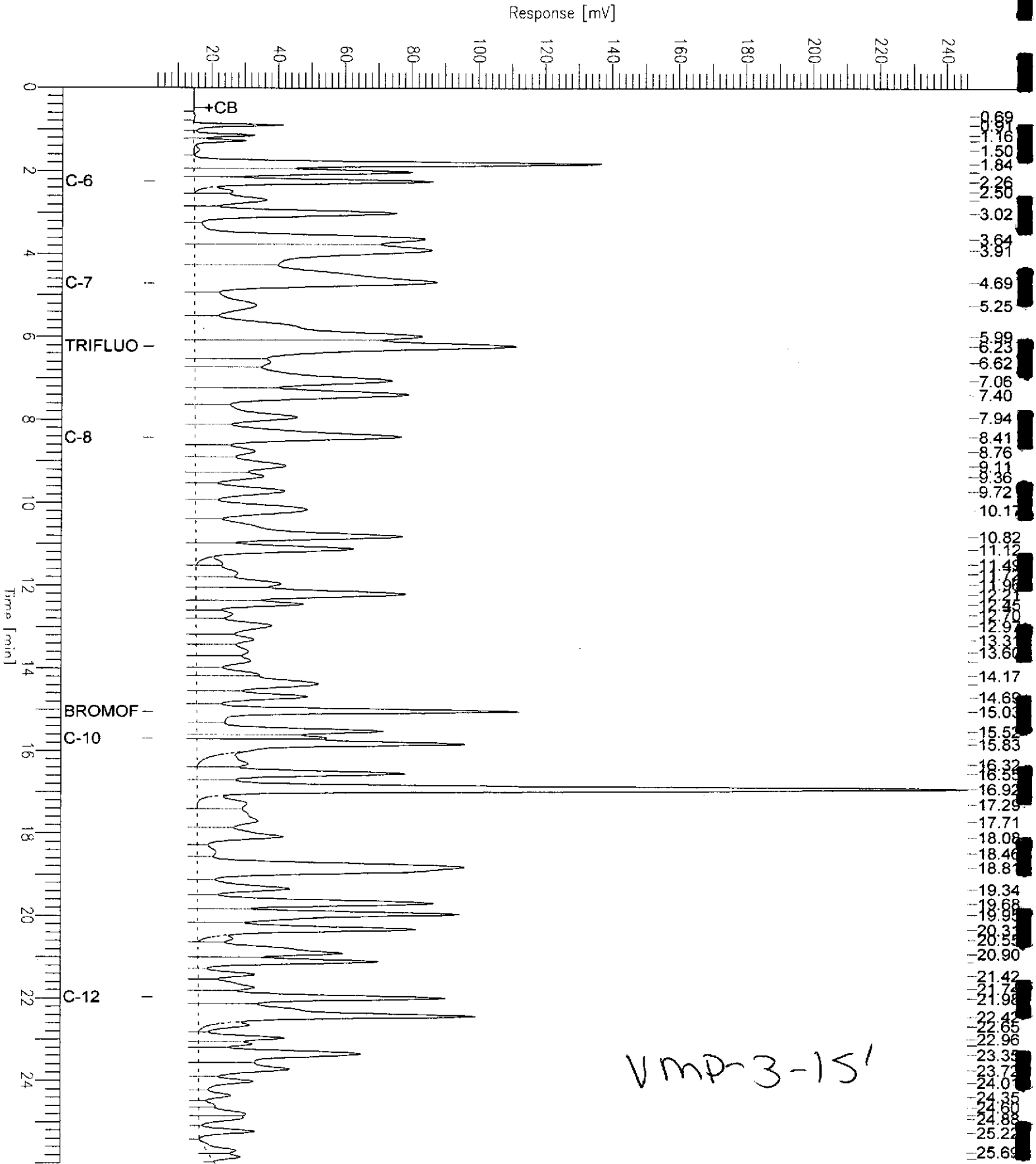
Low Point : 3.00 mV

High Point : 246.75 mV

Scale Factor: 1.0

Plot Offset: 3 mV

Plot Scale: 243.7 mV





Total Volatile Hydrocarbons

Lab #: 172625 Location: Redwood Regional Park
 Client: Stellar Environmental Solutions Prep: EPA 5030B
 Project#: 2004-02
 Basis: as received Received: 06/02/04

Field ID: VMP-1-10.5' Diln Fac: 1.000
 Type: SAMPLE Batch#: 91680
 Lab ID: 172625-005 Sampled: 06/01/04
 Matrix: Soil Analyzed: 06/03/04

Analyte	Result	Rt	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	EPA 8015B
MTBE	ND	21	ug/Kg	EPA 8021B
Benzene	ND	5.2	ug/Kg	EPA 8021B
Toluene	ND	5.2	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.2	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.2	ug/Kg	EPA 8021B
o-Xylene	ND	5.2	ug/Kg	EPA 8021B

Surrogate	NRCC	Limits	Analysis
Trifluorotoluene (FID)	103	71-138	EPA 8015B
Bromofluorobenzene (FID)	108	73-143	EPA 8015B
Trifluorotoluene (PID)	95	55-135	EPA 8021B
Bromofluorobenzene (PID)	98	58-135	EPA 8021B

Field ID: VMP-1-14.5' Diln Fac: 100.0
 Type: SAMPLE Batch#: 91672
 Lab ID: 172625-006 Sampled: 06/01/04
 Matrix: Soil Analyzed: 06/03/04

Analyte	Result	Rt	Units	Analysis
Gasoline C7-C12	2,100	100	mg/Kg	EPA 8015B
MTBE	ND	2,000	ug/Kg	EPA 8021B
Benzene	ND	500	ug/Kg	EPA 8021B
Toluene	ND	500	ug/Kg	EPA 8021B
Ethylbenzene	15,000	500	ug/Kg	EPA 8021B
m,p-Xylenes	4,000 C	500	ug/Kg	EPA 8021B
o-Xylene	ND	500	ug/Kg	EPA 8021B

Surrogate	NRCC	Limits	Analysis
Trifluorotoluene (FID)	145 *	71-138	EPA 8015B
Bromofluorobenzene (FID)	137	73-143	EPA 8015B
Trifluorotoluene (PID)	98	55-135	EPA 8021B
Bromofluorobenzene (PID)	91	58-135	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 ND= Not Detected
 L= Reporting Limit
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GC07 TVH 'A' Data File RTX 502

Sample Name : 172625-006,91672

Sample #: a

Page 1 of 1

FileName : G:\GC07\DATA\155A019.raw

Date : 6/4/04 10:36 AM

Method : TVHBTXE

Time of Injection: 6/3/04 09:51 PM

Start Time : 0.00 min

End Time : 26.00 min

Low Point : 8.82 mV

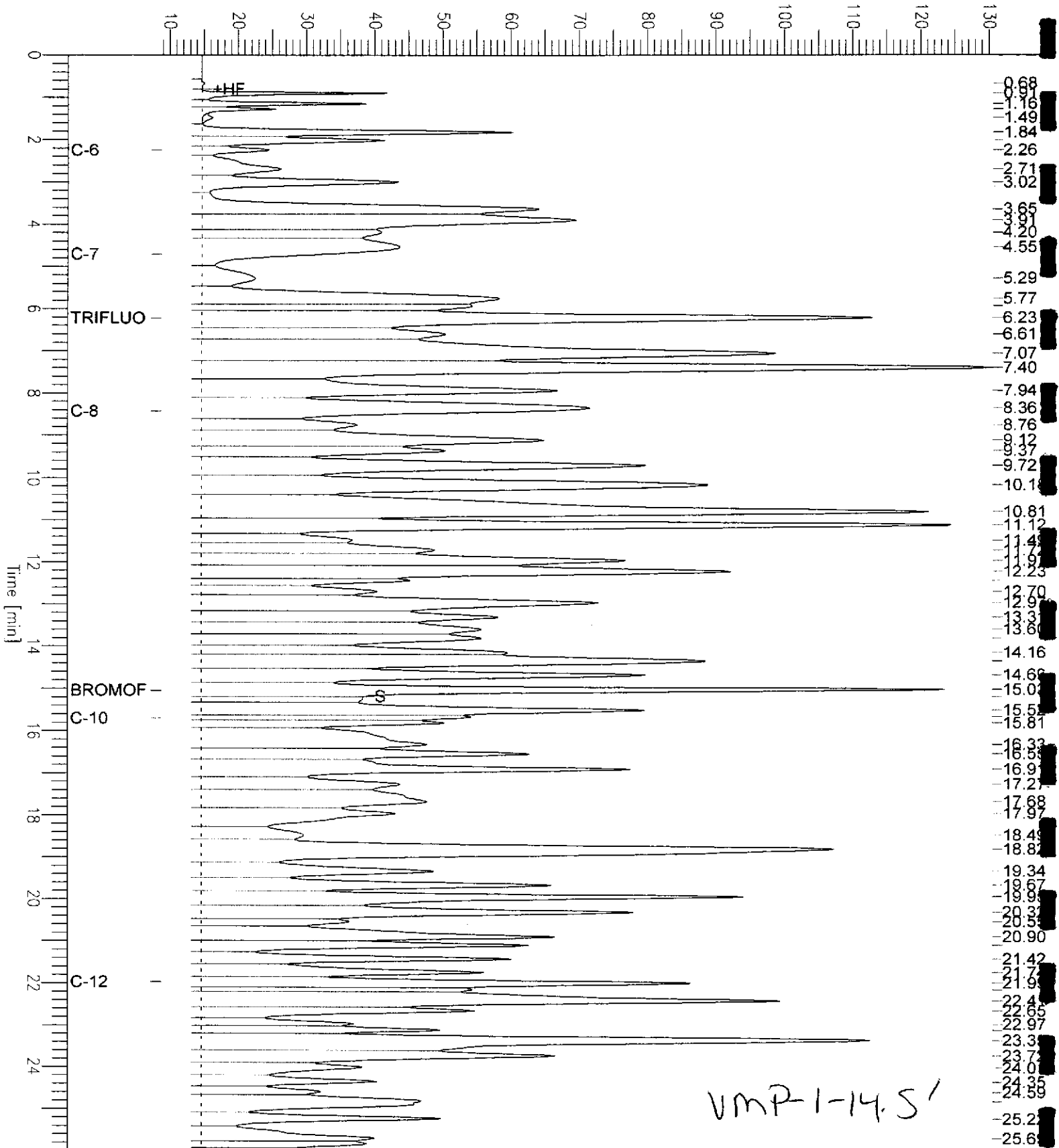
High Point : 130.63 mV

Scale Factor: 1.0

Plot Offset: 9 mV

Plot Scale: 121.8 mV

Response [mV]



**Total Volatile Hydrocarbons**

Lab #: 172625 Location: Redwood Regional Park
 Client: Stellar Environmental Solutions Prep: EPA 5030B
 Project#: 2004-02
 Basis: as received Received: 06/02/04

Field ID: VW-1-10' Diln Fac: 1.000
 Type: SAMPLE Batch#: 91651
 Lab ID: 172625-007 Sampled: 06/02/04
 Matrix: Soil Analyzed: 06/02/04

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	0.98	mg/Kg	EPA 8015B
MTBE	ND	20	ug/Kg	EPA 8021B
Benzene	ND	4.9	ug/Kg	EPA 8021B
Toluene	ND	4.9	ug/Kg	EPA 8021B
Ethylbenzene	ND	4.9	ug/Kg	EPA 8021B
m,p-Xylenes	ND	4.9	ug/Kg	EPA 8021B
o-Xylene	ND	4.9	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	98	71-138	EPA 8015B
Bromofluorobenzene (FID)	122	73-143	EPA 8015B
Trifluorotoluene (PID)	76	55-135	EPA 8021B
Bromofluorobenzene (PID)	94	58-135	EPA 8021B

Field ID: VW-1-15.5' Diln Fac: 5.000
 Type: SAMPLE Batch#: 91651
 Lab ID: 172625-008 Sampled: 06/01/04
 Matrix: Soil Analyzed: 06/03/04

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	38	5.0	mg/Kg	EPA 8015B
MTBE	ND	100	ug/Kg	EPA 8021B
Benzene	ND	25	ug/Kg	EPA 8021B
Toluene	ND	25	ug/Kg	EPA 8021B
Ethylbenzene	260	25	ug/Kg	EPA 8021B
m,p-Xylenes	ND	25	ug/Kg	EPA 8021B
o-Xylene	130 C	25	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	123	71-138	EPA 8015B
Bromofluorobenzene (FID)	161 *	73-143	EPA 8015B
Trifluorotoluene (PID)	72	55-135	EPA 8021B
Bromofluorobenzene (PID)	104	58-135	EPA 8021B

* = Value outside of QC limits; see narrative
 C = Presence confirmed, but RPD between columns exceeds 40%
 ND = Not Detected
 L = Reporting Limit

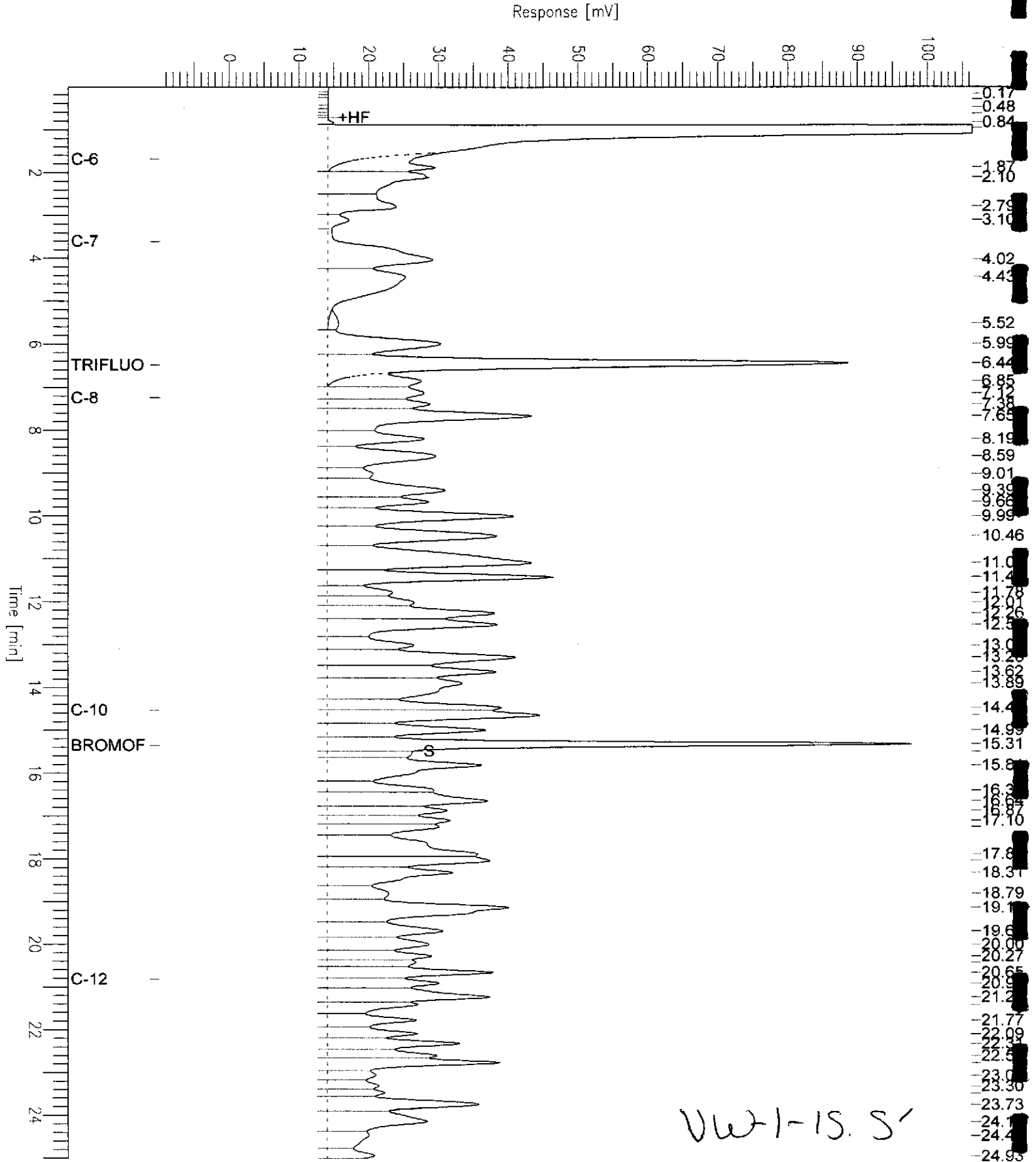
Chromatogram

Sample Name : 172625-008,91651
FileName : G:\GC05\DATA\154G019.RAW
Method :
Start Time : 0.02 min
Scale Factor : 0.0

End Time : 25.00 min
Plot Offset: -10 mV

Sample #: a
Date : 6/3/04 11:02 AM
Time of Injection: 6/3/04 02:47 AM
Low Point : -9.89 mV
Plot Scale: 116.3 mV
High Point : 106.43 mV

Page 1 of 1

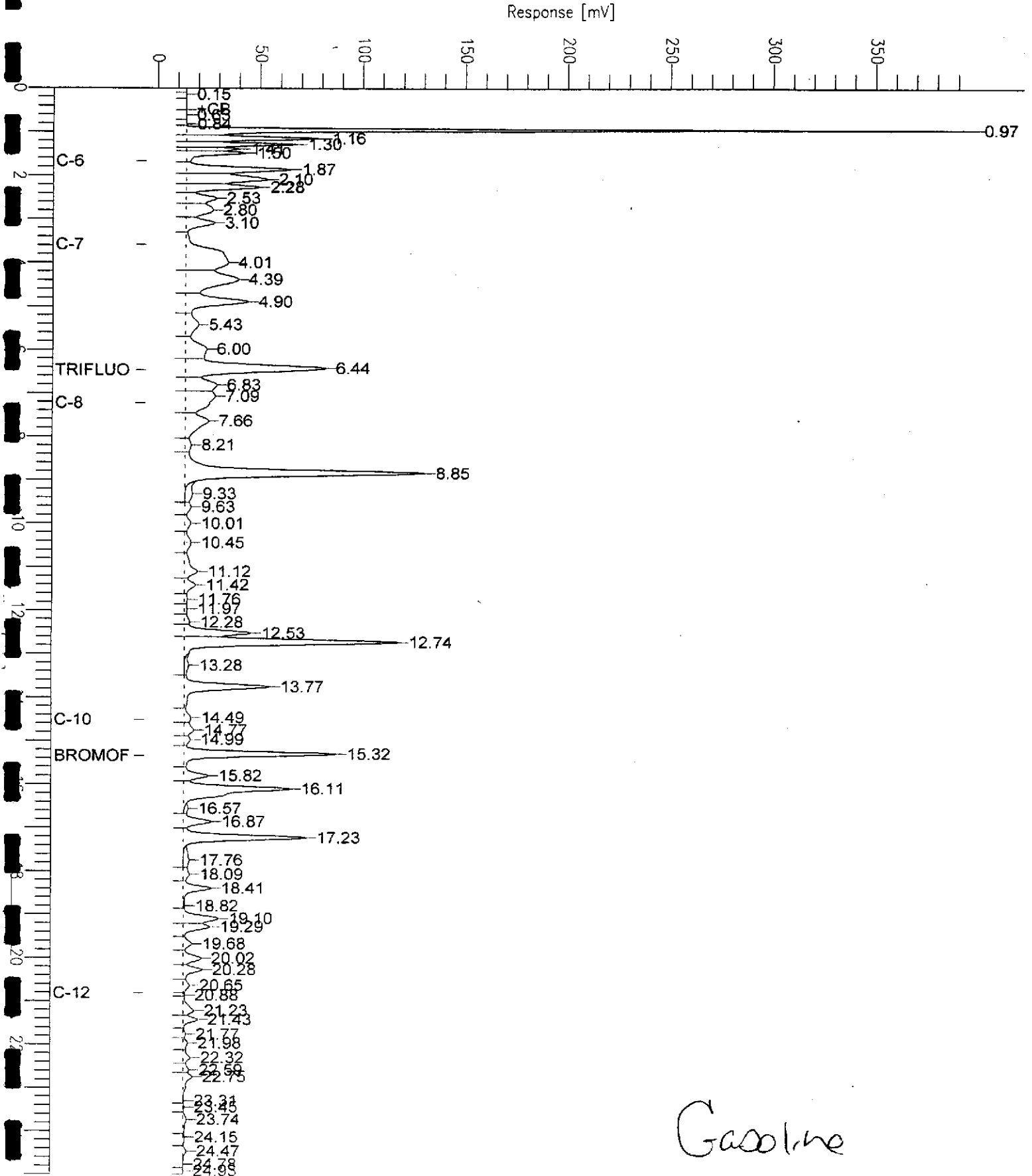


Chromatogram

File Name : ccv/lcs,gc253060,91651,04ws0931,2.5/5000
Name : G:\GC05\DATA\154G002.raw
Mod : TVHBTXE
Start Time : 0.00 min
Scale Factor : 1.0

Sample # :
Date : 6/2/04 05:37 PM
Time of Injection : 6/2/04 05:12 PM
Low Point : -5.41 mV
Plot Scale : 402.9 mV

Page 1 of 1





Total Volatile Hydrocarbons

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02		
Basis:	as received	Received:	06/02/04

Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC253059	Batch#:	91651
Matrix:	Soil	Analyzed:	06/02/04

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	EPA 8015B
MTBE	ND	20	ug/Kg	EPA 8021B
Benzene	ND	5.0	ug/Kg	EPA 8021B
Toluene	ND	5.0	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.0	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.0	ug/Kg	EPA 8021B
o-Xylene	ND	5.0	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	77	71-138	EPA 8015B
Bromofluorobenzene (FID)	88	73-143	EPA 8015B
Trifluorotoluene (PID)	58	55-135	EPA 8021B
Bromofluorobenzene (PID)	68	58-135	EPA 8021B

Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC253138	Batch#:	91672
Matrix:	Water	Analyzed:	06/03/04
Units:	ug/L		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	200	EPA 8015B
MTBE	ND	4.0	EPA 8021B
Benzene	ND	1.0	EPA 8021B
Toluene	ND	1.0	EPA 8021B
Ethylbenzene	ND	1.0	EPA 8021B
m,p-Xylenes	ND	1.0	EPA 8021B
o-Xylene	ND	1.0	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	92	71-138	EPA 8015B
Bromofluorobenzene (FID)	91	73-143	EPA 8015B
Trifluorotoluene (PID)	81	55-135	EPA 8021B
Bromofluorobenzene (PID)	84	58-135	EPA 8021B

*= Value outside of QC limits; see narrative

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

ND= Not Detected

RL= Reporting Limit

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Total Volatile Hydrocarbons

Lab #: 172625	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: 2004-02	
Basis: as received	Received: 06/02/04

Type: BLANK	Diln Fac: 1.000
Lab ID: QC253169	Batch#: 91680
Matrix: Soil	Analyzed: 06/03/04

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	EPA 8015B
MTBE	ND	20	ug/Kg	EPA 8021B
Benzene	ND	5.0	ug/Kg	EPA 8021B
Toluene	ND	5.0	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.0	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.0	ug/Kg	EPA 8021B
o-Xylene	ND	5.0	ug/Kg	EPA 8021B

Surrogate	SRM	Limits	Analysis
Trifluorotoluene (FID)	100	71-138	EPA 8015B
Bromofluorobenzene (FID)	105	73-143	EPA 8015B
Trifluorotoluene (PID)	91	55-135	EPA 8021B
Bromofluorobenzene (PID)	94	58-135	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 ND= Not Detected
 RL= Reporting Limit
 Page 6 of 6

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8015B
Type:	LCS	Basis:	as received
Lab ID:	QC253060	Diln Fac:	1.000
Matrix:	Soil	Batch#:	91651
Units:	mg/Kg	Analyzed:	06/02/04

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	5.000	4.925	99	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	107	71-138
Bromofluorobenzene (FID)	124	73-143



Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8021B
Type:	LCS	Basis:	as received
Lab ID:	QC253061	Diln Fac:	1.000
Matrix:	Soil	Batch#:	91651
Units:	ug/Kg	Analyzed:	06/02/04

Analyte	Spiked	Result	%RRC	Limits
MTBE	50.00	43.79	88	56-137
Benzene	50.00	44.63	89	80-120
Toluene	50.00	44.26	89	80-120
Ethylbenzene	50.00	46.82	94	79-120
m,p-Xylenes	50.00	45.02	90	80-120
o-Xylene	50.00	46.38	93	80-120

Surrogate	%RRC	Limits
Trifluorotoluene (PID)	75	55-135
Bromofluorobenzene (PID)	90	58-135

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8015B
Field ID:	VMP-3-10.5'	Diln Fac:	1.000
MSS Lab ID:	172625-003	Batch#:	91651
Matrix:	Soil	Sampled:	06/01/04
Units:	mg/Kg	Received:	06/02/04
Basis:	as received	Analyzed:	06/02/04

Type: MS Lab ID: QC253064

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	0.1591	11.11	10.89	97	47-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	113	71-138
Bromofluorobenzene (FID)	132	73-143

Type: MSD Lab ID: QC253065

Analyte	Spiked	Result	%REC	Limits	RPD	Lim	
Gasoline C7-C12	-	10.75	10.30	94	47-120	2	23

Surrogate	%REC	Limits
Trifluorotoluene (FID)	117	71-138
Bromofluorobenzene (FID)	135	73-143

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172625	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:	QC253139	Batch#:	91672
Matrix:	Water	Analyzed:	06/03/04
Units:	ug/L		

Analyte	Spiked	Result	UREC	Limits
MTBE	20.00	19.84	99	56-137
Benzene	20.00	19.98	100	80-120
Toluene	20.00	19.93	100	80-120
Ethylbenzene	20.00	20.49	102	79-120
m,p-Xylenes	20.00	20.15	101	80-120
p-Xylene	20.00	20.51	103	80-120

Surrogate	UREC	Limits
Trifluorotoluene (PID)	83	55-135
Bromofluorobenzene (PID)	83	58-135

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC253140	Batch#:	91672
Matrix:	Water	Analyzed:	06/03/04
Units:	ug/L		

Analyte	Spiked	Result	UREC	Limits
Gasoline C7-C12	2,000	2,207	110	80-120

Surrogate	UREC	Limits
Trifluorotoluene (FID)	110	71-138
Bromofluorobenzene (FID)	94	73-143



Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8021B
Field ID:	ZZZZZZZZZZ	Batch#:	91672
MSS Lab ID:	172630-001	Sampled:	06/02/04
Matrix:	Water	Received:	06/02/04
Units:	ug/L	Analyzed:	06/03/04
Diln Fac:	1.000		

Type: MS Lab ID: QC253156

Analyte	MSS Result	Spiked	Result	%RRC	Limits
MTBE	<0.1000	20.00	20.71	104	60-120
Benzene	<0.09000	20.00	20.49	102	62-120
Toluene	<0.04600	20.00	20.02	100	54-120
Ethylbenzene	<0.05900	20.00	20.15	101	46-120
m,p-Xylenes	<0.06600	20.00	19.86	99	43-120
o-Xylene	<0.05300	20.00	20.23	101	45-120

Surrogate	%RRC	Limits
Trifluorotoluene (PID)	85	55-135
Bromofluorobenzene (PID)	96	58-135

Type: MSD Lab ID: QC253157

Analyte	Spiked	Result	%RRC	Limits	RPD	Lim
MTBE	20.00	21.73	109	60-120	5	25
Benzene	20.00	20.46	102	62-120	0	20
Toluene	20.00	19.98	100	54-120	0	20
Ethylbenzene	20.00	20.18	101	46-120	0	20
m,p-Xylenes	20.00	19.70	98	43-120	1	20
o-Xylene	20.00	20.29	101	45-120	0	20

Surrogate	%RRC	Limits
Trifluorotoluene (PID)	85	55-135
Bromofluorobenzene (PID)	97	58-135

RPD= Relative Percent Difference

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8021B
Type:	LCS	Basis:	as received
Lab ID:	QC253170	Diln Fac:	1.000
Matrix:	Soil	Batch#:	91680
Units:	ug/Kg	Analyzed:	06/03/04

Analyte	Spiked	Result	VREC	Limits
MTBE	100.0	113.3	113	56-137
Benzene	100.0	94.10	94	80-120
Toluene	100.0	94.68	95	80-120
Ethylbenzene	100.0	97.32	97	79-120
m,p-Xylenes	100.0	96.39	96	80-120
o-Xylene	100.0	99.20	99	80-120

Surrogate	VREC	Limits
Trifluorotoluene (PID)	84	55-135
Bromofluorobenzene (PID)	88	58-135

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8015B
Type:	LCS	Basis:	as received
Lab ID:	QC253171	Diln Fac:	1.000
Matrix:	Soil	Batch#:	91680
Units:	mg/Kg	Analyzed:	06/03/04

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	10.00	10.96	110	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	111	71-138
Bromofluorobenzene (FID)	104	73-143

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2004-02	Analysis:	EPA 8015B
Field ID:	VMP-1-10.5'	Diln Fac:	1.000
MSS Lab ID:	172625-005	Batch#:	91680
Matrix:	Soil	Sampled:	06/01/04
Units:	mg/Kg	Received:	06/02/04
Basis:	as received	Analyzed:	06/06/04

Type: MS Lab ID: QC253191

Analyte	MSS Result	Spiked	Result	%RRC	Limits
Gasoline C7-C12	0.1900	9.901	9.298	92	47-120

Surrogate	%RRC	Limits
Trifluorotoluene (FID)	128	71-138
Bromofluorobenzene (FID)	127	73-143

Type: MSD Lab ID: QC253192

Analyte	Spiked	Result	%RRC	Limits	RPD	Lim
Gasoline C7-C12	10.64	11.36	105	47-120	13	23

Surrogate	%RRC	Limits
Trifluorotoluene (FID)	124	71-138
Bromofluorobenzene (FID)	118	73-143

Total Extractable Hydrocarbons

Lab #: 172625	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 3550
Project#: 2004-02	Analysis: EPA 8015B
Matrix: Soil	Batch#: 91729
Units: mg/Kg	Received: 06/02/04
Basis: as received	Prepared: 06/05/04

Field ID: VMP-2-10.5'	Diln Fac: 10.00
Type: SAMPLE	Sampled: 06/01/04
Lab ID: 172625-001	Analyzed: 06/06/04

Analyte	Result	RL
Diesel C10-C24	1,000 L Y	10

Surrogate	%REC	Limits
Hexacosane	DO	52-131

Field ID: VMP-2-14.5'	Diln Fac: 5.000
Type: SAMPLE	Sampled: 06/01/04
Lab ID: 172625-002	Analyzed: 06/06/04

Analyte	Result	RL
Diesel C10-C24	650 L Y	5.0

Surrogate	%REC	Limits
Hexacosane	116	52-131

Field ID: VMP-3-10.5'	Diln Fac: 1.000
Type: SAMPLE	Sampled: 06/01/04
Lab ID: 172625-003	Analyzed: 06/05/04

Analyte	Result	RL
Diesel C10-C24	1.2 Y	1.0

Surrogate	%REC	Limits
Hexacosane	107	52-131

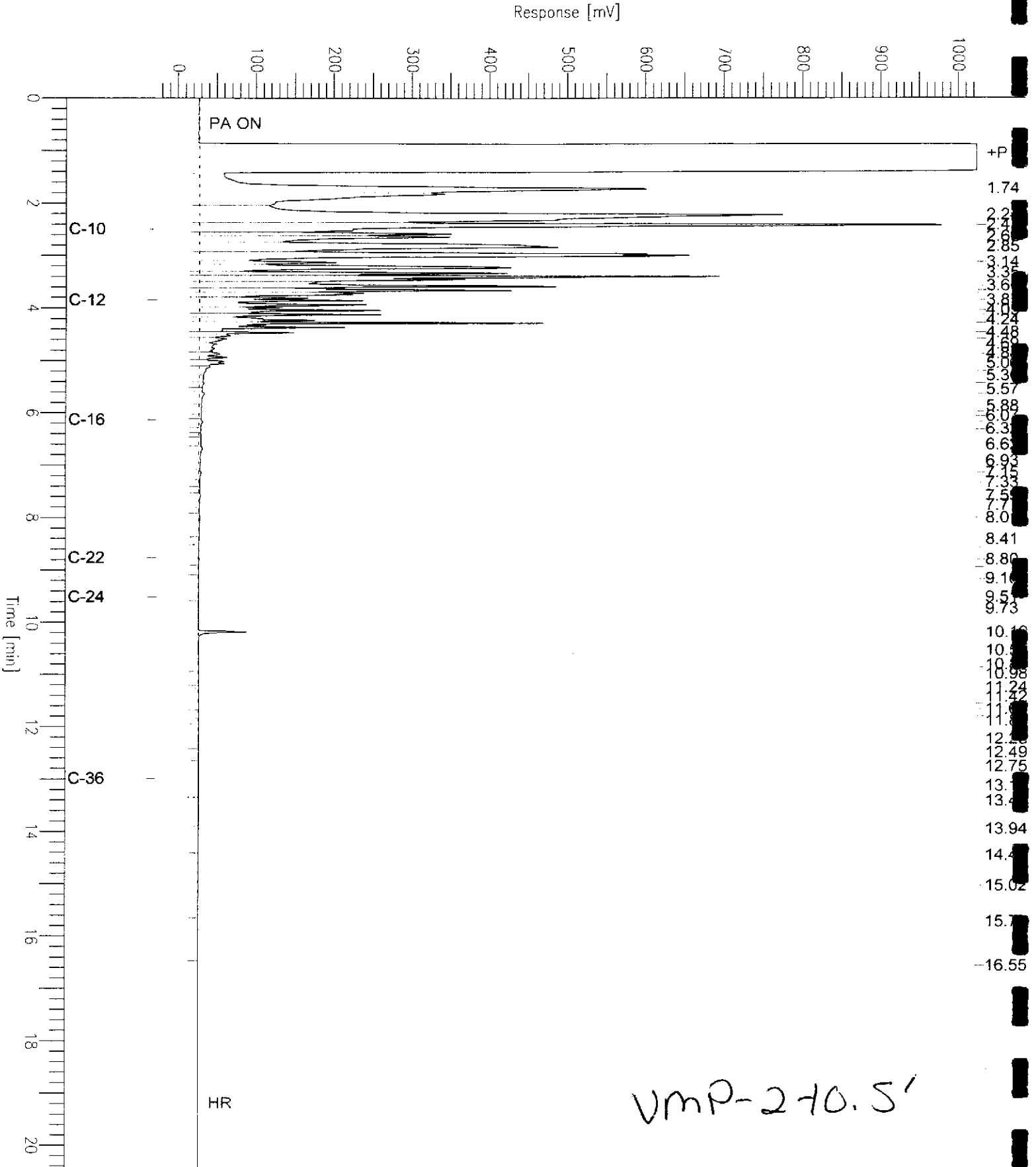
L= Lighter hydrocarbons contributed to the quantitation
 Y= Sample exhibits chromatographic pattern which does not resemble standard
 DO= Diluted Out
 ND= Not Detected
 L= Reporting Limit

Chromatogram

Sample Name : 172625-001,91729
FileName : G:\GC11\CHA\158A011.RAW
Method : ATEH156S.MTH
Start Time : 0.00 min
Scale Factor: 0.0

End Time : 20.46 min
Plot Offset: -26 mV

Sample #: 91729
Date : 6/7/04 09:20 AM
Time of Injection: 6/6/04 09:28 PM
Low Point : -26.05 mV
Plot Scale: 1050.0 mV
High Point : 1024.00 mV



Chromatogram

Sample Name : 172625-002,91729

Sample #: 91729

Page 1 of 1

File Name : G:\GC11\CHA\158A012.RAW

Date : 6/7/04 09:20 AM

Method : ATEH156S.MTH

Time of Injection: 6/6/04 09:57 PM

Start Time : 0.00 min

End Time : 20.46 min

Low Point : -26.06 mV

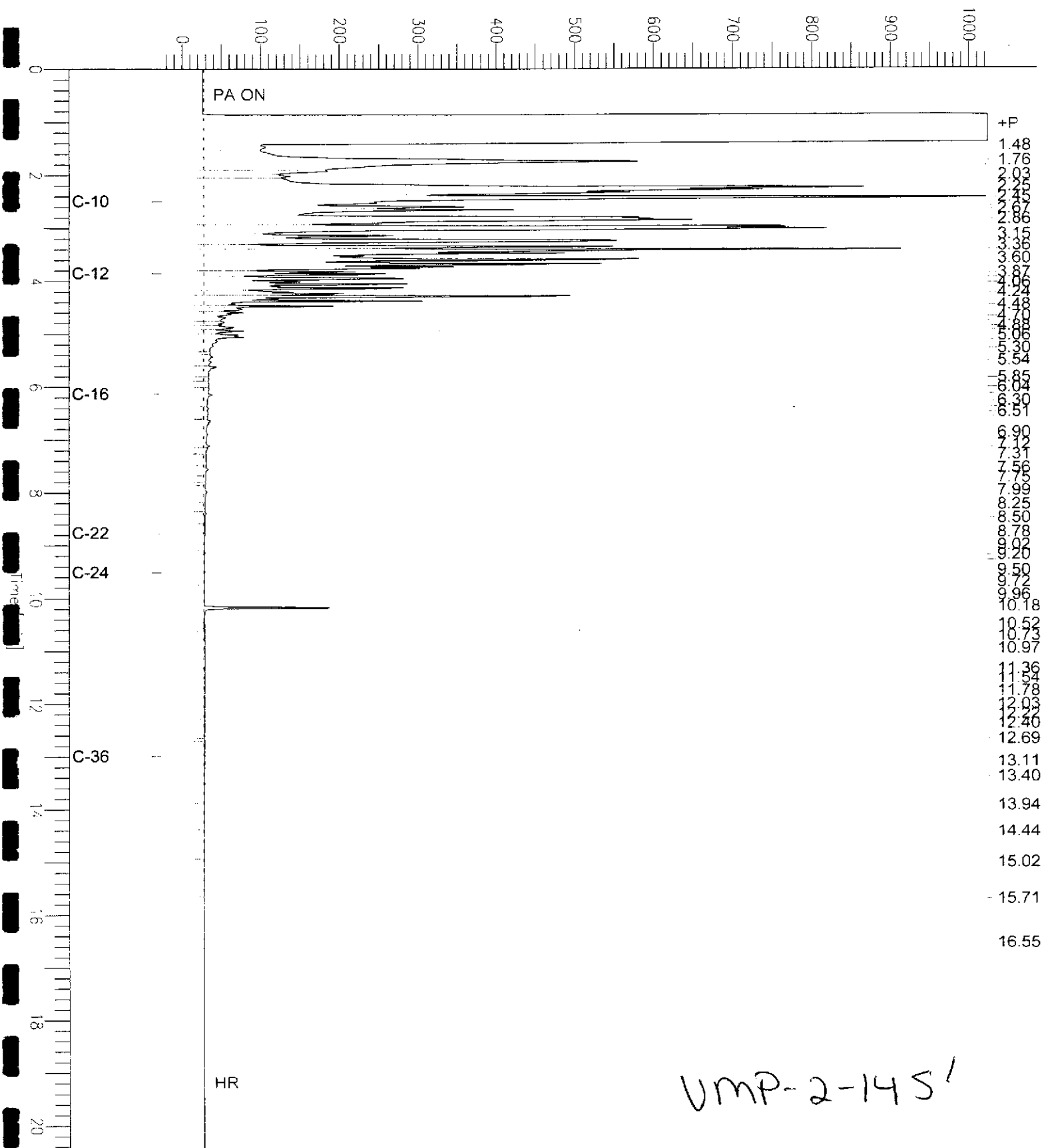
High Point : 1024.00 mV

Scale Factor: 0.0

Plot Offset: -26 mV

Plot Scale: 1050.1 mV

Response [mV]



VMP-2-1451

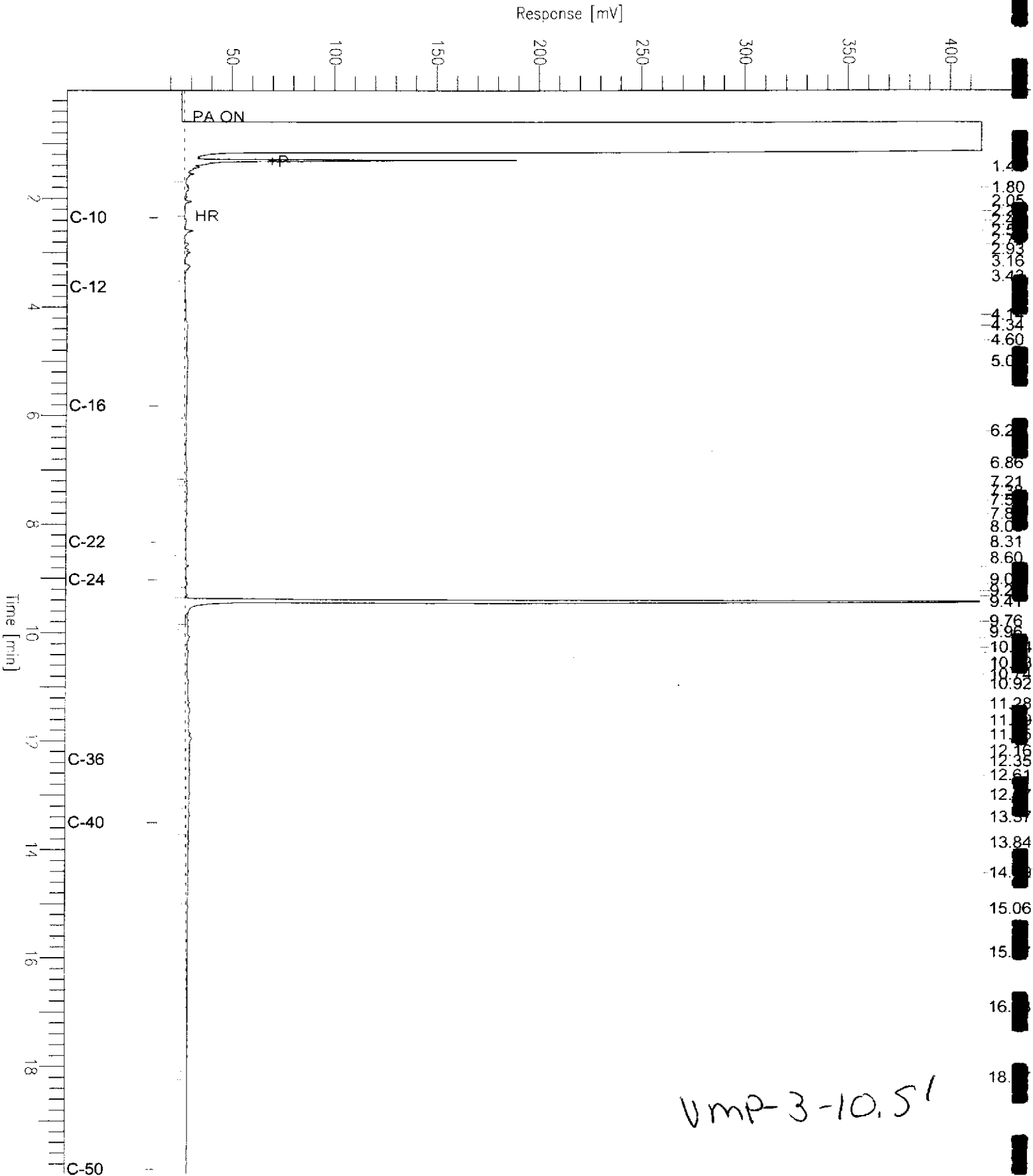
Chromatogram

Sample Name : 172625-003,91729
FileName : G:\GC17\CHA\157A012.RAW
Method : ATEH147.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 19.99 min
Plot Offset: 14 mV

Sample #: 91729
Date : 6/6/04 04:49 PM
Time of Injection: 6/5/04 09:30 PM
Low Point : 14.45 mV
Plot Scale: 400.8 mV

Page 1 of 1



Total Extractable Hydrocarbons

Lab #: 172625	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 3550
Project#: 2004-02	Analysis: EPA 8015B
Matrix: Soil	Batch#: 91729
Units: mg/Kg	Received: 06/02/04
Basis: as received	Prepared: 06/05/04

Field ID: VMP-3-15'	Diln Fac: 5.000
Type: SAMPLE	Sampled: 06/01/04
Lab ID: 172625-004	Analyzed: 06/06/04

Analyte	Result	RL
Diesel C10-C24	470 L Y	5.0

Surrogate	%REC	Limits
Hexacosane	104	52-131

Field ID: VMP-1-10.5'	Diln Fac: 1.000
Type: SAMPLE	Sampled: 06/01/04
Lab ID: 172625-005	Analyzed: 06/05/04

Analyte	Result	RL
Diesel C10-C24	ND	1.0

Surrogate	%REC	Limits
Hexacosane	95	52-131

Field ID: VMP-1-14.5'	Diln Fac: 1.000
Type: SAMPLE	Sampled: 06/01/04
Lab ID: 172625-006	Analyzed: 06/05/04

Analyte	Result	RL
Diesel C10-C24	42 L Y	1.0

Surrogate	%REC	Limits
Hexacosane	106	52-131

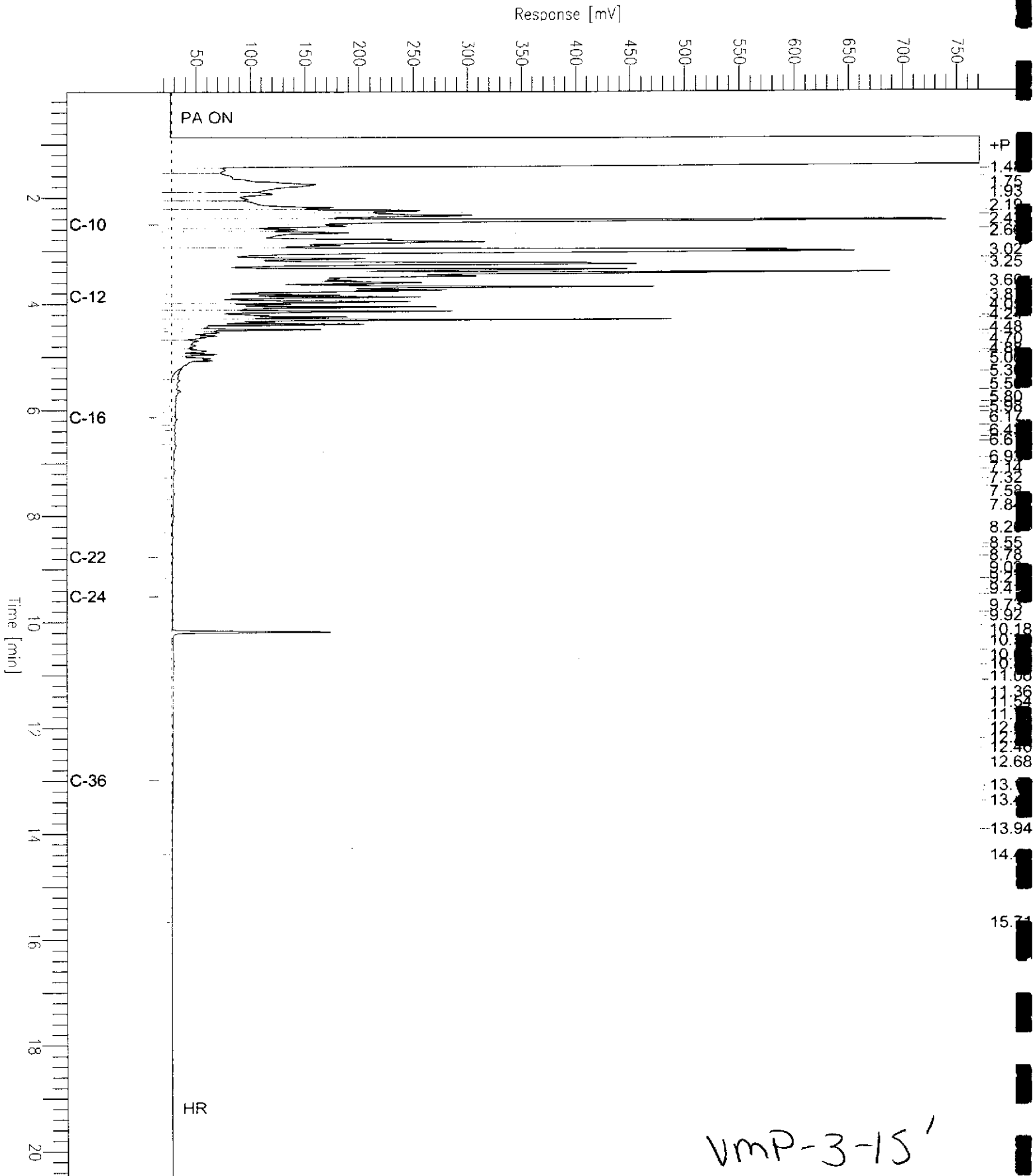
L= Lighter hydrocarbons contributed to the quantitation
 Y= Sample exhibits chromatographic pattern which does not resemble standard
 DO= Diluted Out
 ND= Not Detected
 RL= Reporting Limit

Chromatogram

Sample Name : 172625-004,91729
FileName : G:\GC11\CHA\158A013.RAW
Method : ATEH156S.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 20.45 min
Plot Offset: 15 mV

Sample #: 91729
Date : 6/7/04 09:20 AM
Time of Injection: 6/6/04 10:26 PM
Low Point : 15.48 mV
High Point : 770.97 mV
Plot Scale: 755.5 mV



VMP-3-15'

Chromatogram

Sample Name : 172625-006,91729

Sample #: 91729

Page 1 of 1

FileName : G:\GC17\CHA\157A014.RAW

Date : 6/6/04 04:50 PM

Method : ATEH147.MTH

Time of Injection: 6/5/04 10:26 PM

Start Time : 0.01 min

End Time : 19.99 min

Low Point : 6.71 mV

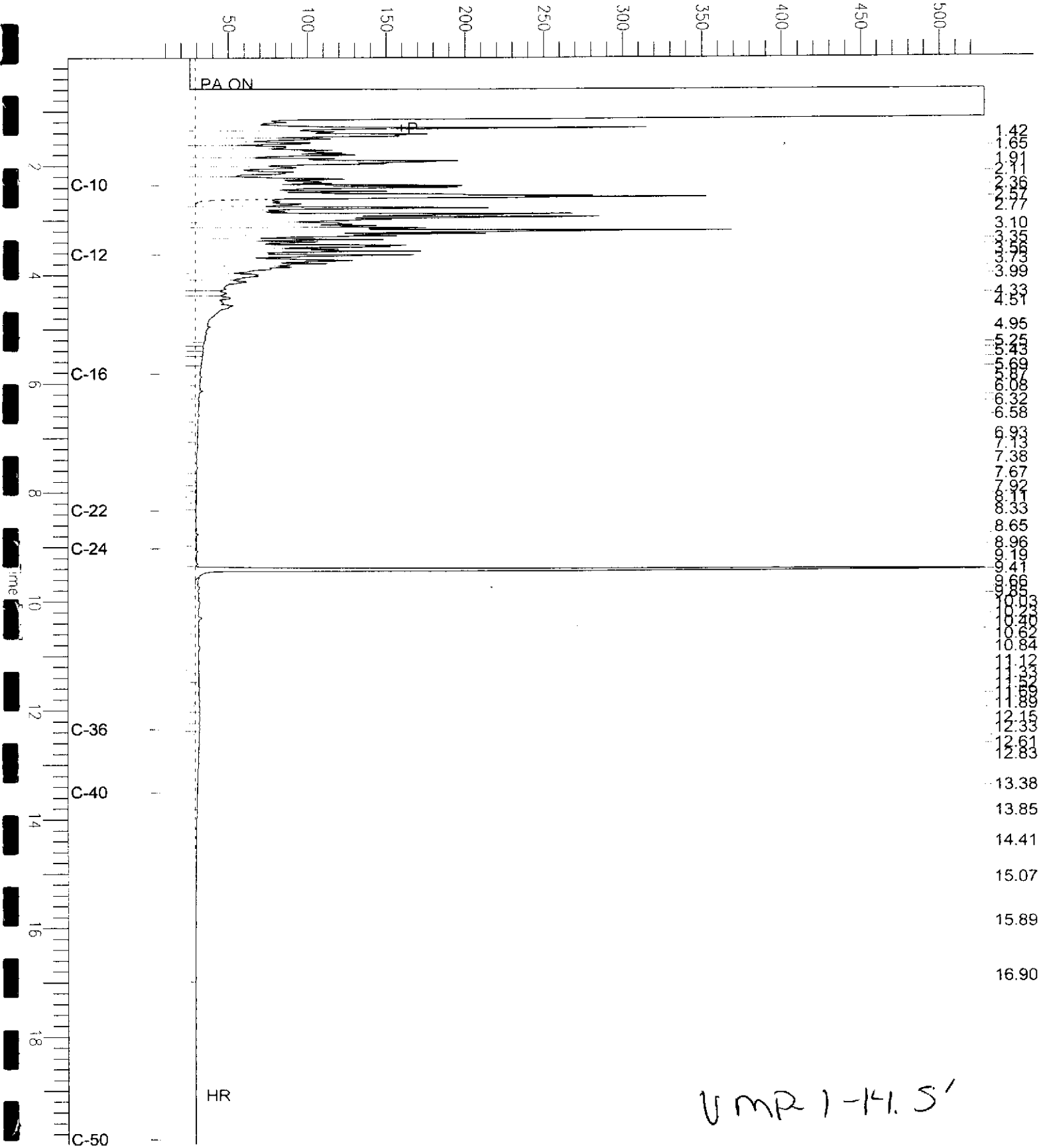
High Point : 528.66 mV

Scale Factor: 0.0

Plot Offset: 7 mV

Plot Scale: 522.0 mV

Response [mV]



UMR 1-14.5'

**Total Extractable Hydrocarbons**

Lab #: 172625	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 3550
Project#: 2004-02	Analysis: EPA 8015B
Matrix: Soil	Batch#: 91729
Units: mg/Kg	Received: 06/02/04
Basis: as received	Prepared: 06/05/04

Field ID: VW-1-10'	Diln Fac: 1.000
Type: SAMPLE	Sampled: 06/02/04
Lab ID: 172625-007	Analyzed: 06/05/04

Analyte	Result	RL
Diesel C10-C24	1.1 Y	1.0

Surrogate	%REC	Limits
Hexacosane	99	52-131

Field ID: VW-1-15.5'	Diln Fac: 1.000
Type: SAMPLE	Sampled: 06/01/04
Lab ID: 172625-008	Analyzed: 06/06/04

Analyte	Result	RL
Diesel C10-C24	1.5 Y	1.0

Surrogate	%REC	Limits
Hexacosane	95	52-131

Type: BLANK	Diln Fac: 1.000
Lab ID: QC253350	Analyzed: 06/05/04

Analyte	Result	RL
Diesel C10-C24	ND	1.0

Surrogate	%REC	Limits
Hexacosane	113	52-131

L= Lighter hydrocarbons contributed to the quantitation

Y= Sample exhibits chromatographic pattern which does not resemble standard

DO= Diluted Out

ND= Not Detected

RL= Reporting Limit

Page 3 of 3

Chromatogram

Sample Name : 172625-007,91729

Sample #: 91729

Page 1 of 1

File Name : G:\GC17\CHA\157A015.RAW

Date : 6/6/04 04:50 PM

Method : ATEH147.MTH

Time of Injection: 6/5/04 10:54 PM

Start Time : 0.01 min

End Time : 19.99 min

Low Point : 14.41 mV

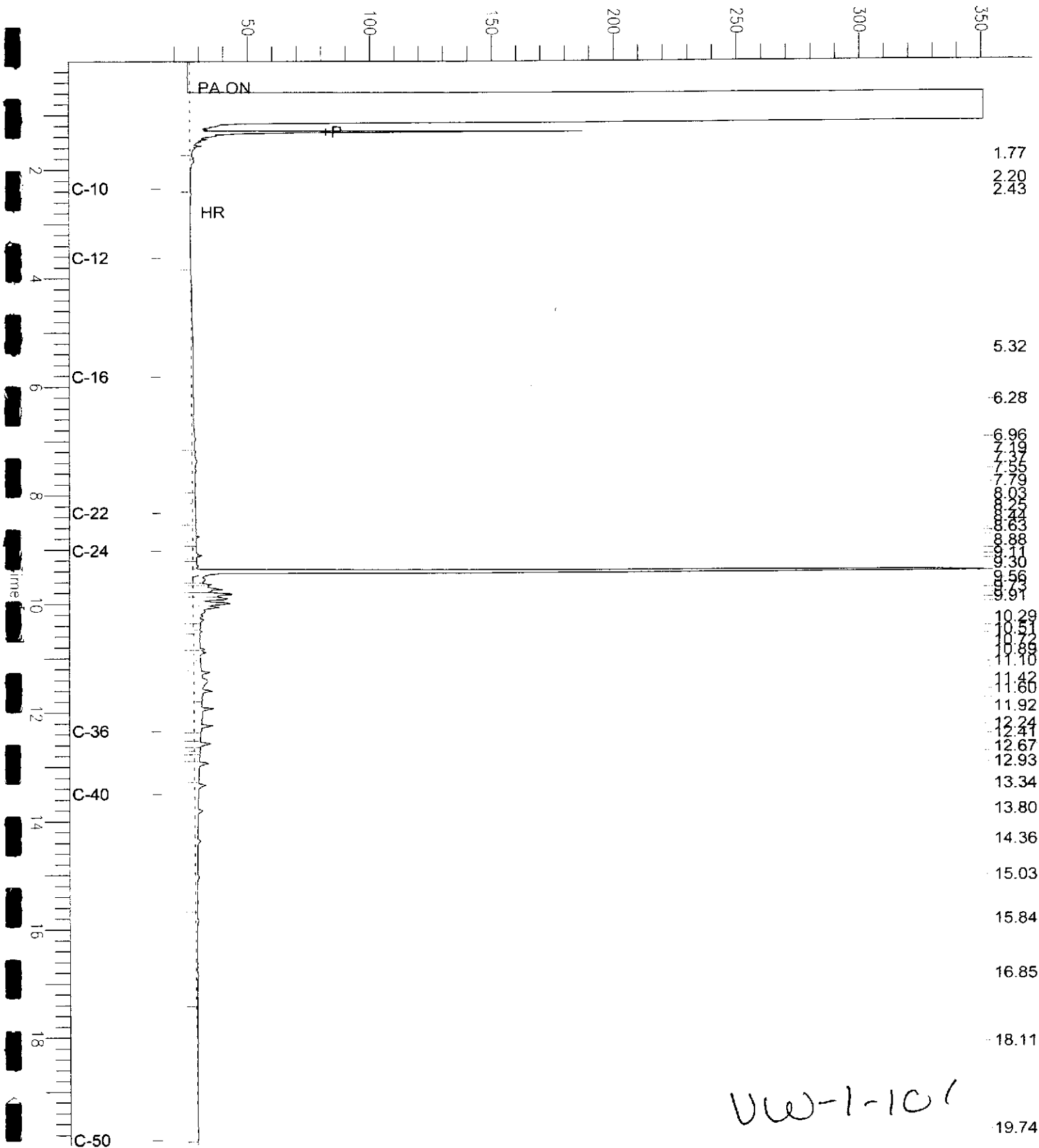
High Point : 350.89 mV

Scale Factor: 0.0

Plot Offset: 14 mV

Plot Scale: 336.5 mV

Response [mV]

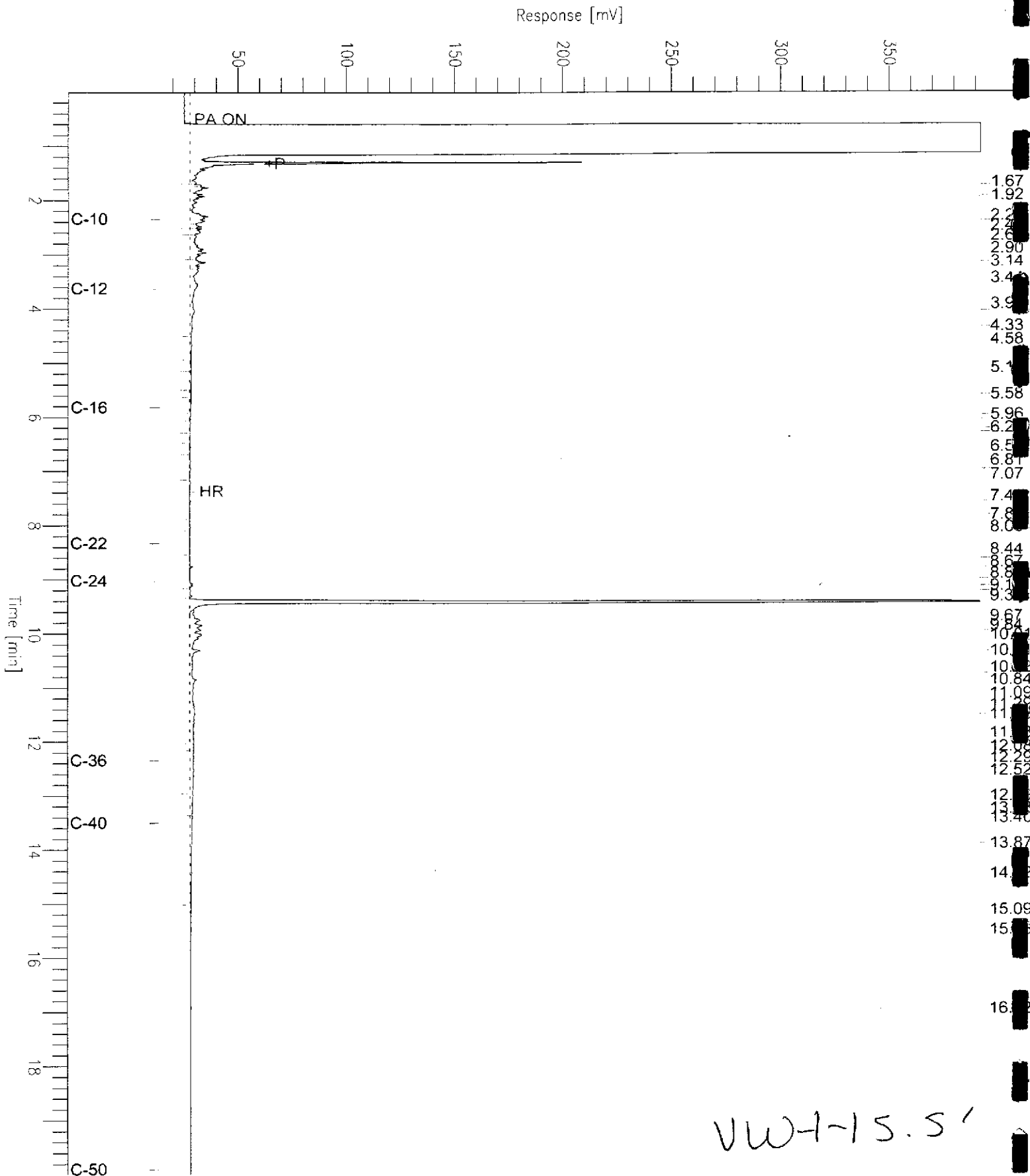


Chromatogram

Sample Name : 172625-008,91729
FileName : G:\GC17\CHA\157A025.RAW
Method : ATEH147.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 19.99 min
Plot Offset: 14 mV

Sample #: 91729
Date : 6/6/04 04:56 PM
Time of Injection: 6/6/04 03:36 AM
Low Point : 14.16 mV
Plot Scale: 378.2 mV



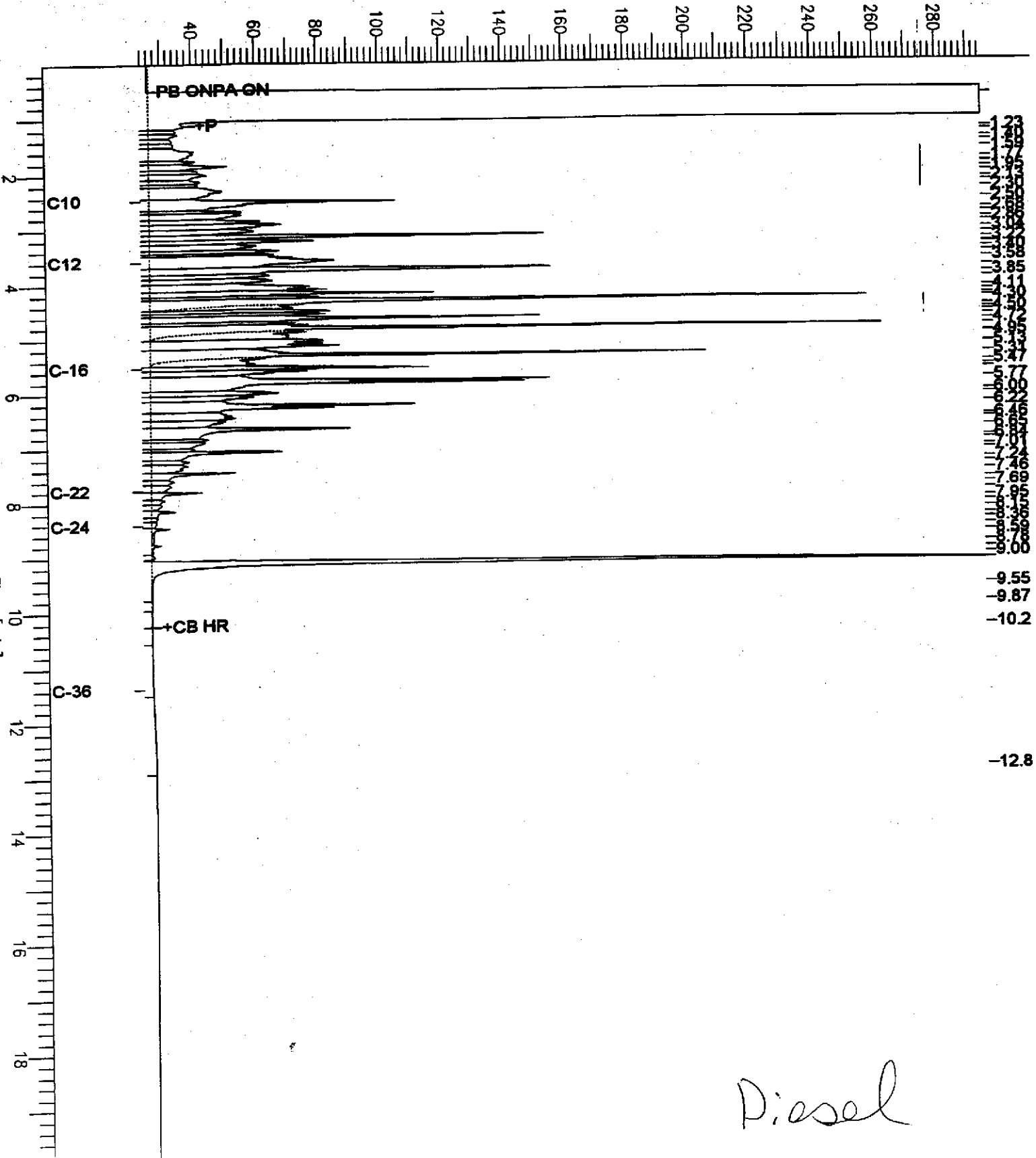
Chromatogram

Sample Name : ccv,04ws0894,dsl
File Name : G:\GC15\CHB\157B003.RAW
Method : BTEH151S.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 19.99 min
Plot Offset: 24 mV

Sample #: 500mg/L
Date : 6/5/04 04:43 PM
Time of Injection: 6/5/04 04:15 PM
Low Point : 23.81 mV
Plot Scale: 271.0 mV
Page 1 of 1
High Point : 294.79 mV

Response [mV]



Diesel

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3550
Project#:	2004-02	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC253351	Batch#:	91729
Matrix:	Soil	Prepared:	06/05/04
Units:	mg/Kg	Analyzed:	06/05/04
Basis:	as received		

Analyte	Spiked	Result	%RRC	Limits
Diesel C10-C24	50.29	45.69	91	56-129

Surrogate	%RRC	Limits
Hexacosane	93	52-131

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3550
Project#:	2004-02	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	91729
MSS Lab ID:	172528-016	Sampled:	05/26/04
Matrix:	Soil	Received:	05/27/04
Units:	mg/Kg	Prepared:	06/05/04
Basis:	as received	Analyzed:	06/07/04
Diln Fac:	3.000		

Type: MS Lab ID: QC253352

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	8.932	50.22	51.33	84	27-146

Surrogate	%REC	Limits
Hexacosane	88	52-131

Type: MSD Lab ID: QC253353

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	49.80	49.83	82	27-146	2	50

Surrogate	%REC	Limits
Hexacosane	90	52-131

RPD= Relative Percent Difference

Batch QC Report

Alkalinity

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Analysis:	EPA 310.1
Project#:	2004-02		
Analyte:	Alkalinity, Total as CaCO ₃	Basis:	as received
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC253570	Batch#:	91791
Matrix:	Soil	Analyzed:	06/07/04
Units:	mg/Kg		

Spiked	Result	REC	Limits
200.0	171.0	86	80-120



Batch QC Report

Alkalinity			
Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Analysis:	EPA 310.1
Project#:	2004-02		
Analyte:	Alkalinity, Total as CaCO3	Diln Fac:	1.000
Field ID:	VMP-2-10.5'	Batch#:	91791
MSS Lab ID:	172625-001	Sampled:	06/01/04
Matrix:	Soil	Received:	06/02/04
Units:	mg/Kg	Analyzed:	06/07/04
Basis:	as received		

Type	Lab ID	MSS Result	Spiked	Result	PREC	Limite	RPD	Lim
MS	QC253571	409.9	200.0	608.9	100	70-130		
MSD	QC253572		200.0	624.9	107	70-130	3	30



Total Phosphorous

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2004-02	Analysis:	EPA 365.2
Analyte:	Phosphorous	Batch#:	91817
Matrix:	Soil	Sampled:	06/01/04
Units:	mg/Kg	Received:	06/02/04
Basis:	as received	Analyzed:	06/09/04

Field ID	Type	Lab ID	Result	RL	Diln Fac
VMP-2-10.5'	SAMPLE	172625-001	13	2.0	4.000
VMP-1-14.5'	SAMPLE	172625-006	51	10	20.00
VW-1-15.5'	SAMPLE	172625-008	39	10	20.00
	BLANK	QC253665	ND	0.50	1.000

Batch QC Report

Total Phosphorous			
Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2004-02	Analysis:	EPA 365.2
Analyte:	Phosphorous	Diln Fac:	20.00
Field ID:	VW-1-15.5'	Batch#:	91817
MSS Lab ID:	172625-008	Sampled:	06/01/04
Matrix:	Soil	Received:	06/02/04
Units:	mg/Kg	Analyzed:	06/09/04
Basis:	as received		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC253666	39.10	49.50	67.80	58 *	70-130		
MSD	QC253667		49.50	66.40	55 *	70-130	2	30
LCS	QC253668		49.50	46.90	95	80-120		

*= Value outside of QC limits; see narrative

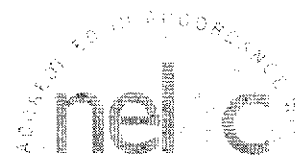
RPD= Relative Percent Difference



Moisture

Lab #:	172625	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	METHOD
Project#:	2004-02	Analysis:	ASTM D2216/CLP
Analyte:	Moisture, Percent	Batch#:	91664
Matrix:	Soil	Sampled:	06/01/04
Units:	%	Received:	06/02/04
Diln Fac:	1.000	Analyzed:	06/03/04

Field ID	Lab ID	Result	RL
VMP-2-10.5'	172625-001	18	1
VMP-1-14.5'	172625-006	20	1
VW-1-15.5'	172625-008	19	1



June 10, 2004

Tracy Babjar
Curtis & Tompkins, Ltd.
2323 Fifth Street
Berkeley, CA 94710-2407

Subject: **Calscience Work Order No.:** 04-06-0160
Client Reference: 172625

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 6/3/2004 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The original report of any subcontracted analysis is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Michael J. Crisostomo
Quality Assurance Manager

Curtis & Tompkins, Ltd.
 2323 Fifth Street
 Berkeley, CA 94710-2407

Date Received: 06/03/04
 Work Order No: 04-06-0160
 Preparation: N/A
 Method: EPA 351.3M

Project: 172625

Page 1 of 1

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
VMP-2-10.5'	04-06-0160-1	06/01/04	Solid	N/A	06/03/04	40603TKNB1

Parameter	Result	RL	DF	Qual	Units
Total Kjeldahl Nitrogen	320	10	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
VMP-1-14.5'	04-06-0160-2	06/01/04	Solid	N/A	06/03/04	40603TKNB1

Parameter	Result	RL	DF	Qual	Units
Total Kjeldahl Nitrogen	420	10	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
VW-1-15.5'	04-06-0160-3	06/01/04	Solid	N/A	06/03/04	40603TKNB1

Parameter	Result	RL	DF	Qual	Units
Total Kjeldahl Nitrogen	150	10	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	099-05-025-1,085	N/A	Solid	N/A	06/03/04	40603TKNB1

Parameter	Result	RL	DF	Qual	Units
Total Kjeldahl Nitrogen	ND	10	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Curtis & Tompkins, Ltd.
 2323 Fifth Street
 Berkeley, CA 94710-2407

Date Received: 06/03/04
 Work Order No: 04-06-0160
 Preparation: N/A
 Method: EPA 351.3M

Project: 172625

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
04-05-1522-1	Solid	N/A	N/A	06/03/04	40603TKND1

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Total Kjeldahl Nitrogen	15000	15000	1	0-25	

RPD - Relative Percent Difference . CL - Control Limit

Work Order Number: 04-06-0160

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
D	The analyte concentration was reported from analysis of the diluted sample.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

WORK ORDER #: **04** - 06 - 0160

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: C-T.

DATE: 08/03/04

TEMPERATURE - SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

- Chilled, cooler with temperature blank provided.
- Chilled, cooler without temperature blank.
- Chilled and placed in cooler with wet ice.
- Ambient and placed in cooler with wet ice.
- Ambient temperature.
- °C Temperature blank.

LABORATORY (Other than Calscience Courier):

- °C Temperature blank.
- 7.0 °C IR thermometer.
- Ambient temperature.

Initial: Tu

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Applicable (N/A):

Initial: Tu

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with custody papers.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Correct containers for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper preservation noted on sample label(s).....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
VOA vial(s) free of headspace.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Initial: Tu

COMMENTS:



ANALYTICAL LABORATORIES, SINCE 1878
2323 FIFTH STREET
BERKELEY, CA 94710
PHONE (510) 486-0900
FAX (510) 486-0532

THE FOLLOWING FACSIMILE CONTAINS CONFIDENTIAL INFORMATION WHICH MAY BE LEGALLY PRIVILEGED AND WHICH IS INTENDED ONLY FOR THE USE OF THE ADDRESSEE(S) NAMED BELOW. IF YOU ARE NOT THE INTENDED RECIPIENT OF THIS FACSIMILE, OR THE EMPLOYEE OR AGENT RESPONSIBLE FOR DELIVERING IT TO THE INTENDED RECIPIENT, YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION OR COPYING OF THIS FACSIMILE IS STRICTLY PROHIBITED. IF YOU RECEIVED THIS FACSIMILE IN ERROR, PLEASE NOTIFY US IMMEDIATELY BY TELEPHONE AND RETURN THE ORIGINAL FACSIMILE TO US AT THE ABOVE ADDRESS BY RETURN MAIL. THANK YOU

TO: Don FROM: Tracy Babjar (tracy@ctberk.com)

COMPANY: Cal Science DATE: 6/11/04

FAX NUMBER: 714-894-7561 PHONE NUMBER: (510) 204-4223

PHONE NUMBER: _____ TOTAL NO. OF PAGES INCLUDING COVER: 2

RE: _____

URGENT FOR REVIEW PLEASE COMMENT PLEASE REPLY PLEASE RECYCLE

NOTES/COMMENTS:

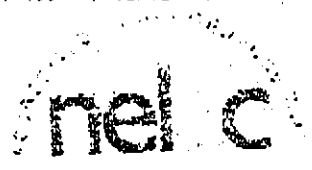
Please change sample ID UMP-1-15.5'
to VW-1-15.5'

Thank You

TJB-

alscience
Environmental
Laboratories, Inc.

Analytical Report



Curtis & Tompkins, Ltd.
 2323 Fifth Street
 Berkeley, CA 94710-2407

Date Received: 06/03/04
 Work Order No: 04-06-0160
 Preparation: N/A
 Method: EPA 351.3M

Project: 172625

Client Sample	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
umber	04-06-0160-1	06/01/04	Solid	N/A	06/03/04	40603TKNB1

Parameter	Result	RL	DF	Qual	Units
Total Kjeldahl Nitrogen	320	10	1		mg/kg

Client Sample	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
umber	04-06-0160-3	06/01/04	Solid	N/A	06/03/04	40603TKNB1

Parameter	Result	RL	DF	Qual	Units
Total Kjeldahl Nitrogen	420	10	1		mg/kg

Client Sample	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
umber	04-06-0160-3	06/01/04	Solid	N/A	06/03/04	40603TKNB1

Parameter	Result	RL	DF	Qual	Units
Total Kjeldahl Nitrogen	150	10	1		mg/kg

Client Sample	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
umber	04-06-0160-3	06/01/04	Solid	N/A	06/03/04	40603TKNB1

Parameter	Result	RL	DF	Qual	Units
Total Kjeldahl Nitrogen	ND	10	1		mg/kg

RL - Reporting Limit DF - Dilution Factor Qual - Qualifiers

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900
(510) 486-0532

0160

Project Number: 172625
Site: Redwood Regional Park

Subcontract Laboratory:
Cal Science
7440 Lincoln Way
Garden Grove, CA 92641-1432
(714) 895-5494
ATTN: Don x132

Results due: Report Level: II

Please send report to: Tracy Babjar

*** Please report using Sample ID rather than C&T Lab #.

Sample ID	Sampled	Matrix	Analysis	C&T Lab #	Comments
VMP-2-10.5'	06/01	Soil	TKN	172625-001	
VMP-1-14.5'	06/01	Soil	TKN	172625-006	
VMP-1-15.5'	06/01	Soil	TKN	172625-008	

Notes:	Relinquished By:	Received By:
	<i>Amber Premier</i>	<i>[Signature]</i>
	Date/Time:	Date/Time:
	6.2.4 1350	6-3-4 8:00

CALIFORNIA OVERNIGHT
C10129000000515

June 2004 Groundwater Samples



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: 23-JUN-04
Lab Job Number: 172914
Project ID: STANDARD
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: Tracy Bobile
Project Manager

Reviewed by: Thomas K. Morris
Operations Manager

This package may be reproduced only in its entirety.

Laboratory Numbers: **172914**
Client: **Stellar Environmental Solutions**
Location: **Redwood Regional Park**

Sampled Date: **06/17/04**
Received Date: **06/17/04**

CASE NARRATIVE

This hardcopy data package contains sample and QC results for ten water samples, which were received from the site referenced above on June 17, 2004. The samples were received cold and intact.

TVH/BTXE:

High Trifluorotoluene surrogate recoveries were observed for many samples as a result of hydrocarbons coeluting with the surrogates. No other analytical problems were encountered.

TEH by (EPA 8015B):

No analytical problems were encountered.

General Chemistry:

No analytical problems were encountered.

Chain of Custody Record

Lab job no. _____

Date _____

 Page 1 of 1

 Laboratory Curtis & Tompkins
 Address 2323 Fifth St
Berkeley CA

Method of Shipment _____

Shipment No. _____

Airbill No. _____

Cooler No. _____

 Project Owner STELLAR ENV. SOL.
 Site Address OAKLAND, CA

 Project Manager Bruce Rucker

Telephone No. (510) 644-3123

 Project Name Redwood Regional Park

Fax No. (510) 644-3859

 Project Number 040617-Ad

 Samplers: (Signature) Aaron Costa

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		Analysis Required										Remarks								
						Cooler	Chemical	Filtered	No. of Containers	TVH + BTEX + MTBE	TEH + D	NITRATE	SULFATE													
1 SW-2	-	6/17	800	H ₂ O	1 L glass / VOA	✓	HCl	3	X	X																
2 MW-11	-	6/17	1305		1 Poly 2 Amber / VOA	✓	N.P. HCL	6	X	X	X	X														
3 MW-7	-	6/17	1245		1 Poly 2 Amber / 3VOA	✓		6	X	X	X	X														
4 MW-9	-	6/17	1225		1 Poly 2 Amber / 3VOA	✓		6	X	X	X	X														
5 MW-8	-	6/17	1145		1 Poly 2 Amber / 3VOA	✓		6	X	X	X	X														
6 MW-2	-	6/17	1120		2 Amber 3VOA	✓		5	X	X																
7 MW-10	-	6/17	1055		1 Poly 2 Amber / 3VOA	✓		6	X	X	X	X														
8 MW-4	-	6/17	1035		1 Poly 2 Amber / 3VOA	✓		6	X	X	X	X														
9 MW-5	-	6/17	1005		2 Amber 3VOA	✓	↓	5	X	X																
10 MW-3	-	6/17	0835	↓	1 Poly	✓	N.P.	1			X	X														

1
2
3
4
5
6
7
8
9
10

Filtered
No. of Containers
TVH + BTEX + MTBE (805 + 802)
TEH + D
NITRATE
SULFATE

Relinquished by: Signature: <u>Aaron Costa</u> Printed: <u>Aaron Costa</u> Company: <u>Blaine Tech</u>	Date: <u>6/17/04</u> Time: <u>1430</u>	Received by: Signature: <u>Steven Stanley</u> Printed: <u>Steven Stanley</u> Company: <u>CST</u>	Date: <u>6/17/04</u> Time: <u>1430</u>	Relinquished by: Signature: _____ Printed: _____ Company: _____	Date: _____ Time: _____	Received by: Signature: _____ Printed: _____ Company: _____	Date: _____ Time: _____		
Turnaround Time: _____ Comments: <u>"SW-2" collected by Bruce Rucker of SES - Bm-Hall</u>				Relinquished by: Signature: _____ Printed: _____ Company: _____				Received by: Signature: _____ Printed: _____ Company: _____	

2000-00-01

<input checked="" type="checkbox"/> Received <input type="checkbox"/> Cold <input type="checkbox"/> Ambient <input type="checkbox"/> Intact <input type="checkbox"/> On Ice



Total Volatile Hydrocarbons

Lab #:	172914	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	STANDARD		
Matrix:	Water	Sampled:	06/17/04
Units:	ug/L	Received:	06/17/04
Batch#:	92037		

Field ID: SW-2 Diln Fac: 1.000
 Type: SAMPLE Analyzed: 06/18/04
 Lab ID: 172914-001

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	0.83	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)	99	74-142	EPA 8015B
Bromofluorobenzene (FID)	106	80-139	EPA 8015B
Trifluorotoluene (PID)	92	55-139	EPA 8021B
Bromofluorobenzene (PID)	105	62-134	EPA 8021B

Field ID: MW-11 Diln Fac: 5.000
 Type: SAMPLE Analyzed: 06/18/04
 Lab ID: 172914-002

Analyte	Result	RL	Analysis
Gasoline C7-C12	10,000	250	EPA 8015B
MTBE	ND	10	EPA 8021B
Benzene	210	2.5	EPA 8021B
Toluene	2.8 C	2.5	EPA 8021B
Ethylbenzene	690	2.5	EPA 8021B
m,p-Xylenes	500	2.5	EPA 8021B
o-Xylene	14	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	143 *	74-142	EPA 8015B
Bromofluorobenzene (FID)	111	80-139	EPA 8015B
Trifluorotoluene (PID)	109	55-139	EPA 8021B
Bromofluorobenzene (PID)	106	62-134	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 b= See narrative
 ND= Not Detected
 RL= Reporting Limit
 >LR= Response exceeds instrument's linear range

Chromatogram

Sample Name : 172914-002,92037

Sample #: a1.0

Page 1 of 1

File Name : G:\GC05\DATA\169G032.raw

Date : 6/18/04 12:55 PM

Method : TVHBTXE

Time of Injection: 6/18/04 09:21 AM

Start Time : 0.00 min

End Time : 25.00 min

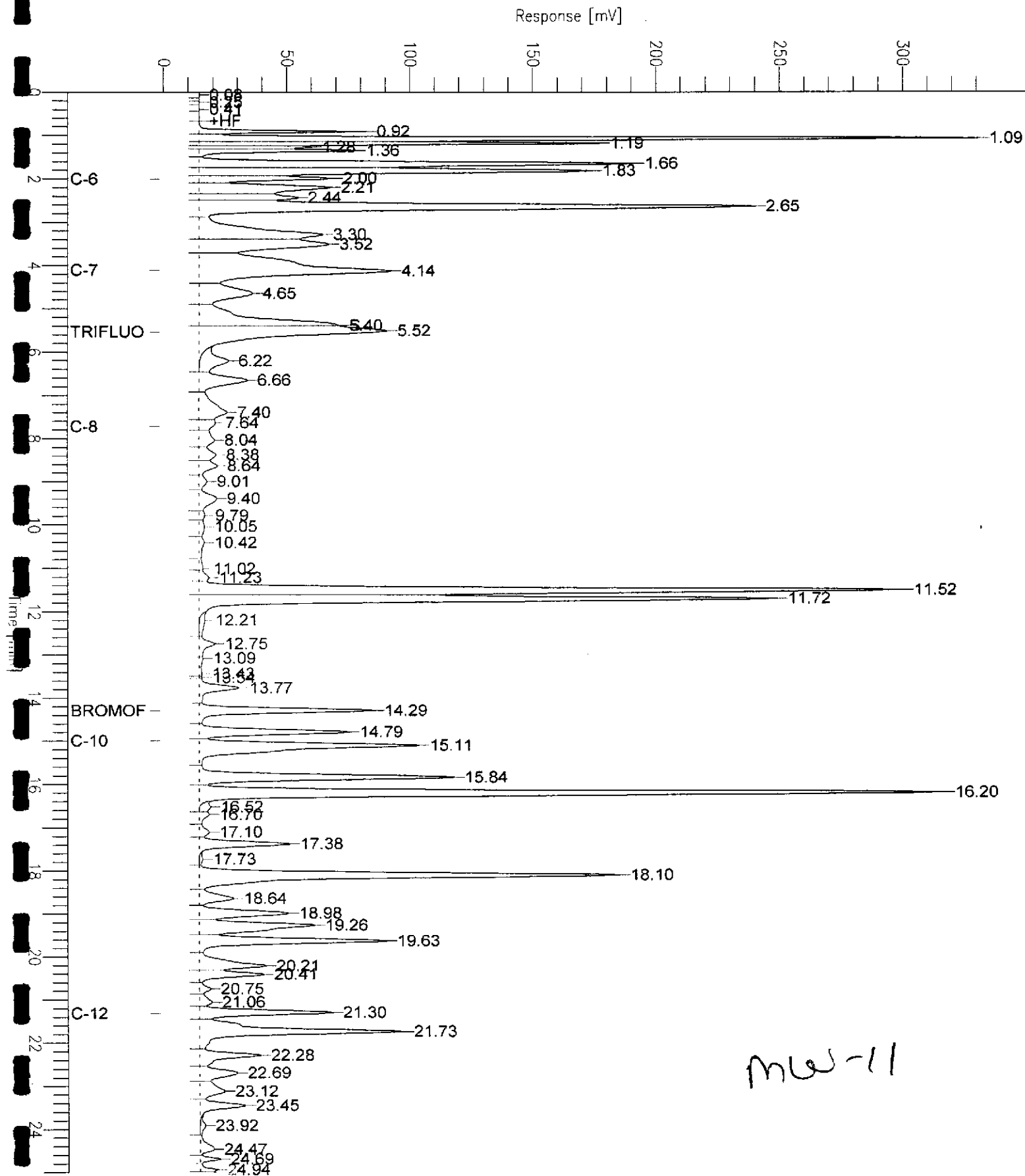
Low Point : -1.46 mV

High Point : 331.10 mV

Scale Factor: 1.0

Plot Offset: -1 mV

Plot Scale: 332.6 mV





Total Volatile Hydrocarbons

Lab #:	172914	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	STANDARD		
Matrix:	Water	Sampled:	06/17/04
Units:	ug/L	Received:	06/17/04
Batch#:	92037		

Field ID: MW-7 Diln Fac: 1.000
 Type: SAMPLE Analyzed: 06/18/04
 Lab ID: 172914-003

Analyte	Result	RL	Analysis
Gasoline C7-C12	9,200	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	150	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	290	0.50	EPA 8021B
m,p-Xylenes	88	0.50	EPA 8021B
o-Xylene	3.0	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	928 *	>LR b 74-142	EPA 8015B
Bromofluorobenzene (FID)	131	80-139	EPA 8015B
Trifluorotoluene (PID)	579 *	>LR b 55-139	EPA 8021B
Bromofluorobenzene (PID)	122	62-134	EPA 8021B

Field ID: MW-9 Diln Fac: 5.000
 Type: SAMPLE Analyzed: 06/18/04
 Lab ID: 172914-004

Analyte	Result	RL	Analysis
Gasoline C7-C12	6,800	250	EPA 8015B
MTBE	ND	10	EPA 8021B
Benzene	350	2.5	EPA 8021B
Toluene	ND	2.5	EPA 8021B
Ethylbenzene	620	2.5	EPA 8021B
m,p-Xylenes	95	2.5	EPA 8021B
o-Xylene	4.2 C	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	124	74-142	EPA 8015B
Bromofluorobenzene (FID)	108	80-139	EPA 8015B
Trifluorotoluene (PID)	106	55-139	EPA 8021B
Bromofluorobenzene (PID)	105	62-134	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 b= See narrative
 ND= Not Detected
 RL= Reporting Limit
 >LR= Response exceeds instrument's linear range

Chromatogram

Sample Name : 172914-003,92037

Sample #: a1.0

Page 1 of 1

FileName : G:\GC05\DATA\169G036.raw

Date : 6/18/04 12:55 PM

Method : TVHBTXE

Time of Injection: 6/18/04 12:03 PM

Start Time : 0.00 min

End Time : 25.00 min

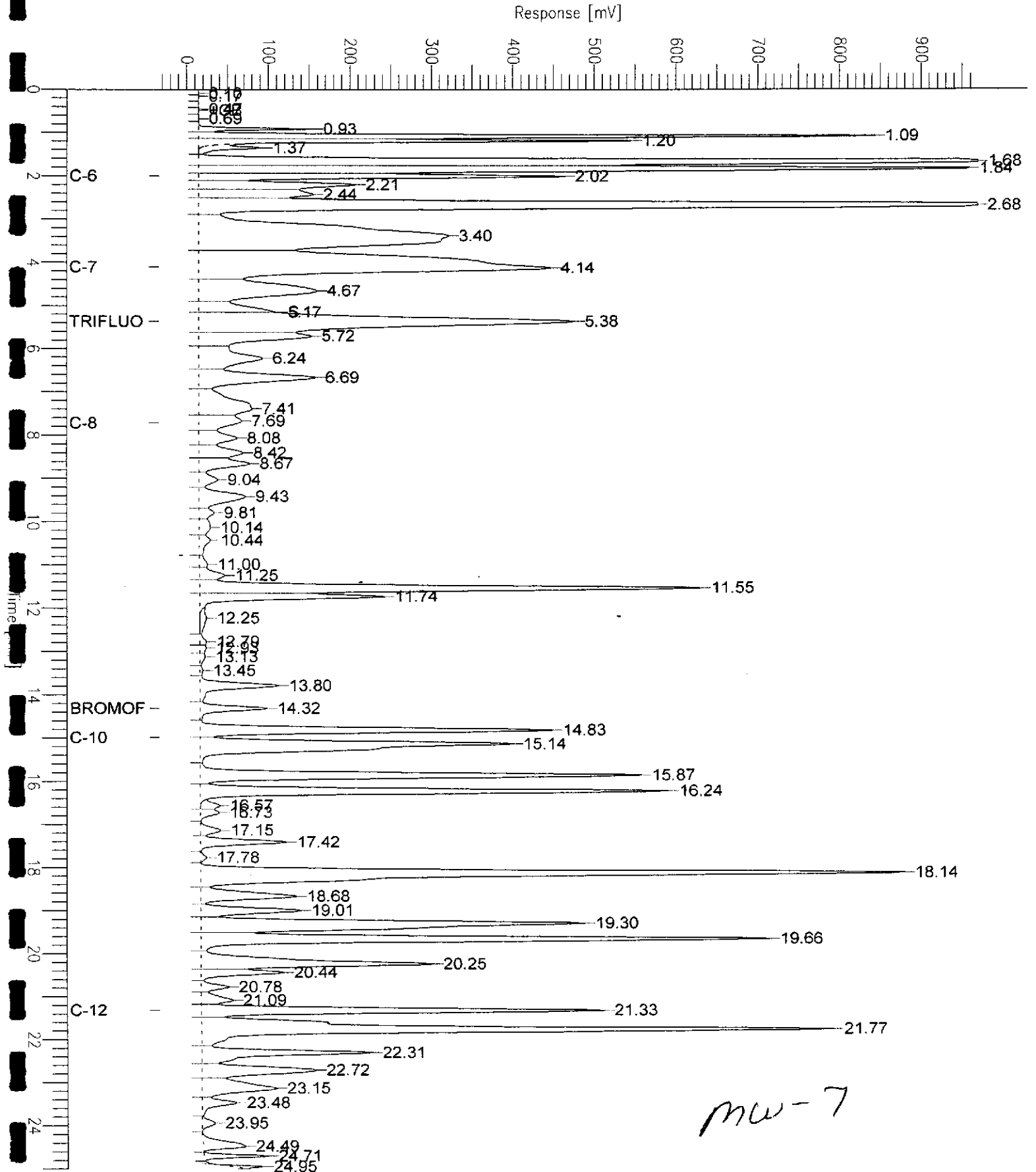
Low Point : -33.55 mV

High Point : 969.90 mV

Scale Factor: 1.0

Plot Offset: -34 mV

Plot Scale: 1003.5 mV



Chromatogram

Sample Name : 172914-004,92037
FileName : G:\GC05\DATA\169G033.raw
Method : TVHBTXE
Start Time : 0.00 min
Scale Factor : 1.0

End Time : 25.00 min
Plot Offset : 2 mV

Sample #: a1.0

Date : 6/18/04 12:55 PM

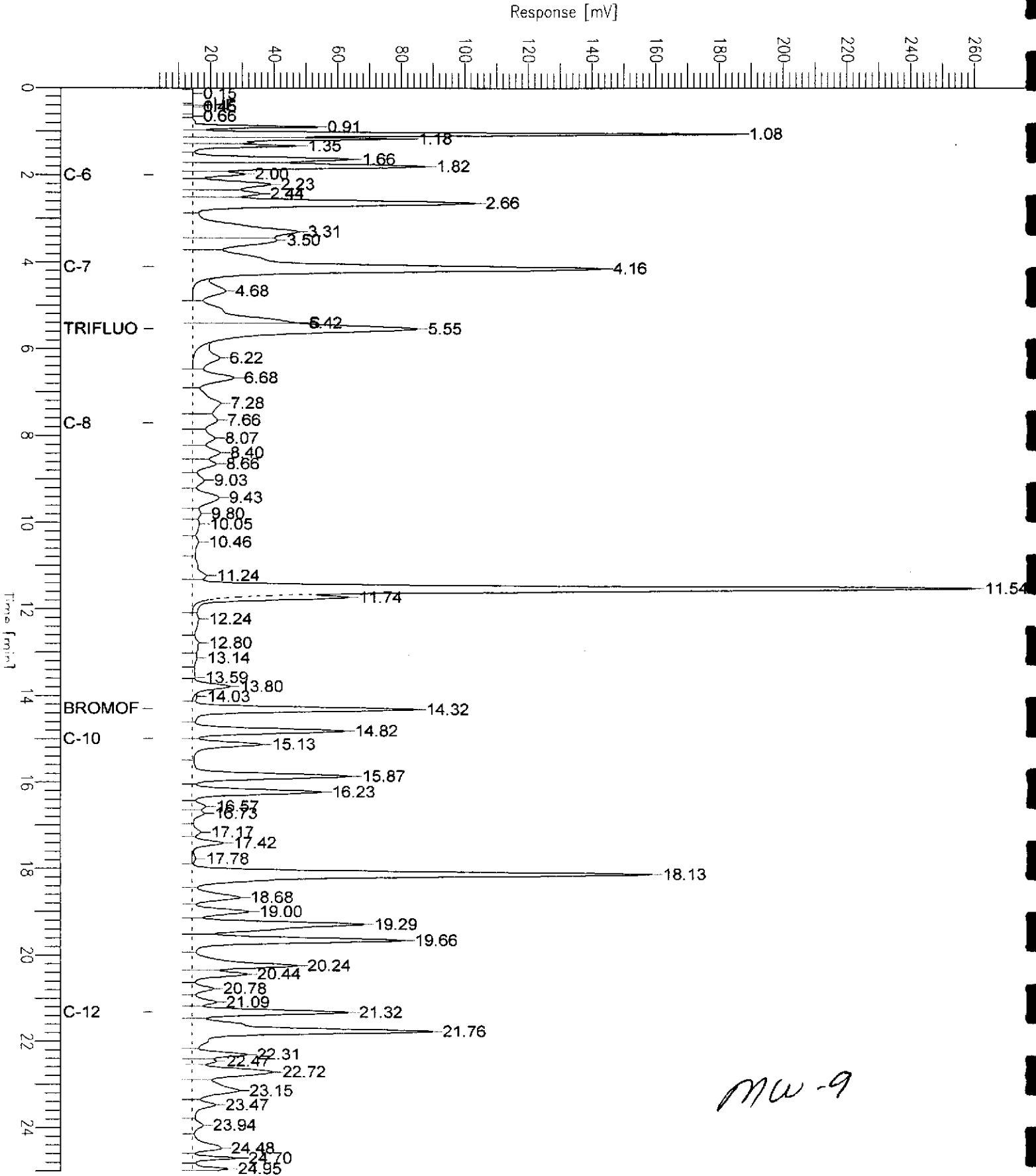
Time of Injection: 6/18/04 10:07 AM

Low Point : 2.16 mV

Plot Scale : 258.2 mV

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High Point : 260.34 mV



MW-9

Total Volatile Hydrocarbons

Lab #: 172914	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: STANDARD	
Matrix: Water	Sampled: 06/17/04
Units: ug/L	Received: 06/17/04
Batch#: 92037	

Field ID: MW-8	Diln Fac: 5.000
Type: SAMPLE	Analyzed: 06/18/04
Lab ID: 172914-005	

Analyte	Result	RL	Analysis
Gasoline C7-C12	5,900	250	EPA 8015B
MTBE	ND	10	EPA 8021B
Benzene	260	2.5	EPA 8021B
Toluene	9.9 C	2.5	EPA 8021B
Ethylbenzene	460	2.5	EPA 8021B
m,p-Xylenes	370	2.5	EPA 8021B
o-Xylene	20	2.5	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	111	74-142	EPA 8015B
Bromofluorobenzene (FID)	108	80-139	EPA 8015B
Trifluorotoluene (PID)	115	55-139	EPA 8021B
Bromofluorobenzene (PID)	106	62-134	EPA 8021B

Field ID: MW-2	Diln Fac: 1.000
Type: SAMPLE	Analyzed: 06/18/04
Lab ID: 172914-006	

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	15	2.0	EPA 8021B
Benzene	0.75	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)	97	74-142	EPA 8015B
Bromofluorobenzene (FID)	110	80-139	EPA 8015B
Trifluorotoluene (PID)	84	55-139	EPA 8021B
Bromofluorobenzene (PID)	106	62-134	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 b= See narrative
 ND= Not Detected
 RL= Reporting Limit
 LR= Response exceeds instrument's linear range

Chromatogram

Sample Name : 172914-005,92037

FileName : G:\GC05\DATA\169G034.raw

Method : TVHBTXE

Start Time : 0.00 min

Scale Factor: 1.0

Sample #: a1.0

Date : 6/18/04 12:55 PM

Time of Injection: 6/18/04 10:39 AM

Low Point : 4.71 mV

Plot Scale: 202.4 mV

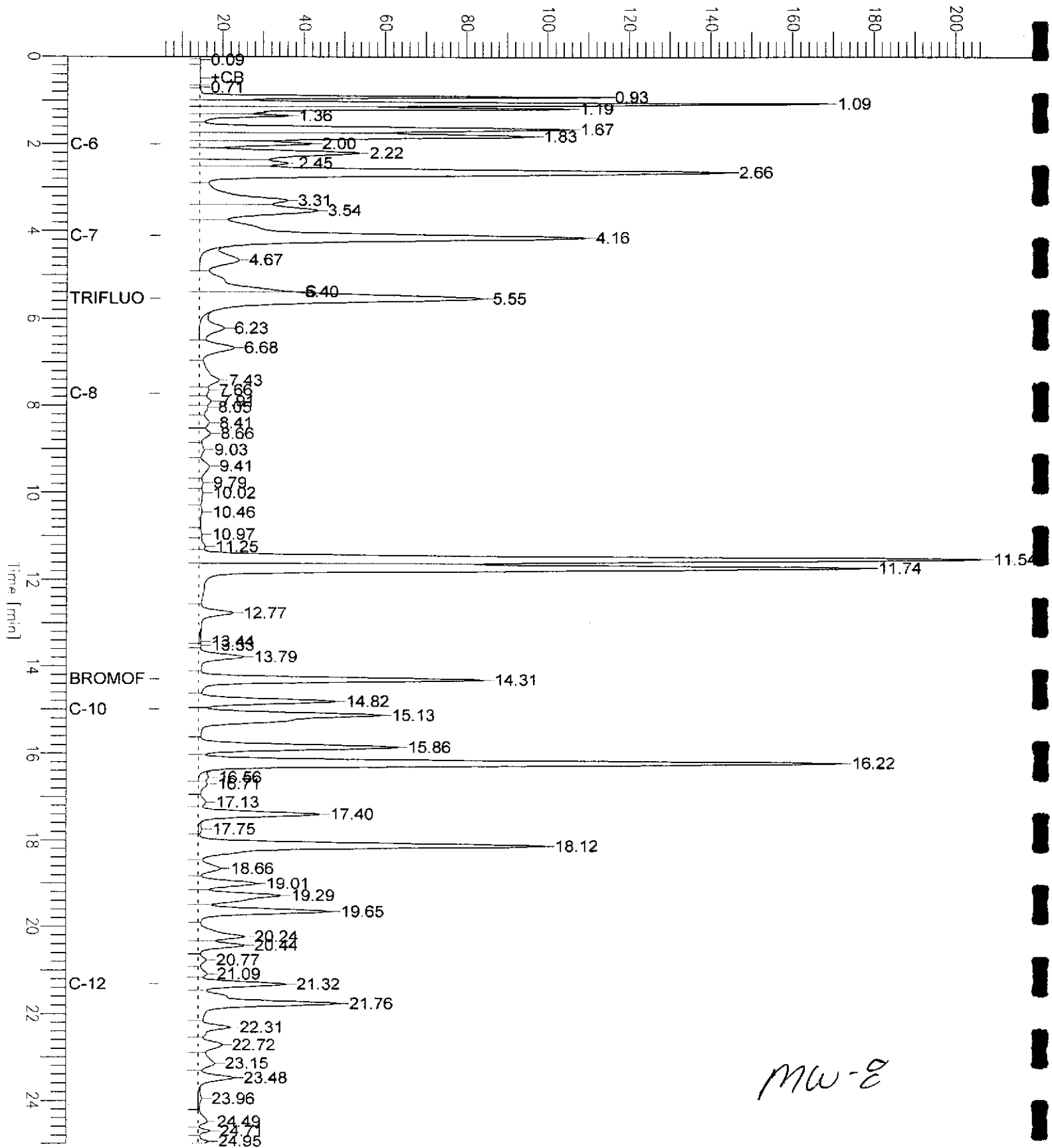
Page 1 of 1

High Point : 207.11 mV

End Time : 25.00 min

Plot Offset: 5 mV

Response [mV]



Total Volatile Hydrocarbons

Lab #: 172914	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 5030B
Project#: STANDARD	
Matrix: Water	Sampled: 06/17/04
Units: ug/L	Received: 06/17/04
Batch#: 92037	

Field ID: MW-10	Diln Fac: 1.000
Type: SAMPLE	Analyzed: 06/18/04
Lab ID: 172914-007	

Analyte	Result	RL	Analysis
Gasoline C7-C12	150	50	EPA 8015B
MTBE	15 C	2.0	EPA 8021B
Benzene	11	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	12	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)	111	74-142	EPA 8015B
Bromofluorobenzene (FID)	110	80-139	EPA 8015B
Trifluorotoluene (PID)	98	55-139	EPA 8021B
Bromofluorobenzene (PID)	108	62-134	EPA 8021B

Field ID: MW-4	Diln Fac: 1.000
Type: SAMPLE	Analyzed: 06/18/04
Lab ID: 172914-008	

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	3.5	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	99	74-142	EPA 8015B
Bromofluorobenzene (FID)	110	80-139	EPA 8015B
Trifluorotoluene (PID)	95	55-139	EPA 8021B
Bromofluorobenzene (PID)	109	62-134	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 b= See narrative
 ND= Not Detected
 L= Reporting Limit
 R= Response exceeds instrument's linear range

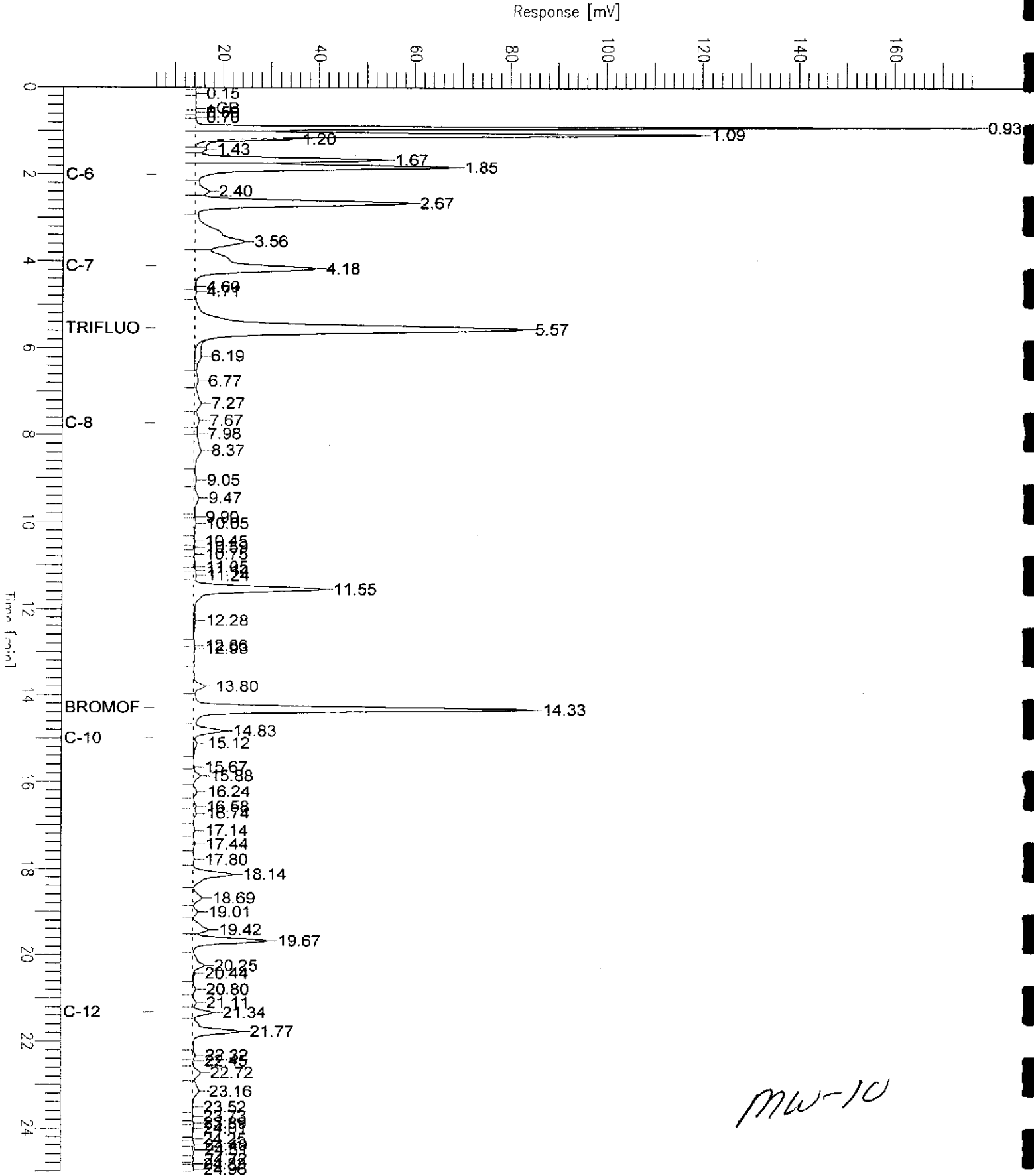
Chromatogram

Sample Name : 172914-007,92037
fileName : G:\GC05\DATA\169G038.raw
Method : TVHBTXE
Start Time : 0.00 min
Scale Factor : 1.0

End Time : 25.00 min
Plot Offset : 6 mV

Sample #: a1.0
Date : 6/18/04 01:33 PM
Time of Injection: 6/18/04 01:07 PM
Low Point : 5.97 mV
Plot Scale: 171.3 mV
High Point : 177.29 mV

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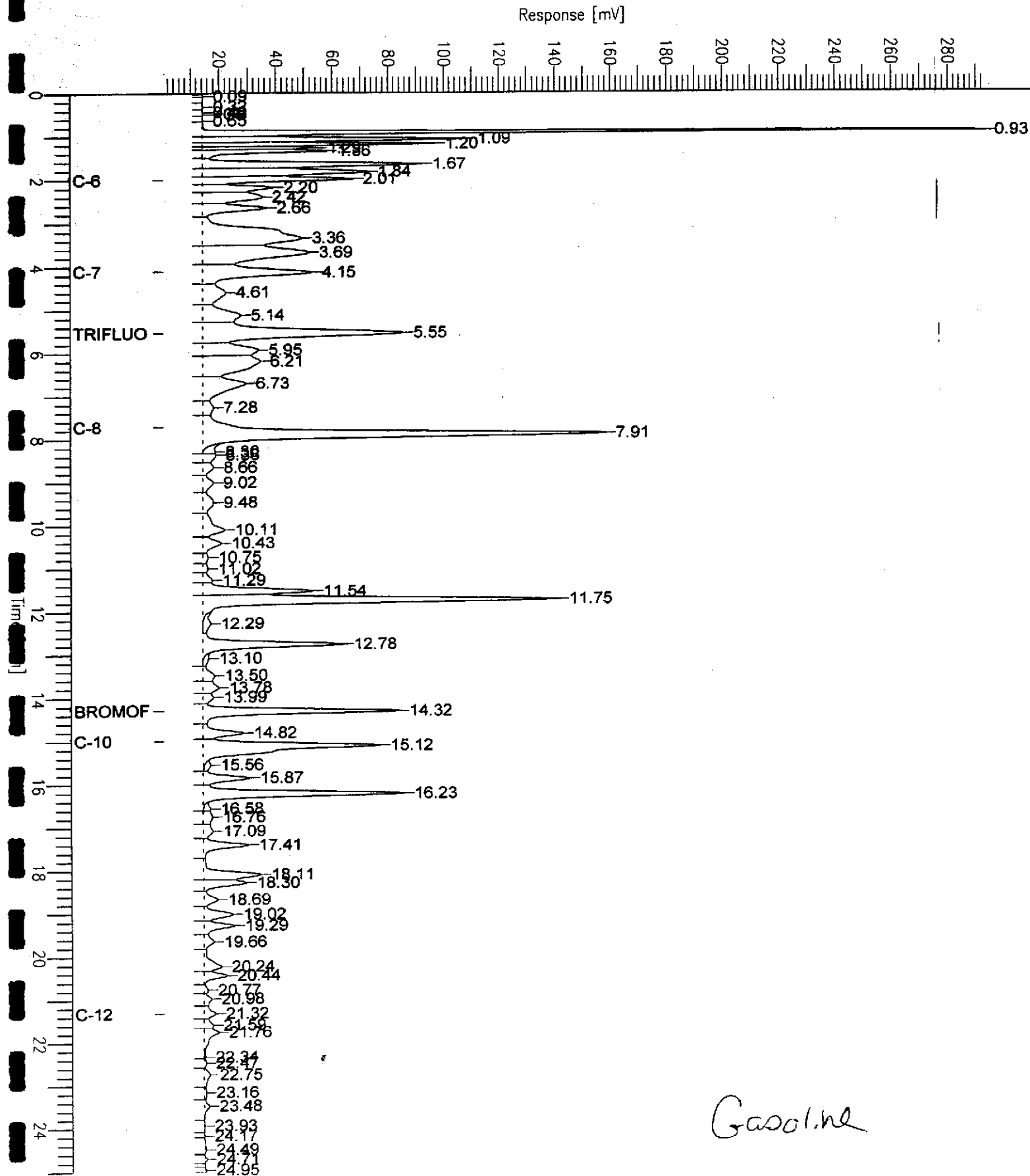


Chromatogram

Sample Name : ccv/lcs,qc254498,92037,04ws1035,2.5/5000
File Name : G:\GC05\DATA\169G002.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 25.00 min
Scale Factor : 1.0 Plot Offset : 0 mV

Sample # :
Date : 6/17/04 11:18 AM
Time of Injection: 6/17/04 10:52 AM
Low Point : 0.29 mV High Point : 293.19 mV
Plot Scale : 292.9 mV

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Gasoline



Total Volatile Hydrocarbons

Lab #:	172914	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	STANDARD		
Matrix:	Water	Sampled:	06/17/04
Units:	ug/L	Received:	06/17/04
Batch#:	92037		

Field ID:	MW-5	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	06/18/04
Lab ID:	172914-009		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	5.9	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)	96	74-142	EPA 8015B
Bromofluorobenzene (FID)	114	80-139	EPA 8015B
Trifluorotoluene (PID)	91	55-139	EPA 8021B
Bromofluorobenzene (PID)	113	62-134	EPA 8021B

Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC254496	Analyzed:	06/17/04

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)	100	74-142	EPA 8015B
Bromofluorobenzene (FID)	102	80-139	EPA 8015B
Trifluorotoluene (PID)	96	55-139	EPA 8021B
Bromofluorobenzene (PID)	101	62-134	EPA 8021B

*= Value outside of QC limits; see narrative
 C= Presence confirmed, but RPD between columns exceeds 40%
 b= See narrative
 ND= Not Detected
 RL= Reporting Limit
 >LR= Response exceeds instrument's linear range

Patch QC Report

Total Volatile Hydrocarbons

Lab #:	172914	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC254497	Batch#:	92037
Matrix:	Water	Analyzed:	06/17/04
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	9.722	97	59-131
Benzene	10.00	10.14	101	80-120
Toluene	10.00	9.592	96	80-120
Ethylbenzene	10.00	10.09	101	80-120
m,p-Xylenes	10.00	10.60	106	80-120
o-Xylene	10.00	10.47	105	80-120

Surrogate	%REC	Limits
Trifluorotoluene (PID)	98	55-139
Bromofluorobenzene (PID)	103	62-134

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	172914	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC254498	Batch#:	92037
Matrix:	Water	Analyzed:	06/17/04
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,044	104	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	118	74-142
Bromofluorobenzene (FID)	109	80-139

Patch QC Report

Total Volatile Hydrocarbons

Lab #:	172914	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	92037
MSS Lab ID:	172892-001	Sampled:	06/16/04
Matrix:	Water	Received:	06/16/04
Units:	ug/L	Analyzed:	06/17/04
Diln Fac:	1.000		

Type: MS Lab ID: QC254540

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	11.76	2,000	2,072	103	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	134	74-142
Bromofluorobenzene (FID)	115	80-139

Type: MSD Lab ID: QC254541

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,106	105	80-120	2	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	139	74-142
Bromofluorobenzene (FID)	118	80-139

RPD= Relative Percent Difference

Total Extractable Hydrocarbons

Lab #: 172914	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 3520C
Project#: STANDARD	Analysis: EPA 8015B
Matrix: Water	Sampled: 06/17/04
Units: ug/L	Received: 06/17/04
Diln Fac: 1.000	

Field ID: SW-2	Batch#: 92093
Type: SAMPLE	Prepared: 06/18/04
Lab ID: 172914-001	Analyzed: 06/21/04

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	105	53-142

Field ID: MW-11	Batch#: 92093
Type: SAMPLE	Prepared: 06/18/04
Lab ID: 172914-002	Analyzed: 06/21/04

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

Surrogate	%REC	Limits
Hexacosane	95	53-142

Field ID: MW-7	Batch#: 92093
Type: SAMPLE	Prepared: 06/18/04
Lab ID: 172914-003	Analyzed: 06/21/04

Analyte	Result	RL
Diesel C10-C24	2,700 L Y	50

Surrogate	%REC	Limits
Hexacosane	89	53-142

Field ID: MW-9	Batch#: 92093
Type: SAMPLE	Prepared: 06/18/04
Lab ID: 172914-004	Analyzed: 06/21/04

Analyte	Result	RL
Diesel C10-C24	1,700 L Y	50

Surrogate	%REC	Limits
Hexacosane	87	53-142

L= Lighter hydrocarbons contributed to the quantitation
 Y= Sample exhibits chromatographic pattern which does not resemble standard
 ND= Not Detected
 RL= Reporting Limit
 Page 1 of 3

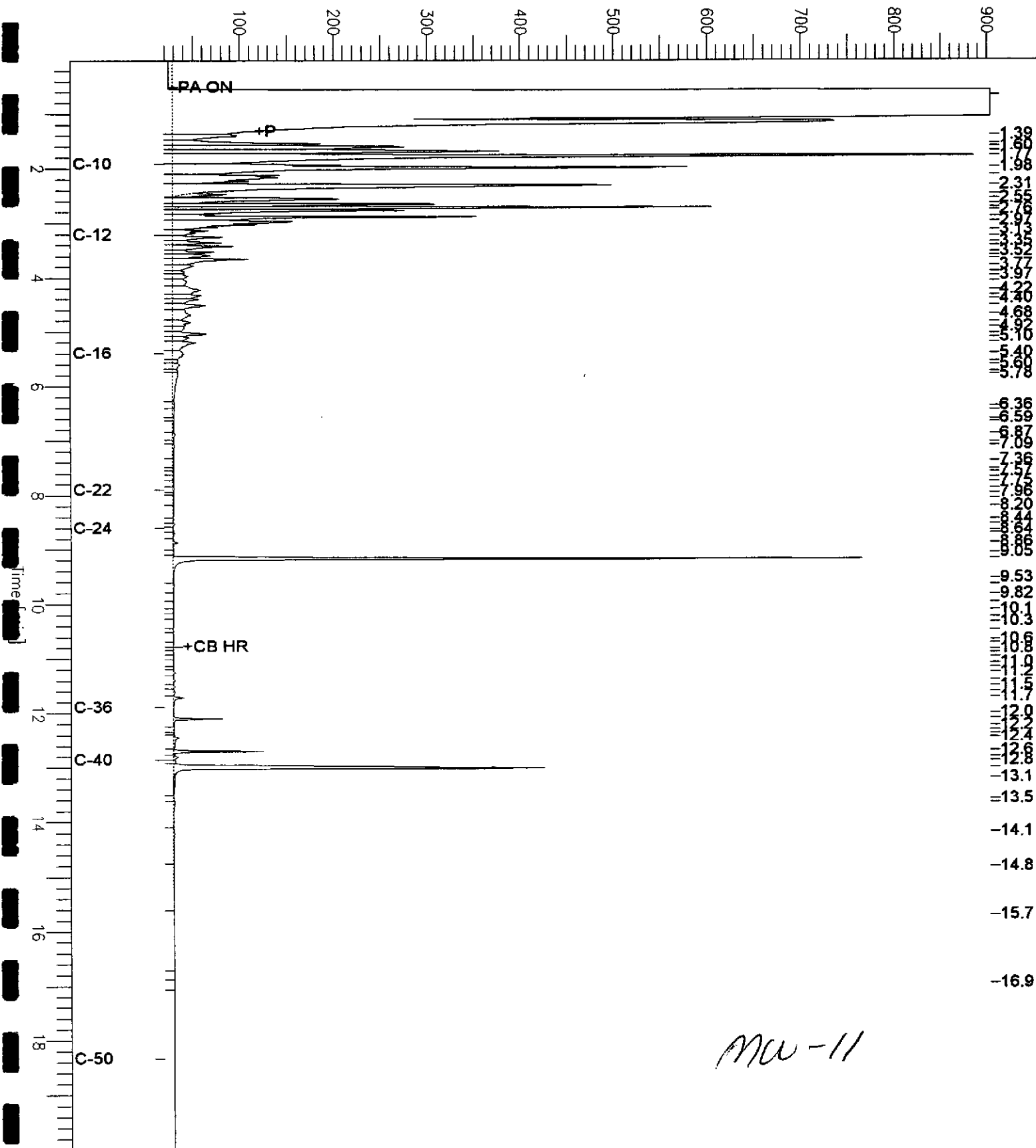
Chromatogram

Sample Name : 172914-002,92093
File Name : G:\GC17\CHA\173A011.RAW
Method : ATEH168.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 19.99 min
Plot Offset: 19 mV

Sample #: 92093
Date : 6/21/04 04:02 PM
Time of Injection: 6/21/04 02:47 PM
Low Point : 19.13 mV
High Point : 903.68 mV
Plot Scale: 884.6 mV

Response [mV]



MCW-11

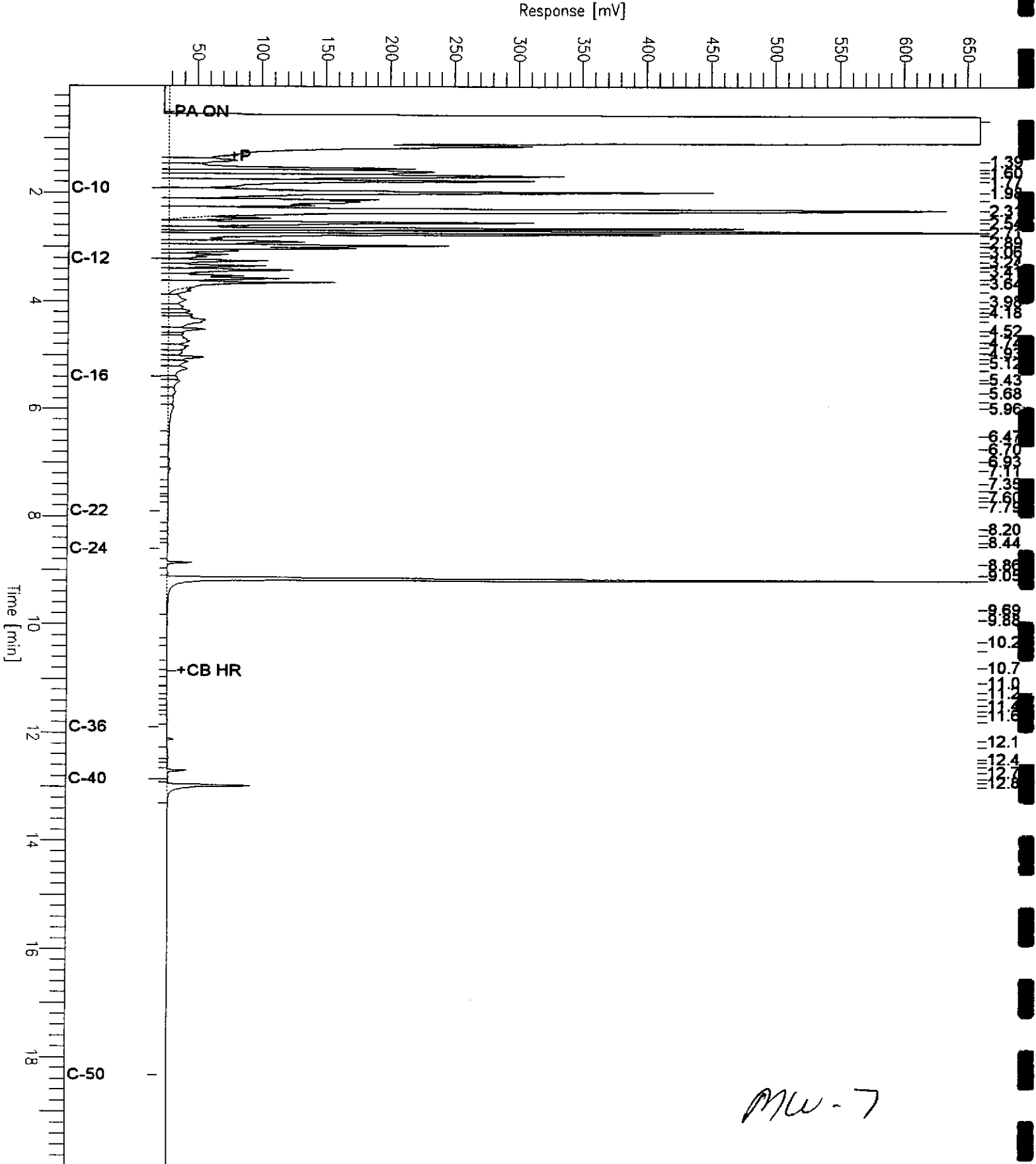
Chromatogram

Sample Name : 172914-003,92093
FileName : G:\GC17\CHA\173A012.RAW
Method : ATEH168.MTH
Start Time : 0.01 min
Scale Factor: 0.0

End Time : 19.99 min
Plot Offset: 22 mV

Sample #: 92093
Date : 6/21/04 04:03 PM
Time of Injection: 6/21/04 03:15 PM
Low Point : 22.04 mV
Plot Scale: 638.0 mV
High Point : 660.08 mV

Page 1 of 1



MW-7

Chromatogram

Sample Name : 172914-004,92093

Sample #: 92093

Page 1 of 1

FileName : G:\GC17\CHA\173A013.RAW

Date : 6/21/04 04:06 PM

Method : ATEH168.MTH

Time of Injection: 6/21/04 03:43 PM

Start Time : 0.01 min

End Time : 19.99 min

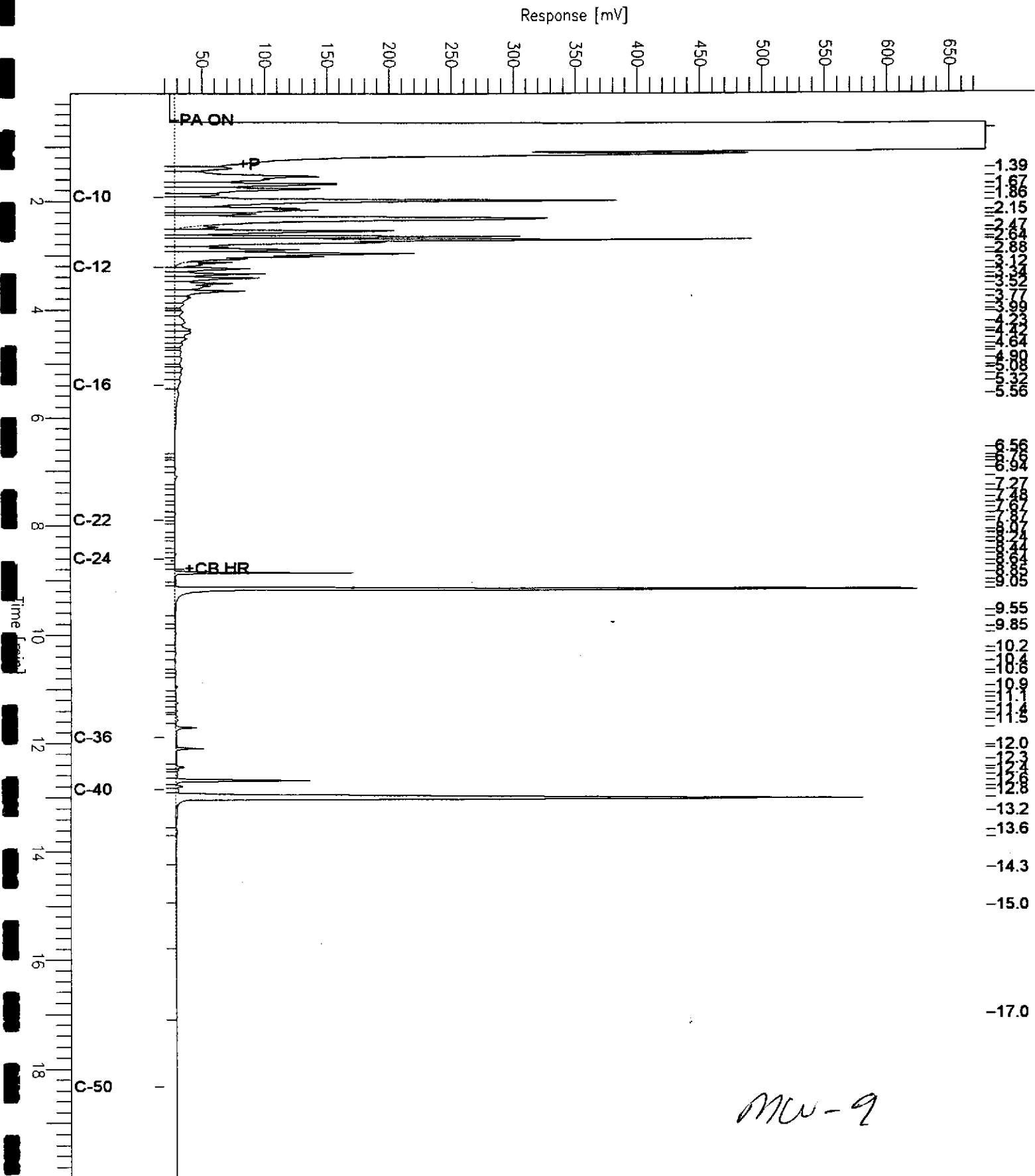
Low Point : 19.06 mV

High Point : 679.72 mV

Scale Factor: 0.0

Plot Offset: 19 mV

Plot Scale: 660.7 mV



Total Extractable Hydrocarbons

Lab #: 172914	Location: Redwood Regional Park	
Client: Stellar Environmental Solutions	Prep: EPA 3520C	
Project#: STANDARD	Analysis: EPA 8015B	
Matrix: Water	Sampled: 06/17/04	
Units: ug/L	Received: 06/17/04	
Diln Fac: 1.000		

Field ID: MW-8	Batch#: 92093	
Type: SAMPLE	Prepared: 06/18/04	
Lab ID: 172914-005	Analyzed: 06/21/04	

Analyte	Result	RL
Diesel C10-C24	990 L Y	50
Surrogate	%REC	Limits
Hexacosane	98	53-142

Field ID: MW-2	Batch#: 92093	
Type: SAMPLE	Prepared: 06/18/04	
Lab ID: 172914-006	Analyzed: 06/21/04	

Analyte	Result	RL
Diesel C10-C24	ND	50
Surrogate	%REC	Limits
Hexacosane	86	53-142

Field ID: MW-10	Batch#: 92093	
Type: SAMPLE	Prepared: 06/18/04	
Lab ID: 172914-007	Analyzed: 06/21/04	

Analyte	Result	RL
Diesel C10-C24	56 L Y	50
Surrogate	%REC	Limits
Hexacosane	87	53-142

Field ID: MW-4	Batch#: 92107	
Type: SAMPLE	Prepared: 06/19/04	
Lab ID: 172914-008	Analyzed: 06/21/04	

Analyte	Result	RL
Diesel C10-C24	2,500 Y	50
Surrogate	%REC	Limits
Hexacosane	93	53-142

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

Chromatogram

Sample Name : 172914-005,92093

Sample #: 92093

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File Name : G:\GC17\CHA\173A014.RAW

Date : 6/21/04 04:53 PM

Method : ATEH168.MTH

Time of Injection: 6/21/04 04:12 PM

Start Time : 0.01 min

End Time : 19.99 min

Low Point : 21.97 mV

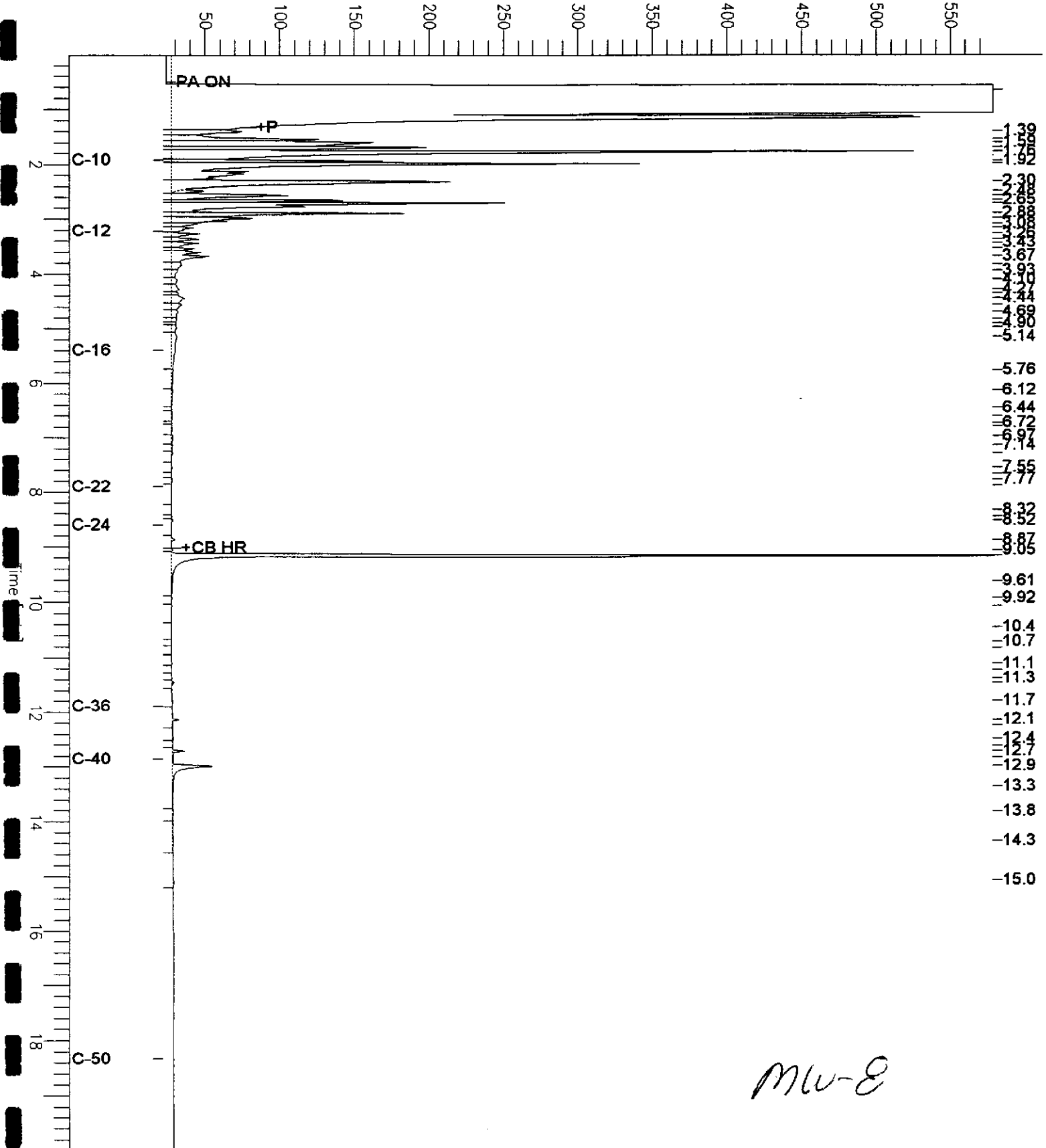
High Point : 578.98 mV

Scale Factor: 0.0

Plot Offset: 22 mV

Plot Scale: 557.0 mV

Response [mV]



MLW-E

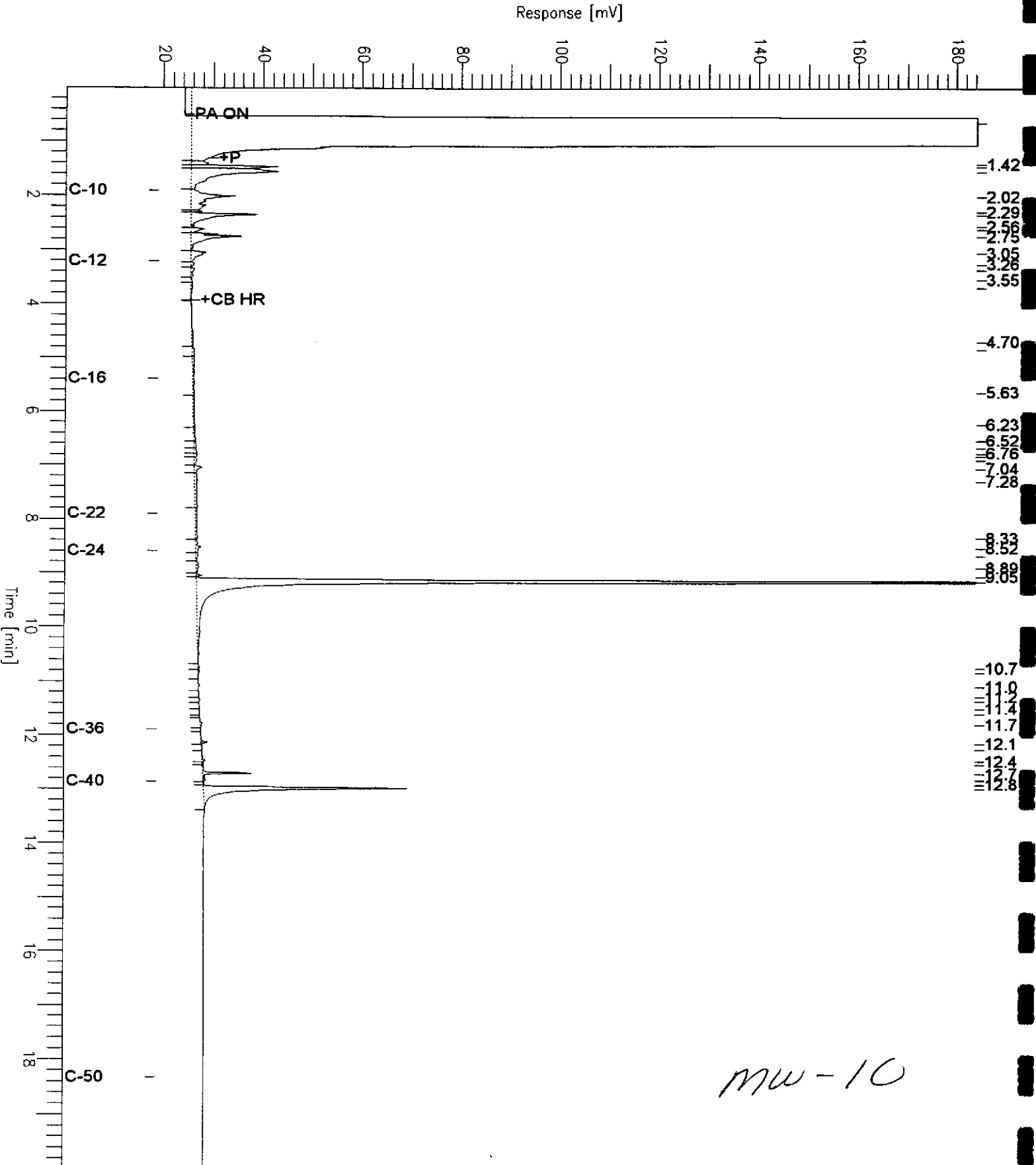
Chromatogram

Sample Name : 172914-007, 92093
FileName : G:\GC17\CHA\173A016.RAW
Method : ATEH168.MTH
Start Time : 0.01 min
Scale Factor : 0.0

End Time : 19.99 min
Plot Offset : 19 mV

Sample #: 92093
Date : 6/21/04 05:32 PM
Time of Injection: 6/21/04 05:08 PM
Low Point : 19.01 mV
Plot Scale: 165.2 mV
High Point : 184.22 mV

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MW-10

Chromatogram

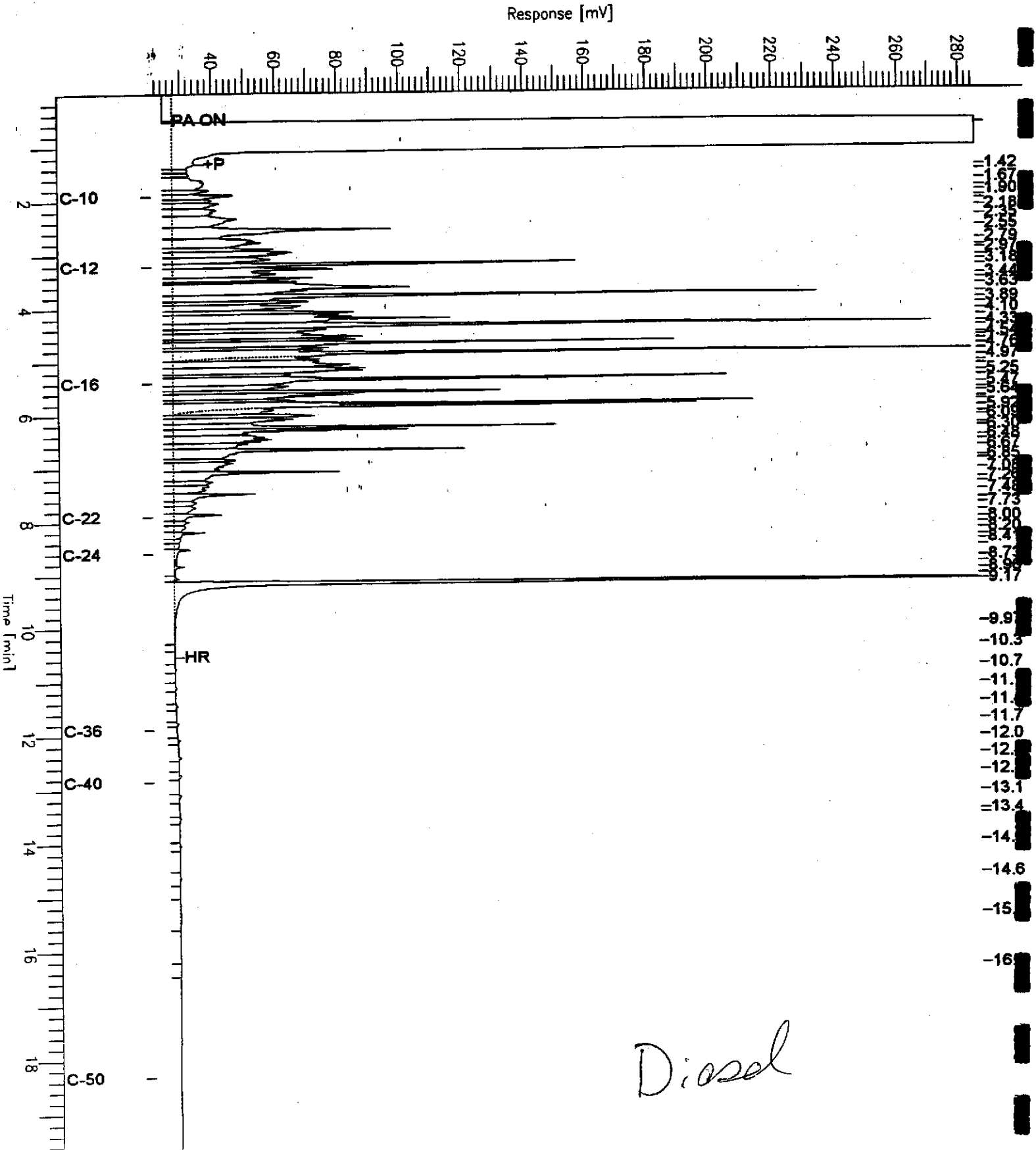
Sample Name : ccv_04ws0894_dsl
File Name : G:\GC17\CHA\172A002.RAW
Method : ATEH168.MTH
Injection Time : 0.01 min
Gain Factor : 0.0

End Time : 19.99 min
Plot Offset : 21 mV

Sample #: 500mg/L
Date : 6/20/04 01:43 PM
Time of Injection: 6/20/04 01:02 PM
Low Point : 20.88 mV
Plot Scale: 264.2 mV

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High Point : 285.08 mV





Total Extractable Hydrocarbons

Lab #: 172914	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Prep: EPA 3520C
Project#: STANDARD	Analysis: EPA 8015B
Matrix: Water	Sampled: 06/17/04
Units: ug/L	Received: 06/17/04
Concn Fac: 1.000	

Field ID: MW-5	Batch#: 92107
Type: SAMPLE	Prepared: 06/19/04
Lab ID: 172914-009	Analyzed: 06/21/04

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	95	53-142

Type: BLANK	Prepared: 06/18/04
Lab ID: QC254718	Analyzed: 06/20/04
Batch#: 92093	Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	85	53-142

Type: BLANK	Prepared: 06/19/04
Lab ID: QC254772	Analyzed: 06/20/04
Batch#: 92107	Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	106	53-142

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

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	172914	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	STANDARD	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	92093
Units:	ug/L	Prepared:	06/18/04
Diln Fac:	1.000	Analyzed:	06/20/04

Type: BS Cleanup Method: EPA 3630C
 Lab ID: QC254719

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	1,858	74	57-128
Surrogate	%REC	Limits		
Hexacosane	80	53-142		

Type: BSD Cleanup Method: EPA 3630C
 Lab ID: QC254720

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,007	80	57-128	8	38
Surrogate	%REC	Limits				
Hexacosane	91	53-142				

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	172914	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	STANDARD	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	92107
Units:	ug/L	Prepared:	06/19/04
Diln Fac:	1.000	Analyzed:	06/20/04

Type: BS Cleanup Method: EPA 3630C
 Job ID: QC254773

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,417	97	57-128
Surrogate	%REC	Limits		
Hexacosane	107	53-142		

Type: BSD Cleanup Method: EPA 3630C
 Job ID: QC254774

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,767	111	57-128	14	38
Surrogate	%REC	Limits				
Hexacosane	121	53-142				



Nitrate Nitrogen

Lab #: 172914	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Analysis: EPA 300.0
Project#: STANDARD	
Analyte: Nitrogen, Nitrate	Batch#: 92054
Matrix: Water	Sampled: 06/17/04
Units: mg/L	Received: 06/17/04
Diln Fac: 1.000	

Field ID	Type	Lab ID	Result	RL	Analyzed
MW-11	SAMPLE	172914-002	ND	0.05	06/18/04
MW-7	SAMPLE	172914-003	ND	0.05	06/18/04
MW-9	SAMPLE	172914-004	ND	0.05	06/18/04
MW-8	SAMPLE	172914-005	ND	0.05	06/18/04
MW-10	SAMPLE	172914-007	ND	0.05	06/18/04
MW-4	SAMPLE	172914-008	0.33	0.05	06/18/04
MW-3	SAMPLE	172914-010	ND	0.05	06/18/04
	BLANK	QC254559	ND	0.05	06/17/04

Sulfate

Lab #: 172914	Location: Redwood Regional Park
Client: Stellar Environmental Solutions	Analysis: EPA 300.0
Project#: STANDARD	
Analyte: Sulfate	Batch#: 92054
Matrix: Water	Sampled: 06/17/04
Units: mg/L	Received: 06/17/04

Field ID	Type	Lab ID	Result	RL	Diln Fac	Analyzed
MW-11	SAMPLE	172914-002	7.5	0.50	1.000	06/18/04
MW-7	SAMPLE	172914-003	1.4	0.50	1.000	06/18/04
MW-9	SAMPLE	172914-004	66	5.0	10.00	06/18/04
MW-8	SAMPLE	172914-005	61	5.0	10.00	06/18/04
MW-10	SAMPLE	172914-007	62	5.0	10.00	06/18/04
MW-4	SAMPLE	172914-008	55	5.0	10.00	06/18/04
MW-3	SAMPLE	172914-010	37	0.50	1.000	06/18/04
	BLANK	QC254559	ND	0.50	1.000	06/17/04

Batch QC Report

Nitrate Nitrogen

Lab #:	172914	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Analysis:	EPA 300.0
Project#:	STANDARD		
Analyte:	Nitrogen, Nitrate	Batch#:	92054
Field ID:	ZZZZZZZZZZ	Sampled:	06/16/04
MSS Lab ID:	172904-011	Received:	06/16/04
Matrix:	Water	Analyzed:	06/17/04
Units:	mg/L		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limite	RPD	Lim Diff	Fac
BS	QC254560		1.000	0.9640	96	80-120			1.000
BSD	QC254561		1.000	0.9271	93	80-120	4	20	1.000
MS	QC254562	<0.01100	5.000	4.724	94	80-120			10.00
MSD	QC254563		5.000	4.752	95	80-120	1	20	10.00

Batch QC Report

Sulfate

Lab #:	172914	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Analysis:	EPA 300.0
Project#:	STANDARD		

Analyte:	Sulfate	Batch#:	92054
Field ID:	ZZZZZZZZZZ	Sampled:	06/16/04
MSS Lab ID:	172904-011	Received:	06/16/04
Matrix:	Water	Analyzed:	06/17/04
Units:	mg/L		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lin	Diln	Pac
S	QC254560		10.00	9.816	98	80-120				1.000
SD	QC254561		10.00	9.380	94	80-120	5	20		1.000
MS	QC254562	1.051	50.00	49.24	96	80-120				10.00
SD	QC254563		50.00	49.53	97	80-120	1	20		10.00

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	29.6	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	31.4	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	23.0
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	18.0
30	Jun-04	< 50	< 50	0.75	< 0.5	< 0.5	< 0.5	< 0.5	15.0

Well MW-4									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Nov-94	2,600	230	120	4.8	150	88	363	NA
2	Feb-95	11,000	330	420	17	440	460	1,337	NA
3	May-95	7,200	440	300	13	390	330	1,033	NA
4	Aug-95	1,800	240	65	6.8	89	67	227	NA
5	May-96	1,100	140	51	< 0.5	< 0.5	47	98	NA
6	Aug-96	3,700	120	63	2.0	200	144	409	NA
7	Dec-96	2,700	240	19	< 0.5	130	93	242	NA
8	Feb-97	3,300	< 50	120	1.0	150	103	374	NA
9	May-97	490	< 50	2.6	6.7	6.4	6.7	22	NA
10	Aug-97	1,900	150	8.6	3.5	78	53	143	NA
11	Dec-97	1,000	84	4.6	2.7	61	54	123	NA
12	Feb-98	5,300	340	110	24	320	402	856	NA
13	Sep-98	1,800	< 50	8.9	< 0.5	68	27	104	23
14	Apr-99	2,900	710	61	1.2	120	80	263	32
15	Dec-99	1,000	430	4.0	2.0	26	14	45.9	< 2.0
16	Sep-00	570	380	< 0.5	< 0.5	16	4.1	20.1	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

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

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

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

Well MW-8									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Jan-01	14,000	1,800	430	17	360	1230	2,037	96
2	Apr-01	11,000	3,200	320	13	560	1,163	2,056	42
3	Aug-01	9,600	3,200	130	14	470	463	1,077	14
4	Dec-01	3,500	950	69	2.4	310	431	812	< 4.0
5	Mar-02	14,000	3,800	650	17	1,200	1,510	3,377	240
6	Jun-02	2,900	1,100	70	2.0	170	148	390	19
7	Sep-02	1,000	420	22	< 0.5	64	50	136	< 2.0
8	Dec-02	3,300	290	67	< 0.5	190	203	460	< 2.0
9	Mar-03	13,000	3,500	610	12	1,100	958	2,680	< 10
10	Jun-03	7,900	2,200	370	7.4	620	562	1,559	< 4.0
11	Sep-03	3,600	400	120	3.3	300	221	644	< 2.0
12	Dec-03	485	100	19	1.5	26	36	83	< 5.0
13	Mar-04	16,000	900	592	24	1,060	1,870	3,546	90
14	Jun-04	5,900	990	260	9.9	460	390	1,120	< 10

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	99.2	1,069	< 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
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

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

**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

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

NA = Not Analyzed for this constituent

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

**Summary of Historical Grab-Groundwater Sample Analytical Results
Redwood Regional Park Service Yard - Oakland, California
(all concentrations in µg/L)**

Sample I.D.	TVHg	TEHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
<i>Exploratory Borehole Samples – September and October 1993</i>							
B10-GW	< 0.05	0.57	< 0.001	< 0.001	< 0.001	< 0.001	NA
B11-GW	1.4	1.3	0.016	0.042	0.033	0.17	NA
B13-GW	810	2,300	12	18	22	73	NA
B14-GW	19	4.5	0.03	< 0.01	0.35	0.85	NA
B15-GW	16	99	0.02	< 0.01	0.33	0.81	NA
<i>Exploratory Borehole Samples - April 1999</i>							
HP-01-GW	1,300	850	< 0.5	< 0.5	< 0.5	0.67	< 2
HP-02-GW	31,000	270,000	760	12	1,100	833	260
HP-03-GW	3,700	1,400 (a)	25	0.71	130	40.5	31
HP-04-GW	67	< 50	< 0.5	< 0.5	< 0.5	< 0.5	15
HP-05-GW	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	18
HP-06-GW	54,000	16,000	830	< 13	2,800	11,000	190
HP-07-GW	42,000	15,000	750	49	2,500	5,290	230
HP-08-GW	13,000	1,900	150	5.4	570	931	120
HP-09-GW	40,000	6,700	1,700	110	2,100	6,890	200
HP-10-GW	23,000	8,400	53	3.2	600	928	57
HP-11-GW	2,000	440	30	0.85	92	53.3	31
<i>Exploratory Borehole Samples – September 2003</i>							
BH-16-GW	35	35	0.01	0.22	0.19	0.98	<0.035
BH-20-GW	<3.0	1.5	<0.005	<0.005	<0.005	<0.015	<0.035
<i>Redwood Creek Creekbank Borehole Samples – May 2004</i>							
CB-1-GW	22,000	20,000	1,400	< 5.0	2,100	210	910
CB-2-GW	54,000	130,000	300	< 10	650	104	120
CB-3-GW	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	< 2.0
CB-4-GW	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	< 2.0

Notes:

TVHg = Total volatile hydrocarbons – gasoline range

TEHd = Total petroleum hydrocarbons – diesel range

NA = Not Analyzed for this constituent